‘Diagnosis of the diagnosis’: Spheres of action in pedagogical diagnosis with reference to the pedagogical translation of a disciplinary collaboration between Medicine, Psychology and Educational Science.

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Preliminary remarks

The author of this doctoral thesis has decided to begin with a question that conveys the contents of the diagnosis concept in pedagogy: to what extent can different ways of thinking be aligned within the reality of education at the same time to respect their particularities? Many other questions that respect the basis of scientific work proceed from this question. The development of an own disciplinary language can bear the restriction of not organising the events in history if it has only one reference: the proper. The proposal regarding the attitudes of collaboration is what allows within the theoretical construction the conformation of a system that facilitates discussion of a reality of education composed by different traditions. Such a system upholds a theoretical and historical organisation in which an organisation follows according to the terms of the own tradition. Over the course of the work, I will propose models, and their associated assumptions, to shape the discussion of the attitudes involved in order to present a structure that maintains a system. According to the presentation of a structure, I am detecting a moment where a commonality relies on calling to synthetic constructs; however, how can opinions relating to such constructs find consensus? Seeking to answer a question about how synthetic constructs can be a priori in relation to the means, this thesis simultaneously deals with how *means* present synthetic constructs.

One intent of the work was to collect contributions from different writings of the author, allowing the third or fourth chapter to be read separately from the other chapters. Nevertheless, the writing reflects a multi-layered character connected to the complexity of education that exerts movement from the introduction to the last chapter. An indication for understanding the connection between synthetic constructs and means is based on the procedures specifically related to concept analyses in this study. After carrying out analyses of thinking, I present means such as diagnosis, disease, time and the individual self at a place of transformation. Together with the influence that the person is changeable, the reality of education can equally discuss how the object of educational science is constituted. In connection with the latter, in describing theoretical leaps from hermeneutics to other theories of pedagogy, I show the efforts to define and implement pedagogical definitions as the pedagogical action. In this way, this work is part of the development of theory stemming from educational science that can help in reviewing contents in other traditions such as those in psychology and medicine. These contents are drawn strictly from epistemology in relation to educational science and pedagogy.

Changes, developments and stages in science have been painstakingly reviewed. In my work, I propose the intention to unify opinions at a time of scientific progress to represent a period before re-entering the study of the environment – I refer to the period that touches on the pause of the pedagogical translation explained in the work. The intelligible world uses products like my work where a deep reflection of understanding can be uncovered and recognised to surround that which is daily encountered. In this context, I detect a pedagogical epistemology whose pedagogical intention is not to collect and discuss opinions on the problem before new generations are formed but to explain a reality – the reality of education – on the basis of communalities that can achieve a renaissance of science.

Using the theory regarding pedagogical complexity written by my Doktorvater Prof. Dr. phil. Elmar Anhalt (2012), I detect, upon the spoken problematisation of the reality of education, the involvement of a disciplinary collaboration in the definition of a pedagogical object. In laying the foundation to my research process I retrieved many writings discussing the theoretical composition of the educational object associated with disciplinary collaboration, but almost none spanned the collision of disciplines to explain the reality of education. As a meritorious doctoral research approach, the topics of reality of education, disciplinary collaboration, pedagogical object and diagnosis concept have not yet found a harmonious blend. Based on this latter problem, I took the diagnosis concept as an entry point for a network of ideas that could arise from a theoretical observation, a proposal and an initial point.

The concept of diagnosis allows an entry into the ongoing scientific systematisation in which pedagogy is involved. As is customary, I am writing the preface after having double-checked all the work and before submitting the final version of the manuscript to my alma mater, the University of Bern. Thus, directly calling on the support of my initial suppositions, from the findings of this research, a suggestion comes about to establish the relationship between the meanings of the concepts of diagnosis and recognition for displaying the phenomenological treatment required by the pedagogical object of study – throughout the work, I will elaborate the phenomenology of the educational object, which was a finding in addition to a reference that permeated the development of the descriptions. This latter type of examination is an option that helps in understanding the complexity that exists in the process of educational research. The reality of education shows its importance in the scientific world by associating itself with the idea of a general reality in which society and science are involved. The existing literature refers to the exchange of methods and the associated difficulties, such as the problems of translation coming and going between different ways of thinking. Nevertheless, assumptions about a single reality seem to encompass only one direction of action. This thesis problematises arguments that suggest explanations of the basic considerations within the structure of a system, which can present the reality of education in science. The presentation of a system does not aim at a complete, explicative portrayal of a reality of education – rather at a discussion of how contents of theoretical traditions can be used in the training of young researchers.

By thinking about the influence that can be exerted on another person, I point to the intention that can be taken from educational science to discuss what is done in the scientific realm, which is immersed in the collaboration of opinions, including those coming from society. Thus, I approach the concept of diagnosis in the encounter of foundational principles from different disciplines. With reference to historical examples, the individual is taken out of the interest to support the own potential as a person in order to speak about the recognition of alternatives. In order to remain part of the composition of a pedagogical appraisal, pedagogical action pursues the above intention, which must be linked to various theories. For the sake of proposing a systematisation of disciplinary collaboration, the practical deed is explained therefore on the basis of the pedagogical action as outlined in pedagogical theory. The connection between diagnosis concept and pedagogical action is to be considered by leaving the option to observe the individual from a self-reliant action (based on the fact that the individual is affected by own decisions or at the same time by those made by experts and counterparts). The

responsibility with regard to Bildsamkeit that each person bears for their own well-being should not be taken for granted. The problem deserving scientific status in the consideration of an individual requires a research problem in connection with human dignity according to freedom, thus the presentation of a procedure regarding the health of the individual. Concrete recommendations that can talk about what an individual transformation process is and how this process influences a personal condition are problematised by the opinion that comes from a position of experts and specialists that cannot be included without analysing the beliefs about how they are deemed to be. To this end, I present in my analysis logical order based on speculations about models from the results of the analysis of concepts and the analysis of the meaning of concepts. Some constructs from the analysis process will therefore result from models of collaboration, specialisation and unity. Two directions associated with the analyses, concepts and models form a loop downstream of the circle of problem development, upon which I discuss educational reality in terms of the disciplinary collaboration and phenomenology of synthetic constructs. In this context, I present a structure that can support the potential of a person's state recognition when it comes to personal accountability, such as the pedagogical diagnosis that speaks about the diagnosis of the diagnosis in the sense of knowledge theory. As the pedagogical diagnosis should not be confused with the pedagogical diagnostic, I recall the distinction on this point that must be kept in mind.

Accordingly, the diagnosis of the diagnosis also refers to the analysis of a diagnostic procedure with reference to the knowledge theory of educational science. By considering the diagnosis concept from a speculative approach, the diagnosis of the diagnosis provides an overview of a course of action. Such an approach involves the intersubjectivity of a person associated with a society. Throughout the manuscript, I set forth arguments about how interactive participation in society can be pedagogically achieved. The participation of the society leads to the dissemination of scientific information that can contribute to collective decision-making through the development of healthcare strategies and self-regulatory programmes. With regard to the description of means in analyses of related actions, I suggest taking a look at synthetic constructs such as recognition that connect the self and the other. The condition of the other is linked to a philosophical argumentation since it cannot be defined with the help of one only discipline. In this way, the recognition of the state of the other, as mentioned several times throughout the thesis, aims at the basis of the discussion of arguments and not at determining what must be disclosed about the status of the other. I therefore propose the reality of education based on educational science as the choice to be used to open the arena of inter- and exchange of information encompassed by several disciplines. The exchange of information between disciplines is not only useful but also necessary in times of scientific democratisation in order to compose understandable research approaches. The notion of 'spheres of action' speaks consequently of the scope of extension between the disciplines that can be discussed in the reality of education.

The aforementioned scope of extension from disciplines or 'spheres of action' also functions as a surface for the placement of guide walls, whereby concepts as entry points develop further theoretical compositions and assumptions to explain realities. Notwithstanding, the reference to realities from other traditions can be explained by the educational reality; the scope of extension is to be expanded by other scientific traditions outside the pedagogical field as well. A present structure of explanatory compositions

shows that humanity is independent of the elaboration of what comes next. I do not argue that humanity has no influence on other processes, but that the simultaneous observation of two or more subject-matters requires a structure that can incorporate their independent character – including also the independent place of humanity. I have established the detachment from what refers to the independence of dependence on the person as a basis to involve disciplines in the education of future generations (i.e. due to actions related to Bildsamkeit and Bildung). With reference to the debate on the realities that are conducted in parallel to concrete actions during a procedure, I note that the educational theory development sets out its position on the problematisation of the individual within the bounds of reliable actions by persons. The idea of disciplinary boundaries as means and from means is one area where I formulate an option for speculation about a reality of education from manifest attitudes, taking into account the analysis of the constantly spoken construction of theory. Such boundaries can be considered, for example, from disciplinary limits or from constraints in the description of a subject-matter. As a preamble, the work is therefore based on pedagogical concepts that must be brought to mind in order to put the reality of education into practice and preserve it in the future.

Summary

This dissertation reflects an application of the theory of complexity of education composed by Elmar Anhalt (2012). The thesis is divided into seven parts: four main chapters, an introduction and two chapters containing closing arguments. The introduction provides information about the research approach. Within the introduction, an initial reference outlines why different disciplines should talk to each other when trying to define the pedagogical object. An important warning attached to the manuscript is that I write according to a temporality that is contingent upon different moments of the manuscript.

Attention is accordingly drawn to the definition of the object in pedagogy with a focus on the theory development of educational science within the reality of education. I work from the assumption that the object of pedagogy is tied to a moral constitution in order to explore the formulation of a current state of research starting from the theoretical framework. So I begin by retrieving from the theory the proposal of a space in which knowledge can be constructed and in which pedagogical objects encounter opinions from other perspectives. I therefore describe the links between pedagogy and the environment and other disciplines, stressing that pedagogy is not medicine; neither is psychology the same as pedagogy. These latter disciplines are selected from the joint work involving the opening of a clinic of the nervous system at a medical faculty and the implementation of a postgraduate programme. Disciplines are independent and based on their own theoretical traditions. For this work, theoretical constructions from related disciplines are used to obtain explanations that favour a moment of encounter – because as I continue to mention, the definition of the pedagogical object within the reality of education concerns scientific development.

Pedagogically, I thus explain how this convergence can be arranged as ‘spheres of action’ that can be linked to intentions and tasks. In order to describe a task from the meeting of the concerned perspectives, I identified access points from disciplines in the area of health that problematise how the pedagogical object relates to a synthetic construct. Consequently, in the first chapter concerning the theoretical framework, I state that ‘spheres of action’ and ‘principles of reality’ can explain disciplinary collaboration on the grounds of what constitutes an individual. From my proposal, as the reader will see, in the way I have moved on through the inquiry, I have written a monograph of a new text that is intended to create a structure based in models that exert elaboration from other epistemologies.

The theoretical framework in this project draws on how arguments are built from a historical-pedagogical reconstruction. The theoretical framework has the challenge of presenting a background that is constantly evolving and linked to ongoing options. As such, the spoken background is localised in the assignment of synthetic constructs. In the organisation of matters regarding references from disciplines, objects of study and reality of education, I started with pedagogy, which has a place in the reality of education, where more than one synthetic construct is being dealt with. I presented the spoken organisation with the help of a historical narrative presented in literary form. I used this literary style due to their feasibility to collect the past, present and future coherently and to overcome the challenge of consistently recalling the theoretical use of

Bildsamkeit and the process of Bildung in pedagogical reappraisal. The attempt to draw a coherent construction from synthetic constructs at the moment when the rules of logic are defined within the pause for thought requires the reader to apply the theoretical experiences previously gained in professional formation. Since this work aims to support a medical study programme and the exchange of content between physicians, psychologists and pedagogues, synthetic constructs like 'disease' are a point of discussion. To this end, I have sought to introduce synthetic constructs that can function as a common reference to other concepts, such as 'diagnosis' to 'Bildung' and 'recognition' to 'translation', in order to discuss what constitutes an individual within the reality of education. Accordingly, the individual is addressed in the theoretical framework and considered for the research design.

The second chapter speaks from the current state of research about the reality of education for problematising this reality with the meeting of perspectives. Focusing on a subject-matter as a diagnosis from a pedagogical viewpoint reveals that scientists presented as experts have attitudes concerning scientific positions such as integration, specialisation or collaboration. I present these latter positions with the aim of speculating on a systematisation of the reality of education based on the development of independent places of disciplines – including the own pedagogical independent place.

From a normative point of view, in the reality of education, the concept of diagnosis reveals – in relation to independent disciplines – discussions whereby a concept can mistakenly be reduced to a process or a process to an action or a concept to a procedure (in the chapters I have written, I have shown how processes cannot be reduced, and therefore, I call this very last explanation an error). Namely, 'diagnosis' in pedagogy has been restricted to the diagnostic procedure in which a qualification is awarded to a person. Can the potential of a person be measured against a qualification? Due to the gap between normative, descriptive, explanatory and speculative stages (Westmeyer 1972) in the theoretical construction of diagnosis, the last question requires a basis for a person's potential. In this sense, 'diagnostic', when it has its basis in by a theory with more potential than the application of a procedure, can be approached as a concept closer to diagnosis and not to the description of one stage in the recognition of a person's condition. I point out that a person's potential has a pedagogical reference through the German construct 'Bildsamkeit'. By and large, Bildsamkeit guides the basis and direction that is taken on as well as from individual paths. In other words, considering that individual paths have been ignored in some disciplines, or that disciplines can evaluate what the individual is without related analyses, questions from the individual's faculty of progress can be joined to the participation between areas.

The marker of my work that facilitates following this latter idea is the recognition of different epistemologies when they coincide at one point and when that point reflects controversies about a person's freedom. For example, this might involve freedom in relation to the point at which it is taken into account – or not. Controversies regarding connections between disciplines may be rejected or treated as restrictions and kept within the boundaries of disciplines. By continuing the organisation of the complex situation and a complex subject-matter, the differences involved in the environment have so far marked reformulations of ideas that can be disruptive. For example, the question of a foundational concept that portrays a controversy at the situational level yanks out the order in which a concept must be considered in its entirety. Within the theoretical

framework, by locating the diagnostic procedure under the analysis of the situation wherein it takes place, I confirm from diagnostic the concept that accompanies the diagnosis as the intention underlying the corresponding actions. In this way, and after carrying out an analysis in relation to the diagnostic, the diagnostic as a procedure is associated with the diagnosis concept which exerts argumentation in epistemology where the educational theory was not sufficiently taken into account. The diagnostic procedure requires a verifiable concept, namely the diagnosis that must be spoken in the pedagogical field. For this reason, the connections between situation and subject-matter must be reviewed, such as questions in two or more directions: Can the individual be restricted by the environment? Can the individual restrict the environment? How do the boundaries of the environment explain the limiting of the potential of the individual? How do the breakthroughs from the individual appear in a confined environment? Does the potential of the individual have a limit? If so, how is a restriction built up with a view to further growth? Through speculation about the integration of the diagnosis concept into pedagogy, the state of the art of pedagogical diagnosis refers to stages of theory formation that need to be sorted out (in order to conform a structure that can later speak about the state-of-the-art pedagogical diagnosis after it is possible to recognise and use the diagnosis concept in pedagogical theory). In this thesis, these stages will be directed to the entry-points, points of reference, points for possibilities and connecting-points for analysis as well as for further analyses, which will have a longer debate in epistemology. I engage with many constructs that at this moment comprise epistemological markers for the responsibility to pursue a pedagogically committed life in science. The diagnosis concept is the case in this work where theory construction is involved.

The third chapter reviews the concepts behind the current state of research to show how they relate to other theories and the participation of disciplines according to the historical register system. In the third chapter, as part of the conceptualisation of the research approach, methodological control is explained by way of the philosophical approach of educational science to clarify how second-order observation organises ‘collaborative purposes’ from the immersion of opinions. The idea of ‘collaborative purposes’ is tied to the collaboration of opinions, which requires a positioning of attitudes to the beliefs of the various immersed scientific cultures. This means that joint participation in common tasks, as they take place in the implementation of processes related to the diagnostic concept, leads to collaborative purposes. Clearly stated, diagnostic requires being analysed according to its integration with the diagnosis concept as was detected from the current state of research. At this stage of conceptualisation, the methods are thus established within the framework of opinion-forming. The integration of diagnostics into a broader consideration – as, for example, part of the recognition concept – has an alternative intention to the one established by medicine, since other disciplines, such as pedagogy, find the need to comment on how diagnostics has other implications from an epistemological point of view. In order to achieve one’s own disciplinary pedagogical language, a review of the pedagogical concepts refers to neighbouring concepts that show how disciplinary differences must be made clear in the requirement for disciplinary foundations. I refer to those disciplinary differences from the theoretical writings on disciplinary collaborations.

In the third chapter, from different epistemic cultures, I allude to a defined plurisdisciplinary collaboration to display the relationship between expert and non-

expert and to illustrate the ‘Bildsamkeit’ concept for connecting to the transformation process according to the theoretical analysis of pedagogical translation as a pause. In this pause and under the possibility of conceptualising it with reference to a concept, speculation places the diagnosis concept as a concept in pedagogy (i.e. as pedagogical diagnosis). In this way, the diagnosis relates to transformation that is explained in pedagogy from the potential of the individual regarding Bildung. The conceptualisation of the work suggests thinking about the individual additionally in contexts outside a specialised scope of action. In such a way, a transformation process presented in the diagnosis indicates that the individual calls on pedagogy or other disciplines to contribute their perspective and from their store of knowledge. The individual can be regarded as a person, patient or doctor as well as learner, teacher, expert or non-expert. Accordingly, an epistemological transfer is presented in the form of pedagogical translation and practical deed. The conceptualisation of a research approach allows the depiction of the directions of concepts in order to obtain cores of the result of an analysis. In this way, the concepts, following a methodological approach during conceptualisation, produce new outcomes at the place where they were originally conceived. Consequently, concepts can be redirected to ask a question about what sort of correlational thinking gave them origin. The correlative approach does not apply within a pedagogical approach when assessing the influence that the learner is changed from one side of an interaction between two people and with regard to the environment. I do not claim that the correlative approach cannot be explained by a mathematical procedure, but I do claim that pedagogy has philosophical reasons to ask what has been changed and for what purpose (an assertion that I have also observed in the medical tradition during the diagnostic procedure). In this sense, I point out that transformation is not about being possible – but about being certain. For the time being, I have pointed out the problem of certainty in my proposal of ‘certainty of phenomenology’.

Despite the borders from independent disciplines, the reality of education acknowledges different theoretical traditions. In this way, a pedagogical work with the proposal to systematise pluridisciplinarity accounts for other objects of study from their dynamics. In this respect, biological theory deals with synthetic constructs, such as disease, on the basis of which the alignment of positions unfolds an action that can be systematised. Pedagogy thus establishes a relation with biology that goes beyond a theoretical tradition rooted in organisms – in other words, a relation established by theoretical thinking. Pedagogy offers to draw from its philosophical background to discuss contents that belong to the a priori or to the a-posteriori notion of the world. As a case in point, the difference between neuronal and mental representations is employed to show discussions regarding related synthetic constructs. Nevertheless, the debate shows that this difference cannot be overcome by subjecting it to a monistic approach, especially when the debate extends to the participation of other perspectives.

In the fourth chapter, I present findings of the reality of education related to synthetic constructs. Pedagogical theory has a background in its own theoretical development that allows discussion of how a connection between concepts can be established, for example, by discussing how the pedagogical object can be defined. The pedagogical object receives a phenomenological treatment that is manifested in the realm of disciplinary collaboration through the conflict between a priori and experimental assumptions. For this reason, I address Hegel and some of the related controversies in

pedagogy that I covered in this fourth chapter. Moreover, disciplinary collaboration provides an environment for observing dependency and independence from constructs. Dependency and independence are questioned with regard to disciplinary borders and constraints that come from the object of study in relation to its own dynamic as a subject-matter.

As the fourth chapter proceeds, I confirmed that contents that come from natural sciences are portable to wider situations with other alternatives. I set out to explain this possibility by rendering accountability to the place of the individual that appears in every theory development. The individual as a producer of artefacts bears the responsibility for what is done in the environment; any theorisation must involve the individual by taking care not to confuse what belongs to the individual and what belongs to the observations. This discussion deserves attention based on the theoretical level at which it takes place and the references it contains. The consideration of the individual is not the ultimate solution proposed by educational science but rather the starting point for connecting synthetic constructs with the changes that take place over time. The permanent changes thus signal a situation described in an educational reality, in which dependent and independent characteristics of positions emerge in order to obtain an orientation towards what is spoken and which governs dealing with content. Such a content of educational realities leads to problematising how the orientation shall be dealt with. Therefore, unceasing updating of the experts is imperative. The reality of education is not definite, and it appears to be actively intertwined with dynamic constructs.

In return, the object of educational science can be stated from its phenomenology (Nicolin 1955). Spheres of action, as described in the theoretical framework, appear on the basis of models by placing the concept of recognition as an umbrella linking other pedagogical concepts. Thus far, the notion of ‘recognising’ cannot be possible without gathering different opinions and moments within one action at the same time. Consequently, these contents of the action must be explained by a system. The fourth chapter reveals how the action can be independent from its manifestation, calling in this way to one phenomenological state related to diagnosis.

In the fifth chapter, the pedagogical translation is presented as one outcome of the thesis. I take the illustration of a person as a patient who suffers to point out a non-interchangeable theoretical intention. Acknowledging that – despite references to disciplinary content – this thesis discusses theoretical compositions related to the educational object associated with the reality of education, the organisation of some concepts is by necessity established only for purposes of disclosure. Otherwise, the formulation of statements by dealing with synthetic constructs could lead to a fracturable circle of ambivalent propositions.

I have chosen the concept of pedagogical translation to point to a concrete contribution of the work since some absolute statements are related to what the figure of the individual undergoes without hesitation. For example, the transformation of the individual can be confirmed without initiating the misalignment of the theory that supports an individual transformation. In order to avoid a misalignment, such transformation must be considered by way of a second order observation. Second-order observation has so far been part of a procedure, but in itself, it provides an option for alternatives with a third place of composition. In this respect, theoretical rules should be

taken into account in order not to prolong a false exchange of untrue premises. The third place of composition is not to be confused with spheres of action, although spheres of action and third place of composition may relate to each other.

Based on the pedagogical translations exposed during this work regarding the diagnosis concept (i.e. the processes of transformation related to the concepts analyses considered over the course of this thesis, especially in the case of this last written statement on the diagnosis concept), the absence of specific theories can be associated with 'imaginary certainty'. I propose to present the construct of 'certainty' with regard to the complexity of Bildung as written by Rucker (2014), in order to support and pursue congruence with the aforementioned notion of 'certainty of phenomenology'. The adjective 'imaginary' in this context should be self-explanatory after being acquainted with the current thesis and the work of Rucker (ibid) in relation to the theory of complexity of education (Anhalt 2012). Due to the description of subject-matters according to the relationship with the environment, when the environment is also presented as open, uncertain and irreducible to planning and governance problems, the 'imaginary certainty' releases alternatives for 'connecting points' (ibid) during theory construction in the theory of complexity of education (ibid). Against the background that the diagnosis concept has not yet become incorporated into pedagogy, the notions of recognition offer the link to foundations through practical action in disciplinary collaboration (i.e. in completely general terms, actions that are scientifically systematised but that consider the relation between the self and the world since the concerted system refers to a systematisation of pedagogical constructs from other disciplines or to those with influence from other disciplines).

In the sixth chapter, regarding findings, I wrote that a task arising from diagnosis in pedagogy is counterintuitive within any pedagogical approach by taking a clear position on working on the own pedagogical language. At the end of the sixth chapter, I mention in the ancillary analyses how emphasis was placed on the development of the work according to the bearing capacity of the concepts mentioned. The diagnosis concept comes about through a connection with medical practice, without pointing out that many of the analytical concepts with which the diagnosis concept is linked originate from epistemological thinking. As a result, my proposal for pedagogical epistemology regarding the diagnosis concept deserves attention.

Accountability on the reader's part and additional definitions for subject-matters in other disciplines must be included for the definition of collaborative directions. As I enounced in the last chapter, directions are not identical to purposes. Purpose as a synthetically constructed term includes the definition of possibilities. Along with the explanation regarding the problematisation of 'purpose', the first five chapters justify the discussion at the end of the work; unlike the second chapter, now after completion of the research, the conclusion provides confirmation that assumptions without 'purposes' have a short-term effect. Pedagogy proceeds from the principle that human freedom is the core that must be respected. For instance, the pedagogical translation that follows the epistemological point for the development of alternatives in the individual's surrounding world must be discussed in the form of 'pedagogical time'.

The sixth chapter concludes by mentioning the 'physicality of Bildsamkeit' to point to the hyper-specialisation of disciplinary content in the light of disciplinary collaboration

from assumptions about unity. While ‘physicality of Bildsamkeit’ does not attempt to confine the discussion of the potential of the individual to brain areas or states of physicality, it contains the purpose of conducting theoretical discussions. The exchange problem between dualities or between inner and outer worlds should be maintained to examine the theoretical foundations that support the register of relationships and how the natural sciences have benefited from the thinkers in the social sciences. Pedagogy is not a discipline to teach negotiation skills between disciplines, but negotiation skills improve through the ability to learn how to formulate better arguments. During construction of theories, statements about synthetic constructs are discussed using the logic field as a fundamental reference for the analysis of thought. Pedagogy related to collaborations and to theories of knowledge takes its part in the responsibility to recognise the potential of the person.

I present this ultimate summary with the usual proviso that the contents are deepened in the chapters. Hence, here follows an abstract that can serve as a reference when reading the contents of this dissertation:

In the attempt to define the pedagogical object by placing the means in the foreground as synthetic constructs, the reality of education reveals itself as a problem of collaboration between perspectives. I wrote about a disciplinary collaboration based on shared tasks related to a biological basis consisting of a synthetic construction. For this reason, a problem is presented that calls for locating a common concept that problematises theoretical traditions with different origins. In respect to this, the concept of consciousness problematises biological, psychological and pedagogical arguments that cannot be resolved by one experimental design. Therefore, I took reference from a conceptual design in which diagnosis is the common concept for discussing the reality of education and the pedagogical object. I present my research in the pedagogical area as it relates to the theory of the complexity of education (Anhalt 2012). I specifically targeted this theory because of its connection with theories of knowledge in science.

My psychological background has provided me understanding of knowledge theories from the proximity of philosophy of science. I understood that such proximity included knowledge theories in pedagogy. Philosophy of science, however, encompasses a broad extension of specificity across the spectrum of disciplines. The broadening of philosophy of science seems necessary since the participation of society at the beginning of the third millennium must be included in the democratisation of opinions. Thus, from a theoretical basis, the plurality of opinions leads to the idea of designing a system. Throughout the chapters, I develop the definition of what I call a ‘concerted system’. In a nutshell, this means that from the initial point of this thesis to the ongoing description of concepts, the plurality of opinions must be seen as the basis for dealing with disciplinary collaboration according to a definition of pluridisciplinarity.

A concerted system is marked by an iterative structure. The assembly of a system that considers its own iterative structure provides for its redundancy on the basis of contingency since its contents are oriented towards specialisation with simultaneous integration. In this respect, the question arises as to how specialised contents can be linked to unity while maintaining a democratic stance. Any possible answer to this last question demands collaboration. In particular, the definition of ‘collaboration’ calls for

complex relationships, since the noun form collaboration implies at least one other definition with unforeseeable directions.

The latter open definition refers to the affected parts that I work from the theory. Thanks to the theory of complexity of education written by my doctoral adviser, I was able to locate, develop and hypothesise the theoretical parts concerning ‘tasks’, ‘observational points’, ‘indications, symptoms, disease and pedagogical translation’ as interpretations in which a process of individual transformation takes place. All taken together help to clarify how diagnosing counts on a pedagogical basis, especially all the theoretical parts, as mentioned, from the concepts ‘search for orientation’, ‘connecting-points’, ‘distinctions’ ‘reality of education’ and ‘educational object’ – those that go beyond an organisation of differences, but have to do with simple, complicated and complex characteristics. Taking into account one of the concepts mentioned above and proposed by this thesis, for example, pedagogical translation with a view to the search for orientation: since pedagogical translation hinges on the individual process of transforming scientific content into emerging possibilities, the notion of certainty with respect to a dynamic subject-matter is at stake when questioning the individual in relation to practice and synthetic constructs. Thus far, certainty has been assured by the exchange of various methods on a synthetic basis. At the same time, certainty can be presented under the open horizon of science.

Contents

Introduction: Diagnosis concept identified by educational science for working on a disciplinary collaboration

The diagnosis concept as a dynamic subject-matter fulfils the requirements for becoming part of an epistemological agenda for the pedagogy of the twenty-first century. Pedagogical diagnosis is not a defined concept in pedagogy. Ultimately, it is not a recognised category or one that can yet be integrated in the pedagogical realm. With this writing, I awaken discussions about registers that can explain why this is so. I take reference to more than one author, whose writings can appear distant from pedagogical reflections.[1] However, with awareness of the challenge this represents, I foresee connecting with certain disciplines and their representatives to compose together an opinion upon matters of recognising another person within a disciplinary collaboration that portrays a plurality of opinions. By seeking to develop an epistemological agenda of disciplinary collaboration, pedagogical diagnosis as an axis of discussion aims to consider the evolution of thinking and pedagogical thinking over time. Hence, it cannot escape presenting a position of authors that can be put to the task of speaking together to discuss the importance of the individual within a context [such a task calls for the self-determination of the authors who write on the topic, but also of the experts who read new information, and of the non-experts who think about recommendations]. These called-upon authors would give notice from different angles of an object of study. For my part, by sustaining some dynamics from a complex subject-matter of philosophical-pedagogical thinking that is interrelated with the world, I will try to show that regarding the knowledge-theory of educational science, the reality of education supports a collaborative position within science. This work meets the challenge of providing reason from a speculative position to what the discussion of logic in the beginning of the twentieth century showed clearly, that empiricism, positivism and the language of supposed facts should no longer be the only reference to one problem. This thesis not only points to a research question, but also opens a discussion.

There is no doubt that a general reality happens, but if doubt could exist, so could a whole composition about how this happening is possible – especially when, in a pedagogical theoretical construction, the voice of the society is to be included. In conjunction, questions arise about how recognising this reality takes place. This work is about discussing the reality of education regarding to the theory construction.[2] Not only the selection of methods for reading this reality but the *dynamic of specific objects of study* raise topical realities (see Rucker and Anhalt 2017, Rucker 2014a, Anhalt 2012). In terms of contemplation, registering a description, experimentation and transmission of this reality, the not simplistic explanation of ‘one to one’ must be taken into

[1] I am convinced that educational science possesses the structure and tools with which knowledge from other traditions can be understood for including within the pedagogical reflections a composition of what the reality of education means in the twenty-first century. A proposal from this work to explain the reality of education is developed during the first three chapters. In the fourth chapter, I seek to make the proposal concrete by discussing the application of models to the concept of recognition. The proposal of models is yielded as an outcome to be concluded and discussed in the last two chapters of this book.

[2] The reality of education relies on questioning its own existence, namely on participating in its own construction. Throughout the contents of the chapters, I seek to establish a basis for this proper contribution by means of a synthetic construct such as diagnosis.

consideration, meaning that a researcher must go beyond the explanation of one element merely belonging to another.[3] Such elucidation must have existed only in stories for children, although the perception of childhood is changing at this moment. In this same vein, not only childhood but also the presentation of the world itself have revealed many parts that create a common and individual reality. Bearing a similarity to human freedom and considering the studies of the philosophy of science, pedagogy draws collaborations up to meet scientific relevance and based upon the wreckage of the history of certainty. Founded on the cornerstone of how to decide how to grant recognition to another person, an analysis on a second observation starts here in problematising in what place and how the diagnosis concept can be localised in the pedagogical framework. With the presentation of dynamic concepts and impasses in positions, scientists in pedagogy can conform specialised teams for spreading the pedagogical language of complexity within several topics in research and society.

In a context of granting recognition to another person, the 'really real' (Geertz in Knorr-Cetina 2003, p. 251)[4] can be an example to be problematised under an encounter of dynamics.[5] Can a notion of reality hold a pedagogical subject-matter? If it does, how does it do so? And to which one this refers to? What form would the organisation of this 'really real' take? Anhalt (2012) and Rucker (2014) have problematised the object of pedagogy in terms of 'perspectivity and dynamic' (e.g. Rucker and Anhalt 2017) according to the complexity of the situation and the complexity of the subject-matter. Now, I offer that, based on concepts, models can be created to facilitate ascertaining facts (in this work, assumptions regarding attitudes). This extends in the development of alternatives and imagined worlds, or possible worlds, in the transmission of knowledge through disciplines. In the case of this work, specifically through the framework of

[3] Similar to the effort that Jean Piaget (1970) achieved by problematising ages and stages of children that can process 'a number' as a *synthesis of class inclusion and relationships of order* (ibid, p. 38), I seek to discuss theoretical constructions. Piaget (ibid) made clear that children represent a stage of development. Perhaps based on this first note, I need to apologise for my immediate next analogy in which I use the notion of children as a rhetorical resource within offenceless and harmless stories.

[4] This work puts together authors and positions from different traditions such that their understanding might contradict each other. I am explaining my assumption throughout the whole work, inviting the reader to search for an own reference on deeper contemplation of the mentioned texts [see, for example, some discussions between Carnap and Wittgenstein and Schlick in Wagner 2009]. To this extent, any contradiction among authors should be read from the paradox of a synthetic constructs itself. Thus, beyond presenting a contradiction, I seek to access from connecting points in several writings that point to the discussion about what contents of knowledge are and how these can be presented in a contemporary context. Like this, the writings of authors referred to and quoted within this text seek to connect with ideas related to each other in order to provide orientation to the reflections that this thesis pursues: theory construction based on subject-matter recognition according to an ongoing systematisation. Consequently, the rejection from Bachelard (1978, pp. 155–165) to Hegel, which is based on an a priori *Gedankenkonstruktion* or way of thinking (according to a terminology used in my current work), can be extended to the non-inclusion of a *neo-idealistic school* (Chimisso 2001, p. 85). Chimisso (ibid, p. 104) also refers to the work of Canguilhem and Koyré (1948 in ibid), where the lack of a franco-hegelian school was based not only on terminological difficulties but also on resentment towards Germany.

[5] The problematisation of this 'really real' can be presented through the extension of the reality of education by meeting biological matters. The link with a physical reality constantly influences the taking of positions of one reality that is presented to *us* through daily life. To this extent, however, I will take into consideration some reflections on common sense and some affirmative statements in favour of keeping scientific standards that differentiate formulations made by non-experts. By provoking content from the side of common sense, the purpose for questioning certainties can take form.

educational science as proposed by Anhalt (2012) as it relates to the complexity of the subject-matter (see Rucker 2014), I set forth with reference to the concept of diagnosis and the challenges that it presents for its transmission. When considering a way to determine what to teach – in a sense, making a diagnostic[6] about how to do it – several elements must be taken into account (e.g. Knauer 1994). This writing must speak about what is necessary to consider in the widening content of a science – natural and social science – when keeping in mind the need to span two positions. Namely, to consider how to discuss the assumptions regarding biological positions in the recognition of a subject-matter, but also to address that if more than one field of study is implicated in the explanation of scientific content, the following question aims to know the field that should be targeted when determining what to teach in 'bio-natural' sciences. This means that this writing will also bear upon why a dynamic subject-matter, such as that associated with biology, represents an opportunity for formulating new goals.[7] The merger between biological and pedagogical knowledge brings a challenge, forming a question about what the reality of education might be – *Erziehungswirklichkeit*,[8] in terms of the analysis of the relation among theory, praxis and historical reference.[9] This is paired with the goal of spreading knowledge while keeping in mind that whatever the outcome might be, the human retains inviolable freedom.

Throughout the history of humanity, progress and expertise in formulation of statements have been commissioned to science.[10] Science is an old construct, having a structure that

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[6] Diagnostic taken as a concept for a process and a task is a connecting point for differentiating the action of recognition that will lead to uphold that, in the execution of this procedure on a level of theory construction, scientists deal with an action that extends to the diagnosis of their own actions. This extension of a concept must be discussed in a frame of complexity when constituting a diagnosis of a diagnosis that is only a starting point for identifying the scope that pedagogical actions may take for the benefit of scientific frameworks.

[7] Drawing on the theory of complexity of education from Anhalt (2012), I propose to reinforce the place of pedagogy as a theory of knowledge that can speak to biological and psychological objects of study on a natural, social and historical scientific basis. Within this realm, pedagogy, biology, sociology, history and other disciplines including psychology, philosophy and medicine, among others, are taken as independent subjects that will look for a place that can be shared within a collaboration.

[8] *Erziehungswirklichkeit* or reality of education as proposed by Nohl (1957), which is constantly revisited by other authors in pedagogy (e.g. from 1933 in Tenorth 2000, p. 268), portrays a cornerstone for the problematisation of perspectives that in this work are taken from their epistemology as assumptions of experts on the side of specialisation. With the intention of reaching clear and concrete scientific outcomes, experts are immersed in a world that looks for unity in explanations that spans in consequence from integration to specialisation in the voice from society (further details are to be found in the third chapter of this thesis). In this tension, pedagogy during the transmission of contents needs to invest also in a collaborative position for letting human beings make the connections that permit them to understand the world. Such assumptions conform to a reality of education that is not empty of arguments, and hence, a current status of the pedagogical space (i.e. spheres of action) seeks to stay up-to-date on the scientific movement.

[9] I take the relation between theory and praxis to problematise that, from a historical reference, three evident moments of assumptions regarding attitudes of positions in science can be considered: unit or integration, specialisation and collaboration. To this extent, calling on the procedure of analysis concept, three models will be composed to display how pedagogical language can continue to be constructed. A fourth moment is latent, and at the end of this work, I will leave open if it can yet be integrated beside the organisation of the previous three or if it will remain as a latent construct for describing a characteristic of epistemological contents: this speaks to conflict, or if integrated as a position, it will refer to the model of conflict.

[10] Once 'science' is taken from its unity and as a formal development of knowledge. To this point and based on it, there will be a discussion throughout this writing in order to problematise that such unity

seeks to give a guarantee about the matters that can be answered and the matters that can find no response. In conjunction with institutions and theoretical reflections, science earns certainty about what is being done[11] as well as about what can be reviewed. In an ensemble of strengths and experiences from different perspectives of disciplines, a systematisation can guarantee an explanation from the status of the summons and recognition of information [but not necessarily to regulate what this information is]. The field of education actively participates in the maintenance of the scientific system,[12] whereupon I seek to detect some pitfalls. In this sense, and thanks to the generation of works like this dissertation, a contemporaneous content of science can be aligned to the most recent tools of theoretical supervision.[13] This structure of academic surveillance will be formulated in this work according to the architecture of complexity theory of education (Anhalt 2012) because it allows [me] to problematise how to convey dynamic knowledge within a changing situation (see Rucker & Anhalt 2017). Together with my team of researchers from Mexico, specifically by the suggestion of Dr. Rubén Martínez Miranda, Professor (retired), we want to give the name *The Group of Bern*[14] to the

belongs to a complex organisation within scholarly groups and society in general. Furthermore, this unity presents sundry positions that have taken changes along the course of time. This unity can be discussed according to the writings of *systems* by having clearly in mind the goal to develop a contribution from the pedagogical area.

[11] I can express in general terms 'what is done' as a goal for problematisation that expresses a reality to be discussed for presentation. However, from the interest in concretising a research approach and the question of how to investigate the reality of education, science grows parallel to what is done in the world and to what is done by scientists. To this extent, I explain the relation between science and reality of education by means of the diagnosis concept and throughout formulation of statements differentiations from pedagogy and educational science. The theory construction is extensive, and therefore, I find support in my proposal regarding 'concerted systems' for handling concepts that are repeated in more than one theory. Such concepts lend connecting points from more than one position that are identified as synthetic constructs and container-concepts in this work. Thus, more than two references meet to explain what is going on to achieve results after being prompted to do so. In this sense, during the implementation of a procedure for the well-being of a person, the previously acquired learning is applied without hesitation upon what has been learned to be valid or not. Having a place to question appears in other moments of theory construction and all the time as a latent feature of the professional who is taking an action on the basis of a person's life. Prompt actions would have a register system that leads to constant analysis. A procedure related to diagnosis should therefore not be underestimated as it has not undergone any analysis process.

[12] Along the lines of the stability of science, pedagogy holds a position of giving feedback to the scientific system once it holds discussions on the tasks and problems that cannot be taken from the side of science (Anhalt 2012, p. 111). For example, Anhalt (ibid) starts an example with a passage from Weniger (1952 in ibid) on decisions of didactics, where a reality of educational processes *should not* be dogmatised [italics added]. I find support for precluding a dogmatisation regarding the historical reference from Dilthey (1900, p. 197) that can also be used for reflection in the synthesis of hermeneutics. In the outcomes of this research, I will explain briefly the place that I give to hermeneutics in my work, which I restrict to the importance that must be given to the individual acting within 'spheres of action'. The place given to hermeneutics is earned by the moment in which a person interprets reflections on the difference between theory and practice, as in the way Schurr (1975) identified them from Schleiermacher's writings (ibid, pp. 96–110).

[13] I take reference to the idea of epistemological supervision from Bachelard (1978, 1966), based on the theoretical supervision that Anhalt (2012) suggested in his work (see, for example, in ibid, pp. 45–48).

[14] An allusion to the Vienna Circle could be given to the researchers on the complexity of educational science that can give a prospective about future tasks from educational science in pedagogy that will go beyond institutional tasks. A definition of pedagogical task will come as an outcome of this thesis (which is composed by the concreteness of actions in and according to specific areas). In short, I list three tasks that will be elaborated upon within The Group of Bern: 1) to continue working on the development of an own pedagogical language that provide concepts for their treatment, 2) to support paths for

endeavours of educational scientists ('members of the complexity of educational science') working to raise reflections from the own pedagogical language. In order to fulfil this action, from philosophy and the context of pedagogy,[15] the current connection to the development of a discipline should be exhibited on the basis of its theory construction.

The connections with reflections collect assumptions that need to be clarified. Among the questions that can be argued inside a translation from a theoretical and analytical educational assumption are: How can assumptions on pedagogy be explained in terms of attitudes of other disciplines? Can they be assumed by other disciplines? Should all the educational actions be oriented towards preventing negative components? What is the area of educational actions – is it organised in terms of definition or connotation? This means wondering about what or who is really the object of pedagogy, in general, as well as specifically within a scientific context. Or could the question be about what suffices to be considered a matter within an educational frame, that is, one that can be portrayed within an educational action? (Inspired in the questioning of Brezinka 1992, p. 42). These are some of the questions that surround a judicious work of educational science, which would target a connection in the collaboration between pedagogy and other disciplines. '*Pedagogy does not inquire into what the human being is for, but it asks about which way the human being must be introduced in order to make pedagogical action possible*' (Mikhail 2016, p. 123). Herein, pedagogy has an open door for interfering with the theory construction regarding that with which something is being worked; this means, for example, about that which is being taught.[16] In this way, the

collaboration with reflections from other theories of knowledge for the development of a pedagogic epistemology [at this point the importance of selecting synthetic constructs comes to the fore] and 3) to foster the question about how scientific knowledge is composed for problematising how it can be taught and learnt or appropriated within the scope of other disciplines.

[15] In terms of Lakatos, regarding the main core of a research program that he calls *hard core* (Moulines 2011, p. 97), I identify that this *hard core of pedagogy* is the analysis of the reality of education. Such an analysis is run upon the transmission of scientific knowledge and problematised, for this thesis, according to the composition between disciplines like medicine, psychology and educational science – when they take into consideration the wide range of discussions on biological content, the social register, philosophical reflection and so many postures that historically have been located within an encounter of interests. From this interchange comes the development of assumptions regarding attitudes that will be explained in the case of the requirement or application of specific goals.

[16] In order to reach out to share a message, pedagogues are engaged within the multi-definition of truth that must be presented using understandable words. This means that after encounter of positions or by executing non-understandable procedures, irrationality must be transformed into rational language. How can this meaning transforming irrationality into rational language be done, in the sense of questioning how this can possibly be accomplished? Thut et al. (2017, pp. 846–847) presented a brief synopsis of principles and a mechanism of brain stimulation that *presumably provide a temporal framework* (ibid, p. 846) for cognitive processes. Through synopses like Thut et al.'s (ibid), elements are to be put together according to their own problematisations and limitations – is this then a viable option for handling the irrationality found in synopses and presentation of brief results? (This thesis yields findings related to brevity). These elements are not only theoretical, methodological or of scientific design, but they also depend upon individual differences among persons that rest on time effects (ibid, p. 844). Like this, techniques based on science specialisation display that *intra- and inter- individual variability* challenges the interpretations regarding the formulations of new and of established protocols (ibid). The justification about how this neurobiological knowledge was taken into account for writing this work is problematised throughout this paper under the matter of 'theory construction' and borders of disciplines by virtue of spheres of action in pedagogy. From an initial suggestion by Wilhelm Dilthey (in Blankertz 1982, p. 217) about an integrative language in science, I take that the words: *problematisations*

borders of pedagogy are under constant distress when pondering the forces that compressed the pedagogical action that is contemplated and explained throughout the content of dynamic theoretical statements. To this extent, pedagogy is responsible for the problematisation of statements within a specific framework of evolving theory construction and inner connotation from subject-matters.

The following work starts from the basis that a topic in neurometabolism is to be taught and shared. Point d'appui is a project proposal of new development of a master study program identified as a 'Master's in Sciences Neurometabolism', under the guidelines of the *Dirección de Investigación y Posgrado* of the faculty of medicine at the University of Queretaro in México. *Universidad Autónoma de Querétaro (UAQ)* opened this program in 2013 with a new generation of students to form researchers from natural and social sciences to compose a multidisciplinary team capable of understanding the individual according to different perspectives. One of the goals was clearly set to identify the complexity of social context and representations of cognition that affect organic factors of integral health (MNM 2014). This dissertation joins the effort to seek strategies for the appreciation of the human being from a different viewpoint, meaning from the existence of more than one perspective; specifically, this writing offers the contribution of a pedagogical position from 'theoretical construction'. With a critical eye, I intend to write a description that resonates with methodical control, theoretical reflection and historical contextualisation in pedagogical terms that I set forth as disciplinary 'spheres of action' in pedagogy. Planted in the idea that there is no total word picture of all components in the world (i.e. that theories are a composition of statements according to sundry levels of reflection as Peter Zima in 2004 studied), the meeting point of disciplines coming from specific perspectives (Anhalt 2012) must be talked over.

The National Plan of Development (PND from its abbreviation in Spanish, *Plan Nacional de Desarrollo*) 2013–2018 in Mexico includes increasing the investment of resources up to 1% of the total GDP (gross domestic product or PIB from its abbreviation in Spanish, *Producto Interno Bruto*) in matters of education, scientific research and technological development (MNM 2014). Based on a vision of education with quality, this plan proposes to make innovation and scientific and technological growth sustainable for economic and social progress (ibid, p. 12). Here, however, it should be marked that the zeitgeist of desire for holding the right manner of individual validity is at the present time not fixed (Anhalt 2017b, 2017c). That is to say, at this point of time in the surroundings, no unique and proper way of dealing with circumstances is in place. Whether multiple methods exist for approaching reality or a reality appears with an own dynamic that does not allow itself to be engaged with classic propositions, on this note, a document that describes the topics as interrelated in the foundations of research from educational science is eagerly demanded.

In this way, the master program belongs to a cooperative effort for strengthening the analytical and clinical intervention of the research academic body in the health sciences of the faculty of medicine (CONACyT, Fondo I015B 2014). This might also be

and limitations of theoretical elements, such as *theoretical, methodological* and *scientific design* in general terms, should provide a basis for considering the individual as an articulation of a collaborative language in science as a next step that leads to the specialisation.

considered support of applied clinical research in company with the opening of a medical clinic of the nervous system. Collectively, it aims to put together a unit for diagnostic and research called 'Clinic of the Nervous System, Unit of Diagnosis and Research in Diseases of the Nervous System of the Department of Biomedical Research of the Faculty of Medicine of the University Autonomous of Queretaro'[17] (UDIESN from its abbreviation and simplification in Spanish, *Unidad de diagnóstico e investigación en enfermedades del sistema nervioso*). Administratively, the clinic has been in operation since 2013[18] under the division of 'Services', 'Services and Research' and 'Research projects' – where distinct exploratory focuses serve under specialised guidelines – this means that techniques of research that are subject to various objects of study are aligned differently (Gerónimo-Cid 2016). For example, one of the big projects targets allying neuroimaging techniques with transcranial magnetic stimulation (TMS) therapy. This writing can function as a basis for being able to understand a technology that continues under persistent composition in the world (see Navarro de Lara 2017, Thut et al. 2017, Arbabi 2013). TMS as a 'non-invasive brain stimulation method'[19] (Navarro de Lara 2017, pp. 262–269) can address an amelioration in neuroimaging by examining the transcranial electrical stimulation (tES) paradigm and its effects on neurofeedback (further references of other works relating to this research approach can be found under Soekadar et al. 2015, 2014, 2013a,b; Liew et al. 2014). TMS refers to a technique in vogue that is in use in protocols of the clinic of the nervous system UDIESN for therapeutic application – for the betterment of patients within the collaboration of experts in neurobiology, medicine, psychology and educational science.

The problematisation of the *spheres of action*, or at this moment called scope of extension between disciplines,[20] belongs to an educational problem once the potential of the human being as complex subject-matter is encountered; this means the Bildsamkeit or faculty of progress of the individual as a patient or doctor or expert, as a learner or teacher or researcher. In the meeting point of the disciplines, the methods show their specificity in procedures of specialised language, which require continuous monitoring. In this regard, neuroimaging methods are in the neurobiological field[21] yet

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[18] http://csn.uaq.mx/ [retrieved on 1.7.2018]

[19] Or specifically as part of a 'non-invasive transcranial brain stimulation (NTBS)' according to Thut (2017, pp. 843–857). The technique has different variations. According to studies with specific delimitations in correspondence to different purposes, it can also be grasped in general terms from the research of brain interface (BI) with revolutionary advances during the last couple of years – specifically, since the beginning of this millennium. On the other hand and looking back to its origins, BI can be situated in the experiments of Eberhard Fetz in 1969 with the operant conditioning of a monkey *to use cortical unit activity* (Soekadar et al. 2011, p. 5). BI, advanced by current stimulation introduced by Barker et al. in 1985 (Soekadar 2016; Liew et al. 2014, p. 2), in the mid-2000s with training cortical areas for neuro-feedback (Hochberg et al. 2006) and the mid-2010s with the combination of methods between brain stimulation and neuroimaging (Soekadar 2016, 2015b), is linked to transcranial current stimulation (TCS) for the allocation of new inquiries and because it shows a direct impact on cortical magnetic fields (SCF).

[20] The scope of extension between disciplines relates to the reality of education once the meeting point of the elements involved can be localised to the scope of extension coming also from each of the disciplines related in a common research approach.

[21] In dealing with the topic of neurotechnology and how it can be problematised under the frame of 'conceptual formulations' for the understanding of elements involved in 'tasks' and purposes of scientific research, a preliminary report of the 'German-Israeli Conference on Neurotechnologies and Healthy

being examined and consequently yielding new formulations of perspectives (e.g. Sack 2010, among others). Hence, discussions on this matter can provide analyses of the current status of this kind of research, meaning where researchers are standing today, since methodologies, theories, positions and experiences of the researchers themselves, the way of dealing with objects of study and internal dynamics of subject-matters are encountering constant modification and development in accord with a work in progress.[22] Technology sets a work under construction, seeking to yield constant feedback for closing the gaps on previous calculations. In this sense, technology raises questions on the borders between man and machine in addition to the socio-technological offering. From a pedagogical perspective, this matter turns the attention towards how the reality of education is modified after a super specialisation of machines where different languages that attempt to be compatible cannot be understood among each other. To this extent, the uncertainty of realities leads to wonder on how to teach and what can be taken as a reference for the next learning task, among many other questions about the way human beings will be able to continue living together. The hypothesis that I will compose describes a complex situation. This hypothesis includes the consideration of the reality of education with an object of study yet to be defined, all based on existing connections of disciplinary contents.

To give an example of how a complex situation engages with a dynamic of a complex subject-matter is a task that can be grasped from the pedagogical side [when self-determination is carried out], according to the argument of Anhalt (1999, p. 144) about how categories are designations based on experience, in which with reference to Kant[23]

Aging 2018' can be consulted (Gerónimo-Cid *in progress*). This congress took place in the Department of Psychiatry and Psychotherapy, University Hospital of Tübingen from 25. to 27. June 2018. Such a congress is a sample of the contemporary transmission of knowledge, upon which results are presented according to the most recent discoveries that are open and continuing under expansion of the research. The diffusion of knowledge through congresses can be discussed further in matters of the integration of an open audience from other disciplines or of the specialisation of contents directed only to one academic culture. This problematisation is located within the stability of disciplines in educational systems (according to the reflections upon disciplines by Stichweh 1993, pp. 243–250). Thus far, knowledge persists in taking a different form from that thought in the transmission and application of the paradigm of 'normal science' (see Kuhn in Moulines 2011, p. 89). The execution of congresses could be taken as a praxis for maintaining a specialised language, which can enter into the pedagogical realm for testing pedagogical concepts. Pedagogy disposes of a scientific structure to test its own constructs and, at the same time, to offer them to the interrelation between the technical languages, to provide tools for other disciplines while establishing bi-directional theoretical supervision.

[22] BI research design provides great potential to collect new arguments for the interconnections of the human body. Simultaneously, advances in this area problematise the understanding and transmission of this knowledge. In considering several stages and actors that are involved in these two actions, this work delivers an organisation of elements that must be kept in mind when trying to reach and grasp a translation in these topics from distinct positions. Without such a systematisation in educational science – which has an initial and apparent distance to biological matters, for example – the delimitation of knowledge according to related groups jeopardises selecting radical or magic thinking in the explanation about the reality. This thesis intends to formulate that, at a present time, a single shot cannot legitimate a bunch of events but that every particular position is composed by an agency manifested in attitudes that can revolutionise orientations to this world.

[23] On this point, a translation from the philosophical-anthropological considerations of Kant was provided – a transition made by Ernst Cassirer according to Sandkühler 2009, p. 42 – which could later be assimilated under the theory of knowledge of educational science (Anhalt 2012). Anhalt (ibid) also problematised reflections of Ernest Cassirer, and not necessarily with reference to Sandkühler's notes in his considerations. To this extent, Sandkühler (2009, p. 45) thought through Ernst Cassirer's thoughts in

and its division on characteristics, Herbart, taking a different tack, worked with a table of categories established on activities (ibid, p. 146). Based on Herbart's proposal of categories, Anhalt identified the structure of a path for making distinctions in the relation to the education of the learner with its potential for changing. These differentiations required a further classification of observable behaviours, which in consequence can be developed into subcategories (ibid, p. 150). To these subcategories, an order of complex educational events under determined aspects can be assigned (ibid, p. 151). In this work, these aspects are featured due to the complex definition of the concept of diagnosis in terms of its encountered dynamics because I will show how a complex subject-matter can denote how individual(s) are presented from different reference points [to which the force of the individual reacts]. The reasons why the concept of diagnosis was selected from the theoretical side will become clear during the description of the collaboration of other disciplines with pedagogy because educational science can take the second order of observation about what the disciplines do – while the involved disciplines have an interest in the person. Thus, thanks to the organisation of the concept and category of Bildsamkeit, it is possible to localise how the potential of the human being affects decisions, from the side of the expert and from the side of the learner, in a continuous state of progress. The endeavour of Anhalt (1999) on the problematisation of Bildsamkeit continued over the years in his development of a systematisation on educational science from the analysis of its complex structure. I am taking reference to these works and related studies in arguing through the concept of diagnosis that pedagogy has a place in the reality of medical education, which from German theoretical traditions can lead to scientific coaction, namely, to consider intellectual cooperation. Through the problematisation of scientific concepts, a structure for the transmission of statements portrays three main models: integration,[24] specialisation and collaboration. This work argues their differences inside a pedagogical framework, surrounding some historical references and speculating on some possible connections for building academic bridges.

Also according to the distinctions of and relations established with the concept of Bildsamkeit, which speaks about the inner potential of the human being, the reflections made on this concept undoubtedly help, but they are not the main core of the work. Here is to say that neither Bildsamkeit nor the description of the program of Master's in Science Neurometabolism from the University of Queretaro are the focus of this research. Notwithstanding, they offered an initial point for the systematisation of a theory of knowledge in the educational realm from German traditions that portray a striking disclosure. This last mentioned happens when, with the suppositions of the works from different times, it is possible to agitate the concept of the 'faculty of progress' of the individual. This narration is feasible due to the potential of the same concept because once it is opened to the consultation of signs of distinctions registered

terms of speculations upon epistemology of natural sciences – in the sense of analysing composition of knowledge from tangible nature.

[24] 'Integration' in pursuing unity. With the purpose of clarity, integration would be handled by this work according to the understanding of unity of science, from a general position, which would differ from unity of contents when it comes from the contrast of a particular. As I explain throughout the work, a reduction based on an integrated understanding yields a synopsis of divisions upon models, where unity earns also an own position or model for connecting with other models inside of systems. The presentation of both positions, unity and integration, as synonyms can be taken as a point of connection for further analysis.

throughout history in witness to the existence of the concept of the potential of the individual, then an ocean of indications releases a problem of orientation. In this case, suddenly it is not about secondary literature; neither is it about ordering according to a historical work nor original quotes anymore but about the way that an argumentation is established and is followed by each individual. To this extent, the work will contain the question regarding the 'principles of reality' that are contained by the 'spheres of action' of positions, subject-matters and their interrelations. For example, one may suspect that some levels of dissimilar situations share some compatibility. In this work, this will be discussed with an eye to enunciate the place of the individual in executing a *pedagogical translation* of different theoretical languages. By localising a process of an action, such as that of translation, under the responsibility of the individual, the risk of a vicious circle can be broken [because articulation between different methodologies and a synthetic basis is at stake]. In this sense, pedagogical translation occupies a primary place in the problematisation of certainty through the concept of diagnosis within pedagogy.

The outcome is proving remarkable, when from the original observations of the dynamic of disciplinary collaborations with dynamic subject-matters, it is possible for a concept to be identified for being proposed within the pedagogical realm. Namely, the theory of complexity of education from Elmar Anhalt (2012) provided the path for a discussion of what can be taken as an object of educational science.[25] In a bold manner, the invitation of Anhalt (2007, p. 115) to reflect on this matter yet pending from a language in logic motivated me to initiate an inquiry on the facts of diagnosis [in relation to an epistemological analysis of the diagnosis concept on what has not yet been spoken by the pedagogical side]. It is always enlightening to realise that disciplines are not confined to one sole methodology and that the spectrum of reaching direct contact with medical doctors and patients, as a case in point, is regulated but open. As such, it implies a huge responsibility that demands professional ascertainment with a certain level of freedom that can come from a space of liberty, respectively self-government applied by every individual. Therefore, a systematisation is proposed from pedagogy – and not from any other field that can provide a structural description of recommending what the affected person/individual/learner/expert may be (Anhalt 1999, p. 216) when using an interplay of *complex perspectives*.[26] The inquiry reveals incidents that tell how a pedagogical construct cannot be taken in isolation from its context. Although the topic would be

[25] Based on the reflections of Elmar Anhalt (2012) and of members of The Group of Bern, my aim is to make evident that the discussions concerning the object of educational science have a wider range of impact on the structure of science and society, as such, on the philosophical studies of science. Thus far, with the spheres of action, educational science confirms to have earned an independent place while considering that the traditions of other disciplines locate educational science and pedagogy in one obligatory place to be considered for the development of collaborations in science: raising new generations.

[26] Anhalt (2012) employs 'perspectives' as a concept for describing viewpoints in unforeseeable circumstances. Addressing this concept, Anhalt (ibid) points out the perspectivity from differences of positions. Thomas Rucker (2014) offered a description of a subject-matter that is under such conditions and that in itself portrays a dynamic that is opened, uncertain and irreducible to problems of planning and governance – and which belong to an order of complexity. I am using these two works for the purpose of analysing perspectives that produce a complex interplay within a situation as well as perspectives that are the output of this complexity, so as to identify outcomes when they are required to be employed by people in a frame of teaching (under the definition of specific goals). Here the word 'complexity' is not taken as an adjective of a manifold of characteristics or of a complicated statement but a concept and category from a philosophical degree.

controversial, the reader is the one and only professional who can pry out the points of connection for further analysis. It is hoped that anyone can enjoy a sort of persistent storytelling for the purpose of communicating a message.

In this way, this manuscript looks for a connection with the previous experiences of the reader, in order to calibrate common criteria between theoretical beliefs, reliable procedures and possibilities for portrayal of ideas. The work has a structure that invites assembly by the reader. It defies a rigid frame by not following the pattern of what might be expected to be dug up next or touched upon. In consequence, the picture leads to an open horizon, which within this structure remains aligned on the development of theoretical statements. With the intention to make following this work a more fluid process, a subsection inside the introduction ensues, describing a roadmap of the propositions considered. With this purpose, throughout this mentioned roadmap of concepts, attention must be given to the way that the reality of education can be problematised in different orders. Namely, according to the combination of theoretical levels within a scientific framework, an explanation of collaborative science is feasible, and hence, an accountable individual can be imagined in the encounter of theoretical positions.

How should this work be read? Roadmap of targeted inquiries and concepts for defining a collaborative agenda and some relations between them.

In this part of the introduction, I present the conditions and assumptions of a scientific procedure according to a stage-based division of a dynamic analysis (see, example of combination of different methods related to the localisation of concepts and instruments for analyses, next to the illustration of *Phasenmodell* in Mayring 2000, p. 191; or also take a look at the description of the complexity of using a combination of 'ways of procedures' to establish an analysis in Kneisler 2015, pp. 59–62). Based on this aforementioned division of a dynamic analysis, I compose a structure for existing theory in pedagogy, for a reflection on the status of pedagogical diagnosis and for a connection with the methods of analysis from a constant speculation on a second order of observation. This construction is mentioned with the intention of giving rise to new formulations, proposition of concepts and recent combinations brought into being that could allow me to confirm if the diagnosis concept is a pedagogical complex subject-matter to be allied as a pedagogical term. Vital to the reader's understanding is that in this section, I reference authors that help me to build the structure of the work. However, citations are allocated according to specifically used and determined argumentation within the contents of the work. In a first glance during the introduction, I am starting a speculation on the concept of diagnosis as a process of transformation that happens from the dynamic of the relation between two persons.[27] My reflection upon this process will not have the goal of marking an ontological existence with reference to a metaphysical

[27] I am aware that the diagnosis concept can be considered from different frameworks and is not problematised only by the relation between two persons. Notwithstanding, for this work, I take into account this relation in order to develop the theoretical problematisation of the object of pedagogy and educational science encountered in a reality of education when a minimum of two positions having a common interest appear together. As an initial point the tension between two given points helps to further open a complex exchange of positions in several levels of a situation.

content,[28] but the intent would be to show how the intersection of opinions in a discussion or encounter of positions can validate a reality of education. I will take into account the manner in which Benner (1991) portrayed the differences between ontological and transcendental in order to reach discussions that I aim to obtain out of historical events for pondering the diagnosis concept as a possible argument in pedagogy. In this way, I indicate a dynamism of exchange which, on the basis of a requirement for openness and flexibility, can give room for more connections within a conceptualisation with structural knowledge (this means that from proposals that do not come out of the blue, but which have a systematic constitution, an analysis on a reality of education can be portrayed). Thus, such dynamism refers to a systematisation that, despite being able to succeed in different manners and likely to come in different boxes, it will confirm an architecture that holds a sustainable system described later in this work as a concerted system.

The information included under this subsection should not be confused with a methodological section as it contains only an overview about how to lay hold of the arguments' organisation. Two levels are constantly taken in the research approach: from 'observation outside'[29] and from the incalculable robust knowledge within dynamic components – here is the intention of understanding knowledge in the sense of vast, wide-spread and perhaps at times nebulous in places. As a matter of fact, this mindset conducts the ongoing transition on the *Noesis* (Sandkühler 2010, §1793u) from the semantic field into epistemic abilities of analysis. This means that the intellectual potentiality goes beyond words while at the same time returning to written ideas – and in this way, generating empirical data. Simply stated, some literature had an influence on the development and other writings influenced the content of the work before the compilation of resources was completed. Therefore, the publications selected can be distributed at some times on this external level and at other times on the basis of the immersion in the topic.

In order to make the text accessible, the chapters are related to one other (1) from a theoretical background (2) to a current state of research and (3) upon an innovative framework that complements the findings for a prospective situation (4) and corresponds to each one of the three previous chapters. The last third point is distributed over the presentation of chapter three and four. Namely, the work takes the form of a reconstruction of the methods employed for this analysis problematised according to the subject-matter of diagnosis within a complex situation of disciplinary participation. The

[28] Nevertheless, ontological reflection helps to differentiate how theorists can present contents of educational processes in terms of theoretical formulations. For example, Hegel presents a different understanding of what is transcendental than from the writings of Kant (according to Williams 1992, p. 93). 'Hegel, like Fichte, regards the transcendental categories as identities of thought and being' (ibid), which Kant relates to a transcendental theory grounded on the thing in itself by separating objective from subjective (ibid).

[29] At this point in time, 'observation' is difficult to locate on a specific level in order to determine concretely if it handles of the observation of a subject-matter, observation of a theory, or observation of the observation. In general terms, here 'observation' wants to give the idea of the distance between an object and field of action when interaction is happening. Hence, here the word is presented in the adverbial form with the use of 'outside' for clarifying two locations. In this sense, the word wants to direct to a mindset portrayed during the work and does not yet describe a methodological position. Unavoidably, the variations of the word are so abstract and so close in proximity that the reader needs to participate in locating moments within the development of the work and moments in its description.

dissertation comprises six chapters within one systematisation. The fourth chapter yields some outcomes from this research. Chapters five and six complete the work and reaffirm the place of pedagogy and educational science in the disciplinary collaboration with medicine and psychology. According to this form of expression, they fit the intention to be able to read them separately while keeping in mind the complementarity of the entirety of the argumentation.

This subsection presents a storytelling[30] of the questions that were posed during the reasoning process of the manuscript. In this process, I present markers within a roadmap to help the reader to easily locate what should be given attention in specific sections of this book. Strictly speaking, this is different from the index in the sense that it gives a quick overview of how to start reading paragraphs as disconnected one from the other while setting forth concepts as a basis of the whole theorisation. Notwithstanding, the idea of storytelling can be discussed against inciting researchers to design 'great story' ventures (Katz 2013); this section was first written after the content-analysis research was concluded. Thus, I was not fostered to complete an attractive draft. In consequence, this storyline mindset compelled neither the analysis of concepts nor the information analysis. Besides, the 'storytelling discussion' of presenting results according to narratives goes beyond a conclusive rejection towards a method. Narratives can be compared with logical-scientific communication (Dahlstrom 2014, p. 13614) and can open a space for a conversation that indirectly handles the social development of groups and orientation of constructs (ibid, Krzywinski & Kairo 2013).[31] At the moment of

[30] 'Against storytelling of scientific results', Katz (2013, p. 1045) points out that '*story telling encourages the unrealistic view that scientific projects fit a singular narrative*'. From this asseveration, I wonder which realistic, authentic or formal view scientific thinkers should follow. A medullar part of this work questions this reality principle. Indeed, it problematises this like that! (i.e. like a principle of reality). Additionally, it opens the space for rescuing writings from the past, in which the recognition of the human 'bent power' or 'bent force' that can be extended was registered as in some proposals made by Humboldt. The observations of Katz (2013) based on Krzywinski and Kairo (2013) are intellectually keen worldly wise; in brief, he reached an interconnected conclusion between journalism and science. Specifically about this differentiation, he considered whether scientific journals would adapt the format or, according to my interpretation, they would return to go deeper into the analysis of science. However, Krzywinski and Kairo (ibid) state clearly that '*[t]elling a story is as much a process as it is an art*' (ibid, p. 687). This discussion should be taken from a wide-ranging realm into a particular one and then brought back out to the public sphere. Krzywinski and Kairo (ibid) accomplished this last-mentioned goal by presenting a concise narrative. In my explanation, with two examples, they made clear that general audiences have changed. With this, they add to the formulation '*[i]nstead of "explain, not merely show"*' (ibid) a further connection *seek to* '*narrate, not merely explain*' (ibid). Thus, I confirm that this work is composed within the pedagogical realm that strives for catching these conclusions, in order to translate them and problematise them according to complex situations – like one between social and scientific development (Dahlstrom 2014).

[31] Because the topic of this work is not a discussion on 'storytelling narrative', I'd rather leave this point for a later reflection. However, this writing can speak about the encounter and contrast between inductive and deductive reasoning with the application of the diagnosing procedure. For example, with the difference between 'procedural evidence' and 'validating evidence' (Rychlak 1959, 1968 in Westmeyer 1972, p. 42) is understood that knowledge development consists of several stages. Hence, it would be wrong to validate that data is the only proof of authenticity. 'Show me your data!' is a common saying at this moment within psychological branches of science – and I suppose within other disciplines. It is a familiar sentence for the sceptical person of different methodologies. Unfortunately, this happens in many moments when scientists have not paused to build, or when they have not ceased building on the scope of their research. As Dahlstrom (2013) summarises, rigour in science is not obtained by data collection alone (ibid, p. 13618). In combination with the reflection of Westmeyer's book (1972), both arguments lead to thinking on science development as a process of growth with more

recognising the orientation of theoretical indications, then, the direction where an idea leads is open. Thenceforth, these notions are tied to one epistemological profile that cannot be separated: at least, not without a problematisation in advance. Ergo, a foregoing dialogue keeps company with reflections – sustaining thus a state of continuous interplay.

Within the development of concepts and dealing with them, this work delivers one concept as a contribution of this work, which is and speaks about the *pedagogical translation*. Also, it delivers a reflection on another concept that might be integrated into pedagogical literature – to wit, the pedagogical diagnosis. Eventually, in relation to the development of concepts, it presents other constructs as suggestions or as thoughts to be reconsidered from existing literature – to wit, spheres of action, principle of reality, practical deed as I received inspiration from universe of discourse, principles of research, practical action and practical intention, distributed on Anhalt (2012), Gifford (2011), Mittelstraß (2011), Anhalt (2009), Matthiessen (2004), Dewey (1925) and Herbart (1824) for thinking on these concepts; namely, thinking of only a few of the many authors who help to develop the argument presented in this work – the argument upon theory construction regarding to synthetic constructs that problematises the reality of education for the development of new researchers in the area of pedagogy and natural sciences. Notwithstanding, in this section, I will briefly present the disciplines involved. Specifically, to what some of these disciplines refer, such as some of their subject-matters being called for upon further problematisation. In addition, I suggest an order for the systematisation of the work according to the usual presentation of data in qualitative research (O'Brien et al. 2014) following the roadmap of questions and the roadmap of the content of the work, as to some relations connecting the use of concepts and categories.

One side of the question of research in this writing implies an analysis of the place of educational science within a collaboration with medicine and psychology – this would portray a supposition on how a realist convention, from Herbart (as identified by Anhalt 1999), and integrative science, from the project of philosophy of science (as described by Moulines 2011), can collaborate together. Specifically, this discussion is about how knowledge recognition can take place within such disciplinary collaboration, in order to improve the work of the involved participating disciplines, their positions, and their representations. With this intention, for example, sociological and historical signs in the work of the educational scientists would delineate the diagnosis concept through its methodological application from outside of the method (i.e. from a level of second order observation as it is handled in the science of education). This analysis holds in mind that the diagnosis concept comes from a medical tradition and that it should first be translated, in terms of being traced from its closest approach in psychology into the pedagogical realm. Caught by the interchange between people (see Anhalt 2009, p. 27), the whole collaboration of disciplines on the levels of the situation, their theories and core terms of their statements, points to a transdisciplinary foundation (Mittelstraß 2011) that sheds light on the development of the diagnosis concept for recognising another

than one classification. Thence, 'storytelling' indicates one necessary point of connection for analysis: interlinkage between nonexpert audiences and specialists in their topics (see Dahlstrom 2013), which might turn the problem of narrative into a pledge of science communication.

person. To this end, the following definitions will compose a basic understanding of the multi-layered character of the research question:

- Spheres of action. This term refers to the pedagogical viewpoint according to the structure of methodical control in educational scientific terms.

- Spheres. This idea is separated from the specificity of the concept of spheres of action from pedagogy. The importance of maintaining open a concept referring to a scope of action of a field relies on detecting a continuing point for further analysis. It will aim to leave a connection to be developed from the language of other disciplines. Moreover, the concept of spheres alone, meaning without any other combination or addition of another sense, has the advantage of being occupied by other principles of science and of research, not only according to theoretical principles of determined disciplines.

Both concepts, in relation to the description of 'spheres', represent a space for problematisation of questions, inquiries, and approaches of research.

- Principle of reality. This is not intended to be homologated with studies involving the principles of research and science in contrast to theoretical principles (Mittelstraß 2005). Although 'principle of reality' is also helpful for the problematisation of different moments and connections within the process of 'knowledge development' and its recognition, 'principle of reality' is a concept that intends to refer to the different levels of analysis that a situation possesses.

- Pedagogical translation. This is a concept that centres on the individual process of transformation. In addition to the theoretical understanding of Bildung, this construct wants to problematise its constant interplay with the existence of another person and the surrounding world.

- Practical deed. This concept sustains the relation between theory and praxis, plus the interchange from particular cases up to the construction of a general overview. Practical deed speculates about the action itself, from its ideation to its accomplishment. In order to problematise this construct, the work uses the knowledge generated regarding practical medical action from the pedagogical view. It fixes attention on the pedagogical intention localised and described in the writings of pedagogical tact.

- Pedagogical diagnosis. Based on the boundaries established by the concept of diagnostic, to the extent of a general pedagogic background, this last-mentioned concept (diagnostic in pedagogy) has referred only to the evaluation of students or to the application of a procedure to reach specific traits during the mechanical transmission of knowledge. My proposal for recognition of pedagogical diagnosis currently aims to go beyond the performance of specific method of observation, evaluation and selection (i.e. from a particular realm of a method or method of specialisation, in which the pedagogical diagnostic has been catalogued). Hence, the concept of diagnosis within pedagogical theoretical construction still needs to be reviewed, analysed, proved and perhaps integrated. In this same vein, it is probable that this concept and category are not yet ready to be adapted into pedagogical tradition. A weighty argument relies on the origins of its problematisation that come from the side of medicine, on which pedagogy has less to say in order to avoid committing categorical errors in the building of a theory.

The development and understanding of the aforementioned concepts are extended profoundly throughout the different chapters of the work. Furthermore, these concepts do not attempt to make a complete image of the interaction of disciplines when being taken separately. For a complete formulation of a problem of research, it is important to begin by identifying the elements involved along with the process of describing how they are related. The presentation of these elements and signs of how they are intertwined is extended in the content of the work and the chronicle of diagnosing with neuroimaging methods. I expect to catch the reader's attention with a narrative of facts about how and why it is difficult to make a breakthrough with new results of research. This dissertation is strongly infused and inscribed by an epistemological profile on reflection of how knowledge is composed with a pedagogical intention. In it will not be found the application of quantitative analysis or direct recollection of samples from individuals. At this moment, in this section of the introduction, the concepts are only to be roughly named with the intention that they can provide orientation for the moments of the work.

In addition to the concepts, it is important to enumerate the disciplines employed for this work, giving light to the idea of the direction towards which they are guiding. In the same way, here the text mentions in a few words how the following disciplines are presented and what they will discuss, namely, some subject-matters that are problematised within this work.

Medicine related to neurobiology is presented through the historical sketch of diagnosis based on neurobiological approaches: for example, through a discussion on methods of neuroimaging. The difference between these two disciplines offers the postulation from the clinical procedure relating two positions of the expert and non-expert in analysing a condition with a basis on the problematisation of given or created reality.

Psychology is presented along the lines of the problematisation of cognitive and developmental psychology. This discipline was taken thanks to its immersion in topics of consciousness and additional sustainment, such as its support during the contemplation of techniques, procedures and evolution of theoretical thinking on the revision of psychological functions. Furthermore, psychology has shown how to take one side on the positions of working with neuronal subject-matters from the empirical part. Psychology has managed in some moments to avoid looking to the ontological matters of its topics of research and to their reflection.

Educational science is presented from its disjunction with psychology. Its analysis of pedagogical content is taken from and for its reflection in a second-order observation (i.e. a reflection of the reflection). This last corresponds to the retrieval phase according to epistemological methods – which, at this moment, is only roughly mentioned, here under the names of 'observation in second order' on an 'analysis concept' and 'analysis of meaning', employed for this work and expanded upon within a whole section. In addition, the circle of problem development from the theory of complexity of education (see Anhalt 2012) provides structure to the position of educational science as a scientific discipline within the project of pedagogy as a science (ibid, Anhalt 1999).

Pedagogy is presented in terms of viable systems. In this way, it encourages the availability for making pedagogical action possible. Pedagogy, as the theoretical building that houses this work, uses the context of the performance of two persons to

discuss the foundations for working with other disciplines. Following the time that moves forward with reference to the actions of today, it opens a space for reflection about what will be given to future generations. To this work, pedagogy hosts in consequence an organisation of statements for its problematisation and transmission. Built upon the correlation of two sides, pedagogy argues about the pedagogical causality that extends how two elements can create a sphere of action in which the last-mentioned two elements should depend directly on each other.

The formulation of 'science of education' is presented only to encompass the project of pedagogy as a science, thanks to the reflections and advances effectuated throughout the development of educational science. With this syntax in English, I find it helpful to make the distinction between a disciplinary state of action and a theoretical framework. 'Science of education' refers to the point of one state, and 'educational science' extends to outlines of cerebration or outlines of thought. Figure 0.1. displays 'concepts, disciplines and subject-matters' as theoretical elements that sustain the complexity of the research approach regarding disciplinary collaboration and connotation of subject-matters to discuss the reality of education. These theoretical elements are arranged throughout the work. At the moment, they are presented for the purpose of utterance.

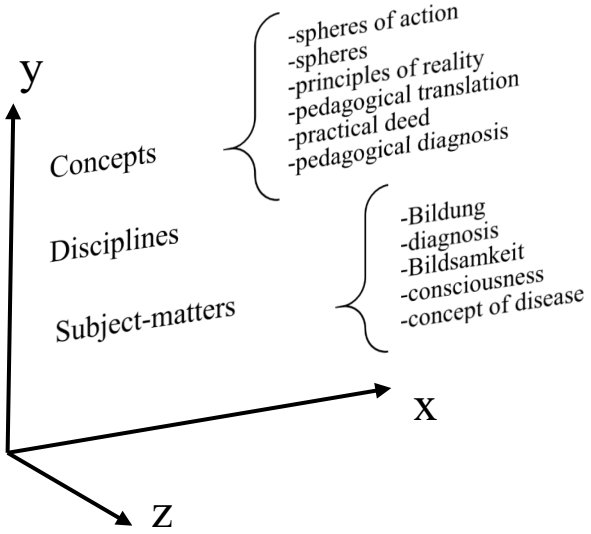

Figure 0.1. This figure portrays, according to a not-yet-ordered manner, the notion of concepts, disciplines and subject-matters. Hence, I present the three-dimensional plane in the search for alternatives where the axis of z still needs to be turned according to the old 'familiar' presentation. 'Concepts, disciplines and subject-matters' are discussed throughout the work. 'Disciplines' receive general mention since they refer to frameworks where the individual participates for the purpose of composing a complex situation. To this extent, three main references in terms of disciplines are constantly retrieved for problematising a collaboration: medicine, psychology and educational science. Nevertheless, the disciplines are characterised by connections with other disciplines. Within the contents of the thesis should be kept in mind the borders of disciplines and subject-matters that are difficult to establish. In this same manner, by considering 'disciplines' as theoretical traditions with their representatives, defining factors on who and what is being spoken for relate to a pluridisciplinary collaboration that is retrieved later. At this point in the introduction, I mention briefly the representation of some disciplines with respect to some actions. For this reason, 'disciplines' is a placeholder in this figure.

Following subject-matters are to be identified in the work:

- Bildung. This subject-matter is selected based on the description of its internal dynamic (Rucker 2014), which is opened, unpredicted and related to problems of governance (ibid, Rucker & Gerónimo 2017). In this work, Bildung refers to the 'analysis concept' (see, for example, reference to this type of use in the pedagogical field in Keiner 1999, p. 18) through which the process of transformation during the recognition of another person will be confirmed. Thus, the subject-matters, when they function as holders of complex internal dynamics connected with the world, are identified for this work as the basis for the concept of diagnosis on the pedagogical side. This means that I intend to identify a process of transformation with a pedagogical origin. For this, the process of self-transformation discusses foundational reasons for self-supervising the development of ideas. With a basis on the project of educational science as a scientific project of 'realist philosophy' (Herbart in Anhalt 1999) in counter-position to the 'realist turn' of empirical-quantitative analysis (Keiner 1999, p. 16), Bildung can offer reasoning to the complexity of a subject-matter[32] in the pedagogical realm that explains this apparent contradiction.

- Diagnosis. In this work, diagnosis refers to a concept under constant transformation. I highlighted the process of transformation that portrays displaying some elements immersed in the relation of expert and learner in addition to rethinking this process in pedagogical terms upon access to scientific trends. Speculating also upon the concept of diagnosis as a process of transformation, the concept of diagnosis is problematised next to the concept of Bildung. Both as 'analysis concepts' (see Keiner 1999) are considered for the execution of the procedure of 'analysis of meaning' that will support the distinction between 'analysis concepts' and 'analyses concept' in concerted systems. This will be achieved thanks to the problematisation and discussion of the characteristics, elements, related factors, historical references and applied methods during this transformative occurrence. This was selected as a common matter of a disciplinary collaboration due to its reference point for the participation of other disciplines and localisation among different disciplines in a scientific area. At the point of diagnosis, all the disciplines touched upon by this work meet, but each of them maintains independence in the form of an own language. The paradoxical position here is that the own language can be problematised as a sign of an encounter of disciplines. This raises a need for a definition and problematisation of what would be required to be an 'own language'. Despite the fact that this paradox can work as a point of connection

[32] I relied on the systematisation reached by Thomas Rucker (2014) for the confirmation of Bildung as a complex subject-matter. Nevertheless, I employ the modal verb of possibility – can – in order to expand the reasoning to other areas of research. Thomas Rucker (ibid) already left this possibility open with the description of this process of transformation. I do not imply a repetition nor do I feel the risk of a tautology in an open process that is opened since I am not explaining anymore the internal-dynamic of Bildung – as Rucker presented options for problematising Bildung with the surroundings (see ibid). In contrast, I am using this exemplification made by Rucker (ibid) to make a supposition on the current place of educational science next to the other theories of knowledge. Taking into account the remark that Bildung is not just a reference to the 'development of the ability to self-determination' (Rucker 2020, p. 57), I aim in my work to reflect on how a concept like Bildung can show a changing dynamic within the individual that is encountered with what is different. As such, I do not yet give a description of a teaching structure, but remain initially with the analysis of how the diagnosis concept presents a complex situation in which elements are to be identified and organised, in order to later formulate the question of how to arrive at supportive teaching.

for further analysis, every discipline coming from different historical moments, delimited by and identified as specific traditions, will work together but remain separate (i.e. within a frame of transdisciplinarity; see Mittelstraß 2011, 2005 for an extension into a longer discussion of theoretical versus research principles). Thus, one supposition of the origin of problems in disciplinary collaborations relies on the idea that people/representatives of the disciplines will not understand or will not pay attention to the existence of different logics when the viewpoint is coming from a strict theoretical principle. Namely, the subject-matter in specific disciplines can have a restricted and focused scope of interest.

- Bildsamkeit. This subject-matter as a concept was taken from the writings of German theoretical pedagogic traditions. Bildsamkeit identifies the inner potential from the individual's standpoint. This is presented in the form of readiness to respond according to the demands of the environment, from the society and common living, for example. Despite considering the infinite potential of the individual, it will manifest itself with a limitation of time. In some scientific contexts, this quintessence will be integrated, and in others, not. Educational science is accountable to this concept in order to problematise its existence. Scientists do not stop being humans, and therefore, contemplating a systematisation of Bildsamkeit could be an option for organising neurobiological concepts from the side of the researcher. Since it can be placed on the individual, Bildsamkeit has a range of 360° in the equation of all persons involved within the approach of research. It would only be necessary to provide a reference from the place that Bildsamkeit could be discussed. This concept is not a core of the work; however, it is helpful for the theoretical structure and presentation of facts.

- Consciousness. This subject-matter was identified because of its encounter with principles of reality (questioning the possibility of a given reality and providing consequential reflections on the encounter between theoretical positions). It displays developed studies in the realm of neurobiology. Moreover, consciousness can be problematised on the side of the figurative aspects, in the sense of figurative functions, of the ontogenesis of knowledge and scientific knowledge. Also, with the topic of consciousness, it is possible to give and to problematise an operative function that sustains the figurative aspects, adding in this manner to the scripts of Piaget that initiated the thinking that figurative aspects are a basis of operative ones. In other words, this also means to sustain with a subject-matter the iterative process of doing research. Namely, consciousness lies on many borders of theoretical reflections, and hence, its selection by Hegel & Lasson (1907) for the presentation of his phenomenology of the spirit reflects its manifold significance. In this work, researches upon consciousness as a topic and subject-matter will give robust form to the analysis of meaning of the diagnosis concept.

- Concept of disease. Disease works as an initial starting point for analysing and putting together the relation of big topics such as consciousness, self-awareness, principles of reality, consequences, actions and measurements taken when an impairment appears, such as those interrelated between two or more positions and persons. Here, the meaning additionally refers to the option of problematising dualistic positions. For instance, one of the most famous problematisations for determining a disease is the interchange between the general and the particular. Without regard to one example, the bipartition follows under external and internal positions of a situation and object of study, among several others. It has helped to display more than one connected element while focusing

on one person: the person who suffers – to wit, the patient and person willing to know about her or his condition. The interconnected interests that occur with the concept of disease call for a synthesis of contents to trigger a function and unite an interest for common well-being.

Representation of the following disciplines with actions include within this work:

- Historians, who have registered events as facts from the history of medicine, psychology and pedagogy and from whom I take reference to their records. In general, historians continue providing discussions of incidents that give a basis for what we have done and the path we have traversed.

- Philosophers, who have given systematisations to speculations, theoretical reflections and reflections of thinking, namely in the content of appraisals [I refer to the execution of analyses that attempt to break through the ambiguity of a concept, a notion within a systematisation, an order of hierarchies, etc.].

- Sociologists, who have presented an exposition and analysis of social events that can be retaken from different perspectives

- Pedagogues, who have described the transmission of knowledge, organisation and systematisation according to scientific parameters, with the aim to disclose actions, especially educational actions, for the development of next generations

- Scientists in the field of education, who can provide reflections of events in pedagogical parameters and terms belonging to and under the auspices of the project of pedagogy as a science

Special note! As can be seen here, neither medical doctors, neurobiologists nor psychologists were taken in an active representation for the development of this work. This necessitates the idea that it is a work that has come from the pedagogical viewpoint and did not have the intention to portray an opinion coming from the medical, neurobiological or psychological realms. Thus, the philosophical methodology from educational science helps to establish a clear perspective in the work.

Usual presentation of data in qualitative research

Here is presented a sketch or map for localising the contents in the work according to the usual way of presenting the summary of the information and customary report of data in qualitative research. I took reference from the 'Standard for Reporting Qualitative Research, SRQR' (O'Brien et al. 2014) in order to give clarity to the work relating to its structure of the composition of the argument for the application of educational complexity theory (see Anhalt 2012). This section is intended to provide orientations on the following points – these points are listed according to 'topic' and 'meaning'.

Topic	Meaning
Contribution:	Pedagogical translation
Topic:	Pedagogical diagnosis that reveals the disciplinary collaboration between mentioned disciplines/and the process of pedagogical translation from the standpoint of connection of the subject with the world
Title of the work based on a review of titles:	First option: Neurobiology, Psychology, and Science of Education. A complex collaboration that interacts in the conformation of diagnosis and

Topic	Meaning
	early diagnosis of neuro-metabolic dysfunctions: the case of a clinic of the nervous system
	Second option: Pedagogical diagnosis encompasses a position of reality and an interchange of opinions – conceptualisation of the initiative of pedagogical translation
	Third option: 'Diagnosis of the diagnosis' in terms of Medicine, Psychology and Educational Science – and an invitation for pedagogical translation
	Fourth option: 'Diagnosis of the diagnosis': Spheres of action of pedagogical diagnosis based on the pedagogical translation of an interdisciplinary collaboration between Medicine, Psychology and Educational Science
	Fifth option: 'Diagnosis of the diagnosis': Spheres of action in pedagogical diagnosis with reference to pedagogical translation of a disciplinary collaboration between medicine, psychology and educational science
Methods of analyses and iterative reflection to problematise the meaning of concepts:	Circle of problem development, *Zirkel der Problemgenerierung* (Anhalt 2012)
	Observation in second order and third place of composition
	Perspective and Perspectivity
	'Analysis of meaning' (Schwarz 1993) and 'analysis concept' (see application in Keiner 1999)
Method of collection of information according to an iterative process:	Identification of 'points of connection for further analysis'
	Procedure of systematic scientific search literature (Kopp et al. 2017; Kopp-Heim & Minder 2016; Bates et al. 2016; Best et al. 2014; Eibl 1991)
	Consideration of advance literature
	Presentation and feedback
	Regulative classification to manage a search strategy on more specific literature
	Scrutiny of pedagogical texts according to a pedagogical perspective
	Information that launched the points of connection for further analysis from a pedagogical perspective with common topics in other disciplines
	Order of concepts according to a pedagogical structure of complexity
	Formulation of the index of the dissertation as concerns a list of concepts and structural moments that can sustain to collect more information and to start or to continue again from the beginning
Space of research:	Sphere of action that is in line of the 'universe of discourse' from Dewey (in Anhalt 2009, p. 27)
Awareness of a difference between an object of study and subject-matter:	This work is predicated on the difficulty of taking objects of study for the definition of contexts and theory development. In this respect, objects of study are problematised with their own dynamics as subject-matters, which connote the way in which they are worked on.

Table 0.1. This table contains points that are discussed in this thesis. These points are listed according to a presentation of 'topic' and 'meaning' (see O'Brien et al. 2014) to provide a general overview. The elements written under the column 'meaning' are used for the compilation of the proposals of this research. As the name of one of the methods refers to the analysis of meaning, the contents listed in the column 'meaning' are analysed with reference to theoretical statements in pedagogy and educational science.

The following topics deserve immediate explanation. The remaining points will be discussed in detail throughout the work.

Topic regarding to the title of the work based on a review of titles: The title must include reference to the '*iterative process*' of research (O'Brien et al. 2014, p. 1246), that is in

particular within the systematisation of my work related to the circle of problem development (Anhalt 2012) as a method of control in connection with foundations of research. The title must also reflect the complexity of a situation and the complexity of the subject-matter that I took as the basis for the composition of the research question. In this vein, the disciplinary collaboration of fields of research that work with volatile results from the internal dynamics of subject-matters in combination with changeable environments must appear in the title. Thence, the following five titles were appropriated for consideration:

Firs option: Neurobiology, Psychology, and Science of Education. A complex collaboration that interacts in the conformation of diagnosis and early diagnosis of neuro-metabolic dysfunctions: the case of a clinic of the nervous system – Although this title opens strongly with the enunciation of disciplines contemplated for a common collaboration, and despite the fact that it evokes explicitly the design of an interplay of situation and subject-matter as complex, it does not refer the reader to the expectations of what can be found within the content of the text. Furthermore, it gives priority to a specific diagnosis and to the case of a clinic of the nervous system, neither of which is really problematised. Hence, this title misdirects the attention in terms of the direction of this research.

Second option: Pedagogical diagnosis encompasses a position of reality and an interchange of opinions – conceptualisation of the initiative of pedagogical translation – This title might confuse the reader once the pedagogical diagnosis is not handled as a completed category in pedagogy. Hence, I identified that it cannot be used to show precisely that the contribution relies on the pedagogical translation.

Third option: ‘Diagnosis of the diagnosis’ in terms of Medicine, Psychology and Educational Science – and an invitation for pedagogical translation – Perhaps this one does not clearly speak the reality’s reference taken since the terms are considered only from the pedagogical side and not simultaneously from medicine and psychology.

Fourth option: ‘Diagnosis of the diagnosis’: Spheres of action of pedagogical diagnosis based on the pedagogical translation of an interdisciplinary collaboration between Medicine, Psychology and Educational Science – In the last part of this work, this title resembles the analysis in second order of observation with specific attention to the concepts provided by this work. With the notion of rethinking an action of diagnosing, it identifies the qualitative approach of research and the hermeneutical process of data collection, and throughout, the complexity of the analysis that is next mentioned. The meaning of these methods is extended within the work and problematised through the path of science with constant reference to pedagogy, which strives to clarify the complex object of study with which it deals.

Fifth option: ‘Diagnosis of the diagnosis’: Spheres of action in pedagogical diagnosis with reference to pedagogical translation of a disciplinary collaboration between medicine, psychology and educational science – Finally, following the sequence of modifications in the titles of this work, this title is based on the fourth attempt at writing a title that could reflect the dynamism of the work. This fifth attempt follows the same

criteria described above during the fourth option. In this title, some prepositions and conjunctions were changed upon completion of the work and after thinking through the overview of the findings. Thus, this work has yielded a sketch of how to suppose the understanding of the reality of education; then, the connection between actions, objects of study, subject-matters and assumptions related to them reaches a complex coherence from the theory of complexity of education (composed by Anhalt 2012).

Topic regarding to the methods of analyses and iterative reflection to problematise the meaning of concepts to be applied and discussed in a different range throughout the writing of the work:

1. Circle of problem development, *Zirkel der Problemgenerierung* (Anhalt 2012) is a method of control related to the foundations of research.
2. Observation in second order and third place of composition for the development of alternatives. Hence, it is applied from a position of educational science and not only from pedagogy.
3. Perspective and Perspectivity. I understand that with these concepts, Anhalt (2012) problematises simultaneously the evolution of differences through which pedagogy has gone in the theoretical thinking of positions. In this way, it is not possible to consider everything from only one perspective (for example, Anhalt 2012, p. 68), and for this reason, a systematisation with reference to Elmar Anhalt's theory of complexity of education is offered. Perspective, which refers to the method of event observation, brings the theoretical requirements to the fore (see Rucker 2014, pp. 35–38). Perspectivity indicates the situation with respect to the foundations of research (see ibid, pp. 38–39).
4. 'Analysis of meaning' (Schwarz 1993) and 'analysis concept' (see application in Keiner 1999). Both methods take the concepts to handle the discrepancy between the meaning of a concept in contrast with its multiple application –portraying inclusively contradictory presentations.

Topic regarding to the method of collection of information:

1. First, it was necessary to identify the 'points of connection for further analysis'[33] described in previous research related to the collaboration between disciplines and with a changeable subject-matter owner of an

[33] For this step, it was important to keep in mind that these 'points of connection' represent a temporary stability (Anhalt 2012, p. 50) in the description of a subject-matter. Educational science has the task to employ the awareness of such a steadiness with the intention to compose an object of study adaptable to changeable contexts (ibid). For this reason, educational science can participate in the development of other disciplines and the transmission of their contents. In this sense, educational science takes part in and by alerting the scientists about the methods employed for the generation of reliability. This means, in other words, that a teacher – that might come from any area – should not provide a content of knowledge as a recipe or universal knowledge for the purpose of being continuously reproduced. The teacher should direct the attention of the students to their own questioning on the content matters of what they are learning. This position regarding the consideration of the teacher can be problematised based on the type of research conducted that after 1945 (Tenorth 2000, p. 276) developed under the influence of viewpoints of human sciences relied on by critical-philosophical positions to empirical pedagogy (ibid, pp. 277–282).

internal-, open-, uncertain-dynamic, irreducible to problems of planning and governance.

2. A procedure of systematic scientific search literature (Kopp et al. 2017; Kopp-Heim & Minder 2016; Bates et al. 2016; Best et al. 2014; Eibl 1991) based on identification of concepts and interrelatedness of subject-matters, along with reflection on the connection of their categorisation, was taken in consideration.
3. From the outcomes of the reflections, reading of literature and analysis of meaning in the conceptual-structural composition from different theoretical traditions, advanced literature began to be considered.
4. In forums of experts, colleagues and other interested scientists, the understanding of the advances was presented. In the context of the frame of colloquiums, open meetings, congresses, symposiums, seminar papers and presentations, the research progress was discussed accordingly with meanings of the categorical employment from the statements and theoretical formulations. Feedback was taken into account and sometimes integrated for the calibration of the theoretical position within the search of orientation.[34]
5. This progressive and regulative classification manages a search strategy during the acquisition of information that at the same time allows a constant process of revision. With the delimitation of pertinence regarding terms, the acquisition of literature became more specific.
6. Once terminology was revised, from an overall scientific use to a single concrete pedagogical one, and vice versa, connected exploratory inquiries of pedagogy started to appear. At this point, now from the perspective of pedagogy, the task became to observe and to detect the emergence of activities within the pedagogic theoretical construction. This involved a more concrete scrutiny of pedagogical texts.
7. In support of the previous sixth step, but with an important modification of the scrutiny process and identification of concepts, then all the information collected started to make sense according to and in terms of the pedagogical tradition. In a more precise manner, from the pedagogical realm, the information launched the points of connection for further analysis with common topics in other disciplines.
8. In the same manner, the concepts received an order character within a pedagogical structure of complexity, meaning the organisation of the elements involved – according to the relation of disciplines among each other, from the overview of the complex situation and taking the side of the subject-matter into account, from the internal-dynamic of the changeable interchange of components, the information started being compiled in view of the pedagogical interest. This is to say: to assemble a collection of texts

[34] Feedback was not only integrated when it opened to an extreme the scope of the research direction. Pointedly speaking, this was a confirmation of how the philosophical profile and the initial matters identified portrayed a potential for other tasks and for being developed in several directions (i.e. from the diagnosis concept to the discussion about recognition, the reversal and forwarding of questions to a reality regarding how the object of educational science can be conformed, respectively how the complexity of education confirms the structure for collaborative readiness from the participating disciplines).

from the pedagogical intention of learning how to make a man out of a man and how to aid the development of another person and of the next generation.

9. The skeletonised plan started taking shape by formulating the index of the dissertation as concerns a list of concepts and structural moments that could be extended within the work. In this way, more literature was retrieved that now came through the lens of educational science. This integration of arguments from different sources sought to conform an integration of pedagogy and other disciplines into a common reality within a coherent exposition, which implies a reality that is shared by several standpoints, in other words, persons and disciplines in this case.

Topic regarding to the space of research: Sphere of action that in line of the 'universe of discourse' from Dewey (in Anhalt 2009, p. 27) discusses from the pedagogical side and with pedagogical intentions the levels of the research situation related to the diagnosis concept from the presentation of a reality of education.

Topic regarding to the awareness of a difference between an object of study and subject-matter: This work is predicated on the difficulty of taking objects of study for the definition of contexts and theory development. Since the object of study alone indicates the thing to which the activity relates (Sandkühler 2010, §778) and subject-matter is taken from its internal dynamic and specifically from the development of an experience in educational science (see Rucker 2014), I was aware of this difference when redacting two utilisations. Subject-matter connects to theoretical statements and is further connected to the means by which it becomes itself a subject of inquiry – for instance, how it is linked to the course of actions leading to other questions in science. Sometimes, I employ the word 'object' with reference to the German discussion of the concepts *Gegenstand/Objekt* and in contrast to the German elaboration of *Sachverhalt* (Sandkühler 2010, § 2683bu). I stayed on the threshold of the complexity of subject-matter from the theory of complexity of education (Anhalt 2012), explained according to the *Komplexität des Sachverhaltes* with a '*mutual interconnectedness of all ... components*' (Goguen/Varela 1979, p. 34 in ibid, p. 76) that is deepened by Rucker's (2014) explorations on the complexity of Bildung.

1. Theoretical framework regarding the spheres of action

Opening statements: Reality of education is linked to the cross between interrelations of perspectives – considering such a supposition, a systematisation that supports this statement is required in parallel to a structure that can explain access as this happens. Such a systematisation is embedded according to a pedagogical-theoretical framework. Starting from the context in which the theoretical framework evokes the dynamic of a pedagogical subject-matter, educational theory opens up the space for indications of what it is like to be – for example, both in general and in particular for the discussion of a question about the nature of a concept with regard to the arrangements between theories. In other words, this means that educational theories set the point of reference for their later problematisation. On the basis of a theoretical framework, a theoretical space is required due to an iterative constitution of science. I explain such space from the theoretical framework through spheres of action regarding argumentations. Spheres of action therefore speak from the pedagogical viewpoint in order to recognise assumptions about how to present the object of pedagogy according to a reality of education. Simultaneously, an attempt is made to avoid fallacies by considering mechanisms – such as reduction and viability – that may be lost in the complex situation of recognising the procedure for estimating the condition of another. These mechanisms will be presented in the next chapter as part of the research process upon the current state of research by means of the diagnosis concept when this construct commences to be thought within the reality of education according to the following theoretical framework.

With the historical encounter of a variety of positions regarding pedagogy (see Lischewski 2014; Keiner 1999; Brezinka 1992; Blankertz 1982), I want to discuss the ideas in the *intentione recta* of 'general praxis of pedagogy' and the ideas of *intentione obliqua*[35] of 'educational science' for establishing the background for an approach in the 'process of transformation' of humanity during the consideration of another person, respectively, recognition of the condition of *the other* [based on a procedure].[36] For this, I will discuss an analysis of a concept of diagnosis from pedagogy according to the proposal of a reality of education. Pedagogy has earned a place in the scientific framework, which must be pursued to be discussed in approaches outside institutional restrictions. This work will show why educational science is within the realm of taking decisions, in which it is often ignored that the positions about reacting under emergency conditions are also within a systematisation of previously considered parameters.[37] I am

[35] Jörg Ruhloff (2001), in an article on the philosophy of *Bildung* and education, identified the difference between affirmative knowledge and the philosophical questions that come from direct or oblique intentions respectively (ibid, p. 60). To this end, within this thesis would be found the position of reflection in the second order for obtaining the forward-leaning purpose that deflects from the internal dynamic of a subject-matter.

[36] The recognition of the other involves the recognition of oneself. Hence, the action of recognition requires an individual transformation process – which I propose to be connected to the world. In order to give this proposal a structure, this relationship needs to be analysed. A parallel discussion is suggested for thinking on how the difference between the other and the self has a relevance to further actions.

[37] As a very simplified argument, which I do not want to state easily, but within the realm of educational science, professionals of different disciplines can act upon it. I want to be very careful with this footnote,

opening within this first paragraph with the idea that professions have profiles that do not support comparison. This means that medical doctors, for example, have a professional profile that cannot be compared with that of pedagogues. Neither is the profile of any other discipline that employs a pedagogical basis to be considered under the pedagogical tradition. Like this, as a matter of fact, not every regular person will know what to do when an accident happens. How was it originally determined that a person can become a medical doctor? Disciplines *are* – in terms of *being* – but how were their classifications first laid down? I do not establish the goal of this work to be defining a discipline, but I will grant problematisation to the difficulties during the process of describing a discipline when the reality of education is pursued for the purpose of clarifying a concept such as the diagnosis concept (i.e. a concept that requires of the collaboration between theoretical traditions).

I started with the documentation of the place that pedagogy and educational science have given to the procedure of diagnostic. From goals related to such procedure established by disciplines, the analysis contained how disciplines were formed to maintain the implementation of a diagnostic procedure. Pedagogical diagnostic rears on censorship and selection according to recommendations for thinking on it (e.g. Jäger 2010; Schuntermann 2009; Van Ophuysen & Lintorf 2009; Ingenkamp 1997; Knauer 1994; Kleber 1992; Kutscher 1979; Klauer 1978; Döscher et al. 1977; Pawlik 1976; Ulich & Mertens 1973). Pedagogical diagnostic as a diagnostic procedure takes place within a complex situation that I explain in terms of the process of recognition. Additionally, it has been my intent to review whether pedagogy can join the process of diagnosis as a diagnostic discipline (so considered up to this moment) when assuming the problematisation of diagnostic disciplines as discussed in texts from Sadegh-Zadeh (2012), Wieland (2004), Schwarz (1993), Westmeyer (1972), Gross (1969) and that will later be extended under the certainty offered by procedures and according to the requirement for implementing logical systems. For this, it is worth explaining the process of diagnosis within a complex scenario of complex premises (Schwarz 1993) while also pointing out if a process of transformation takes place within the exercise of the actors involved, and how. This would refer to the figure of the person (i.e. the patient and in a medical context or learner in the pedagogical one. In both contexts, the figure of the expert, teacher or doctor marks the counterpart upon which a tension amid areas of interests comes into view). Questions are formulated around this point, for example,

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because, on the other hand, emergency situations must not be taken lightly. Disciplinary profiles account to systems and processes that cannot be reduced among themselves. Thus, the borders of pedagogy and educational science must be established according to and explained with foundations of reasoning about how opinions between areas can participate and collaborate. By restricting pedagogy to the extent of schools, representatives of science have damaged the benefits that can be learnt from pedagogical tradition. As a matter of fact, this institutional façade exists, and therefore, the 'market' is opened to professionals that teach without a background in the history of pedagogues. Pedagogy is yet at work on the development of an own language, not in order to restrict the access from diverse interests, but in order to continue consolidating the spirit corresponding to pedagogical tasks. In the portrayal of the reality of education, other disciplines effectively are participants in how to put together the contents for bringing up younger generations. The presentation of an open reality of education calls for a responsibility to revise the content in which the participation of society begins. This is done with the intention to grant reliability to the proposal of pedagogical concepts. Pedagogical concepts, like any other concept in the scientific scope, would proceed on a consecutive testing of the consistency of the constructs – therefore, other works will be required to be connected with this for the prospect of a pedagogy for the next century.

to know how we have allowed naturalism to rule many areas of our daily life (see Varela 1988; Block 2007; Alisch in Schlüter & Langewand 2010) that we have allowed ourselves to be blindsided by the effects of a perceived unity in science, for example, by the belief in certainties and logical explanations of 'facts'. Such a strong conviction leads people to have a blind faith in results rendered by a machine.[38] In this sense, a pause should be taken to wonder how humankind can confuse the idea of assistance and scientific cultures with some stances in epistemology (see, for example a line about such a reflection concerning 'representation' in Sandkühler 2009). This last-mentioned idea is being replaced by discussions that pursue effectiveness of economical systems.[39] Thus, in a similar but distinct direction and with these questions calling upon a contemporary background, how is it possible to ensure that the learner achieves the greater potential directed towards a moral life? Based on the notion that moral life has been proven in many atrocious contexts not to be questioned for the execution of some actions [when, for example, they were not even under the impression of their confusion with tasks], one can assume that morals should be part of the explanation of the world.[40] Or can the morals be put aside? (see opinion on Levina's consideration about Heidegger's ontology by prioritising freedom over ethics, in Williams 1992, pp. 1–23). This last question must be asked in the context of the analysis of the reality of education.

The extension and limitation of approaches requires direct questions from the grassroots. For example, in order to know what *we*[41] know and to realise what content is available

[38] The statement connected to this footnote is not limited to giving a social access to the belief of how to understand the world. Scientific reactions can be guided by incomplete definitions of ambiguous content, and sometimes some ideas are forgotten due to a bad criticism from linear thinking that should be located on a collective level and not on a scientific one. In other words, the boundaries between general society and scientific professionals are not clear, because scientists are also human beings. In this thesis I do not follow the evaluation of an approach or the establishment of a judgment, since I will argue that the development of a statement can be organised according to different levels of a systematisation. In this way, some statements are opinions and some others raise questions to the theory construction. Nevertheless, during the proofreading of the writing contents, some statements are too catchy to not comment on them.

[39] Based on the 'effectiveness of numbers' one can forget that an analytical basis holds the structure on which signs like numbers reach their effectiveness. To this extent, the observation on a procedure from its theoretical constitution raises an analysis about how a course of action has a place within an own conformation.

[40] I am not writing a treatise upon actions related to morals. However, by mentioning that the diagnosis concept has moral implications from logic (e.g. Schwarz 1993 or Gifford 2011), I will leave an idea about how the morals can yet be problematised in the relation of a procedure and its assembly. In a corresponding reference, in the third chapter, I relate moral action with self-reflection and the development of Bildsamkeit.

[41] An intentional use of the first-person plural pronoun is given in this paragraph. I exert the integration of the person within a theoretical exercise that seeks for objectivity by being aware of the inclusion of the human being in natural descriptions and philosophical speculations. Nevertheless, I will try to stay with the third-person formulations for a more familiar way of presenting scientific objectivity. Along the same lines, I voluntary write the first-person singular (i.e. I) to account for the responsibility of what I am stating and proposing. My commitment relies from the beginning of this work on creating the set for a research formulation that is opened to the influence of the individual within realities design. I am not committed to an only experimental research that was initiated by a positivistic approach in the way that I continue learning from the reflections of other scientists. An example would be those reflections made by Habermas (1973) upon the work of Ernest Mach, whose attempt to differentiate reality from metaphysics on an ontological basis (ibid, p. 104) showed a mistake by relating elements with perceptions through the personal pronoun I – in German *ich* (ibid, p. 106) – with which an individual position was included that was not systematised.

for discussing this topic, we can discuss what we do not know and what we suppose we know. Hence, I am setting an intentional misdirection within this work by throwing out several questions. Following reflection on the inspiration of the analytical proof of exclusion[42] about the development of alternatives (Salmon 1973, p. 131), in the words of the historian Veyne (1990) regarding how 'we do not know what we know' (ibid, p. 95), we will be required to perform a work of introspection within written knowledge and covering the knowledge that we possess. At this point in the first chapter, I mentioned briefly that when putting together tools of logic with the historical register of facts, this combination would challenge the up-to-date averments of a general reality – speaking about what should be considered as a reality. In the words of a layman – or better said, of the included person – here a translation of thought is required from a deep understanding of the meaning of words and their symbolism – the words as symbols, the symbols as words in reciprocity – and their insertion into a context with its consequences for the elaboration of new ideas as happens in what the contents of the diagnosis concept describes or during the process of recognising another person.

Between the historians and the philosophers, there is a place for the pedagogues. After all, someone needs to translate what writers of history make universal as distinct from what, as a general idea, philosophers discuss as impossible within a frame of transmission of knowledge that takes account of the plurality in modern contexts. Along the same lines, enclosed by sociologists and philosophers, within this work will be passages given to the reflections of the pedagogues.[43] In this way, one hypothesis of the work reads that the reality of education does not happen without collaborations. With this option, the place of pedagogy is not intended for translating the contents and traits of cultures of research groups[44] to which a specific procedure is referred later as the

[42] Salmon (1973, pp. 129–133) wrote about '*analytic, synthetic, and contradictory statements*'. In this section, he gives notice to the analytic statements that despite being valid do not necessarily yield helpful information in the description of a condition. Analytic statements are not formulated for a universal application; for example, in the same manner that Carnap (1996, p. 55) presented, the combination of physical and logical terms creates a range of valid analytic values that is distinct to the scope of synthetic approaches – as a contingent modality-term (ibid, p. 75). In my own words: we benefit from these differences in order to test that what is being formulated in a scientific framework is reliable for a later knowledge transference. I can say that analytic statements are different in terms of the scope of unimaginable combinations in the presentation of alternative formulations. Thus, exclusion based on analytical proof yields possibilities that have not been mentioned (see Salmon 1973, p. 131).

[43] I do not propose gathering a bunch of disciplines for making sense of an explanation of a reality. Hence, a passage within the conceptual framework is considered for the implications related to disciplinary work. The disciplines are taken from their contributions that I will look upon in the encounter of dynamics within the reality of education. This means that they will be taken as a basis for problematising the relation between the assumptions of specialisation, unity and collaboration.

[44] By thinking on the pedagogues in action who, on the basis of their work, make a theory construction, I intend to display that the place of pedagogy is beyond a science of a praxis. Similar ideas on pedagogical development can be found in Benner (1991, p. 119). Furthermore, when pedagogy is capable of holding a systematisation of models upon different ways of thinking (as I show in the fourth chapter), pedagogical contents can jump outside a system by means of the individual into another system. This gives reason to the problematisation of the participation of other disciplines within pedagogical tradition at the same time that, in a concrete manner, pedagogy localises how from assumptions of attitudes, contents from these disciplines in a pedagogical sphere of action interact with and are counteracted by other positions (hence, a speculative pluridisciplinary collaboration is thinkable). This means that from pedagogy, a hypothesis can be developed where contents can be neutralised during a moment of pause upon understanding for the purpose of following next steps. The moment of pause is developed by the interaction with counter-positions. Like this, a dynamic moment is also created during a *steady* moment.

pedagogical translation [such a procedure makes a distance between pedagogy as a discipline and an individual's way of acting in connection with the world]. In addition, the scope of such translation is clarified as not having taken place without rules on the extension of all the knowledge. For this, I will provide the idea that this translation happens as part of a systematisation. Since such translation of content is what pedagogy takes for problematising purposes, pedagogy relies constantly on the paradox of being without being of what can be understood out of it – this means by taking reference on perspectives under a plurality of scenarios. This paradox renders different shapes within the pedagogical content, and hence, it will appear in different moments and under determined circumstances that up to now have been registered by sociologists and historians. Then, not by putting pedagogy in the place of a translator but as a discipline within a system regarding means for later analysis, actions that are reported in the history of medicine and psychology, analysed in sociology and discussed in philosophy, can reach the intention of problematising them into a phenomenon of education. This phenomenon will speak about how a concerted system consists of disciplinary collaborations that could explain the reality of education. Chimisso (2001) identifies that the notion of collaboration is to be found as pedagogical value in modern science, as Bachelard proposed that '*modern science is the moral activity*' because of the rejection of an object that advances expeditiously and which requires ongoing commitment (ibid, p. 95).

In this way, despite the teamwork of disciplines like medicine, psychology and educational science, from a sociological standpoint (e.g. Pickersgill & Van Keulen 2011), that operate in the diagnosis of a person but do not collaborate in all scenarios, historical contexts provide a record of interactions and consequences that is noted by sociologists and identified by educational scientists (ibid, p. 186). Whether the place assigned to *education* as a discipline can be considered a proper interpretation about where to locate the action of educating, or whether the position and perspective of the interpreters is properly defined, are other questions that can be posed, and that, throughout this inquiry, would be handled as synthetic information for re-entering the discussion of educational topics.

So much is written! The amount is so great that a work of systematisation must start with questions to the basis and identification of concepts, words, their logic and reflection and comparison of some of them that anyone might select for one analysis. For example, addressing the concept of diagnosis and diagnostic in pedagogy involves the problem of the definition of the diagnosis concept because of a lack of written works that can explain why pedagogy should be called upon sparingly for diagnostic purposes.[45] Despite the awareness of empirical pedagogy regarding the limits of psychological evaluations (Jäger et al. 2010, pp. 1–17), this empirical side is called only for the settlement of behaviours according to predetermined parameters. Nevertheless, in an incipient moment, the diagnosis concept as a meeting point delivers the problem of orientation due to the encounter of plurality in opinions. Since the place of the diagnosis concept is integrated within larger steps of action, I identify also that in diagnosis as a process, the notion of 'orientation' serves as reference for the people involved – for following

[45] The disciplinary profile of pedagogy confirms that pedagogy establishes the foundations of its own contents. Hence, the limitation to the directions of an action proves to be wrong. Pedagogy therefore has more to add within the formulation of how a procedure is linked to the analytical position.

instructions or taking decisions affecting the life of a person or under an own responsibility.

In the following text, I will advance from the relevance of the topic of the pedagogical object as a synthetic construct to the implications that this analysis will have in the diagnosis concept from the pedagogical perspective of the collaboration among medicine, psychology and educational science,[46] because I explain a systematisation for understanding the reality of education in the case when the diagnosis concept is taken as a reference for speaking upon 'recognition'.[47] Specifically, I have a special interest in this work's capacity to deliver a contribution to the science of education – marked as a scientific proposal from the theoretical tradition of the project of pedagogy as scientific discipline.[48] In the interest of consistent writing in the presentation of the theoretical framework from the pedagogical side, I open with the idea of *spheres of action* as a pedagogical space and as a pedagogical supervision of the work. The pedagogical supervision continues with the notion of Bachelard's dialectic (1978, 1966) in order to present at a current point the concept of diagnosis as means of observation, reflection and supervision. In this order, the space described by the spheres of action as a theoretical construction allows demarcation of the interrelation of perspectives within changeable moments. In this manner, such a notion holds the basis of the consecutive concepts proposed by this research. In a first moment, without yet differentiation in trends of pedagogical thinking, this following space seeks to integrate a moral sociocultural and historical interest that a human approach of pedagogy has also left (Schütte 2015, pp. 28–56[49]; Lischewski 2014, pp. 393–395). Thus, a theoretical construction can set the basis from practical experiences and for the application of further procedures. As such, the current state of research problematised by the

[46] Educational science is taken from its position of second-order observation and pedagogy, in general, from the praxis of its theory. I seek to repeat constantly this difference in order to establish clarity in the use that I give to this difference. As a matter of fact, in this very last statement in which this footnote has its root, I left an intentional ambivalence about the place where to put the adverbial form of 'pedagogy' on one side and 'educational science' on the other. I want to do this in order to arouse the attention of the reader to this work.

[47] A specific outcome of this work relating to the reflections upon 'recognition' will display the chain of logic as analysis concept, development of models and diagnosis of the recognition concept. All are within this sequence as an iterative and circular performance for getting better and making the best out of one person.

[48] Later and during the work, the problematisation will follow the interaction with the reader based on considering the philosophical proposals of, for example Kant, Hegel, neo-Kantians, and on the consecutive scientific disruptions proceeding from their appraisals. With the purpose of creating alternative formulations, I set authors to talk among each other in order to estimate that their proposals have connecting points that can help to explain the reality of education. In any event, I am not attempting to erase the differences that exist on the register of works nor to avoid attending to the direction that other authors recognise from the composition of theoretical positions (Lischewski 2014, p. 150), in which, for example, Dilthey, Litt and followers of the humanistic approach of pedagogy were distinct from propositions of Herbart or neo-Kantians. Precisely because of connecting points apropos phenomenality of the self and the world, these last-mentioned pedagogical schools of thinking portray a potential that must continue being exerted in the pedagogical theory.

[49] With regard to an educational scientific and philosophical problematisation, the 'technological' part that Schütte (2015, pp. 28–30) refers to as the reconstruction of the model of Sloterdijk next to the 'ethical' and 'anthropological' side serves as a reference of the argumentation in which a way of scientific collaboration should be taken in consideration of finding educational processes within the encounter of opinions. Because as Chimisso (2001) noted from Bachelard's writings, the technology establishes a continuous development and requirement of collaboration in modern science.

conceptual historical consideration meets the technological procedures for displaying results on neuronal and mental representations from the past and the present – located accordingly within pedagogical spheres of action – as a topic of common interest for the disciplines related in this work and by bringing the current state of this situation in line with a present moment for defining the educational object next to a complex situation.[50]

Spheres of action as outline of a practical deed

In this text, the 'spheres of action' will extend the moment of a clash of interactions between theory and praxis that embraces historical contextualisation, theoretical reflection and methodical[51] control (Anhalt 2017a, Rucker & Anhalt 2017) regarding a subject-matter of educational science.[52] This encountered subject-matter is theoretically constructed on the observation in second order. Why a second order? Because the model of action and reaction is already known and speaks at a singular level that does not relate to the complexity of the human being.[53] However, the enticement of retrieving linear explanations pushes reporting correlations from specialist knowledge.[54] Human beings within systems cannot be defined by an only rule (see Anhalt 2012, p. 24). From the medical side, Richard Koch (1920, pp. 32–34) stated in this context that humans make systems that should not be completed with regard to their well-being. Therefore, proposals for wider systematisation is required for advancing complexity theories that can respect the freedom of the person. Through the proposal for systematisation of human actions in terms of complexity theories, everlasting questions can be discussed that bring greater consequences to the continuation of life. Strictly, because descriptive perspectives that come from observers of mechanisms of action of a self-organisation of systems (Anhalt 2012, pp. 258–259) are focused on what keeps a system alive, and how – such descriptions meet a complex condition with the clash between different positions of science, and they can be currently taken by the complexity theory of education from Elmar Anhalt (ibid). In addition, the benefit of a metatheory in the analysis of theory and praxis can clearly be appreciated – especially when this analysis can be extended from the pedagogical realm to further epistemological connections.

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[50] In this respect, after completing the research, I write in advance the reader's orientation that I will attempt to define the educational object from a phenomenological approach.

[51] Anhalt (2010) pointed out the use of the concept of method outside of an empirical-analytical view. Methods are beyond verifying and falsifying assumptions (ibid, p. 92). Along these lines, other works can be found discussing this matter; for example, Wallner (2002) or Sandkühler (2009) gave an overview on the development of science according to a European system that went beyond self-reflection and that could not be sustained anymore by a traditional epistemology of a validation of assumptions.

[52] The subject-matter of educational science relies on a clue for activating the dynamic of theoretical assumptions because, as I will show, an educational object represents a synthetic construct that I take for making visible some suppositions in a disciplinary collaboration. To this extent, I will start providing grounds about how the reality of education can be built upon collaborative assumptions.

[53] In the third chapter, I present that the second-order observation opens a third place of composition. I set on this spoken place a moment wherein to explain the core of subject-matters and the root for philosophical speculation for designing models within a concerted system. Furthermore, I expect that after reading this work, a way to compose a problem of research can be better explained.

[54] This thesis handles the differences between specialist, integrated and collaborative 'statements' and assumptions. Any of the three indicates distinct assumptions of positions towards explanations in science. My proposal of pedagogical diagnosis identifies mechanisms that are interrelated to the assumption of any of these positions (taken as models in the fourth chapter), their implications and the exchange among the other positions. Like this, I argue that the reality of education contributes to the proposals for systematising science where pedagogy and educational science take a part.

On this note, the questions to how to make a man out of a man by means of educational endeavours belongs to the human existence (Brezinka 1978, pp. 41–53). With the intention of concretising the abstract 'existence', reference is drawn to the historical register system. At the same time, ambiguity is avoided by looking at the work from an educational perspective and linking it to specific ways of thinking that take theoretical development into account. Different approaches are counselled through events in history. I name this 'moment of influence' as the *contextualisation*, which sets a place for the description of an event. Along the same lines, scientific concepts are not finite, nor are they exclusive for an only description of a subject-matter but are connected to further discoveries and reformulations. The way to bring forth these new formulations relies on what I understand as the *reflection*. Reflection is accompanied by observation from the context of what is being reflected, such as the basis and direction of the content that is sought. Finally, academics enounced statements under principles and regulations that should trespass private motives; hence, the proposal of problems in research is oriented towards the ethical and common good of society. To that end, I understand the *surveillance* through the scientific spirit[55] that regulates the criteria of good quality in research work. This involves the condition that although the scheme of problem statements remains open to modifications, the elements under inquiry occupy established parameters.

Due to an observation in the second order of the theoretical application – this stands for a deliberate observation of a *self-preserved subject-matter*[56] – the principle of reality is set according to the differentiation between what happens on the plane of the actors, on the theoretical formulation[57] of this observation and on its reflection. [The plane of actors is problematised with the difference between non-expert and expert]. In these terms, *principle of reality* corresponds to a composition of descriptions regarding different levels of a situation that relies upon several perspectives for the visualisation of a dynamic subject-matter. In so doing, the action of a story is portrayed in an active scenario of spheres of action that depict practical deeds, which I propose to discuss from the individual [specifically, from her or his self-transformation process]. This does not mean that 'principles of reality' is oriented to a specific kind of person or group of persons but that, as Anhalt (2009) identified, the subject or particular individual is the one responsible for the decoding of messages (ibid, p. 19). Spheres of action formulate a place for reflecting the foundations of research in educational science, along the lines of a 'universe of discourse' that Dewey (in ibid, p. 27) displayed or that Anhalt (ibid) presented as a 'problem space' for the observation and discussion of social interactions with their outlines.[58] As I will display in this work, spheres of action are a place that can

[55] Chimisso (2001) in relation to 'science and morality' described 'scientific spirit' as the '*pursuit of knowledge 'for the sake of knowledge'* [italics added]' (ibid, p. 67). She noted in the context of Bachelard's discontinuity regarding his experience in classrooms that ''*scientific spirit' required self-transcendence through complete commitment to the scientific enterprise* [italics added]' (ibid).

[56] A *self-preserved subject-matter* addresses an object of study as a subject-matter with an own dynamic that helps to describe the dynamics surrounding it.

[57] The theoretical formulation from a second-ordered observation on the structure of a concerted system might refer at this moment to a general formulation that should not necessarily match with a specific theory nor with a specific discipline. With the presentation of the pluridisciplinarity approach, I will show how a general formulation still has problems to solve.

[58] While engaged in the idea of connection with 'social influence', one must be prudent when taking into consideration the different levels of observation that can be classified in theoretical thinking. For

be conformed within a concerted system when actions of other disciplines from a pedagogical view are taken in assuming scientific positions.

The consideration of the spheres of action (1) in detection of analysis concept, (2) for a parallel analysis of meaning and (3) upon assumptions regarding attitudes of ways of thinking looks for an affiliation with the consequences of an action on a social level – since these are taken on three slightly different levels of, at this moment, a general mention as a common collaborative situation.[59] A work in pedagogy takes account of a continuous 'performance' and seeks to explain its boundaries (see Anhalt 2012, p. 264). Not only in an educational framework, but in and regarding science in general, the worry about the verification of what we are doing goes back to the questions: 'What do you mean?' and 'How can you know it?' as Herbert Feigl enounced after he earned his doctorate with Moritz Schlick (1882–1936), with whom he pursued an understanding with the theory of knowledge from cultural German-European groups in the Vienna Circle. For instance, Feigl worked later on the validity and significance of science at the University of Minnesota (Feigl in Carrier 2007, pp. 21–22). This is one of many other connections among American and European countries that are being tackled in earnest through the exposition of this research.

1.1 Description of the spheres of action of contemplated disciplines

Focused on the relevance of the topic of research, to begin, the contemplated disciplines for this research are to be described: for instance, medicine with its spheres of action in neurobiology, and pedagogy with its spheres of action in empirical pedagogy and applied psychology. Due to the recognition of biological premises along pedagogical actions (see, for example, Strobel-Eisele & Wacker 2009, p. 9), these disciplines are inevitably engaged in the formulation of what comes next in educational topics. From the side of medicine, when Richard Koch (1920) spoke about the transition in medical ways of thinking concerning diagnosis, he stated that Galeanism had a greater success than Hippocratism thanks to the contents that were learnable[60] (ibid, p. 20). Thus far,

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example, the theorisation of 'foundations of research' in pedagogy portrays different opinions, and some of them declare that it is not possible to contemplate design or application issues simultaneously (Drerup 1982 in Anhalt 2009, p. 29). This point in question is also addressed based on the writings of Schmidt and Amelang (2012) during which in this thesis brief discussion of the difference between educology, applied psychology and empirical pedagogy within the development of this first chapter, where I clarify that this work is not in the purview of immediate application. However, within this same dilemma, Anhalt (2009, p. 30) takes reference from Halfmann (1995 in ibid) in exclaiming that pedagogy in analogue to sociology must take direct influence and relation with and from reality along with communication to confirm the composition of a society. Hence, 'applied research' and 'theoretical research' entail a difference that should be constantly kept in mind during the realisation of any scientific work, including the pedagogical.

[59] The formulation of a common collaborative situation refers to a system that remains to be ordered. With the development of the work, the 'common' and 'collaborative' characteristics of a situation will give shape to a concerted system [because recognition takes place while several perspectives within one same moment have a common interest]. This system contains 'assumptions of', and 'assumptions regarding attitudes of' that lead to a content integration and concerted action of linking models.

[60] In this context, I will not go into the meaning of 'learnable', but into the conditions for selecting one of two options to ensure continuity of 'content distribution'. 'Content distribution' is different from 'research content' and any other content. Content in itself must refer to the question of what should be organised, which in this initial section aims at listing what should be observed during a disciplinary collaboration (see later reference to Schleiermacher from Schurr in the section of 'Morality and self-

the development of modern biology of his time has supported the termination of supernatural diagnoses grounded on morbid demons (ibid, pp. 27–30). [His analysis continues, since he reflected more deeply on how the diagnosis can be problematised with philosophical and medical contents.] Biological premises have different purposes that for this work, they connect with the experience of delivering knowledge in a master's study program of neurometabolism, in which questions should be contemplated about how to facilitate the description of a situation under different principles of reality that work according to different spheres of action. [The facilitation of such description aims at localising an entry point for the problematisation of the problematisation, where it can refer to an ongoing formulation of statements.]

Descriptions of situations are then examined for clarity in the research approach. In the theoretical framework, the differentiations and connections in the diagnosis concept are detected from the spheres of action of the participating disciplines. These disciplines involved not only display a historical connection, but also common references to epistemological reflections that can be found on the periphery of their approaches, since the basis of their actions is composed according to different notions of truth. Epistemological reflections can refer to the figurative and to the operative aspects of Jean Piaget's (1970) genetic epistemology[61], meaning in the cognitive area[62] to the perceptions and mental operations, in contrast to the transformations of actions from one state of functionality into another (ibid, p. 14). Therefore, a brief discussion[63] regarding

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reflection'). I suppose that Richard Koch (1920) referred to an understanding of 'portable information' from the Galeanism mindset in comparison to the Hyppocratism approach, in which, as he mentioned, the student had to be prepared. With regard to Hyppocratism, the setting was more complicated to converge. Both approaches provide a basis that needs to be broadened to create an environment to support knowledge transfer. My analysis, however, initially focuses on identifying attitudes that can shed light on how this 'portable information' has a greater value for scientific development. Not only by mentioning some approaches would the acquisition of knowledge succeed, but by beginning to identify the search of what mankind has sought, a clearer picture can be deployed against what is necessary to work. Consequently, language may be clearer in the formulation of statements.

[61] Genetic epistemology had the purpose of systematising findings from developmental psychology in a theory of knowledge that could account for historical and sociological disciplines (Kneisler 2010, p. 128). Kneisler (ibid) articulated upon this proposal based on the influence that Piaget has had in the formulation of pedagogical theory. Since pedagogy has manifested openness to and integration of neighbouring disciplines (ibid, pp. 126–127) in the definition of its object of study, the pedagogical specialist literature needs to keep expanding its knowledge to other fields of research to incorporate knowledge while mainly underpinning the proper terms from pedagogical traditions.

[62] From the historicity of educational science and pedagogy, I detect that a debate appears in terms of the acceptance of cognitive standards (Helm, Tenorth, Horn & Keiner 1993, p. 253) or a clear statement that seeks to separate educational science from cognitive structures (Krüger & Rauschenbach 1994, p. 7). This work needed to take into consideration current approaches in cognitive studies in order to be able to take an own posture on the mentioned debate and with the intention to delimit a border with another branch of science. By localising the spheres of action from the pedagogical viewpoint, during the findings described in the fourth chapter, I clarify how this debate can be situated within a scope of extension and action in a system. Cognitive standards belong to the scientific work of historisation; hence, by affecting the other fields (pedagogy included), the relation to these standards must be pinned down to be contemplated. Furthermore, this helps me to delineate a problem of educational science by paying attention to its own evolution alongside scientific processes.

[63] The formulations *knappe Erläuterungen und knappen Überblick* (Anhalt 1999, pp. 15, 238), *knappe Überlegung* (Tenorth 2000, p. 277) and *knappe Darstellung* (Anhalt 2012, p. 234) give reason for a 'brief' reference to the composition of an argument under philosophical rigour. In different moments of these mentioned writings, 'briefly' noting contexts has helped to make a pause or to refer to the necessary pause for later taking notice of how theoretical points can be connected, one to another. With

such functionality and its ways of action would bring understanding to the reader about what is considered as problematisation of the cognitive area in the social and natural sciences and what might be problematisation of the transformation of mental operations. A brief discussion is suggested with the intention of not overlooking educational scientific and pedagogic intentions, because as the thread may be lost, a participation of disciplines takes place in what I will use to describe an educational reality.

When a proposal on these problematisations comes from the theoretical framework and current state of research, the exchange of knowledge[64] extends to the concept of consciousness for understanding its relation with cognitive matters and for questioning the consequences of selecting a subject-matter that ties phenomenality with localisation. Thus, at this first moment in the theoretical framework, the matter concerned by a speculation has evolved with advances in technology. Thence, the basis of Piaget's approaches should be reconsidered in the light of new proposals [such reconsideration draws attention to the fact that an update never stops. Later, during the work, this characteristic is explained with regard to the conceptualisation of the work]. This reconsideration meets pedagogy after pursuing clarity in the composition of an educational reality because, otherwise, certainties that are being sought in a general reality will never be reached since certainties must be limited (like being within a frame with boundaries). To this extent, pedagogues have other tools from educational science[65] with which the bridge between specialisation and unity can be connoted and some limits for the certainties can be established. This means, in other words, that pedagogy comes from a tradition where the division of positions can be reflected and, in contrast to any monistic approach, pedagogy can handle the encounter of teleological with physical explanations. In the context of reflection on a reformulation based on progress, the diagnosis concept appears as a connecting point for the provision of means to speak about biological approaches that are stressed by social and epistemological viewpoints. From the socio-epistemological offer, the diagnosis concept shows its transformative facets when they come from the particular practical deed upon the recognition of another

inspiration in a pedagogical mindset, I draw on this resource for giving reference and finding points of connection in wider problematisations in disciplinary works.

[64] The exchange of knowledge yields 'recognition upon knowledge', which is an attitude towards the reality of education when this attitude is problematised by pedagogical translation, practical deed and principles of reality (in more classical terms, this problematisation of knowledge draws on the link between theory and praxis to the reality of education, when both are in connection with the surrounding world, from and with an individual involved). The key points to bear in mind after reading this last statement corresponds to 'exchange', 'recognition', and 'attitude'. The work will attempt to create a structure for the collaborative readiness that is revealed through translations of spheres of action, the problematisation of the individual and the phenomenology of a subject-matter.

[65] At this point, certainty will refer to a latent construct that has different orientations. Theory of knowledge in educational science allows an analysis of the various facets of such synthetic construct as certainty [due to its connection with philosophical approaches for reflecting on a reality of education]. Briefly speaking, 'certainty of practice' is different to 'certainty of methods'. Further differentiations can be established, such as a 'certainty of methods in research' with 'certainty of methods in practice', which may lead to 'certainty in practice' distinct from 'certainty research'. In contrast to the dynamics of certainty, discussions upon how they are crossed would support proposals for systematisations in understanding the reality of education. In this short formulation, attention may be directed to the uniform distribution of prepositions with the order of nouns by task level. An in-depth analysis must be continued with the 'certainty of phenomenality' mentioned later in the next chapter. The 'certainty of phenomenality' could clarify the discussion about the connection between phenomenality with localisation.

person [not of her or his condition]. This work follows the line upon the constant retrieval of the particular from specialists to the general from an integrative position in a context of analysis between theory and praxis. Specialisation and unity as theoretical positions for this problematisation[66] meet in the action for the recognition of another person that is until today limited to the execution of a diagnostic[67] procedure and that speaks about a similar problem in the delimitation of subject-matters, disciplines and methods – as happens in the case of education and pedagogy when they were indistinctly taken [or when they have been mixed with the field of psychology without taking into account the distinction of traditions].

Both aforementioned theoretical positions for potential problematisations, in the analysis of the situation and in the analysis of the subject-matter, represent an interchange between social and natural sciences that is portrayed in spheres of action [despite the development of several approaches aimed at the internal communication of machines, whenever they need to be shared among people, the approaches are used to be spoken in other theoretical languages]. Both take place during the action of recognising and becoming acquainted with another person while applying a course of action, meaning during the up-to-date, considered execution of a diagnostic procedure [the discussion regarding the exchange of positions is part of the reality of education, which must be disclosed on the basis of the current state of research presented in the next chapter]. The relevance of the topic includes keeping in mind that to formulate what comes next in the educational realm includes spreading of knowledge of the performance of the fields in question. Where spreading knowledge occurs in the relationship of teaching and learning, a reflection will appear (Schaller 2012). The reflection, separated from speculation from the Hegelian approach (see Hegel & Lasson 1968, 1962a, 1962b), takes place as part of handling an explanation through the presentation of concepts that do not exist naturally in the world. In this way, I set a connection to the notion about how Piaget (1970, p. 18) tried to demonstrate how coordination of actions is rooted in reflective abstraction, which becomes mental operations and structures (ibid, pp. 21–40). He asserted that 'reflection' is not based on isolated actions but on coordinated ones; this is an effort that I want to join by problematising the coordination of actions as an interplay of spheres of action involving disciplines – this means to offer scale to the picture by zooming out from a micro level to a wider view for going on to a macro level and coming from a macro to micro level simultaneously. The portrayal of positions or models from specialisation to unity and from unity to specialisation in a concerted system under a collaborative position will clarify this option.

Following on the heels of this initial description involving what is necessary to keep in mind while spreading knowledge, the 'sphere of action' would be called upon and

[66] The heritage of assumptions about unity that raise questions on assumptions about specialisation goes far beyond an understanding of the world that should be congruent. By leaving no room for other explanations, a lack of unity would be referred to abstract and ambiguous expressions. Hence, specialised statements in the field of expertise from which they originate could be dogmatic and leave room for other experts who are general scientists when they are admitted outside their field of expertise.

[67] In the fourth chapter, I provide proof that educational scientists are not executing a diagnostic procedure but, in reality, a diagnosis when taking this procedure from a meaning of the analysis concept of recognition.

located in a pedagogical action, thanks to a pedagogical intention, and delimited after the interaction of two positions in a relationship where medicine, psychology and educational science are involved as disciplines. The pedagogical action remains to be explained in the text in the case when one individual can connect with another. Thus far, the exposition of practical deed will explore this idea in more depth. In this first chapter, the conceptual medical and psychological spheres of action according to medical and psychological frames[68] are presented within a theoretical framework. The intention is to problematise the position of unity in the sense of universality with that of specialisation in the sense of specificity or particularity that needs the collaborative assumption for the development of a bridge. For a pedagogical intention to be conformed in a reality of education, the position of the individuals refers to those who need to integrate technical knowledge into the practice and move from theory to praxis. This is a challenge when taking into account that the individual is not only a means but meeting-point of disciplinary positions and of inquiries towards changes. In the pedagogical tradition, the individual, for example, portrays a focus-point that is exerted but that cannot be easily grasped without the risk of taking *their* transcendental condition as a metaphysical [pedagogues do not take the individual for granted from an ontological side, but disciplines that surround collaborative work can do so, for example by focusing on the elements of a specific approach, such as problematising the causes of a disease. Hence the importance of reckoning with pedagogical partners is underlined by the contribution to remember the composition of a Bildung-supporting teaching, as Rucker proposed in 2019. From the text of which I take that a transformation process exerts the formulation of strategies that should not be forgotten when carrying out other activities such as research.] On this basis, educational science takes responsibility in order to avoid an ambiguous discussion.[69] Therefore, the requirement of a systematisation upon a process in a situation contributes to avoiding this hazard.

Is the concept of 'sphere of action' coming only from the pedagogical side? As a matter of fact, the viewpoint of this work discusses an answer to this question. Although 'sphere of action' would imply a pedagogical concept, the development of arguments would mark whether it is a construct that can be restricted only to pedagogy. Admittedly, a medical sphere of action in this work would report from the pedagogical face and not even try to express a medical opinion. Meanwhile, and despite my psychology degree, I inwardly set this work apart as an educational attainment. In view of the fact that psychology and pedagogy are two distinct disciplines, this work can be consigned to the family of *scientia moderna* of pedagogy[70] in the sense of a knowledge theory from the place where educational science can be detected. This is tangential to the controversy between *scientia* and *doctrina* (Deeley 2001, p. 259); going beyond the two distinct Latin words, it refers to the different conceptions of science (ibid; Stichweh 1993, p.

[68] By giving place to other disciplinary frames, I intend to recognise the boundaries set by other theoretical constructions that I can only report in this work from a pedagogical viewpoint. Hence I refer to them from a proposal of pedagogical 'sphere of action'. The boundaries become important when establishing one own position.

[69] In the conceptualisation of this work, I am presenting some preventive measures that educational science presents from its historical development.

[70] From the translation of science or *Wissenschaft* by searching for the reasoning of how pedagogy can work as a scientific project. This matter appears in the distinctions in Latin between *disciplina* and *scientia* (Stichweh 1993, pp. 236–237). See also and explore www.navigium.de. The distinction upon the project of pedagogy as a science goes beyond a wording in Latin. To this extent, I set forth the discussion from change of thinking with pedagogical trends after the writings of Kant and Fichte with the alternatives on proposals such as those from Hönigswald that can establish a basis for pedagogical principles (Benner 1991, pp. 90–112).

237) that can be extended to the historical place of pedagogy in science. Whether these words are used with reference to a specific historical moment,[71] for example, from an Aristotelian sense (Deeley 2001) of a unified position or from a context of learning where *doctrina* and *disciplina*[72] are polemical under the subordination or hierarchy according to knowledge (Stichweh 1993), the way that a position of science is conformed to these reflections brings forth study programs for next generations.

1.1.1 Brief discussion of a medical spheres of action for starting a differentiation

In rough terms, medicine encompasses action and reflection of 'intervention, manipulation and control' (Sadegh-Zadeh 2012, p. IX) in curing people and promoting health. An argumentation about how medicine might accomplish these goals requires specific knowledge. As such, medicine is a field in which anyone who is not a doctor, as an observer from a different discipline, has less to say unless what is at issue is the clarification of concepts for their reflection in other systems. On this, the idea of analysing the knowledge from technical and scientific information under the mentioned 'clarification of concepts' has an epistemological position and comes from the 'open notion' of the potential of the human being [when the suitable context for conveying concepts can be presented]. Herein is where the analysis of the influence of one person's action on another develops an approach of research outside the framework of an only discipline and moves into the realm of the field of educational science. A proposition for starting the problematisation of the collaboration between medicine and pedagogy is grounded on the analysis of how body parts have neurobiological borders that to date cannot be resolved.[73] A passage consisting of thousands of pages should be expected in

[71] *Paedagogica Historica* is one study from 1996 that Depaepe & Simon (in Keiner 1999, p. 27) conducted to analyse the historiography of education in reference to the period between 1961 and 1996. This span of time takes on importance after considering post-war effects on scientific development.

[72] The argumentation is so much wider. Since as a matter of only thinking on words, to *scientia*, *doctrina*, *disciplina* is missing the distinction of 'dogma' from *proclamations primarily authoritative* (Deeley 2001, p. 259), for example. Moreover, going deeper into the roots of the language, this discussion can even be wider. Hence, the importance of writing a delimitation in my work from the problematisation of united or specialised or collaborative reality of education from the side of pedagogy through the analysis of the concept of diagnosis becomes clear – from its analysis as a complex subject-matter within a complex situation (for following my inspiration, see Rucker & Anhalt 2017, Rucker 2014, Anhalt 2012).

[73] The mere relation between body parts and neurobiological borders does not seem to require direct cooperation between medicine and pedagogy. By referring to this relationship, however, a closer approach can be launched with the aim of reformulating discussions from the past that can be linked to current pedagogical statements about collaborative work. The connection has existed since the past, but the pedagogical statements have been relinquished to execute what other disciplines determined. Or, assuming that pedagogical statements have contributed to the accomplishment of scientific content, then pedagogy has to continue this work through the register of problematisations in order to explain how disciplinary collaborations have been carried out. Hence, in this section I present that the relation is not between body parts or between an inner and outer world, but rather about the formulation of statements. Namely, a biological approach can be portrayed by formulating an exchange between a social and an epistemological approach. By gaining access to assumptions about a medical exercise, the statements connected to research content speak of a previous teaching and learning activity to which I do not refer. This is so far an initial point to draw a distinction between the research system and the science system, which can address a reality of education from a system that enables to work on it. In this sense, I do not present descriptions, but problematisations that reflect a way of thinking about a procedure and that go beyond a mere collection of texts. As a case in point, I take acknowledgement of the warnings about not presenting a general system of knowledge (Nohl 1933 in Nicolin 1969). From the side of medicine and pedagogy, scientists are aware of not to determine in systems what human beings are but to act within systems while conforming the structure in which they are carried, as Richard Koch

this section; however, I vote for the simplicity of a line of reasoning portrayed by the entanglement of statements of social, natural and practical sciences, as in medicine and neurobiology.

As already mentioned at the beginning of this chapter, for this thesis, I propose to take a look on the fields of philosophy and sociology that contribute to the disciplinary work between pedagogy, neurobiology and psychology. How do these disciplines achieve this contribution? At a theoretical level, I rely on the already established cooperation between the disciplines, as in the 'sociology of medicine'. Sociology of medicine has a previous collaboration with pedagogy. Sociology of medicine can be in one instance discussed by the theory of knowledge of educational science in philosophy with the intention of being differentiated from the knowledge of neurobiology (see Pickersgill 2011). As one of the most common references that exists, according to my knowledge, in favour of furnishing certainty on the basis of concepts that seek to explain not only the connection between body and mind but all the relational mechanisms that happen in between. In modern times, researchers are asked to go beyond the original dualistic approach of Descartes insofar as the mind can stir the body (Sandkühler 2009, p. 27). With the purpose of showing how a *tool of confluence* displays a collaborative reality for aiming at agreements, concepts have to be searched through descriptions of work. The concept of diagnosis is a tool of confluence in the collaboration of the three key areas, and therefore, the sociological analysis of the conceptual medical exercise is taken into account.

My interest in the diagnosis concept follows not only the desideratum of aiming to clarify this concept within and from the same field of pedagogy and educational science. Beyond that, but demanded by this delimitation, an analysis of borders of disciplines and shared processes among them aims to understand the result of a disciplinary collaboration and to describe it as rooted in the foundations of the work of 'principles of research' (Mittelstraß 2005). This is because such a mindset is useful in considering the differentiation of the basis of neurobiology since, in the sphere of neurobiology, one of the critical moments in this field depends on the basis of the concept of reality that is taken, that is to say, from a monistic to a holistic position, respectively from a specialisation to one collaborative perspective of science.[74] The transition between these last two is of interest to the discussion on disciplinary borders. The discussion on theoretical boundaries refers to a reality that is modified by each disciplinary 'state of the art' when the modification is not from the theory but from the way science is conducted. In this respect, I identify that the place of pedagogy must be described as scientific or not scientific, in relation to the theory of knowledge of educational science.

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also noted (1920, p. 32). The action should take into account the fact that reality is changeable. Consequently, the concepts that speak of a human reality should be kept open. Based on a transition in medical thought development where systems cannot be considered in the medical field, Koch (ibid) explained that concepts are not carved in stone.

[74] In this contrast between 'holistic' position and 'collaborative' perspective of science, an entry point for a discussion can be detected. If holistic refers to an overview of a situation, it would require the understanding of a common situation or, accordingly, it would refer to the collaboration of different positions that conform an integrate perspective. This marks the difference between integrative and collaborative perspectives of science as problematic and requiring a further consideration for analysis that I take from assumptions regarding attitudes.

Hence, I propose to examine points that could mark a problematisation of such 'reality'[75] from what I am proposing as 'principles of reality'. Accordingly, a discussion of this description of the reality in research is accomplished when the beliefs and assumptions of various disciplines are problematised in terms of how the fields collaborate. This discussion leads to considering whether there is or could be only unity or specialisation in science, where encounters of opinions happened that could require translation. With this description of and from the participation of various theoretical traditions, some similarities and differences between areas such as medicine and neurobiology can be and would be problematised in order to obtain a principle of research[76] or, more specifically, according to this work: to obtain a place for sphere of action of mindsets 'outside' the pedagogical realm. A place grounded in the discrepancy between praxis and theory in a multiplied dialectic state.[77]

On this note and as an example of a problematisation regarding content of research, I identified from general literature the concept of disease organised according to the triangle of 'medical condition', 'health' and 'prevention' that encircles an exchange between 'robust knowledge' and the 'circumstances' of a situation.[78] This example under consideration is relevant in understanding the disparity in the agreements and common points of participation of disciplines when their representatives seek to work on topics of neurobiology and accordingly requirements of actions[79], such as in diagnosing neurobiological impairments. Hence, in order to identify the problematisations of other disparities, the enclosure of neurobiology from a side of neuroscience as a discipline connected with medicine draws a border in order to believe that the topic can be simplified by the society for explanations concerning an organ like the brain. Beliefs and scientific systems that through the actions of the structure and

[75] The proposal of a reality based on research principles (see Mittelstraß 2005) links to the reality of education by assuming as valid the contents that must be understood by younger generations. Nevertheless, these contents must go through a process of questioning and confirming evidence. The disciplinary collaboration between medicine, psychology and pedagogy or educational science is not the only one that establishes the analysis of principles of reality, but for this work, the relation between these disciplines is one that has a large scope for starting work on further tasks to development an epistemological agenda.

[76] Principle of research will refer within this work to the composition of dealing with subject-matters in combination with the tools of a theoretical tradition. In the section of 'inter- and transdisciplinary work' involving the discussion of the writings of Mittelstraß (2011, 2005) will enlarge the analysis of the category of 'principle of research' to the connection with the principles of reality that problematise the reality of education.

[77] The disparity between theory and praxis is not the only one found after thinking on the composition of the reality. Thus, as a compound position of more than two sides, the switch of two reference points can be multiplied by the production of animated aspects of subject-matters. To this extent, 'sphere of action' is problematised in terms of the pedagogical perspective and according to the methodical control of pedagogy undergoing evolution. The localisation of a sphere of action in the collaboration between medicine and neurobiology (together with the problematisation that this differentiation presents) should be considered as a continuous problematisation that creates a place where reflections upon existing descriptions make pedagogues to work under current challenges.

[78] I cannot define any of the three parts of the organisation of the concept of disease because I am not a physician. Nevertheless, I try to show how this organisation refers from the pedagogical point of view to moments which, when carrying out the tasks involved, awaken the reflection of young researchers. The research developed in the medical area should not easily be adopted from the outlines of daily life. In this sense, my work makes use of a narrative way to formulate an argument with a philosophical basis that at no point speaks only of analogies of the acquisition of basic knowledge.

[79] Effectively, diagnostic is a common point of participation from medicine, psychology, sociology, history and pedagogy (Tenorth 2000, p. 270), among other disciplines.

functions of institutions and cultures, which form the concept of disease and that would be immersed in the scope of medical sociology (Hillmann & Hartfiel 1994, p. 538), are part of the coactivation in a life in balance. This combination also provides through the concept of disease an initial starting point for analysing and putting together the relation of topics such as consciousness, self-organisation, principles of reality, consequences, actions and measurements taken, such as the interrelation between two or more positions and persons. It is true that medical sociology does not involve a direct treatment of patients in the emergency room,[80] but neither does educational science, nor philosophy, at the moment of stabilising a patient. In truth, the doctor is a person who feels, thinks and learns from what is written and from the experience of others. Thus, the doctor and the patient are persons to be taken as social entities that cover all the requirements for being analysed within social liaisons, including the pedagogical.[81] Moreover, from the side of the expert, the discussion of intuition as a construct also employed in medical and professional procedures (Gross 1969, pp. 50–54) has the opportunity yet to be disentangled in philosophical updates [like what emerges from the pedagogical project as a science about synthetic constructs].

Through the exposition of the spoken medical exercise grounded on the relation encompassed by the doctor as an expert and the patient as morbid or curious and inquisitive, sometimes including a person eager to learn about his or her own condition, an unpredictable nucleus develops that may be analogous to the studies of neuroscience, specifically neurobiology, when systematising a knowledge that connotes its own dynamic and development while on the other side is the environment that denotes how to work with a changing subject-matter [different disciplines can learn together from each other by sharing the problems that they have dealt with in presenting a coherent method]. Up-to-date research on the topic of consciousness related to neurobiology, for example, opens this domain of expertise beyond the existence of the single correlational position between two parts: neurons and thinking. Since the intention of grasping the studies of 'brain sciences' relies on the achievements of principles of reality or the different levels of a situation that are generated in the discussions of incommensurability betwixt the inside and outside world or problematisation between neuronal areas (see Herzog 2016 et al.; Hagner 2008, p. 16; Gerónimo-Cid 2017b); in and from both referential points, educational science has stepped in with a contribution regarding how to read the confluence of theoretical actors from the potential of the person (see Grzesik as well as Anhalt in Klattenhoff 2004), without attributing importance to the professional role that might exist within the bidirectional relation. Related to this interest of participation, I stress as one point the recognition of previous knowledge acquired that helps a researcher to foresee when to rely on neurobiological or neuro-social outputs.

Biological matters are interrelated with epistemological explanations as Piaget (1970, p. 13) also suggested regarding the development of his ontogenetic approach of research.

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[80] Here would be necessary to elongate the discussion about the wide range on the scope of medical procedures and treatments since the operating room is not the only place of action for the medical doctor. For this reason, a systematisation of the area of medicine on the different activities should be contemplated.

[81] In this respect, pedagogical analysis requires that it goes beyond description. A pedagogical analysis refers, for example, to the question of what the human being is, the question of what can be achieved for, and the question of how this can be achieved. Nevertheless, this thesis provides an opportunity to identify the people who appear in contexts that might appear distant in the first place for pedagogical activities.

Hence, biological questions crossing on the path of epistemological formulations would give sense to occurrences of the division of sections of reality regarding the intermediation of the *external* and *internal world* that might have an origin in the economy of energy in terms of the cost of failure – which should not be confused with the dualistic position of soul and flesh, but that is a sample of many other divisions still required in the process of discussing inquiries. Since the influence of computational systems has indicated that the loss of rules within a system causes greater damage when these systems are not distributed (Varela 1988, p. 55), it may come about as a consequence that in research, knowledge for the researcher should be structured in a way to avoid losses rather than maintaining a strict standard of a universal truth[82] (while it is too early to discuss *what is* truth, I will pursue discussion of assumptions of attitudes that give credence to this topic). The information generated during the research exercise corresponds to knowledge blocks that manifest a requirement for thinking previously presented in learning and composing the structure of a research system.[83] This structure of a research system is referred to as another moment of knowledge application that is attached to a self-reflection for ensuring the connection with further work in the society (see, a connecting point from Luhman in Stichweh 1990). Thus, the research content from a research system would reflect different commitments previously achieved during a teaching content. Moreover, with the creative note of Varela (1988), another motivation can be added to the collaborative composition of scientific work:[84] collective register and discussion of advances (as I will show in the outcomes of this work, this register should come from realities of different disciplines). In a related note, and from an author that worked next to the pedagogue Edwin Keiner (see Schriewer, Keiner, Charle 1993), Stichweh (1990, p. 197) marked within the organisation of scientific

[82] For example, in relation to the studies of transcranial stimulation and neuroimaging methods, this characteristic is exhibited through the achievement and scope of results of research, where the interpretation of all the studies is more than that which can be put in alignment together for reaching a standard of universal truth. Necessarily, this research needs to be referred within a posture of specialisation. Ironically, this would speak about the situation where and when the researcher should not know and cannot know all the interrelations of all the experiments of TMS – however, this is an independent trait that should not remove the specialised and technological knowledge that scientist in this realm require. Thus far, the notion of specialisation confirms the beliefs and values that a scientist acquires and with which the scientist is engaged. The current negotiations with machines in the realm of specialised cultures reflect that the reality to be researched is partly created.

[83] In this respect, a system can be speculated to have a place in research. The information generated during the research exercise is different to the information collected during another stage of 'receiving knowledge' (Stichweh 1900). The research activities produce their own knowledge, while the reception of knowledge comes from earlier sources. The research system has to be distinguished from a scientific structure in which the research system is created by internal values of research groups. However, on this thesis will begin this differentiation by only touching from the side of research system some manifestations of the scientific structure. This research system is called a concerted system to explain the reality of education. In this manuscript, a system is speculated from a specialised position that must not be extended to cover other assumptions in a situation. A concerted pedagogical system is therefore part of a specialised position that cannot confirm all assumptions from other disciplines, but can provide a bridge for connecting means to understand alternative logics in other approaches.

[84] 'Collaborative composition of scientific work' will be displayed as a model of collaboration for explaining the reality of education. After presenting a difference between a general state of scientific work and a specific collaborative pedagogical model, the contributions from pedagogy to science can be clearly set within a pedagogical realm [as noted in the last footnote].

knowledge that '*conservation* and *organization*'[85] can prevent the loss of available material.

In this manner, with the insights gained from the 'interlock of worlds' from inside to outside,[86] some of the arguments in the vocabulary of medicine for describing a medical condition can become familiar in the theoretical discussions of other disciplines. Because doctors – for a long time – have also been part of an activity of transformation (Hufeland 1839, p. 2) in this spoken relation, the 'independent' or 'natural' part of a 'reality' must continue to be under constant question, with the aim to make progress regarding specific indicators of the human body. In support of writings from the past, yet with the advances of current times and with the division of systems to the smallest proportions (see micro consciousness in Zeki 2003, or a reflection on consciousness and the small network argument in Herzog 2007 or a discussion of both articles in the explanation of the concept of simple and complex in Gerónimo-Cid 2017b), we are not able to ensure in many scientific languages the description of the 'affair of healing' in terms of what belongs to nature and what is inherent in the *art of healing*. This 'healing power' (Hufeland 1839, pp. 1–5) exposes clearly that there is an inner force that comes from nature, one that is or might be influenced by outside handling methods. However, as it remains, methods from today cannot grab what happens in the presentation of singular and smallest proportions within the interplay of complex biological, physical, mathematical, logical and philosophical systems of the world. By giving control to nature in itself but providing a space of reciprocal influence within the 'affair of healing', Hufeland (ibid, p. 2) stated clearly that such understanding cannot be grasped in school systems. With the proposal of the diagnosis concept from pedagogy, this statement will give reason for how purposes of school systems are different from what can be achieved based on the potential of the individual, which is manifested in several interplays with the world and which cannot be restricted by a bad mark or result on one test.

Previously in this section, the rupture in nature and its handling has been noted. In addition, the position of medicine, as in itself, is a part of the proposal of a solution for the problematisation of dualistic positions. The rupture allows a sphere of action for a theoretical observation of change and construction of concepts. This happens due to the placement of medicine when it is not a science but when it has to do with scientific problems (Rothschuh 1965, pp. 8–14). Therefore, the relevance of medicine as an art and the limits of its activity separated from psychology and sciences of the mind (ibid) turns on the independence of the participating areas by having different interests and coming from different traditions. Nevertheless, addressing the autonomy of domains is not enough to describe how these domains differ from each other, but makes a point that experts can take into account the knowledge developed in the other domains. For instance, the scope of the domain of medicine sets limits on the definitions of objects of study that come from other disciplines. Thus far, to count on medicine becomes a key

[85] Conservation and organisation in this context are characterised by the analysis of the meaning of these words as a method that comes from their own intention. For example, the conservation of texts shows the work of thinking about how to store information. The organisation of contributions over time aims to establish a link to a society that can have access to the continuance of thinking.

[86] In the case of Hufeland (1839), the reciprocal relation of inside to outside can be referred in the interplay from nature and 'potential' – in the sense of vitality or life force*, Lebenskraft* as it was written by Hufeland (ibid), to the external manifestations of the body, as wounds, inflammations and physical operations of the body.

action when looking to keep a theoretical order in the structure of disciplinary collaboration while avoiding a mix of perspectives and methodologies. In this way, a collaborative assumption regarding science distances itself from the scientific assumption of integration or unity. Collaborative assumptions differentiate during any presentation of outcomes that, despite coming from one specialised area, such research contents must be understood with the participative influence from other groups of beliefs.

To this expanse belongs the richness of the encounter of diverse approaches of research, those that open controversies regarding the methods and ways of access and study of subject-matters and the way that subject-matters suggest their own procedure for being pondered. I identify in the disciplinary collaboration a fertile meeting point because, based on controversies from valid and contra valid arguments, the synthetic formulation of approaches can be reached, namely, accepting the influence of the culture on the people or rejecting the influence of the inner potential of the human being at the moment when all is determined (Becker 2006, p. 13). Then, in contrast to this questioning within the neurobiological set, the approach to medical outcomes, is useful for other theories, since physicians draw on a long tradition to consider nature but are influenced by theoretical traditions from the two-way relation between the person and the surroundings (Hufeland 1839, pp. 1–44).[87] From the side of medicine, the dialectic formulation of human existence would not be pointed out, but it would be an entire conception of the human being that is also seen in medical approaches. For this latest problematisation, the notions of social science are called into play, for contributing to the inquiry on theoretical influences that extend the notion of man into a plurality of frameworks or of positions of traditions.

In this sense, I will not even try to give definitions with regard to medicine but rather will attempt to analyse the composition of how, in general terms, concepts in theory construction and in a situation of interchange of perspectives are built. For this, I make reference to some concepts developed in different areas but with the precaution of seeking to avoid categorical errors in logic (see Salmon 1973). This means indiscriminately mixing notions together that cannot and sometimes should not be distinguished due to its unreadiness in regard to being reflected [because first notions need to go through stages in a research system]. In this work, there is an attempt to problematise with established research the problems of the immersion of recognising and treating procedures for analysing the condition of a person under determined contexts. For this, it is not for me to delineate the own medicine that is the métier of the healing relationship of humanity, but to pay attention to its procedures for the further discussion of a pedagogical approach, like that intended by the ‘pedagogical diagnosis’. In the case where it would not be like that, then there would have been an irresponsible omission of evidence of modern times and, in consequence, a work of fallacy by taking actions without considering external influences.

[87] The exercise to be performed at this moment of the exposition relates to the development of research contents that when executed by individuals will call for the connection of previous knowledge, its application along with its differentiation and in these terms, a real possible way of making something out of this combination. In any other way, the researcher would be only reproducing previous schemas that would not aim at reach more progress or specifically to reach other questions.

1.1.2 Brief discussion of pedagogical spheres of action for establishing connections

In this section, I will not clarify the definition of either empirical pedagogy, rationalist or applied psychology.[88] Instead, I give a short historical summary of a few significant authors who at different times accounted for the knowledge of two positions: the hermeneutic and the empirical pedagogy from reflections upon practical philosophy and showing an area of tension that composes other areas of discussion. Johan Friedrich Herbart (1824), as a professor of philosophy in Königsberg, analysed the studies of Locke and Leibniz regarding the historical development of psychology from Descartes in terms of trying to portray a description of the soul of the man in the context of the development of psychology.[89] On this same matter, Herbart investigated the conflict between mathematics and spirit (ibid, pp. 180–183). In light of this perspective on the difference between statistical and philosophical work, he stated that a longer debate is required.

In this text, Herbart manifested his position of the *given reality*[90] (ibid, p. 187) at the same time that he reviewed why the psychology of his time should have been considered outside the realm of empiricism and why the 'facts of the consciousness' can also be discussed as speculative knowledge (ibid, pp. 187–189). This text pertains to the halfway enhancement of his ideas towards general pedagogy, not merely because it was written between his *Allgemeinen Pädagogik* (1806) and *Umriss pädagogischer Vorlesungen*

[88] *If and only if* necessary, I will come back to clarify how applied psychology has an origin in the writings of pedagogy (see, for example, Herbart 1824). While pedagogy supported the foundations of applied psychology, pedagogy comes from a different tradition by dint of an educational object that needs to be defined (see, for example, Nicolin 1955, p. 142). This would emphasise that the unclear differentiation between two disciplines can bring a mix of concepts from one area to the other. What we would be living at this moment of separating the disciplines could be a natural stage of 'theory construction' and 'development of thinking' (a clear 'natural stage' of the theory construction first after the modification of the traditional epistemology; Wallner 2002). For example, in the discussion of the foundations of a modern and newly positioned hermeneutics pedagogy (Dilthey 2002), Löwisch stated clearly that the understanding of Dilthey regarding the fairness of subject-matters of the natural and social sciences came from a stage in which Dilthey progressed from the basis of psychology towards the interrelation of the psychic life (ibid, p. 118). From here, it should still be problematised in terms of how the 'diagnostic in psychology' as a direct foundation of application in psychology serves nowadays only for the selection of a procedure of intervention, in which the intervention in itself is now addressed to one subject of application (see *Anwendungsfächern* in Schmidt and Amelang 2012).

[89] Johan Friedrich Herbart (born 1776) is situated as one author of the times of working on the status of pedagogy as science (Lischewski 2014, pp. 227–230). In this frame of mind, together with Ernst Christian Trapp (born 1745) and Friedrich Daniel Ernst Schleiermacher (born 1768), the mentioned authors are all previous to the time of the *human approach of pedagogy* where hermeneutics was later proposed by Dilthey (in ibid, pp. 227–438) and was subsequently reclaimed by Nohl (ibid, p. 409). Hermeneutics was a way to avoid dogmatising ways of thinking (Dilthey 1900), where the human being is a participant. Nevertheless, with the exposition of a given reality that Herbart presented and the search for an own pedagogical language (an intention that was likewise pursued by Dilthey), I identify that a conflict between scientific assumptions can be discussed. Consequently, the conversation upon this conflict in a current context sheds new light on how to ensure that the pedagogical language refers not only to terminology but holds a deeper problematisation bearing on the need for a systematisation in the work with other disciplines.

[90] „Alles unmittelbar-Gegebene ist Erscheinung; alle Kenntniß des Realen beruht auf der Einsicht, daß das Gegebene nicht erscheinen könnte, wenn das Reale nicht wäre" (Herbart 1824, p. 187).

(1835) but because he was able to show how 'mental faculties'[91] grab the '*faculty of the self*'.[92]

Those 'mental faculties' and the 'faculty of the self', in combination with approaches of philosophy, would be able to help in the definition of the differences of actions and the theoretical constructs that describe them. As such, education as subject-matter, but as situation as well, refers to a process of actions (Brezinka 1992) that work with the aforementioned human faculties. With this observation, I open this section for a conversation on how several elements are epitomised and how they are closely connected, one to the other, on the composition of the topics with which educational science should deal. Mental faculties and faculty of the self are recurrently held in the process of reporting one reality. The consideration of one reality is not the approach of this research, but a reality is one referential point where the pedagogical statement discusses the shape that subject-matters depict in pedagogy. Both, from a pedagogical viewpoint, are problematised according to different levels of a situation that should be congruent during the transmission of an idea.

This first chapter is meant also to confirm that all the 'processes' require a certain period of time. For example, the process of execution of an action is likewise affected, and the passage through time of the concept of education has been confronted with several modifications and understandably different receptions. For this reason, several passages of this writing refer to the unfathomable literature found in several languages, which has been written over centuries. Some efforts can be found in written compendiums for portraying the ongoing development of science and pedagogical object of study throughout the changes of thinking during the time (see, for example, Lischewski 2014; Böhm 2004; Deeley 2001; Keiner 1999; Benner 1991; Stichweh 1991; Blankertz 1982).

With this line of thought, it is to be understood that modifications in the approaches of pedagogics are gradual, too. Anyone can get an idea of the modifications in the world of education by reading the accumulation of texts with their proposals along the timeline. At the moment of writing this section, I set myself the challenge of displaying theoretical stances grounded on foundations that have concurrently moved beyond the theories that supported them, even those that are based on such theories. Based on the fact that theories evolve, a route supposing that the reality of education is not given is displayed in the change itself. At this moment, I will not attempt a longer description of the change or transformation that I might be referring to. However, a theoretical modification is a matter where social transformations occur according to the stretch throughout critical realism to real idealism, for example (see, a reference to this change in Sandkühler 2010, §2218). Later, these alterations need to be ordered. From the theoretical framework, this order is to be understood as the precondition for a system, a system that can include a

[91] With inspiration on the concept of *Seelenvermögen* and *Gemüth* of Herbart (1964 in Anhalt 1999, p. 85 et seq.).

[92] I want to introduce the term 'faculty of the self' as an understanding of the formulations of Herbart of the *Vielseitigkeit des Interesses* and *Charackterstärke der Sittlichkeit*. I am taking the 'faculty of the self' from the reference to the concept of Bildsamkeit that I first portray within the current state of research for a later problematisation with the intention of an action in pedagogy. Within this thesis will be shown if I was able to give a definition to this concept in a proper manner. As a reference, the argument of this thesis provides links to the faculty of the self with ways of procedures from the process of research in different areas, in order to recognise how pedagogy works with an object of study that is associated with several approaches.

conceptualisation. This means that when modifications take place, the alterations would require ordering. Theoretical modifications and theoretical order are not the same, both differ from social transformations, so all the above are independent of each other. Independence, also as a general term, belongs to a feature in the theory construction that can be tested through the application of theoretical tools.

With the tools of logic and of 'common sense' (see, for example, Moore 1977, pp. 32–59), it can be proved that there is no particular negation that can be considered universal[93] – and I am writing this last statement while aware that in the realm of common sense, this might sound discernible. To this extent, common sense refers to the reflection regarding the possibility of what can be called true that is false (ibid, p. 35). Hence, the idea of thinking that a false statement is not universal can result in a paradox. Like this, logic depends upon the mental facts that are going to be problematised as certain or not in terms of '*the state of being conscious*' [emphasis added] (ibid, pp. 46–50). At this moment, I give a place to mental states that confirm that the consideration on them refers to a disposition, so as to be in contact with the environment (in a similar idea to *Anlage* or disposition and *Umwelt* or environment, which was described upon Bildsamkeit and self-organisation by Benner 2001, p. 67). Furthermore, a variety of texts can be found where a general idea follows that any statement can be right unless the converse is proved (a deeper reflection can be found in Hoyningen-Huene 1993). In other words, and in order to repeat the sense of the statement, an individual affirmation cannot be absolute; otherwise, this would lead us to a vicious circle, like saying that all statements are revocable with the exception of the very last avowal made. There have been, however, times in which, due to hegemonic social powers, there were no options. Still, the attempts at thinking in a different way can testify to the freedom of the human being.

By making a connection with the historical register of assuming positions, the statement begs the question of how to problematise freeing a human being in a context of multireferentiality of opinions or suitably in a collaborative one with plural convictions.[94] Thus far, when the collaboration does not refer to a universal assumption, how to speak about freedom in the form of multiple opinions. Presuming the multiplicity of opinions to explain the educational object in relation to the educational reality, examples from the theory illustrate the content of an explanation. In this work I present only some examples that support an explanation of the reality of education associated with individual freedom. As I mentioned before, there are conditions of the time that modify interests regarding ways of proceeding. I would not be able to describe in detail

[93] At least, it would not be that easy to say the opposite based on the fact that once a statement is accepted as being at least general, it should accompany a whole systematisation and an analysis of the interplay and structure of components. The position of 'common sense' joins the presentation of facts based on an external reality that somehow should get along with proposals on the organization of a composition of reality (see discussion on '*What to do with common sense?*' and its argumentation based on Thomas Reid (1710–96) and his '*An Inquiry into the Human Mind on the Principles of Common Sense* of 1764' (in Deeley 2001, p. 548). This means that 'common sense' can be considered with the reservation of providing a systematisation of the interaction of elements and components of a theory with a reality and its principle, according to this work, as accounted in the Theory of Complexity of Education (Anhalt 2012), which I use for analysing a phenomenon of educational science within the collaboration of other disciplines.

[94] According to Herbart (in Schlüter 2010, p. 73), the state of freeing the human being relates to the development of self-consciousness.

the work of the authors during the 'Industrialization and *Kulturkritik*', 'Progressive Education', 'National Socialist Movement', 'Transcendental Educational Philosophy', 'Hermeneutic Pedagogy', 'Critical Educational Science' or 'Empirical Educational Science' (as noted in Lischewski 2014). Instead, I can try to help myself with the analysis conducted in previous divisions from pedagogy to educational science (Benner & Brüggen 2000) towards identifying indicators for the reconstruction of how we have reached the point where we are standing today – yet trapped within the lag of positions of reason and experience.

Ernest Meumann mentioned how an empirical science appraises a complementary part of a whole certainty. I pursue to portray an example of theory development by referring to different ways of addressing the difference between some normative problems under frameworks of empirical[95] science (see, for example, Brezinka 1992, p. 8). I refer to the normative sense when reaching for an institutionalisation spread over cultural and social traits of scientific groups (Zima 2004, pp. 69–84), which means that without having had any social analysis, the scientific realm could be tainted by political ideologies. To this extent, ideologies – political also – are a place where notions can have an origin, but in a scientific structure, they need to be systematised in order to follow them up in the same theoretical realm. Namely, the work in pedagogy of Herman Nohl represented a change in the historical consideration of pedagogy, to be replaced with the focus on the individual (Benner 1991, p. 201), making it possible in this way to confirm that the main approach within the principles of research is not only empirical in educational science. On this point, the differentiation between educational science from second-order observation and pedagogy from praxis helps to find a place in the institutional arena within which the reality of education can be situated while not limited to it (ibid, pp. 145–147). In Nohl's work, an additional clarification was contemplated through social sciences[96] (Lischewski 2014, p. 411). Grounded on the individual and social modifications reflected in philosophy, pedagogical empirical positions are not to be separated from the human approach of pedagogy. Thus far, the span between the particular and the social directs attention to the reflections in practical philosophy proposed by Herbart – namely, by appealing to the potential of the individual through *Bildsamkeit*.

Earlier, Herbart portrayed discussions encountered that referred to a point at which different positions can be judged as being right, but that were presented with different approaches (Herbart 1824, p. 215). With the description of my reading, I will try to contribute to sustaining published considerations that make sense for the development of *connections* with further approaches to research or *connecting points (for further*

[95] The empirical side is discussed in more depth by Benner (1991) with the positions of experimental pedagogy that although both descriptions are close to one another, they represent two access points to understand, trace and follow separate theoretical development in psychology and pedagogy. Moreover, a normative approach within an empirical procedure remains only one part of the larger composition. For example, Westmeyer (1972) has provided a clear discussion of a normative approach situated in the tension between logic and empirical experience within a system that combines inductive and deductive analysis to move the normative approach from a starting point in a process in difference to a result (ibid, p. 42).

[96] Disciplinary collaborations that have taken place in theory construction along different moments in time can already be sensed. Hence, this work will argue in favour of the collaborative interplay of specialisations and integrations, but especially about how to explain that a collaborative 'disposition' succeeds.

analysis[97]*)*. Simultaneously, I introduce the notion of *possibilities of problematisation*[98] in the realm of neuroscience and neurobiology from a pedagogical domain as a place where eternal discussions about a certain viewpoint are conferred within new discoveries, involving epistemological analysis of old concoctions within a space of collaboration.[99] With this, I mark that updates in the division and assemblage of knowledge[100] belong to theory construction, which will continue growing and reaching new challenges throughout.

Historically registered neuroscience is a research approach that came into its own at the close of the last century (1990) and one of the biggest with which the new millennium has started. From this general consideration, here titled 'neuroscientific' appraisal, I direct the attention not to the contents of this spoken field but to the appearance of an assumption regarding unity within a specialised work from neurobiology. The interchange between two perspectives gives the sense of different directions that one same starting point might contain. This course of action has extended its influence, in a sense affecting many disputes in science. Without exception, the field of action involving pedagogy is susceptible to this collision of progress. In this, I am trying to articulate reasons how the approaches of neuroscience can be included into those of educational science and how they can under a specific optic be considered to have a common purpose. This discussion can be situated between empirical pedagogy and applied psychology in the problematisation of the story of the *humanistic approach of pedagogy*[101] by speculating that if neuroscience refers to one general approach and hermeneutics can decipher contents of unity in science from a stand in opposition to dogmatisation, then a connecting point from a possibility of problematisation between both fields might exist that needs to be articulated. Nevertheless, this area of tension helps to open a speculation that will be consistent with other directions to where this work can lead.

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[97] '*Haltepunkte*' according to the theory of complexity of education by Elmar Anhalt (2012). This is a construct that the author started working with earlier; see, for example, Anhalt (2010).

[98] This term differs from the epistemological view with regard to 'connecting points' from Anhalt (2012, 2010). The possibilities of problematisation are based on the structure of the concerted system proposed by the spheres of action described in this research. Possibilities of problematisation will take shape during the course of the work as an interchange of assumptions about and of attitudes. For the moment, as I have presented, neurobiological research needs to be considered due to its constant retrieval in previous pedagogical works.

[99] This space of collaboration will compose the hypothesised reality of education that, with and after the development of the work, the general description as a space of collaboration will achieve the description of specifics through the understanding of how 'content integration' and 'concerted action' are constituted.

[100] The assemblage of knowledge is explained in the third chapter in the description of pedagogical translation.

[101] Although the word 'hermeneutics' in the English literature referred to the lapse of time of the work of '*Geisteswissenschaftliche Pädagogik*', I mention the words 'humanistic approach of pedagogy' to try to coin a term that might be applied to a current exercise of pedagogy in the field of neurosciences with the problematisation of the individual in a pedagogical context from the inner-force to exert a process of transformation. This is different from conceiving the individual as a mix of internal components, and I will explain how this can happen in an epistemological construction. Furthermore, when hermeneutics is under a name that is explained in a different manner to 'interpretation' of rules, and which is not the core of assumptions, hermeneutics pedagogy has the domain for problematising appraisals from other areas under suppositions.

In the fields of neuroscience and neurobiology, one of the biggest discussions pivots on internal and external reality. The analytic conflict between 'what is given' and 'what is obtained' finds a prolific area on the basis of the humanistic approach of pedagogy and its evolution towards a critical educational science to a later empirical access (see Lischewski 2014) in the direction of the pedagogical acquisition in the *Bildsamkeit* of the learner, thanks to the challenge for the educator to adapt to the needs of the trainee[102] (ibid, pp. 399–401). This solution has been in preparation for more than 200 years with the writing and publication of reflections on matters of education, society and science in different writings since the time of the Age of Enlightenment (see Blankertz 1982).

For example, in terms of humanism, it is pertinent to scrutinise the meeting of positions of how the subject-matter of education should be taken into consideration and how this would change according to different perspectives. Whenever it is possible that anyone can wonder why educational science belongs to the division of individualism or collectivism, the history of pedagogy should be examined with closer approaches to the birth of modern pedagogy (ibid, see, for example, pp. 70 et seq.). This must be done with the intention of localising signs along the trail of history that confirm that the human being produces an own reality in the self, which contrasts with a shared reality and that cannot rely only on one person. Notwithstanding, the position of one person is crucial in the systematisation of a new perspective of reality, among surroundings, relationships, interpreter, thinking and so on. This is said with the intention to maintain awareness of how a reality from an individual position can be developed, which contributes to straining the assumptions of unity versus specialisation.

The sequence of events on the 'formation' of people must be read alongside its effects on society and how these incidents are mutually affected. Some traces are left in stories, like the novel *Emile* and the consequences of the perception of such heritages in different cultures (see Calvo 2012[103]) after its evolution and formalisation into its idealists' positions – because in the way that I am expositing this section, despite having a scientific frame of reference, the interplay with surrounding positions will nourish thinking development.[104] As well, during a contextualisation, considering the repercussion of the 'obligation of education' can be productive in terms of receiving and

[102] From German texts, the proper word employed in this context is *Zögling*, which has different translations into the English language. Namely, some examples of these translations lead to the ideas of student or non-expert interested person (i.e. who is interested in extending knowledge on a condition). Based on the problematisation of educational reality upon the collision of disciplinary statements, I stretch the role of the boarding pupil or *Zögling* relating to actions of protégé, learner, mentee, disciple (other restrictions from terms would apply if the theory is taken under specific purposes).

[103] Carlos Calvo Muñoz is a Chilean author that learnt directly from the Brazilian Paulo Freire (born 1921). Calvo (2012) situated a pedagogical map into educational territory. In his proposal, this territory extends beyond an institutional context that should be further analysed. In 2018, he pursued a project concerning what he calls 'epistemocide' in the institutions. With his work, I set an episode in history wherein ideas from different countries can influence a regional integration in which persons from local communities modify their own individual constitution. In this context, *Emile* is not a story that initiated reflections on what human beings do by bringing up new generations but a seed that, even after not being followed, left an indication for being registered by historians upon the modification of social thinking into global-local and local-global regions.

[104] My work does not stem from sociology; however, social forces give clarity to one state of influence and ongoing modification throughout time and regions.

providing education with a difference in theory and praxis (Blankertz 1982, p. 87) and local versus global contextualisations.

In this way, I recognise that in the evolution of teaching, pedagogues would confront their own development within the modification of a context. Industrialisation, for example, produced the concept that some people could look for ways of understanding a new way of living. In this case, the well-known Pestalozzi wrote with his work of the 'Method' a contribution on pedagogy in industry (see ibid, pp. 105–110). His reflections on how to see 'beyond' what was evident (see ibid, p. 110) had, at that time, an impact on formal constitutive force in teaching. Later, Schleiermacher expressed an interrogation rescued from the dialectic of the existence that considers the protection of children and their reactions, the possibility of what can be done and the intention of what should be provoked within the young generation (in Lischewski 2014, p. 251) within scenarios of change during the Prussian reform. In this way, the form of making a line of thinking, this means to perform an argumentation; namely, the development of arguments establishes an influence on consequences about how formal education could be created (see, for example, reflection on a more realistic school in Blankert's 1982 opinion by examining the work of Schleiermacher, Humboldt and Dilthey, pp. 114–115).

Many other authors should be brought to the reader's attention when writing about a contextualisation. However, and as I said it, I will not do this because my argument at this introductory moment goes beyond a support within a historical frame of reference. The argumentation that I follow attempts to address the differences betwixt scientific theory and ethic [under an observation in second order upon the reflection related to hermeneutics extended on the humanistic approach of pedagogy, which aims at a phenomenological reflection yielded out of a duality] (this argument must be developed through this work with some traces of Schleiermacher in ibid, p. 114; as well as Sandkühler 2010, §299) as one method of organisation among many others for the development of a conceptualisation. My argument is not restricted uniformly according to the proposals of Schleiermacher, but without a doubt, the discussion that I am opening follows how the project of pedagogy as a science yields a continuum based on theory, moral purpose, the strain between individual and collective. Moreover, I do not seek to ascertain any particular pedagogic position, though the nexus remains with the individual.

What can be done with these differences of positions is compelling, for example, those that Anhalt (2012) systematised under the optic of complexity in the description of *perspectivity of educational science* in a situation and on the *perspectivity of education* in the formulation of categories of a subject-matter (ibid, p. 110). From this, I take the influence of its representative authors that has developed in the contemporary debates of educational science and pedagogy. Furthermore, I have an interest in continuing the discussion of how these authors are connected with the project of pedagogy as a science from the time of Johann Friedrich Herbart at the beginning of the nineteenth century and why the debates of 'pre-set conditions' or the aforementioned tension between what is

given and what is created suits contemporary studies of philosophy, educology[105] and neurobiology.

Regarding the word neurobiology, I might rely on a general description of the word 'neuroscience' to include the liaison between neurobiology and philosophy from a theoretical construction of pedagogical spheres of action. Both, neurobiology and philosophy in conjunction have developed debates in terms of reality that have benefitted the scholarly debate of 'neuroscience' (for example, Pauen & Roth 2001, amongst others). In a present-day context, neuroscience can learn something from pedagogy when pedagogy can be inserted into its disciplinary collaboration. For this, from the context, data can be taken to explain how 'education' can cross over the border from interaction with people to a questioning of how people interact with each other, meaning to set a constant interchange between pedagogy and philosophy with the use of tools of sociology, history, neurobiology, psychology, the natural, practical and human sciences.[106] A brief discussion on the transformation of the approach to pedagogy from humanistic to that of critical education to empirical with a rough differentiation in terms of theory of knowledge would help for this portrayal.

In some manner, to situate the reader in the conceivability of polar opposites at the same time needs to be possible for shedding light on how theoretical conflicts conform our surrounding world.[107] An unceasing tension between the *way of the ideas* and the *way of the signs* did not begin with John Locke and his analysis of rationalism and empiricism (Deely 2001, p. 521) but marked a division in the innate nature of the world that has been problematised for centuries. The time required to make visible the question of the differences in epistemological premises gives an idea of the burden that reality has with proposals for understanding the world. This means that the systematisation done by historians can be used later by pedagogues to discern other solutions created in different environments. A consequent heritage of regarding the world as divided into parts plays a role in trying to see the world in unity when a person must offer a report. With reference to such a theoretical framework, I expect to provide contents about deeds that from pedagogy require continuing and constant consideration.

The human being is one (or at least is a premise that is to be problematised here); however, the differences of methods and the representative authors that have introduced them have conferred a reformulation and often a confusion concerning what can be handled in an initial approach, or what can be taken on the part of a human being, and how to do this. To follow the example of Locke is to say that his studies on the empirical stage of the development of children in conjunction with his discovery of their 'natural temperateness' (Lischewski 2014, p. 132) through empirical methods from psychology would have consequences in the approaches of science but from a philosophical

[105] In this section I refer to the concept of 'educology' presented by Brezinka (1992) to designate 'theories of education' employed in German traditions.

[106] I am aware that the recognition of the constitutive and regulative principles in pedagogy, according to previous pedagogical studies (for example, see, Benner 2001), relates to explanations of pedagogical interaction with tasks and their difference with the pedagogical praxis (ibid, p. 96). To this extent, the combination of pedagogy and philosophy with regard to the analysis concept of diagnosis in neuroscientific research speaks for an entirely new brand in pedagogy.

[107] As for the statement associated with this footnote, I recognise from the theory that a reality is a sort of independent event. At no point will I confirm that a single reality prevails in pedagogical reality, but I note that the theoretical framework outlines the existence and possibilities of multiple realities.

consideration of reality (see, Deely 2001, p. 736 et seq.), just as in pedagogical appraisals, as well. From an interplay between science and disciplines, having the position of an expert[108] becomes mandatory for stating specific cornerstones in the theory – those that, depending on viewpoints, some contents have turned to appear as the bedrock of some traditions. Punctually in pedagogical theory, the position of an expert ties the pedagogical observation to the contextualisation of the reality of every kind to be presented. With the notion of the expert, pedagogy can call up the discussions from philosophy, for example about technology.

An expert's opinion becomes manifest at the moment a certainty can be rendered in order to answer questions about where the cause of a problem can be physically localised (see Van der Eijk in Cooter & Stein 2016). The destiny of being split that needed to rely on one experiential approach was in conflict with the experimental one in the fields of natural philosophy, medicine and rhetoric (ibid, p. 62) – and this could be another reason why a discussion of medicine and neurobiology should be taken into consideration. This can be understood based on the search for certainty that the human being desires, a certainty that must remain as it is contemplated but not assured.

Humanity has required centuries to explain how we have worked with the environment and about what we are; this means to question about who this *one* is that is here? It is not surprising to find that there remains no unique answer: rather, a path of controversies. On the path of pedagogy is also an effort to assemble discussions on the validation of the approaches of research. In the past and stemming from it, the delimitation of the object of study of education has not yet become clear, and the empowerment of the 'philosophical pedagogy', as a term employed by Meumann (1920, p. 3) to refer to the part of pedagogy that should be complemented with auxiliary sciences and towards which emissaries of experimental pedagogy such as Meumann showed a doubtful opinion regarding the composition of this work, is still pending almost one hundred years later.

In the same text from Meumann can be seen a clear tendency to believe in the empirical collection of data as a confident value of reality – as an illustration of the world. However, this same outline of experimental pedagogy maintains that the interpretation plays an important role in the logical basis of empirical and experimental research (ibid, p. 26). If at this moment anyone should be required to rely on a method, there would be a tendency towards the 'best one', although the 'best one' can rest upon a large interrogation point created by the analysis of several perspectives. With writings that take a clear position like the aforementioned, it is remarkable to plainly see the conviction towards a given reality with which the world is integrated. In this spoken text, with a differentiation between a child of the city in comparison with the child of a village and an asseveration of a difference that is noted based on this condition (ibid, p. 30), the quality in the consideration of the world as a given existence appears evident. The environment influences calculations, but a systematisation aims to make clear that the 'environment' must be measured with variables such as the disposition of the individual. (see in this section the reference to the work of Benner, 2001). The pedagogical sphere of action takes further observations into account.

[108] With the position of the expert, I refer to the intellectual authority that is depicted in spheres of action.

The proposal of empirical pedagogy is intended to gain some distance from the specificity of psychology in order to have a broadened approach in the reconstruction of a whole complex of the external conditions interwoven with the corporal life and the influence to the child (ibid, p. 28 et seq.). As a matter of fact, it would be questionable to assess how much could be split between pedagogy and psychology since there are representatives from every side who are confronted by each other in saying that the experimental consequences should be accounted to whole systems in psychology and not just limited to particular topics (see Stam in Tolman 1992, pp. 17–24). Like this, not only psychology, but pedagogy and other disciplines within the realm of science face the problem of dichotomy and of a never-ending story in terms of endless discussions that do not exactly appear to have a positive resolution.

I take the approach to psychology based on the historical *cognitive revolution* (Baker in Tolman 1992, p. 11), in which the questioning of psychology and pedagogy of the independence of the experimenter and the purity of science both have been involved. In parallel, I take Herbart's conception of applied psychology to problematise the belief in a certainty given to psychology (1824, p. 180), whereas those who try to see the evolution of thinking on pedagogy would return eventually to question the evolution of the concepts of the mind, respectively correlations of the psyche of the human being. Unavoidably, those interested scientists would stumble upon the path of the experiments and experimental psychology that play the role of uniqueness (see Meumann 1920, p. 38) of the whole growth and transformation of pedagogy[109] with regard to the teaching of research contents. Thus far, from the pedagogical background, the realm of teaching in a social context meets the question of how to handle individuals that transform in themselves but that modify likewise the environment. The environment represents an opportunity for problematisation when it in itself can be questioned as to what extent something is really given, including the perception of the human being's self.

As can happen when reading texts from different times, anyone can detect the relevance of the words of Herbart in his 'look at the history of psychology since Descartes'[110] (Herbart 1824), when he started with '*Des-Cartes*' (ibid, p. 213 et seq.) in showing the importance of the division and organisation of knowledge with access to nature in contrast to God. This differentiation pertains to capturing the condition of grasping the everlasting existence of the human being, which basically the pedagogues are required to handle in moulding the next generations. Consider also Locke's view about the 'ability of thinking' or 'mental faculty' for enlisting some capacities of experience that are different from the ideas. On this ground, I speculate on the epistemological reading on how psychology, pedagogy, and teaching in medicine are related when considering

[109] At this point, I decided the use of the pedagogical word based on the development of the argumentation of Meumann (1920) when he places the context of *Erziehungslehre* in the realm of teaching content with a purpose of transformation. In this respect, I still refer to the contents of the research that can be linked to the teaching contents that are not dealt with by this work. On an initial approach, this thesis identifies elements that can later be used by the disciplines involved – not only by pedagogy. The point to be considered in mentioning the transformation of pedagogy is linked to the transformation of the individual within the framework of teaching, which at this moment refers to the description of spheres of action that can be problematised. To this end, I offer to first explain the territory where pedagogues can be located. Importantly, pedagogues play a greater role than describing their actions and listing their path of recommendations. Therefore, this section shows evidence of the exchange between neuroscience, pedagogy and philosophy.

[110] „Blicke auf die Geschichte der Psychologie seit DES-CARTES" in Herbart (1824 §§17–22).

the human being in describing the selection mechanism and the concept of recognition in a multi-layered approach towards educational science as in a disciplinary collaboration and on how to impact the processes of education. In the theoretical framework, I identify a 'mechanism of selection' because this is one facet among others of what it refers to as the process of pedagogical diagnostic in the current exercise of pedagogy. This means to scrutinise how selection relates to collaboration, specialisation, and unity for conforming to the reality of education in the midst of educology, empirical science, and hermeneutics. Likewise, with the mechanism of selection, other mechanisms should be connected within the interchange of contents between different positions in order to emphasise that selection does not happen on its own.

1.1.3 Principle of objectivity

One of the goals of the work is to reveal that objectivity is not merely isolated by empirical proof that scientists familiar with recognising the condition of another person might discuss (see Von Krehl et al. in Zappe 1989, p. 4; Gross 1969, p. 12) as, for example, with the asking of questions in the process of diagnosis.[111] In accordance with this goal, this work will show that objectivity is tied to one context. Then, since every context is under constant construction and influenced by the subjectivity of individuals in a scientific culture, the principle of objectivity must be explained in terms of a problematisation of the mechanism of philosophical reduction and problematisation of viability (see Gerónimo-Cid 2017b). Consequently, these mechanisms activate the current state of research towards recognition of the subject-matter in a disciplinary collaboration.

After the organisation of the contextual factors of the 'environment' and of the 'individual', objectivity can be portrayed in the frame of reference of the concept of diagnosis in the area of pedagogy (Kraus de Camargo 2013, p. 10). This raises a contextualisation that matters once the individual needs to stand out after a differentiation added to specific requirements, because the individuals themselves possess actions to be performed. Consequently, the individual represents a role player for handling, from the mechanism of selection, the mechanism of reducing contents, making them viable through a process of translation.

When considering that for the process of diagnosis, the principle of objectivity includes a mathematical process of 'total induction' (see a mathematical explanation in Forster 2016, pp. 1–16) when it entails a statistical syllogism of probability (Westmeyer 1972, p. 35), the interplay between diagnosis and diagnostic can be problematised by the reasoning of differentiating intentions from unequal disciplines [when the reasoning from the diagnosis concept contains a value judgement about different ways of procedure, see presentation of objective and subjective probability and inductive probability in ibid, pp. 35–42]. In this way, from induction to deduction, this means that translating induction while gathering particular signs enabling explanation of the diagnosis concept is reduced from medicine to psychology and from psychology to medicine in reciprocity (ibid). I foresee that this work will make a contribution in terms of the analysis of translation from the diagnosis concept related to both aforementioned areas to educational science and vice versa [as in the present case, by confirming, within

[111] With the execution of the diagnosis concept as a process, the concept acquires dynamism from the interrelation of perspectives.

the framework of a proposal for systematisation, the space created by the interconnected disciplines in a reality of education].

By considering translation as a concept that is within a pedagogical systematisation, with the encounter between the concept of pedagogical translation and that of diagnosis, the analysis of meaning for the treatment of a patient from a medical viewpoint (Schwarz 1993) lends itself to speculate how a reality of education is portrayed. During the application of a diagnostic argument within the context of a diagnostic procedure, statistical inductive systematisation (Westmeyer 1972, pp. 31–46) operates in parallel to the principle of maximum assertiveness (ibid), which considers the examination of conditions with regard to the principle of exclusion (see, for example, Salmon 1973, pp. 129–133). In this respect, different conditions may be found depending on different statistical moderators (Westmeyer 1972, p. 34) so that the criteria of the expert can be discussed in terms of types of statements, for example, induction, deduction and hypothesis (according to Pierce in ibid, p. 25). With the problematisation of a principle of objectivity, the principles of reality take shape for constituting attitudes that come from integrating disciplines within one system or as identified to this point as a space for collaboration. In this space, the principles of exclusion and consistency will take place on assumptions regarding a specialised experience.[112] As mentioned earlier, at this moment, specialised attitudes concern those that are collaborative and are first explained by the mechanism of selection. With this in mind, I want to return attention to the individual circumstances that present a distinction in every case. In the same vein, the process of analysis of the diagnosis concept cannot be homologated to one universal norm [because the diagnosis concept is tied to systems]. This would mean that the concept of diagnosis displays moments of the controversy between general and particular that set the stage for inquiry.

1.2 Problematisation of mechanisms: reduction and viability

Reductionism refers to the transference of one *statement* into a new one (see Hoyningen-Huene 2007). However, since one 'statement' alone might encompass a wide range of content, there is a problematisation awaiting the person who states it. This means that there is a problem according to whatever 'principle of reality' is taken as spelled out by the determined composition of descriptions regarding different moments within a situation. A principle of reality does not explain a reality – but only the levels for observing it. Enclosed in this delineation, a formulation can begin that keeps in mind that the really real is not the target, rather, its ideation is.

In terms of different principles of reality and in order that they can have an intersection with each other, there must be an agreement or conversational points regarding

[112] From the disciplines involved along a diagnostic procedure, their mechanism of selection regarding the exclusion and consistency of what the disciplines consider displays the symmetry on ways of procedure that speak about their own specialist profile. The reference to symmetry can be explained in parallel from a sociological perspective to show the arrangements through which scientists go for establishing statements from their own disciplines (see observations on physics and molecular biology from Knorr-Cetina 2003). Despite the fact that this is not a sociological work, observing characteristics in the composition of expert groups raises epistemological questions that occur when they take place in the reality of education. Educational science collects this information to identify differences in the formulation of theories that need to be understood by students and interested parties.

interchange among each of the principles. I hold hypothetically and for a moment in a completely innocent position for this agreement that there is one reality with several principles.[113] The supposition of one reality will yield the constitution of a system when understanding that one reality alone cannot be sustained in a global world stacked with references. Thus, a system of speculation about the specialisation of groups can be provided that may differ from the contents about this specialisation.[114] The way that I employ for sustaining this approach is through the problematisation of the category of 'viability' of Ernst von Glasersfeld (1995) on the grounds of the genetic epistemology of Jean Piaget (1970). I am setting the combination of viability and reductionism as a solution for recognising a systematisation that needs to be developed and portrayed. The mechanism of reduction should under no circumstances lead to an implicit appropriation of contents and traits of the cultures of research groups. Therefore, problematisation with other mechanisms is necessary. Establishing viability as a mechanism that is selected by specialised positions helps to set limits of theoretical supervision[115] before approaches become popular and lose their intention. Almost automatically, the theoretical foundation of Piaget (ibid, pp. 10–13) would forbid me to consider one only reality without sustaining, or at least mentioning, to which system this reality belongs. This system is contained by the reality of education with the concept of spheres of action in this work. Genetic epistemology speaks about scientific knowledge and how the latter is in constant construction.

With the intention of gathering two mechanisms[116] from philosophy for the analysis of the reality and their consequences of human action, I start with the naïveté of tracing

[113] The naïveté mentioned on the statement related to this footnote shows that 'principle of reality' is a connecting point that must be deepened in future research. The ascertainment of a reality is within the realm of education when it comes to the problem of an educational reality. Against this background, the associations of arrangements of other realities attract the attention of expert discussions on the subject of the historical and philosophical evolution of thought – that refers to the basis on which the disciplines are oriented and on which each one of them works according to its own tradition. Thus, in the absence of a well elaborated argument, the disciplinary collaboration could be restricted to follow the patterns of what has been done until now.

[114] Contents of specialisation may not participate in the constitution of the system, since specialised concepts do not refer to dogmatic definitions. Contents of specialisation may lie between research content and teaching content to explain how the specialisation position aims at continuous problematisation. From the area of conflict, conceived to understand the contents of specialisation in different areas, the scope of specialisation provides access to analyses of how scientific changes can be discussed in social terms (see, for example 'critical objections to Kuhn and their significance for the reduction of subjectivity in diagnostics' in Kutscher 1979, pp. 101–118).

[115] The moment of influence, characterised by the participation of different research approaches, aims to be in play with reflection and surveillance from pedagogical spheres of action. In conducting an analysis that takes into account the mechanism of viability of open available possibilities, the statements are evaluated against a philosophical basis that establishes a framework of a reality that can be employed or that can be constantly retrieved for supervision. In this way, the mechanism of reduction is not used to make an invitation to ideas that were not previously reflected and that were not connected with other theoretical ways of thinking. In this respect, the concern of various scientists and pedagogues to give approaches from autonomous research programmes an independent character is being considered and should be successfully covered (see, for example some statements written by Mittelstraß in Battro 2008).

[116] After compiling the whole work, three mechanisms were identified as part of the problematisation of pedagogical diagnosis with respect to a system. At this point in time, I start by naming only two mechanisms that serve as a basis for focusing on the development of selection as a concept and as a mechanism of assumptions regarding attitudes towards science. By including other mechanisms, the

historical contexts where there has been a starting point for fragmentation of knowledge. This means that in one moment [of history or during a specific point in time], some knowledge has been one and the same for different traditions.[117] Under this position, one knowledge possesses the position of one reality that bifurcates in so many other principles. Alternatively, principles that compose realities include contemplation of an interactive reality that questions a solipsism (see Fuchs 2008, pp. 25–50), opening further approaches of research inside the recognition of another person. Here, it should be said that only one reality would scarcely be possible when the own subjectivity is composed, thanks to the contact with other persons nearby. Hence, it is necessary to mark that on the basis of social components, the bipartition of an 'original' point and consequences has only a functional role that is contradictory in itself within a definition of the same origin. The cliché in English is 'What came first? The chicken or the egg?', which can resemble a game for children that misdirects the question if it restricts an answer within the boundaries of the question.

Using these terms and, at the same time, the paradox on the positions against the reductionism of an only explanation respectively against one-only reality opens a scenario where any possibility of universality of knowledge at the very moment of its appearance has been confronted (see, for example, historical traverse on one of the most controversial interchanges of the time, i.e. between the soul and the brain and its *Naturalisierung*, *Reduktionismus* and *Lokalisationismus*, in Hagner 2008, pp. 21 et seq.). For this and in regard to the mechanism of reduction of concepts, it is important to keep in mind that the words of the concepts or the words related to the concepts have different meanings according to different theories and different disciplines. Hence, the analysis concept that is set under an analysis of meaning within its surroundings provides clarification or speculation as to what was intended.

A goal to problematise the mechanisms of reduction with viability, harmonised with a principle of reality, is to distinguish the fallacy in explaining an only reality that can legitimate points of origin for the remainder of principles, which might have consequences for propositions about the actual state of things. The mechanism of reduction will not speak immediately and necessarily about the creation of a new reality, but it would require such speech when – with this aim in mind – some actions considered under this authority could be taken from their consequence.[118] From this comes a

concerted system proposed by this work for discussing the reality of education shows itself to be open to further theoretical statements within later knowledge construction.

[117] In addition to the intention to talk about an ontological existence, 'knowledge' refers to an instance of content that is a basis for supporting actions or their absence. For example, the content that unites some actions is not a reason for an action, but the last instance of what the content is. The construct of 'contents' releases the traps in which knowledge, but not its contents, has been held. This latter idea may seem more like a coherent reflection than an introductory basis. However, looking at the controversies through which knowledge has gone, the idea of keeping some options open is the reason why the content is bound to several and already written discussions and how possibilities are also a basis for the development of the work.

[118] With the basis of going beyond a personal explanation that can only make sense for the principle of reality being spoken, for example, during a solipsistic approach, the principles of reality should aim to give an indication of how the individual has a place of influence that is influenced by the surroundings. In this context, the proposal in this thesis to consider measures from their legitimate value addresses to the pedagogical translation as a problematisation. Within this problematisation, the exchange of contents is valid, but under certain periods of time and in awareness of the circumstances that promote

historical trace as an outgrowth of historical discussions showing how disciplines are joined throughout contexts. If it were possible to reduce everything from one discipline to another, how is it that some concepts have remained unspoken in some disciplines? Or how is it possible that they remain under some limitations? For example, the diagnosis concept that may almost be ignored in pedagogy will inflict nuances on the question of being reduced or of being an origin for further actions and reflections. But concerning the object of modern pedagogical thinking, the diagnosis concept has not been integrated within its theoretical construction. The full length of this manuscript unscrambles different suppositions for this point.

By now, and important in this section, it is necessary to hold in mind the poor attention that has been given to the scientific languages of neurobiology and pedagogy as disciplines working in tandem (Alisch in Schlüter & Langewand 2010, p. 196). Perhaps this might be due to the development of social sciences into empirical sciences and the transformation of cognitivism into computational sciences (Varela 1988, p. 16). This evolution of the scientific languages is better apprehended when dealing with the difference from outside and inside the body and the perturbed question on 'essence' or 'incarnations' in the world (Fuchs 2008, pp. 25–36) because in this area of conflict, there is a possibility for reduction (ibid, p. 37) or expansion of knowledge according to assumptions that might become obstructed by the production of information.

From the outset, it must be clear that the approach of *mental operations of reality* (Von Glasersfeld 1995, p. 13) is spoken from different perspectives, and every one of them has provided a legitimate way of evaluating the adequacy of knowledge. The way that they can be refuted is through exercising the expertise of different disciplines. In the hope that a researcher does not necessarily need to repeat the same formation as another researcher in order to be able to analyse the performance criteria of a study, for example; there would be a certain range of adaptability that should not be trespassed with the intention not to push to obtain specific results. With this in mind, the need for a collaboration with another discipline and not only keeping the domain of one single perspective is brought to the fore. A philosophical alternative proposal leans towards the 'constructive realism' of Fritz G. Wallner that can wrap manifold stages of a general reality in the 'estrangement'[119] or confrontation of theories (Anhalt 2003). Through the differentiation of theoretical positions, I expect to shed light on how a concept of philosophical thinking can be introduced into a pedagogical analysis – to wit, the concept of recognition by means of the analysis concept of diagnosis presented by the procedure of diagnostic.

Von Glasersfeld gave the idea that if certain results are not reproduced, it can be said that the study is *not viable* (1995, p. 22). This happens conceivably in the way of application of instruments, but what is of greater importance here is to define that the particular that is applicable is due possibilities of development within a domain of experience; this means that a person can be moulded and in this way make plausible and

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their constitution. Consequently, pedagogical translation can map the process that helps to expose the validity of 'consequences' in a principle to be defined that is under construction.

[119] '*Verfremdung*' in Anhalt (2003).

viable a knowledge (ibid, pp. 1–20) within a determined situation.[120] While theories evolve, so do the instruments. The evolution of instruments does not infer a subordination to a decreed resolution. With the previous paragraph along with this one, I pursue to show that, effectively, theories evolve as well as instruments in a way that they can accentuate their flexibility. There is a gradual change in the *Weltanschauung*[121] that explains how traditional epistemology is no longer viable for the use of pedagogical theories at the moment of dealing with a transformable environment (ibid) and with different principles of reality. Thence, the area for '*pedagogical epistemology*'[122] appears to be distinguished from other theories of knowledge and theories of science, with the intention not to create a bigger confusion between mind and body. I refer to the importance of continuing to compose pedagogical theories that work with the movement of the world. On this note, a step during this composition relates to identifying where in the theoretical framework options may be found for connecting analyses.

With an ambiance opened to modifications, the concept of true or false is no longer tied to a pre-existent reality (see Von Glasersfeld 1980), but to an adaptive advancement in pairs between the surroundings and the person. Every person makes a difference and adds a fluctuation, in the sense of variation and unpredictability, to the translation of components. Thus, the integration of a person within a situation generates an unimaginable combination of relations. Beyond a directional or multidirectional orientation, the sequence is altered not just by two elements but by a *third* – or better said, by an *uncountable and unreckoned* inner position of the man. I designate the potential of the individual to this 'third'[123] inner position, which I will formulate using the concept of Bildsamkeit as the inner potential of the individual being analysed on the spectrum between the biological and the self-determination of the human being, respectively, actions involving the biological side and the own judgement of the individual.

The analysis of the concept of viability in pedagogy, such as the alternatives of the contexts that have created a term must be taken into consideration. As a case in point, Anhalt (2010) summarises a variation in understandings on the concept of constructivism, where different courses of action are to be seen together in order to reconcile realities with common points and disparities. This can be seen in the positions of the radical constructivism of Ernst von Glasersfeld with the constructive realism of

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[120] From this theoretical basis, the moulding in the sense of elaborating on character of one person, according to systematisation upon the individual, will be a connecting point with an outcome of the research.

[121] Ian Hacking (Kuhn 2012), for example, recognized this word, derived from the German *Weltanschauung*, as almost an English idiom as in the expression *world view*.

[122] I note that pedagogical epistemology refers to the study of educational science from a German theoretical tradition. To this extent, pedagogical epistemology can be recognised as distinct from other theories of knowledge by considering its foundations, which are not connected with a division of theories of mind. The pedagogical epistemology grasps the development of the human being, who has access points to the theoretical considerations of aesthetics and art, for example.

[123] The 'third' will prove evidence that the *tertium comparationis* in effect offers a way to localise a problem (as Anhalt presented within the development of his theory of complexity of education, 2012, p. 188, for example) or to show how a problem was not seen (as with the problematisation with the *tertium non datur* principle; ibid, p. 254). I take that the third occupies a place of composition for the insertion of a non-contemplated influence. My theorisation goes closer to the comments read in Anhalt (ibid), and with certainty, I could not avoid removing this idea from my observation.

Fritz G. Wallner for the explanation of one world with several variations. Notwithstanding the clear clash of opinions, how might reduction and viability work in tandem? Two descriptions can be incompatible even as they are speaking in parallel from a mutual interest. In this way, Wallner (2002, p. 33) notes that science – and specifically, human science – from the European invention of the concept might differ from the Asian notion.[124] Further conceptions of whatever science might be have taken place during the divisions of particular understandings towards the world. To this extent, the creation of *Geisteswissenschaft* in pedagogy springs from the writings of Dilthey (2002, p. 100) from a German tradition that would explain how on still another continent, almost 100 years later, there are affirmations on how science and education see themselves as split (Samuels 2009). Perhaps such disputes reflect clearly the forces that appear in the problems of the mechanism of reduction and that do not allow thinking on a universal theoretical basis.[125] This means that when setting the rules of interaction of components under a determined principle of reality, if one of these rules denies the existence of a specific perspective, a path of theory can be blocked later for any subsequent category or concept within any kind of statement, bringing in consequence the formulation of a determined scope of view limited to one side of the perspective. Upon this rule, I set a *principle of openness* which, at least in my proposal for understanding the reality of education, I aim to integrate with a willingness to a collaborative readiness. The following subsection presents the reference of a field that appears on the context of the complex of empirical science with tools of reflection.

1.2.1 Neuroeducation as an example of related connections

Neuroeducation is a field that can be found under the name ‘educational neuroscience’ (Samuels 2009), ‘neuropedagogy’ (Larrison 2013) or as a ‘collaboration between psychologists, neuroscientists and educators’ known as Mind, Brain, Education (MBE in ibid; Battro 2008). Some of the differences reported within this disciplinary teamwork impact how the discipline[126] of MBE tries to study problems from the learning sciences to the schoolroom (Larrison 2013). However, the approaches in connection with the participation of the above-mentioned fields of action may still contain proposals that regard pedagogy as a scientific discipline that distinguishes education as an object from its classical consideration as a practice field. Moreover, access to the cognitive sciences has a range in which considerations of disciplinary collaboration can go beyond one area

[124] To this point, I would add, drawing on other ideas from around the world, that despite globalisation and the history of heritage through European colonisation, there are remains of home-grown, indigenous civilisations that challenge the affirmations of international science with other ways of perceiving the world (see Castañeda 1995 and Castañeda 1975 in Mollenhauer 1977, pp. 27–39). Different positions work together by creating their own means where they can meet. Whether one integrates the other or has a greater influence is part of a constitution that can be explained more deeply by analysing the meaning of a concept for a situation.

[125] From the impossibility of a universal theoretical basis, the need of assumptions regarding attitudes within models appears to invite formulation.

[126] With regard to the constitution of MBE as a discipline or as a field of action, the comments written previously on a discipline in relation to science should be retrieved. For example, the discussion of epistemic cultures from the notion of discipline, commented by Knorr-Cetina (2003), which is also considered for the integration of the sociological reflections in my argument for a disciplinary collaboration of philosophy in pedagogy, leaves an option open to observe the connections formed in MBE closer.

of specialisation that can be improved by others.[127] The initial proposal of research drew some inspiration from the collaboration of the areas of mind, brain, and education. Therefore, taking a look from the theoretical framework that I am exposing to this point of my updated perspective of this field and writing a brief report on it would be laudable.

This field entails two basic notations that should be reconsidered when exploring its publications. One involves how effectively educational science possesses a sinuous way in the development of its subject-matter and how it 'has a troubled history as a scientific discipline' (Ansari & Coch 2006, p. 146). Second, in the German traditions of educational science, education refers to a subject-matter and should not be confused with the discipline that performs the act of educating. In contrast, in the field of MBE, education establishes both the subject-matter and the discipline that works with it. Some similarities in the theories of education have been noted on different continents, but there are also differences that must be registered if future analysis is to be performed.

As such, in neuroeducation, education seems restricted to its scope related to teaching classes in primary schools (Cubelli 2009), and coincidental qualms stem from a narrow perception of the scope of education. On one hand, arguments show that theories about the mind are relevant for education, but not theories regarding the brain (ibid). On the other hand, theories on the science of neuroeducation are descriptive, cannot be assumed to be prescriptive (ibid, p. 563) – and by reason of their theoretical intention, they have difficulties in being speculative. Perhaps the flaw in these studies of neuroeducation relies on its endeavour to ameliorate the matters of education that are restricted to 'the learning brain' – as if learning would be the only matter of education – for this, to stress that this is not the only case is one goal of a current positioning strategy related to the project of the science of education. This encounters an own position of educators who seek to reflect on the motivations of teaching (Larrison 2013) but that is too centred on scholarly education, to wit, the Elementary and Secondary Education Act (ESEA) or No Child Left Behind (NCLB)[128] and its integration in the curriculum of learning sciences (ibid, pp. 1–7).

Right beside the problematisation of biological knowledge that this writing tries to approach, not only from a biological conception but from the analysis of a methodological one (i.e. an observation in the second order according to a conceptualisation), in contrast to the field of MBE, my approach goes into an analysis that comes from the theory of knowledge of German traditions that put the biological needs of a person next to or particularly into a context. It speaks about a different direction and way of entering into the observation of the problem of disciplinary collaborations and their objects of study. It also addresses a different approach that cannot be ordered according to the investigations of neuroeducation or MBE.

[127] I do not state or conclude that MBE's approach refers to providing benefit to only one discipline. The wording must draw attention to the idea that my research proposal differs from research into neuroeducation. On the other hand, in view of the benefits that each participating discipline can bring to the other, an approach proposes for the development of epistemological work from educational science.

[128] These programs and 'legislative reforms have merit, but in and of themselves, they are insufficient' (Zigler & Finn-Stevenson 2006, p. 174). Hence, my work proposes to join to an alternative approach that reflects on the subject-matter of education as on the reality of education and educational science within a complex situation (according to Anhalt's proposal in 2012) for delivering points of connection for analysis – and further actions.

Notwithstanding, neuroeducation indicates *an alternative measure of standards that assess not just facts* (ibid, p. 6) in the realm of critical thinking (ibid). In any event, neuroeducation deploys skills of schooling that are definitely rich in educational matters, but from an analysis of the theory, they are not the only direct access to reflection on them. Furthermore, although '*the pedagogical approach of neuroeducation (Hardiman et al. 2009) is not directly aligned with any single curriculum* [italics added]' (in ibid, p. 11), it targets modifications in policies that can be restricted to specific institutions.

The approach of 'teaching and research' in the science of mind, brain, education and learning (Ansari & Coch 2006) suggests an interesting multilingual component for understanding a problem of performance on its different levels. As a researcher, as an expert, as a teacher and as a layman, one must be careful with the transfer of such a model of multiple levels of analysis into an implementing level. This means that while counting on the basis of different 'moments' during the completion of an activity may be helpful, a complex architecture of knowledge from different situations must be considered simultaneously. This is important due to the possibility of contemplating, within the situation, the register of different dynamics of several subject-matters that are related with the subject-matter of education. Furthermore, employing various methods of data collection would influence the presentation of results. Surrounded by questions on the scope of research of the neuroeducation field, whether from a concrete declaration on the influence of curriculum in the schools on individuals or from an inquiry about how to develop cognitive skills that can be pragmatically employed, this field marks an entry point to a wider discussion regarding the interaction of disciplines. At the same time, it obfuscates whether a concept of mind is closing or opening to the realm of biology in the scientific frame.

As a prerequisite, setting a parameter of translation on the different levels considered is required as I propose the use of the 'pedagogical translation' as a process of the transfer of knowledge, along with different levels of reasoning within a collaborative space of spheres of action, since every theory possesses a domain of validity (Patry 2012, p. 9) that must be explained. I present translation as an assumption in this work, but one that to date is not to be found in the literature of mind, brain and education. For the reasons with so many different alternatives that are laid out in this section, I see a conceivable field for the application of the reflections generated on the second level of observation,[129] where this work is located. A theoretical approach can be developed on the grounds of the existence of such a reflection on the collaboration of mind, brain and education – but that recognises the independence of this field. Also, the interaction with this composition of theoretical traditions would necessarily join to show an openness to alternative conceptions due to the number of combinations. Understanding that a development into a collaborative space of three strong disciplines might prompt popularisation and negative consequences for expectations about what can be done with science (Larrison 2013, pp. 26–31), part of the contribution is that an action in the form of teaching and learning would disclose levels of observation when wondering about its complex conceptualisation (Schaller 2012). To this extent, ontological assumptions are seldom considered within an epistemological, scientifically theoretical and

[129] I explain this second level of observation as a second-order observation in the third chapter during the conceptualisation of the problem, where I put the analysis concept into practice in the analysis of meaning within contextual problems.

methodological background (ibid, p. 21). Consequently, in this work, from questioning the epistemological position of knowledge theory upon disciplinary collaboration, MBE for example, explained by the reality of education, the systematisation of ontological assumptions according to 'spheres of action' and the individual is problematised.[130]

1.2.2 Openness to alternative conceptions

The importance of the context lies in the accommodation of theoretical elements that, like bricks, will comprise a structure, but at the same moment, what is built is based on the terms of an *own language.*[131] Following the metaphor, this means that any wall that might be assembled refers to an existing concept of a wall that would try to portray the 'thing in itself'. But what is 'the wall' if not a *blind spot*[132] where it is possible to problematise the differences between words, concepts and things as representations and as meanings of a constitution of knowledge?[133] For clarity of exposition, this moment

[130] The systematisation of ontological assumptions has an educational interest, as mentioned by Biesta and Hannam (2009), in relation to how a matter in education 'should be educational' (i.e. to have an 'educational interest'). An educational interest is existential 'about how the child can come into the world and can come to exist in the world, not as an object of other people's ideas, projects and intentions, but as a subject of his or her own life.' (ibid, p. 176). In this sense, the systematisation of ontological assumptions is achieved by focusing on spheres of action and possibilities of influence from the individual. My proposal for a strategy follows on from this, not to make assumptions about what ontological statements are, but to problematise them with what has been written about them scientifically. Therefore, ontological content is protected by theoretical statements that should aim to remain open. In this thesis, the educational approach occupies the place of reflection on itself for the pursuit of pedagogical discussions thanks to its link with theoretical approaches in society, looking for how to make the most of a person within a disciplinary collaboration in terms of research content. The pedagogical approach lends its strength in translating the goal of discussing what the individual existence in the encounter of disciplines has to do with a later development of dealing with her or him.

[131] This will be interesting to problematise when proposing that the search for an own language of educational science might refer to a 'blind spot', of which educational science needs to be aware. In this way, educational science – or any discipline – would be able to develop concepts within an own language once an external perspective is taken from inside or a third place of composition for questioning the concepts that have originated inside the own tradition. This 'third position' reinforces the importance of including the participation of other disciplines, not only for the benefit of connecting a discipline with the world but also for the support of others when considering several perspectives simultaneously.

[132] The wall would relate to the aforementioned 'third' place. The metaphor of this wall refers to the pedagogical object that in terms of an own language is under constant construction. This reflects the difference from object to subject-matter because, as such, the pedagogical object does not have the intention to be solidified without contemplating an internal dynamic of a transcendental meaning and how transcendence might be involved.

[133] The presumed position of the wall as a third place, yet described within the theoretical framework, will be further clarified with the problematisation of discipline as a unity (on a first instance, I must assume that the image of a wall as an independent point that can be shared in theory construction can be related to other disciplines. By searching for a figure like a front wall or a leaf I attempt to render a visible surface on which ideas are displayed to others and in this way can be scrutinised by ideas presented from an opposite place. The wall refers to the figure of a deliberately created surface that also points to the blind spot when the conditions of different perspectives, including one's own, are marked. Both the own conditions and those of other perspectives can be limited to each other in different moments. In this respect, the figure of the created surface can depict a unit that does not aim to be absolute). The conceptual framework of the work, where combinations of theoretical approaches are put to use, for example based on Helm, Tenorth, Horn and Keiner (1993) with a historical reference, presented how a discipline such as educational science cannot yet be autonomous, but is connected with a continuous openness for questions and with thought-provoking impulses (ibid, p. 275) from other disciplines and from the society. The historical register system of events on which a discipline is embodied underlines the intention of some theoretical statements to problematise principles of reality

about constituting the organisation of contents and traits of cultures of research groups equates to opinions being gathered regarding an entirety of epistemology. Upon such a speculated unit, many objects of study in traditional science are identified and selected. On another level of what might happen within a unit,[134] the internal dynamics of these objects would help to connote the definition of what these objects are and how to deal with them. After a unit in an epistemic culture has been identified, according to a scientific basis, this supposition of a unit needs to be reviewed. Directed towards a revision of the contents of what is being taught and that is being handled in the realm between teaching and learning from research, the relationship between expert and learner is enclosed because literacy is sought to happen according to institutional social parameters that can be registered for later problematisation.[135] The substance of education is achieved by the agency of tangential clashes of opinions pertaining to ontological, phenomenological and epistemological reflective constructs analysed using pedagogical tools (i.e. from the basis of reflection on what the substance of education is during the interweaving of theoretical positions and social influence).

Settled on a blind spot, the descriptions of reality are delimited according to at least one perspective and at any rate proceeding from one viewpoint of a participant. This one perspective can be repeated several times in all the other viewpoints that are not immersed within the determined scope of extension. Outside of contexts in which propositions and descriptions of a reality 'govern', a theory possesses a range of openness where its systematisation is valid or not valid anymore. These alternative conceptions can be feasibly seen during theory formulations (see Zima 2004) once the latter are scrutinised. Analyses are performed with the intention to confirm that the accepted one perspective can be multiplied by all other perspectives that are not directly in touch with the aforementioned scope of extension of immersed elements. The space opened by the reflection of 'with what' something is being handled and the way that it is being handled is shown by indications, which in a theoretical sense are means of thinking (see Elias 2004 in Schaller 2012, p. 27). For the immersion into other areas – in other words, interrelation between fields of study – analysis of specific mechanisms and systematisations would be required.[136] Thus far, these mechanisms succeed

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to which some of them might refer to independent disciplines – this means that the intention of autonomy has a bearing on a particular moment when a discipline is taken as a point of reference.

[134] Since the totality of an explanation at this point is mentioned by me only from speculation, events relating to other levels can also come from events outside the spoken unity. Stimulating discussion therefore does not have to be integrative, but from the pedagogical point of view they are identified as those that can contribute to the achievement of a goal.

[135] At this point I am writing about the openness that a theory building based on its own structure possesses. On the other hand, however, scientific openness from a social perspective can be reduced by political interests of 'providing solutions and securing results'. In circumstances corresponding to this last option, the debate between theory and practice can be thought about what is more appropriate for a group. The possibility of having an open approach to further theory development involves a connection that is more familiar within the pedagogical domain according to an attribute given by society. To this extent and in an attempt to avoid a general description of events, the texts that remind the scholars that the theory would be prate without demarcating its political interests, give shape to aim at a democratic science. In this way, caution is advised when working with two places regarding separate intentions. Openness to alternative ideas is not achieved by bringing together social action and theory. However, by referring to the tension between these two sides, the context can help to explain how this open option is maintained.

[136] I connect to this point the systematisation of pedagogical translation that to this moment I am localising as a possible place for its integration into the disciplinary exchange of contents. Within this

according to the means of thinking, which I propose to problematise in line with pedagogical spheres of action.[137]

With this in mind, when seeking a clear display of the variety of theoretical organisations, it makes sense to take a look at the discussions of how the 'humanistic approach of educational science' is constituted in light of its openness to conceptions. In it, positions will be found that do not clarify the use of a theory of education, praxis and reality of education (Anhalt 2012, pp. 83–160). In the references along the trail of history, it is possible to see more than one pedagogical action that can be organised alongside other components of education. This is to say that a reality of education can exist without a theory of education (ibid, p. 91). Such reality of education composes an ontological matter of 'contingent exceptions and limits of information that are visible on the collision of assumptions'[138] (Schaller 2012, p. 28). In this case, for example, Schaller (ibid) performed an inquiry on the topic of learning, in which he pointed out the discussion of relational perspectives between educational science, psychology, philosophy, sociology and neurobiology (ibid).

A lifetime would be required to present some of the approaches studied in the social and natural sciences in an effort to provide an understandable discussion to a whole compendium of elaborate positions that by now comprise thousands of books, files and areas of storage space, virtual and physical, that have registered the discussions in re-formulations through time. In consequence of the fact that this requires a sophisticated folding technique, I identified a blind spot that sets a 'connecting point for analyses' (based on the writings of Anhalt 2010) on the generation of a problem that could permit studying the sundry alternatives in a systematic manner at the same time as proposing words of understanding of the complexity of the theory. With this, I foresee that the reader can aim to understand the complexity of the reality of education in a comprehensible way, bearing in mind that the openness to alternative conceptions is based on defining what is handled, how is handled and for what purpose.

Consequently, for this subsection, and drawing inspiration from previous works in educational science, I want to highlight that one goal of a metatheory,[139] as in my approach, will be to identify some traces related to the knowledge development localised at the point where sociology meets with philosophy and educational science at the moment when they look towards the complex situation involving a collaborative space

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work, I am proposing to include the mechanisms of reduction, viability and selection for problematising the spoken contents and methods.

[137] The difficulty of this proposal is to find out what the 'means of thinking' refer to. In other words, to get an explanation of what the spoken 'means of thinking' are.

[138] '*Revisibilisierung von Kontingenz*' (Schaller 2012, p. 28).

[139] The character of a metatheory from educational science relates to the division between empirical practice and speculative work. This mentioned division in pedagogy depicted that the modifications made in the 1970s, which called for empirical methods from psychology and sociology (Ingenkamp 1992, p. 7), could not be ready to accept metatheoretical considerations. Ingenkamp (ibid) discusses the notion of 'praxis without register from analysis' according to the topic of the status of empirical-analytical pedagogy in the German tradition of educational science. Had such works not been written about how the influence of other disciplines in the pedagogical realm has taken place, most of them empirical or from the empirical debates that occurred during the twentieth century, pedagogy would not be in readiness to provide the assumptions from its academic tradition to discuss an educational reality – which at a current point in time in the first quarter of the third millennium goes beyond a purely empirical treatment.

and towards a complex object of study such as a dualistic division of body and mind. In this sense, my research joins the effort pursued by philosophical reflections from the educational realm. Therefore, a more extensive work would be required for enouncing the detected theoretical divisions between the sociological tradition and the philosophical one, but unfortunately, I can only acknowledge these works where such ruptures are worked in detail (see, for example, Schaller 2012; Schlüter 2013).

Over the history of scientific knowledge, this is not the first time that concepts can be taken among disciplines. Such progression of meanings about objects of study alongside the collusion of methods has exhibited the compatibility of some fields at the same time instead of allowing decomposition of structures. With this, parts of theories have also been indicated that up to now have not been systematised, as in the humanistic approach to educational science (Anhalt 2012, p. 106), and that are sometimes able to be employed from the social sciences into the natural ones, and sometimes not – or the other way around. With this incommensurability of concepts between theoretical constructions, an approach related to the problematisation of the 'viability'[140] of concepts between unrelated traditions appears possible, and consequently becomes visible. This means a lack of connections, in other words, no existence of essential bridges to help in the necessary crossing from one side to another. Turning this approach into one about the problematisation of 'viability' of concepts between disciplines, this means amidst the interchange of different methods, theoretical positions and perspectives. Hereafter, assumptions regarding traits from attitudes in disciplines are gathered to catch some of their specific goals, a number of which can be incompatible with each other; therefore, the conflict exerts a systematisation.

From this setting, could the difficulty of sharing concepts between disciplines be due to lack of training in different areas of action? Could it be because academic formation has been focused only in terms of some specific topics? These questions pull attention to the individual within a social context. The whole relation of the same words in different disciplines calls attention to a complex reconstruction of traditions. Simultaneously, it catches the interest coming from diverse areas of research that need to find shared objects of study or a moment for communalities, that is, mutual connecting points for analysis. In this manner, although an 'assembled reality' could be explained, an idea of something provided can more closely approach the reason for working constantly at all times, parallel to an apparent need to recognise the independence of the 'thing in itself' without claiming what it may be. A synchronous constant circular way of working together would never come to an end because the involved parts would be required to resolve a ceaseless undetermined dynamic. Thus, the problematisation of 'viability in pedagogy' would refer to a bond between philosophy and educational science with openness to other research areas (this can mean, in other words, to hold an attitude of accepting input from neighbouring research areas). A clear example is found in the studies on the 'brain' that cannot guarantee a certainty of a whole that is true of this organ. However, the brain can offer a collaborative space between disciplines that are

[140] 'viability' as a category taken from the writings of Von Glasersfeld (1995) can also refer to the mechanism for the problematisation of a sinuous path that a collaboration of disciplines has gone through in composing feasible subject-matters.

seeking to resolve how a *cerebralisation*[141] (Becker in Schlüter & Langewand 2010, p. 107) is explained according to the particular viewpoints engaged.

1.2.3 Function of selection as a mechanism

Selection is different from the *pedagogical function of supporting the development* of the faculties of the human being (see Ingenkamp 1976, p. 60). In terms of the historical track of the action of educating, Wilhelm von Humboldt promoted in 1810, in the context of the classical philology, the introduction of exams pro faculty (Blankertz 1982, pp. 94–124). In contrast to the school certificates brought in some years later, first with the philologists, later with the physicians and finally for the theologians and jurists (Ingenkamp 1971, p. 48), both actions can bring forth a slightly different gradation of pedagogical strategies in these separate time periods. Upon a differentiation from their goals, the concept of selection encourages dealing with it as a mechanism that has a place in history.

The first of the last-mentioned actions could target the selection of candidates as they earn the right to study something, while the other could do the same in proving a 'competence' and achievement of objectives, first after developing specific activities in different situations. Both actions should be directed to strengthen the pedagogical function of support; however, this was and is not the case.[142] This thesis will attempt to discuss arguments about why and how this does not happen as it should and could be when an action runs under a collaborative space. For example, problematising pedagogical action with an institutional task can serve to prove that the human being cannot be evaluated according to some criteria of any of both aforementioned goals (Fuchs in Mikhail 2016, p. 121).

In the educational area, applying the word selection has several uses; for example, someone may select contents to be taught or another may select aims that might be incorporated into a normative content or be used for its validation (Brezinka 1992, p. 196). These functions of selection might be associated with the purposes of disciplines (Ingenkamp 1971, p. 53) that, in conjunction with academic systems and higher education, have relied on the unity of teaching and research (Stichweh 1993, pp. 242–

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[141] 'Zerebralisierung des pädagogischen Diskurses' (Becker in Schlüter & Langewand 2010, p. 107) or cerebralisation of the mind, spirit or consciousness prompts the debate about several theoretical traditions that are concerned with neurobiology. Becker (2006) explained reasons that influenced the neurobiological reception in a positive and negative manner in the pedagogical German foundation. Namely, the postwar period left a position of scepticism against biological results. Nevertheless, the cerebralisation of a theoretical discourse (specifically according to her opinion regarding pedagogy) should be taken with caution and awareness of which ideas can be swapped inadequately. Caution is required also from the psychiatric side and for cognitive disciplines (Dahl & Raz 2019, pp. 129–131) when brain imaging is taken for promoting idyllic results (ibid).

[142] Through the concept of selection with the executing of actions, like the development of certificates or application of exams, in the way that these are historically related, they display that the pedagogical object is tied to social influence. By showing the interaction between society and the pedagogical object, selection earns attention, raising speculations about what maintains disciplinary attitudes of choice, preference and determination in the sense of recognition – of competences, in this case. From sociological works, a register of activities would yield traits of behaviour for sketching a map of connections. From the pedagogical construction, selection appears to have connections with other constructs. In this way, selection is an independent concept that in the theoretical composition affects the pedagogical core.

243). In this course, the transfer of the concept of selection into functions of control, motivation, eligibility, reporting, etc. ratify the area of different interests that elucidate each other. Censorship or attestation of a result may lead to the combination of a function with its application, creating sundry combinations that can reveal how concepts from other theoretical traditional intentions are mixed in the composition of a person. Specifically, a force of concepts appears in the reality of education that, if not understood, the place of the stronger concept would be given to the highest bidder in a contextual situation. For example, in neurobiological work, the attitudes of more relevance are those linked to biological objects instead of to those described by an organisation of principles of reality [To this extent, scientists from neurobiological research are called upon to participate in the discussion regarding which problems appear during the presentation of results when they are outside of biological evidence restricted by tools or description of parameters].

Function, as in function of selection, is to be remembered in this modern era that employs a place of practicality, on which authors like Immanuel Kant positioned a regulative maxim (see Sandkühler 2010, §757), one that contrasted with a previous concept of the ancient world of the 'cause'[143] of Aristotle (ibid, §756b). Function as a concept can operate under the anamnesis or causal previous history of a person as a *medium* or as a *function porter* (ibid, §757b). Consequently, by applying a function, the reference to a personal and specific reliance from the individual in – as well as accountable for – a context, a theoretical account is given [To this extent, I am giving a dynamism to the development of 'context' that is beyond a frame of action where beliefs can be crystallised as in a mere description of a reality given. Thus far, my proposal on the reality of education targets to problematise actions, reflections upon them and theoretical systematisation related to previous academic discussions that have taken place in more than one area]. Either cause or consequence would be problematised on varied schemes of analysis and of use. For this kind of reflection, wondering about the constitution of a system where pedagogical provisions intertwine with the effects of different operations can be valuable.

Within this part of the chapter should be mentioned then the ongoing support made by the pedagogues, intertwined with the *unities* of *pure activity* (Grzesik in Klattenhof 2004, p. 31) that are composed by *figurative conceptions* or *extension of ideas.*[144] On a related note, another action of selection can be found in the writings of Johann Friedrich Herbart aimed at identifying the criteria for setting some goals on the henceforward *will* of the learner. This approximation of Grzesik is highly complicated, considering the work of educational science and neurobiology. Hence, the contribution of systematisation from my work aims to problematise the conflict between scientific assumptions (unity, collaboration and specialisation) for speculating on how reality of education is composed when the individual assumes a main role within a system. In parallel, the specialised position will give ground to recognising how to speak about the

[143] '*Causes* must be distinguished from *reasons* for an *action* [italics added]' (Sandkühler 2010, §2840b). To this extent, the concept of cause has also a systematisation where connecting points for further analysis are related to lines of thinking and ways for presenting an argument (see *Okkasionalismus, Determinismus, Kausalität, Empirismus* in ibid, §§2841–2842).

[144] *uneigentliche Vorstellungen* or *Vorstellungsmassen* in Grzesik in Klattenhof (2004, p. 31), which problematises the relation between the inner and the surrounding world.

contents of neurobiology as differentiated from the contents of pedagogy by using the concept of selection.

Related to this third option in the description of the concept of selection, the learner themself decides the requirements for the own actions in order to accomplish the proper formulated goals (ibid, p. 15). Based on the figurative conceptions, the requirements for the prospective pedagogical action would be enhanced by a future need for *constant development* (ibid, p. 20). As such, options upon selection can be gathered for explaining that the manifestations of an action are to be considered by diverse referential points they form. The system that explains these manifestations can be boarded out of the specificity of single cases. Concerted action or collaborative readiness[145] with the expert or teacher would procure a scenario of support for the achievement of the goals. In the same way that Anhalt (1999, p. 214) identified from the writings of Herbart, the expert would provide to the non-expert new possibilities for connection with new inputs for learning about a condition, in which constitutive moments of education would have an impact from the self-organisation of each person.

To this point, the concept of selection with three different 'options of action' arises with different intentions and with diverse functions. One action involves supporting the inner potential of the individual, while another action is to censor and to pick out a person among others – namely to elevate characteristics for specific tasks – and a third action speaks about putting in practice a belief with intentions towards collaborative readiness.[146] Nonetheless, the concept might have even more systematisations depending on the theoretical organisation that is behind its use. However, these classifications are connected at the point of circulating around the inner potential of a person. Without a doubt, here is an encounter with positions from assumptions regarding decisions related to the starting point for positioning oneself and the action of influence from another person. The instant of decision, however, reveals that no position can be saved from selecting a syndetic opinion.

This thought directly leads to the next step in the problem according to a theoretical account: what could the most adequate theory be for appropriating an experience? Distributively, who or what could serve in the main role for making a pause of and for selection in the sequence of the interchange of content, and under which method? In favour of these reflections on the area of philosophy, the historical confrontation of advancements posits that no solution arises without controversy. Suddenly, empiricism

[145] With the mix of constructs, like of 'collaborative readiness or concerted action' and 'concerted system', I expect to show the closeness of the intention, execution of an action, development of an action and action in execution – because they are part of a system. Within this concerted system, the discussions on differences between goal, cause, reason, purpose, direction, extension, potential, performance and others will yield more than one topic started from theoretical construction throughout history. All these words taken as entry points into constructs tend to imprison opinions to the extent that it is almost impossible to work on them. So if they are presented in a context, their meanings can be associated with connections in-between. In this thesis, I will not speak about dogma and about how dogma is included in the explanations and organisations of knowledge (see, for example, *Enzyklopädie* in Sandkühler 2010, §545bu); however, the confusion regarding explanations helps to push the exercise of thinking and learning how to think on specific topics to take a position or positioning within a situation. To this end, disorientation must be part of a pedagogical work that seeks to awaken formulations for ways of reasoning in order to assume a character within a topic.

[146] From the putting in practice of beliefs, the assumptions of attitudes will come in the later portrayal of models during the fourth chapter.

is attached to realism and both or many other additional positions that are within – as in discussions of the pragmatism of John Dewey's concept of 'learning by doing' with an emphasis on the autonomy of the subject (in Sandkühler 2010, §1409).

1.3 The individual as commander of the processes of transformation

Mental processes cannot be reduced to physical events (Fuchs 2012, p. 334). Herein, a fallacy can be enounced when not considering the problematisation of the many sides of a discussion [or considering all without a systematisation]. This means that (1) the physical mechanisms of neurobiology as (2) the mental states of psychology and (3) socio-cultural processes, which I associate with mind reflections of philosophy should be considered when speaking of the constitution of *Mental States of the Brain* (see, for a more comprehensive explanation of some terms ibid, pp. 341–343). In this order, merely to say that there is a correlation between these three states that should be discussed or cannot possibly be explained yet is not a scientific position that can be followed. However, to search for the reason of cause of mutual relations in a scientific world marked by a plurality of positions represents an ongoing modification. Alluding to pedagogical references, such plurality renders an extension in knowledge (Keiner 1999) of the imaginable combinations in terms of how dynamics are related. This search for reason calls upon a *search for orientation* (Anhalt 2012), through which the current scientific system based on integration and specialisation can be displayed.[147]

Within a system that considers integration at different levels, many approaches can be unified in different places. For example, the 'integral systemic level'[148] (Fuchs 2012), when considered from a horizontal plane or 'horizontal circular causality' composed by biological and social cycles (ibid, p. 333), depicts the 'vertical circular causality' from the individual. Strictly speaking, the subjectivity from the individual translates physical stimulations into mental reactions (ibid, p. 334). I propose to support the formulation of this vertical plane for the integration of *individual* processes of transformation within a macro level, such as the process of 'Bildung' related to the process of general education on the interchange of the self and the world. This interest also comes from the side of pedagogy with Sloterdijks'[149] 'vertical stress' (Schütte 2015) for the accountability of

[147] With the display of two positions from assumptions of specialisation and unity (i.e. integration), I formulate the hypothesis that collaborative assumptions work for formulating a third model. This model of collaboration is presented in the fourth chapter as a finding of how the reality of education can be understood. Other models are possible; for example, I refer to a possible model of conflict after thinking about how attitudes are unattainable between positions. To this extent, models that can problematise a scientific system would be proposed from the understanding of realities of other disciplines and subject-matters.

[148] From my proposal, I will take that an integral systemic level puts together the intersections from interrelations between an individual position and the world. The important difference involves a pedagogical translation that takes place in second-order observation from where a similar interchange succeeds. Furthermore, I take that an integral systemic level is localised within a scientific position of specialisation. This last is another difference in the pedagogical translation, which from the pedagogical side occurs from a scientific collaborative position, hoping to reach and being manifested in disciplinary concerted systems [and by positioning within the description of a reality of education]. To this extent, disciplinary concerted systems can also be identified by the disciplinary collaborative systems. I am aware of the closeness of the formulations, and for this reason, I will seek to encourage forbearance from the reader while following the argument until the fourth chapter.

[149] Schütte (2015, pp. 26–27) takes into account the debate about considering Sloterdijk a pedagogue or a philosopher with reference to his philosophy on the construct of Bildung – in terms of

the individual in the interplay between philosophy and culture according to a heuristic scheme of Winfried Böhm (in ibid, p. 29). Although Fuchs and Sloterdijk speak of a slightly different approach to 'verticality', both aim to modify understanding from the individual position. To this extent, Schütte spoke about Sloterdijk, and Sloterdijk and Fuchs about verticality. Fuchs and Schütte covered that when this position moves in a different level of horizontal disruptions, as in the reflections of Fuchs (2012, p. 331), or when the individual exceeds himself as in Schütte (2015, p. 33), an intentional individual action[150] is connected with an interchange of positions.

One of the characteristics is that Fuchs (2012, p. 336) did not identified the order of 'mental illnesses' according any manual, but in terms of the description of the situation. At this moment, I would identify it as from a *second order observer*, i.e. an observation from the viewpoint of one 'outside' the system where he problematises that technology, such as fMRI studies, provide evidence on effects that come from the individual pushing the self during placebo treatment (Mayberg et al. 2002 in ibid, p. 340). In this way, he opened a possibility for discussing the influence of subjectivity in the treatment of the patient that goes beyond the only state of 'mental illnesses'. Since in his description, he conveys the relation within the clinical practice to the 'patient's experience and behaviour' (ibid, p. 335).

The situation to be depicted here regards the placement of the subject[151] as the basis of further presuppositions, the *Hypokeimenon*, as was described by Aristoteles in Wallner 2002 (p. 34) and that is confronted with the European *dichotomical* tradition (ibid, pp. 33–44) – that would give a basis to the discussion of science as integrative in counter-position to specialisation (as a unity of contents in contrast to a unity of teaching and research, for example, which by the end of the first four chapters must be comprehensive). On this ground, the outstanding contribution of European scientific thinking is to realise that more possibilities are doable than those offered by science or available within science by different branches. In this vein, pedagogues hold the responsibility of contemplating a kind of knowledge for all the citizens of a community, including the ways of thinking outside a specific model and those that are also too extensive within disciplinary problematisations such as philosophical opinions.

Endorsement: The process of *Bildung*[152]

Blankertz (1982) wrote from the context of describing advancements in the studies of pedagogy in which Wilhelm von Humboldt defined the path of individuality from the

Bildungsphilosophie, alongside the contributions of Humboldt, Koller, Adorno and other philosophers and pedagogues, he lays out the discussion of an interplay with cultural science.

[150] To this intentional individual action, I will refer to an individual practical deed that is tied to one purpose.

[151] Here, the exposition of subject and individual manifests a close relation that seems to be parallel, one to the other. This portrayal of the 'specific' concerns the influence of manifestation as discernment.

[152] Christiane Thompson, the translator of some work of Jörg Ruhloff as a researcher of the theory and philosophy of *Bildung*, wrote that the term could remain untranslated due to its philosophical reference (Ruhloff 2001, p. 69). In addition, Rucker & Gerónimo (2017) wrote that the significance of the concept of *Bildung* has increased due to the formulation of pedagogical issues. From this point onward, the word will be handled in this manuscript as a concept in English literature and not as a foreign word. In addition, according to the opinion of Stojanov (2006, p. 27), the translation of Bildung to other languages would not capture the concept discussed in scientific frameworks.

inner force to oneself as Bildung (ibid, p. 101). In the context of a country under reorganisation, with the Prussian Reform came the approaches of educational reworking that aimed to retain the classical and ancient studies of 'classical philology' (ibid, pp. 88–104). Surrounded by the terrorist consequences of the French Revolution, an educational concept was brought forth that could work as a diametrical mediation of opposites (Lischewski 2014, p. 173 et seq.). With these modifications regarding social compositions, other fluctuations appeared in the expectations for the human being. In this way, a classical concept of Bildung honed in on cultural and individual interpretation (Koller in Wigger 2009).

Bildung would refer to a process of transformation, to which not every modification should be ascribed under this construct. One indicator for deciphering which action leads to an operation of Bildung in education relies on activities having purpose within a moral and ethical orientation – as in the work of Johan Friedrich Herbart that was discussed in Rucker (2014, p. 65). As a consequence, it is possible to state that Bildung refers to a process of self-transformation within the autonomy of a sphere of action for a specific greater good. By localising Bildung in this space of autonomy, a cornerstone for the further movements during a systematisation is laid by an individual that will not give reason to all that comes from a person.

A deeper discussion can reveal that one of the problems regarding the definition of this concept of Bildung is that there are allegedly different understandings and perspectives of what this word should be referring to. As such, Rucker (2014) goes over the same ground as Ricken (2007), in which Bildung has the characteristic of a container construct. In this sense, Bildung portrays a constant problem that cannot be solved without problematisation in a context [by taking definitions of 'theoretical contexts' into consideration, I call for caution on crystallised beliefs in order to release the potential of concepts and the individual who formulates upon ideas].

Bildung is a concept that refers in general terms to the potential of a person. In its original form, Bildung took a direction towards individuality, which was a spirit of the epoch in the transition from the classic to the critical idealism of moral freedom (Lischewski 2014, pp. 163–179). The concept, so to speak, was in contrast to a similar proposal from Friedrich Immanuel Niethammer, who had a stronger orientation towards 'vocational training', a graduated education system, and less towards a 'humanist' education (Blankertz 1982, pp. 79–101). Like this, Bildung according to the thought of Wilhelm von Humboldt, as one of the most famous authors on this topic, was defined as the means of 'individuality to itself, as the interminable task that would last as long as life itself' (Blankertz 1982).[153]

Within this primary idea might be found a bridge to the definition of the 'own' along the line of the notion of emancipation of this period in history. As such, a position of specialisation does not have the purpose of defining what the self is, as within a context of revolutions, but to open a path offering the search for an agreement on how to portray the relation between the subject and its relation with the world (Rucker 2014, p. 61) [from the position of an expert who works together with a non-expert on specific

[153] 'Bildung wurde definiert als der Weg der Individualität zu sich selber, dieser Weg aufgefasst als unendliche Aufgabe, so dass Bildung nicht abschliessbar sei, vielmehr das ganze Leben über währe.' (Blankertz 1982, p. 101).

domains according to the description of the 'collaborative readiness' I present in this work]. Nevertheless, the concept of Bildung not only refers to an action of the person, but to theory construction. More than 100 years after the proposal of the concept of Bildung, Eduard Spranger and Clemens Menze initiated a classification for a theory of Bildung (Lischewski 2014, p. 179) that later would be discussed in scenarios of empirical work (Koller in Wigger 2009).[154]

This incipient approach of 'reinforcement of the first person' [as one possible orientation of one emergent proposal] leads to later questions regarding its currentness of data in the presentation of a description of realities. For instance, does a particular reality surround the subject in the description of the self? To this extent, teleological influences would display a force that can explain how a later expulsion of the church came about as a consequence of the requirements stipulated within science. Or is it that there is no external situation that can be taken away from the participation of the subject? Relating this case to historical analyses, on the topicality of classic definitions of Bildung, theoretical statements from the past might not reach the harmony that they sought. Hence, proposals from theories that were not and have not been connected with the development of counter-arguments, require formulation on the dynamic of the interaction between the self and the world according to the plurality of opinions. A plurality that relevance considers an inherent constant dispute cannot hold the ideal of a total harmony (ibid) [mainly because a radical positioning in plurality might exclude philosophical arguments of what human beings have the potential to be[155]]. To questions of this sort, the concept of selection appears in order to censor the control of how to modulate the formation of a person. Because of such reasons, the work of Humboldt was not entirely published until 59 years after he completed it (Lischewski 2014, p. 175).

What could have so strongly motivated such a delayed release of Humboldt's work? Perhaps an intention to keep standards in science? (see, for example, the argument on continuity of new discoveries, Stichweh 1993, p. 239). My research is not about trying to provide an explanation of how the career of Humboldt took some time to become well-known (see historical work of Bruford 1975, pp. vii–29). However, in similitude with other modifications in science, I can identify that the position of Humboldt started from an inner force or a 'potential'[156] of the person but with many possibilities of influence on this construct. This means that this construction was problematic when

[154] In this way of thinking, the observer could see how paradigms of experimental research sprawl through discussions of the program of Bildung. Perhaps the ambition after reaching out to objectivity and a closest entrance to one only reality triumphed over the consideration of subjectivity as an inner procedure. Or, as I am already leaving glimpses of the path of this thesis, neither objectivity nor subjectivity ensures the formulation of a proper question of research. Nevertheless, technological progress prompts more seductive reflections that on many occasions must necessarily be limited to quantitative methodologies. In this way, after reading the contents of the arguments of this work, it is expected to exert the own criteria of the reader for localising how approaches of research can also be invalid by targeting only to 'objective' data.

[155] Moreover, these contents are excluded due to their proximity to metaphysics. Thereby, the determination of Bildung risks becoming abstract by establishing norms of arguments based on correlations– whether numerical or related to other concepts. The difficulty of presenting Bildung in a neurobiological systematisation can therefore be assumed.

[156] 'Potential' was not a word employed by Humboldt. From the German *ausgebogene Kraft*, the idea can resemble a 'bent force'. This force has been discussed by Rucker as the potential that comes from the person.

confronting that the ideal of the individual, as contemplated by Humboldt, came from 'a given *a priori*[157] intelligible inner being' (Schütte 2015, p. 49) [as inherent or previously determined to the person[158]]. Herein lies the fact that the relation of the self with another can be discussed under several scenarios; namely, the self can be related likewise with specific relationships, with the world and with the self (Rucker 2014, pp. 73–75).

This sounds problematic or at least leaning towards a conflict when at the same time the 'persons' should not be constructed by other instances. Examples might include the 'state', as in a nation that makes machines out of people (Schütte 2015, p. 54). On the other side, it is possible to see that the plurality from which Humboldt spoke risks no longer being sustainable in modern times where technology is tied to the daily life of the people [here 'technology' is mentioned as one of many other connecting points with a polemic on what was made by the man that is not ambiguous. Nevertheless, to one updated viewpoint, artificial intelligence and many calculations that cannot be predicted show that yet more work has to be done on radical unitary positions]. This new order of compositions between the state, person, technology and plurality of thinking, but of use to all the reflections that resulted from these combinations, required an update in the reformulation of the different concepts of the 'inner potential of the person'.

Rucker (2014) proposed the disposition of Bildung as a process of *development*, *maintenance* and *change of order* (ibid, p. 70), under which he has continued to work for a better understanding of the interchange of components belonging to the relation of the self and the world (Rucker & Gerónimo 2017, p. 5). Rucker's systematisation allowed portraying an action of the subject as a subject-matter of transformation. The description of this action can be problematised at the moment of confronting the certificates and results of exams with what a student has truly learnt (Ricken 2007, p. 19). Like this, Bildung represents a dispute[159] in science that should be taken into consideration for a discussion on expectations of the people and from the people towards accomplishing their own achievements. In the case when Bildung would not be considered in the discussion of selection and recognition, then a medullar part of the systematisation would be missing. As such, theoretical reflection, historical contextualisation and methodological control should not exclude from the subject of interest the process of transformation of the *self* of the person that needs to be in contact with the world. I propose that this exclusion does not happen because the individual belongs to the basis of the reality of education.

[157] Italics are written in the original German text of Schütte (2015).

[158] Consequently, this idea of being previously determined, without problematisation leads to a further discussion about what metaphysics refers to. At a present moment, connecting points on this matter can be extended on discussions upon analyses of authors like Leibniz, Humboldt, Sloterdijk (Schütte 2015) that I speculate regarding additions from authors in other disciplines.

[159] I foresee that the dispute over Bildung is to be extended beyond the consequent problematisations of a container construct; I refer to the connecting point with the model of conflict for assuming attitudes in science, which I will not yet handle as a model in this work. The continuity of this current educational philosophical research aims to work on the development of the description of this fourth model of conflict.

2. Current research state of the diagnosis concept in pedagogy

Opening statements: In a general and technical area, the diagnosis concept is localised by its dynamic elements from a pedagogical perspective as a synthetic construct to take into account the relations of scientific positions that can problematise the reality of education as a system. While the animated aspects of a pedagogical subject-matter can be related to the diagnosis concept, the recognition of disease as a means to be used for conversations about uncertainty in certainty has not yet been sufficiently considered by the basis of pedagogical action and the individual's inner potential. The reference to particulars calls for considering the epistemological mechanisms involved. Following speculation of assumptions about the differentiation between the diagnosis concept and pedagogical diagnosis, purposes of actions come to the fore in order not to be confused with goals and intentions. The state of research enables the theory to discuss the tension between the individual and the social influence – between the particular and the general, between practice and theory. The current state of research of the diagnosis concept in pedagogy shows that the work is not about the diagnosis concept or disciplinary collaboration, neither about a subject-matter, but about theory development from educational science.

In this chapter, I will present the current state of research on the concept of diagnosis in and from three primary[160] main divisions: (1) the situation of the diagnosis concept while contemplating the scope of different areas, (2) how it can be problematised with regard to its own dynamic and (3) consideration of this current state of the concept of diagnosis within the attempt at a pedagogical formulation. Despite the fact that the concept of diagnosis is not the object of study of this thesis, diagnosis as a subject-matter allows to present the theory development from educational science. The diagnosis concept therefore functions as a reference that must be explained in order to achieve a problematisation of pedagogical epistemology. The diagnosis concept is aimed at presenting itself in the process of research from educational complexity. For this purpose, the theory of complexity of education offers the already noted divisions. Hence, it is important to realise that the diagnosis concept will be analysed from its possible condition as a subject-matter in an epistemologically oriented appraisal and not as an object of a specific empirical research.

Second, I will discuss from the viewpoint of educational science the points of origin[161] that were considered for this work from the disciplines included, and I will provide a brief reflection upon disciplinary systematisations that can appropriate diagnosis as part

[160] Since 'diagnosis' as a subject-matter lacks recognition in the pedagogical area, I am presenting the current state of research on this concept with help from three main divisions: situation, internal dynamic of a subject-matter and consideration to an epistemological self-reflection that requires a systematisation in connection with the two previous divisions. The focus on the concept of diagnosis comes from my own research. To this extent, the basis provided for thinking on the aforementioned divisions comes from inspiration on texts of the educational area, specifically from direct contact to the works of Anhalt (2012), Rucker (2014) and Rucker & Anhalt (2017).

[161] 'Points of origin' is circulated through the idea of entry-points as 'connecting points' for starting an observation according to the theory of complexity of educational science from Anhalt (2012). During this work, several alternatives appear for the identification of a compound in theory with further statements.

of their own processes. I will present from current literature what[162] these systematisations tell to be true during the process of recognising another person. In terms of holding staunchly, going through and exploring the beliefs of scientific groups within a wider problematisation will give structure to the related topics presented in this work. These beliefs are explored from the division of situation, subject-matter, and theoretical position; not by describing them but by speculating about them and their consequences, such as the manifestation of scientific controversies. These controversies are drawn from the inner dynamics of elements relating to diagnosis and diagnostic as subject-matters. The elements are tied to the theoretical supervision that holds pedagogical diagnosis as an epistemological construct in educational science. For this, throughout the chapter, I will take reference to the idea of assumptions as the central problematisation of this work based on the tension between attitudes of unity and specialisation of science[163] – for a later extension on a collaborative bearing.

To this end, pedagogical action is briefly called upon to sustain the scheme of interaction between expert and learner in the interpolated crossroads of theory and practice (see, for example, Böhm 2011). Pedagogical action as a formed theoretical place also maintains a state-of-the-art condition, where the theoretical framework lays a foundation for a later historical conceptualisation of how to integrate diagnosis within the language of educational science. Namely, with this speculation on the diagnosis concept, the proper language of educational science reaches a wider scope of extension. As a part of this point, the potential of the individual will be reviewed as an active zone that enables the constant dynamic of formulation of suppositions. To this extent, the current state of research of the diagnosis concept is linked to its own theoretical framework construction.

2.1 State of research of the diagnosis concept in the scope of different areas

Diagnosis in medicine is motivated by the appearance of a disease (Gross 1969, pp. VIII–IX). It can be prompted by the detection, definition and therapy for one disease. In this sense, medical diagnosis is a well-thought-out procedure since it must be successfully connected with a process in continuous modification (ibid, p. 3). On account of a conceivable pending separation of objectivity and subjectivity, the disease is stuck on a cultural description of how and what must be felt under the influence of a specific condition (Duden 1992 in Lachmund 1997, p. 33). From the change dynamic of the components of diagnosis, the question about how the living conditions are composed remains attached to one systematisation in connection with the diagnosis concept within approaches found in various theories. Thus, and in parallel to a complex systematisation,

[162] The 'what' connects to the beliefs mentioned within the next statement. As an author with a philosophical influence from the theoretical construction of psychology and now of educational science, I understand that there are statements that can rely on words having multiple definitions. Hence, the 'what' and 'beliefs' shall direct the attention to previous discussions in epistemology (see, for example, a reference to Bachelard, Cassirer, Knorr-Cetina and others in Sandkühler 2009) while at the same time leaving a free connection with a next idea.

[163] In saying 'assumptions of attitudes', I portray that despite corresponding 'attitudes' towards the realm of an active readiness upon the environment, 'assumptions' are based on the confrontation with the self. Thus, 'attitudes' relate to an active state, based on beliefs, that is more passive; in comparison, 'assumptions' relate to the performance of reflection and speculation that questions iteratively how anyone has done something.

the concept of diagnosis enfolds an interactive reciprocity with the environment that I propose to explain with the help of a system of the reality of education.

In addition to the theoretical work of classification of diseases and symptoms (Leiber in ibid, p. 16), experts related to medicine have worked to analyse the content of the concept of diagnosis from a 'theory of knowledge' of medicine (Sadegh-Zadeh 2012; Gifford 2011; Wieland 2004; Matthiessen 2004, i.a.). From such an outline, several stages have been detected in the history of medicine, composed of the action of recognising the condition of a person. In this way, diagnosis does not represent a unique constitutive moment but the conjunction of interrelated stances [because diagnosing comprises a process in which not every patient complaint is a clinical phenomenon that can be distinguished from symptom and indication; see, for example, Schwarz 1993, pp. 6–9]. Additionally, the process of diagnosing can be problematised through logical-systematic concepts with a moral constitution whence these are attached to a contextual correlation where someone reads the conclusion and someone is affected by this decision (see Westmeyer 1972, pp. 24–32).

'Diagnosis' as a concept in medicine and psychology[164] considers the position of interrelation of two persons with the environment. With this position of interrelation, the concept of diagnosis is confronted with the division of an empirical stance and/or a dogmatic position of analysis of beliefs and facts (identified as attitudes). Furthermore, the human skills of the doctor precede the interaction leading to success in diagnosis; that is to say, for example, ability of speaking, knowledge about what to speak, empathy with a patient, experience and expertise regarding diseases, among others.

With this as a basis, the historical clash between 'physical facts' at the beginning of the twentieth century (e.g. percussion in Auenbrugger 1912) and 'understanding of criteria' 60 years later (see Westmeyer 1972) can be spanned to produce a continuum in the theory.[165] Fitting in the pedagogical outline, the influence of socio-historical facts is open to a reciprocal position of analysis because the human being exerts changes on the surroundings and the people involved. Based on the resource of 'analysis concept' from educational science,[166] a later conceptualisation would permit considering facts as constructs in correspondence to the production of signs[167] and creating suppositions

[164] Other disciplines like sociology and epistemology (Lachmund 1997) could be added to a list of fields that account for thinking on the concept of diagnosis as an interrelation between the person who is in need, ill or the patient; the expert or the doctor and the surroundings.

[165] I am problematising this continuum within the perspective of educational theory. This will provide the advantage that people can share more languages within and for scientific purposes. By displaying this example about the reactions towards the end of the body, I can hypothesise about how moral actions bestow on themselves an aesthetic intention in terms of transcendental existence relating to phenomenality of human ways of thinking. With the writings on aesthetic education (e.g. Dietrich, Krinninger, Schubert 2013), pedagogical diagnosis can be situated as part of the discussion between body and moral freedom.

[166] For this work, the 'analysis concepts' taken are Bildung and diagnosis as process of transformation during the translation from summoning to recognising. Both concepts are discussed next to the concept of Bildsamkeit to explain the uncertainty in relation to the action of the individual.

[167] Throughout the thesis, contents upon symptoms will be handled through controversies about ways of thinking. This ways of thinking refer to signs of distinctions and their meanings. Despite that this thesis engages with a pedagogical tradition rather than a treatise on semiotics, proposed by Charles Sander Peirce (1839–1914) (see, for example, Anhalt 2012; Sandkühler 2009; Deeley 2001; Liu 2000; among

about the place where these signs come from. This last interplay between historical sociology and biology has the intention[168] to earn markers of theoretical evolution. Such an association can bring[169] benefits for the constitution of progress in the area of educational science that can be inserted in the proposal of Rucker (2014b) and his analysis on progress and knowledge development. Then, since the biological constitution of the man affects his socio-historical position as well, it is necessary to possess a systematisation that considers first the planning and operation at the time that any pathological case can also be said to appear. Such a situation would require a readiness for collaboration between disciplines based on the assumption that one discipline cannot explain everything. This readiness, however, can theoretically be described in many collaborations that show the conflict in science that can be presented in the society on the basis of the beliefs and facts provided by distinct groups. This is to say that a research into the current state of the diagnosis concept should remain open.

The analysis of beliefs and facts from assumptions of attitudes by different scientific groups can help to reveal an academic conflict that has already been acknowledged. This conflict cannot be removed from the further development of concepts, like diagnosis, that lies in a multi-layered disciplinary work. By remaining on the level of action execution, the controversy can be expanded because every involved discipline carries its own contents – in the sense of interests, intentions or orientation that may come from an own tradition.[170] In this way, I detect the opportunity for tackling this discussion with the description and problematisation of terms like figurative and operational aspects[171] from the theoretical framework as they provoked dispute regarding the difference between neuronal and mental representation through historical examples. Also, I set forth to extend the discussion in terms of Bildung, which in a theoretical framework has been discussed as a consecutive process from an inner force. Finally, as one diagnosis component, anamnesis as individual recollection spans the vertical plane with mutual reactions in the world. From the mindsets of the involved disciplines, these are contents and they are ways of thinking that produce contents that intersect during the action of recognising another person. Thus, different theoretical traditions can be served by this discussion and be of assistance when an open reciprocity is accessed to examinations in

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others), the connection of symptoms as a discussion on 'signs' during the diagnosis concept provides an entry-point for establishing contributions in and by related fields.

[168] This interplay between sociology, history and biology has resulted in some registers in the past that can be traced as markers of this mentioned theoretical evolution. Moreover, for this work, a collaboration of disciplines speaks upon the theoretical position of this work, entailing the conformation of a reality based on collaborations. Like this, the intention aims at something that has been done and towards the direction of ongoing theoretical development.

[169] I am taking the modal construction with the use of the modal verb 'can' based on the fact that although this is a current state of the 'research of progress' in educational science, this point in question is able to yield more possibilities and to open options on the path of how to build theoretical development in science. Here I am aware that I hold that 'progress' entails the direction of 'development in science', when I know that 'progress' can be further problematised in terms of its steps, speed, leaps and discontinuity, just to name some examples among other discussions as Sandkühler (2010, §731) noted.

[170] Hence, here the word 'contents' is taken as a translation from the German word *Gehalt*.

[171] At an early stage, here I referred to the 'symptom, indication and sign'. I needed to restrict the scope of the research to the 'figurative and operational aspects' of genetic epistemology of Piaget (1970) that gave a basis to the organisation of genetic epistemology according to the terms of semiology. Only in this way could I handle keeping a systematisation in line with considering diagnosis content.

and from philosophy, epistemology and self-theoretical orientation through pedagogical language. This is not a description of a methodological approach, but from the description of the current state of research, the controversy refers to the state-of-the-art situation that can be discussed according to the complexity in educational science.

With the concept of diagnosis in educational science, for example, another kind of questioning can be found, differing from that of medicine. This would happen upon integration of the concept of diagnosis into the pedagogical construction as I have been postulating. In contrast to theories of knowledge of medicine, the theory of knowledge of educational science needs to handle problems of definitions of the subject-matter of pedagogy (Brezinka 1978). On this basis, the need for an own language of educational science goes along with the requirement for a definition of an object of study that in the case where it is surrounded by the meeting of disciplines, this characterisation should come from the pedagogical side when in a pedagogical stance. A motion between the object and the surroundings appears at the moment that the same 'object of study' is shared by several differing disciplines.[172] This movement brings an understanding to the impact on the diversity of the richness of methods handled by scientists in the field of education, which should be used in the teaching of a dynamic subject-matter. Also, in this way, such a context portrayed by a complex situation reveals that co-operative methods, from a collaborative position in science, are required for handling an object of study in the consecutive application of actions and taking of decisions. During the presentation of the current state of research, the requirement of these co-operative methods is only mentioned; their description should follow from the other disciplines into the composition or when put in practice of another work or in reference to an already disciplinary collaboration, for example, when teaching contents of neuroscientific results or by jumping from object to action. By thinking on how to put in practice the composition of phenomena, in order to show the different directions in which objects of study can go, specific objects of study are to be considered on reference from a subject-matter dynamic in conjunction with the methods in different disciplines (i.e. through analyses of synthetic constructs regarding to different applications).

As a matter of fact, by considering an object of study directly without considering the elements that are related to it, the object of study creates a level in the execution of an action. From medical research, Gross (1969) mentioned that some conditions indicate a direct operation without decisive questions intended for diagnosis (ibid, pp. 1–5).[173] In this case, such situations are documented for knowing when the decisions are necessarily part of an order of action. During the later formulations, reflections upon this level indicate some clashes in theoretical approaches. In this way, I propose to turn the view also to the internal dynamic of these objects of study as subject-matters by taking into account their inner motions. In this sense, exploring *subject-matters* of pedagogy from this action level can open understanding of how they have been reduced over the course

[172] At this moment, the 'object of study' would be handled from the theoretical construction level. This theoretical level of construction would refer to the general idea from the observation in a second order of how an object of study can be constituted, namely the nature of an object of study and the meaning of the term. This level is explained in the chapter dedicated to the conceptual framework, where the methods are problematised next to a historical contextualisation.

[173] In the statement connected with this footnote, for example, the object is not defined and thus the condition requires an action without necessarily being bound to the dynamics of the subject-matter of diagnosis.

of history in different disciplines and in the same educational science in conjunction with fallacies. A false notion of an object of study has in the past resulted from lack of consideration of all the components immersed within the description and definition of what is being observed, and how. Perhaps this has happened due to matters of time and being in a rush – not being able to make a pause to retrieve more knowledge. Anticipating this characteristic, the discussion held in this work is extended with the use of examples and possible explanations. Namely, in passing, it can be said that the feasible pedagogical diagnosis has been reduced to its activity of diagnostic.[174] Hence, it would be incorrect to formulate that from its scope of research, the specific task required is merely to observe and to inform.[175] This is a reason for considering more than one moment in the recognition of one person because, one way or another, it also comprises a process of analysis and thereafter a means of educational science in a pedagogical framework.

Thence, with the possibility of spanning the concept of diagnosis in several disciplines, and since the process of analysis is not restricted to one specific field, the widening of the application of a reflective process is possible for medicine, psychology and other disciplines of observation immersed in the 'documentation' of a person that is joined to a constellation of 'moral' foundations – because the outcome of diagnosis targets the well-being of a person (see the review of the 'moral action' from diagnosis in Schwarz 1993). As a matter of principle, this lengthening targets reflections upon theoretical borders based on norms. The critical argumentations between the normative and descriptive positions would be missing here (such as in pedagogy in Weingartner in and according to Brezinka 1978, p. 6) that are confronted by empirical traits of academic circles (see *Genese und Geltung* in Westmeyer 1972) in the development of approaches for research. These reflections cannot be possible since the diagnosis concept cannot yet be ordered within pedagogy or educational science – at least, reflections coming from the praxis in the medical area are not possible, but they are feasible on a theoretical level. Thereupon rests the requirement for adding to the research design under the optic of new advances and movement in science, in the same way as in the reflections of pedagogy and educational science.

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[174] Nevertheless, the word 'diagnosis' is also trapped according to its grammatical construction. For example, 'diagnosis' as a noun can additionally refer to antecedents or statements when they are the outcome of basic conditions (see Popper 1966 in Westmeyer 1972, p. 23; moreover, a dictionary definition can be used to confirm that 'diagnosis' refers to: *'the distinctive characterization in precise terms of a genus, species, or phenomenon*', see https://en.oxforddictionaries.com/definition/diagnosis [retrieved on 1.6.2018]). In this way, 'diagnosis' might be a proposition of a condition that is taken as a certainty of a reality; namely, it can be taken as a fixed characteristic. According to the explanation of Westmeyer (ibid), the results of psychodiagnostics are a diagnosis for a further action such as prognosis. However, this is not a quick conclusion to be drawn on the problematisation of the word 'diagnosis'. As a matter of course, Westmeyer (ibid) develops a whole work of analysis on the report of positions and propositions, which clearly shows that the utilisation of the word 'diagnosis' refers to different intentions. In this way, scientists are in search of conditions or scientists are held through the confirmation of conditions for the development of an explanation, namely validity (Schulte 1971 in ibid, pp. 25–26) – not surprisingly, the topic must be immersed in the discussions of the ways of procedures: deduction, induction and hypothesis (Pierce 1878 in ibid).

[175] With this statement, one of the tasks taken by this thesis can be localised, which would be to extend the arguments in this discussion. Only as a reminder, after completion of this work, 'tasks' would properly refer to the specificity of actions in groups of scientists. For example, to observe and to inform would turn out to be a task in conflict during the development of an own pedagogical language.

On the other hand, I detect from a current state of research that the diagnosis concept from the pedagogical position can meet the problem of normativity because it holds a gap of problematisation between a descriptive stage to an explicative and to a speculative one (ibid, p. 18) from its construction in the theory. The discussions debating the spoken hiatus are surrounded by epistemological positions and ordered according to the interaction between one expert and a counterpart. In this way, although I could speculate on an expectation for education and science regarding how to dictate some ways of proceeding, in the process of diagnosis lies the unavoidable causality of the physicalness and corporeality that cannot be predicted or isolated to just one moment of the analysis.[176] Reflecting this same expectation, other problematisations on the interrelation of two persons have been taken during the history of pedagogy around 1968 within frames of 'symbolic interactionism' from George Mead (1863) and considered by Klaus Mollenhauer (born 1928), for example, in Lischewski (2014, pp. 441–445). Or enclosed by 'critical rationalism' around 1978 within a period from the critical educational science to the empirical one, from Herwig Blankertz (born 1927) and Wolfgang Klafki (born 1927) to Wolfgang Brezinka (born 1928) as noted in Lischewski (ibid, pp. 448–489). Or some years later, through the underlying construction 'system-constructivist pedagogy' around 1996 (ibid, pp. 565–566), from Kersten Reich (born 1948) with a close formulation reflecting the works of Niklas Luhmann (born 1927) and Humberto R. Maturana (born 1928)[177] (ibid). More recently, in 2010, Reich's work was published again in a 6th edition (ibid). However, a redirection towards the relation of two positions in a context of health that should be taught later has not until now earned a higher degree of attention.

Hence, a possible consideration after the trace of neurobiology within the studies of 'theory of systems and constructivism' (ibid, pp. 542–543) can connect two different interests from the side of the expert in health (e.g. the medical doctor) and from the side of the specialist in the composition of the roles of two persons (i.e. the pedagogue). The connection between two persons coming from one neurobiological problematisation is not sufficient to harness the potential of the individual and how this is treated. In this way, the pedagogical state-of-the-art considerations from the 'analysis concept' of the diagnosis lead to a controversy. In order to understand how different authors in pedagogy (see Kutscher 1979; Ingenkamp 1977; Pawlik 1976; Ulich & Mertens 1973) can be situated under the title of 'pedagogical diagnosis' or 'psychological diagnostic' according to a current dispute, the correspondence with the action of observing another person, in this case a student who is evaluated, selected, motivated or qualified, is yet to

[176] Almost at the end of writing this thesis, a text from Francisco Varela et al. (2001) came into my hands to give further argumentation on the *large-scale integration problem* (ibid), namely organisation and systematisation of conceptual frameworks. In terms of neuronal network and cognitive processes (see also Thut et al. 2017, p. 846), Varela et al. (2001) showed on a neuronal level how two events are part of an only mechanism of interactions under debate. In this way, I find a basis to discuss that reliance on physical events portrays a complex organisation. In the paragraph following this footnote, I begin to give direction on the merger with neurobiological studies. 'Physicality of Bildsamkeit' is to be composed by several groups of research studies that cannot be restricted to one perspective. Thus, for this work, I take knowledge from the relevance of brain interfaces.

[177] I wrote down the date of birth of all these authors based on the orientation that this time-lapse can offer for the scientific systematisation of the twentieth century. Without a doubt, historical periods would be relevant in different manners. To this extent, the first third of the 1900s rendered a spirit in the clash with the position of scientific specialisation. Consequently, these are a few names to keep in mind in reading within the field of pedagogical knowledge theories.

be analysed. For this, there are writings on the functions of educational systems that point to the assessment of a person (Ingenkamp 1977). Different classifications can be found that reflect a variety of goals for achievement and different purposes of ethos of fundamental propositions (see Pawlik 1976).

Opinions on functions of selection, control, motivation and qualification (Ingenkamp 1977, p. 50) can be contrasted with categories of qualification, selection and integration in other writings (Kutscher 1979, p. 20) or with pedagogical decisions in terms of modification or allocation through selection, reports and submission of information or of marks assignment (Van Ophuysen & Lintorf 2009). Namely, through the critical analysis of fairness (see Heid 2015) or censorship (see Ingenkamp 1977), an extensive array of variability uncovers the importance of the influence of any 'action' from one person to another. However, these are just some possibilities of problematisation that will not be deepened within this work, though they provide an opening for the discussion, a junction or a focus point (i.e. 'point of connection for analysis and for further analysis') from the inner process of diagnosis[178] and judgement as allocation of interchange of opinions. In point of fact, pedagogical diagnostic is part of empirical pedagogy, but this procedure continues to provide a connection with reflections from other pedagogical perspectives (Saldern 2010 in Jäger et al. 2010, Lay & Meumann in Benner 1991, pp. 137–154) about updating definition regarding reality of education. In a broad description, empirical pedagogy considers withal the discussions about the purpose of pedagogy itself along with educational science. Considering the interest in the learning process, as in delivering efficacy to methods for teaching and distributing information (Ditton et al. 2010, pp. 9–12), this branch of pedagogy also makes a contribution to the reality of education for recognising the condition of another person.[179] In this way, branches of pedagogy can be situated in movement from the interchange of positions.

Finally, in describing the present state of research regarding speculations upon the diagnosis concept in pedagogy from the at-this-moment encased psychological diagnostic,[180] characteristics of an expert in how to apply the test to an individual or a group of people are possible to contemplate under the optic of bidirectional effects. Skills related to trust, of observation and for identification of distinctive features and previous knowledge of the situation and of the patient (Irblich & Renner 2009, p. 16 et

[178] I situate the pedagogical diagnosis as an external process that strives to accomplish the postmodern position of existence outside the individual but linked to it (see Sloterdijk in Schütte 2015, pp. 43–68).

[179] In this way, I give account to sides in pedagogical tradition, and in any event, I will not intend to say that the empirical side of pedagogy should not be considered.

[180] This is to say in this way, from psychology, because at this moment, diagnosing one person from pedagogy is placed within psychological procedures. Furthermore, I raise attention to the problem of confusing the application of the words diagnosis and diagnostic. The difference between the diagnosis concept, subject-matter of diagnosis and diagnostic procedure is not spread in a language outside of contexts from specialists. Therefore, within this chapter, I explain this difference in order to encourage awareness that a composition of the pedagogical diagnosis concept should not be trapped by the procedures of diagnostic. In this manner, the pedagogical diagnosis concept refers to a problematisation of recognition that will be traced after the conceptualisation in the third chapter. The undifferentiation of the two different constructs resembles the use of 'education' for referring to the discipline, the action and the object of study. By pointing out such an overlap, from the identification and recognition of a research's current state, both sides of a folded sheet must be spoken of with the intention to begin with an order outside of a mixture.

seq.) are some milestones that can be problematised for the purpose of inquiry into related constructs such as the aforementioned fairness or censorship. Thus, not only the inner motions of the diagnosis concept as an object (epistemological subject-matter), but the related elements problematised with a circular causality[181] (Fuchs 2012), display that the current state of this concept is a stepping stone for opening approaches to research. Along these lines, the diagnosis concept can be presented from assumptions of specialisation that will need to manage the problems of integration into a concerted system or with assumptions of collaboration (first after analysing the collaborative assumptions with those regarding unity). Although a specialised position earns an expertise with defined attitudes, assumptions regarding specialisation cannot escape connections with influences from the world.[182]

Since pedagogy and psychology have not been treated as disciplines of diagnosis because they have been relegated to the handling of specific actions, at least to the degree of a general understanding of what they should be in charge of, their reach of action is confined to diagnostic as an initial approach of estimating of a person's condition[183] that is limited to institutional spaces such as schools. This relinquishment extends almost to the evaluation of the specific competences of particular subjects. Thence, this redirection is one way of composition and access point from a current principle of reality, which indicates other principles that are yet to be detected or developed for later problematisation. This means that other options are possible, according to the diverse theoretical positions of teachers in biology, for example, but also in proportion to the students that come up with innovative ideas. To this extent, the contribution of new ways of thinking is presented from a speculative notion that seeks for a later empirical confirmation – as has been suggested for the encompassing of the theoretical and empirical pedagogical theory by Benner (1991).

In the matter of spaces for ideas and of principles of reality, the question arises as to how pedagogy and psychology build the quality criteria that are followed corresponding to positions towards the individual and according to different academic circles. In this way, the derived consequences of methods can be appreciated as, for example, the existence of criteria catalogues that might regulate objectivity (Van Ophuysen & Lintorf 2009, p. 68) and that would not address the area of medicine because these disciplines use a different theoretical tradition of observation. Nevertheless, with regard to this point, it

[181] 'Circular causality' (in Fuchs 2012) proposed for rethinking the process of diagnosing during mental illness by taking reference to the subjectivity, interpersonal relations of the person and physiological organisations.

[182] At this point in time, I differentiate the 'assumptions of' and 'assumptions regarding'. Assumptions of a position refers to the position itself, which shows the name of a model in a concerted system of science, while assumptions regarding a position comes from the attitudes of a position, which come from the tasks of an individual. One can be seen from the overview of the connections, while the other relates to an individual who is in contact with other assumptions and positions.

[183] In this work the person's condition is constantly differentiated from the self of the person. Restrictions that are granted to the person should remain at the level of the condition and not on what the person is. With respect to the limits, their development is also viable also at the levels of the condition. Thus the self of the person calls out to be problematised. Considering that this difference at performance level is difficult to control from a reflective point of view, questions are asked about the relationship to the reliability of the self: How can the self be affected by constraints? To this aim, by addressing the meaning of a doubt, questions point out: How is the self-influenced limited by descriptions? In order to be able to collect pedagogical tasks out of this situation, pedagogy needs to confirm to what pedagogy refers and how pedagogy can develop such inquiries.

is worth asking about the mechanisms that run in parallel to the scholarly ones, like the understanding of the causes of a problem based on the integration of physicalness and corporeality within an approach of research. The need for such understanding can be considered as one requirement within the current state of research.

Related to the difference between physicalness or corporeality, I advise that the diagnosis concept is grounded in the intentions of differing theoretical traditions. Heretofore, this concept could be analysed within its epistemological construction with the reservation of discussing the differences between the disciplines that apply it in specific moments. Scilicet spheres of actions[184] related to the diagnosis concept meet a venue of alternative ways of thinking within a nutshell of dynamic elements. In this way and beyond the already explained diagnosis concept from a brief general viewpoint, the concept of diagnosis has put together principles of medicine, psychology and pedagogy (see, reference to pedagogical diagnostic in contexts of 'curative pedagogy' or *Heilpädagogik* in Tenorth 2000, p. 265). Alongside the analysis of the place of pedagogy and educational science next to other knowledge theories and integration within the society, the diagnosis concept directs a discussion of directions and orientations of academics. By calling upon 'diagnosis' in a later analysis of meaning (with an interdependence in the appraisal of contexts), historical writings registered that pedagogues meet a problem in the recognition of another person and the situation facing them (for example, in the medical treatises of Strümpell 1892, p. 2). In this way, a person recognises not only another person but also situations, and the action of recognition redirects upon itself. This can bring the idea that scientists diagnose the historical happening of events. Specifically, educational scientists and pedagogues diagnose the direction of science, research and teachings (Keiner 1999, p. 25). Consequently, related to the diagnosis concept, during the exercise of recognition is wondered: how can the principles for working together be explained? (when in the diagnosing situation is clear that different disciplines give a contribution from each side, a contribution that is required but that is submitted constantly to only one side of the individual condition). This question can be answered by assuming that a concept puts together principles from different spheres of action. Should the hypothesis on the collaborative assumptions of pedagogy be true, a model on collaboration would make sense, and the reality of education would be understood from a complex situation.[185] Insofar as 'diagnosing' is concerned, related tasks would not be restricted to a process but to synthetic constructs with more than one direction during their retrieval, application and/or reflection. In this way, the diagnosis concept helps to organise knowledge. – where, as possible ulterior category, it can hold a structure for systematisation.

2.1.1. Dynamics of elements of pedagogical diagnosis and pedagogical diagnostic

Until now, 'pedagogical diagnosis' has been a theoretical category that has lacked sufficient argumentation in the academy. Before setting forth the explanatory notes for the concept of 'pedagogical diagnosis' according to its current state, I need to establish 'propositional knowledge statements' (see Treagust 1995, p. 330) that remain open at

[184] From the beginning of this work, 'spheres of action' was defined as coming from the pedagogical perspective. In this sense, this whole can also be read according to the transmission of information and differentiation of tasks when teaching and learning knowledge.

[185] Thus far, educational scientists and pedagogues have diagnosed the direction of science, research and teachings (Keiner 1999, p. 25).

the end of running or executing the diagnosis concept (see Jäger 1992, pp. 138–139; Jäger et al. 2001, pp. 854–855) because the process of diagnosis is attached to scientific means that follow an order of knowledge-development and progress in knowledge. This means to say that the process of the diagnosis concept represents, like science itself, an unfolding step to be kept latent for activation. This last might sound like an imprudent or extreme statement on the vindication[186] or comparison between science and diagnosis [establishing such a comparison or confirming such a justification is not within the purview of this work]. Nevertheless, the diagnosis concept makes it possible to show how multi-referential viewpoints can be gathered together. Thence, the approach of putting scientific intention and outcomes of assumptions of this intention within a system aims at identifying positions through attitudes.[187] This is to say, the aim is to display a way to understand the reality of education, to give character to the collaborative assumptions in science through the portrait of a complex situation related to the theory of complexity of education (see Anhalt 2012).

In this section, 'pedagogical diagnosis' and 'pedagogical diagnostic' are handled to obtain an approach to the circumstances[188] under which 'pedagogical diagnostic', for example, follows different purposes because at its core it contains propositions that portray movement. Such motion remains active in its interchange among people and in the space of surroundings. Premises of pedagogical diagnostic deploy dynamic subject-matters when they reference consequent actions that are controversial due to criteria that are multi-referential. One access point to the difference between these two constructs relies on perspectives and application of methods. However, from the theoretical framework, the reference to different methods establishes that more assumptions should

[186] The word 'vindication' has a notion of justification that connects with scientific discussions that must be established through *descriptive*, *explicative*, *speculative* and *prescriptive* approaches (Westmeyer 1972, p. 18) in which neither prosecutor nor culprit is sought. I state reflections on science that I do not connect to a juridical system, and hence, the released normative instance requires a translation during knowledge transmission (see the normative argument from the 'context of discovery' to the 'context of justification' of Reichenbach 1938 in ibid). Echeverria (1997 in Balsiger 2005, p. 60) marked the 'context of education' in relation to these ideas of Reichenbach for suggesting that what is in play within the scientific space can be analysed by pedagogical tools. The localisation of the diagnosis concept in a scientific structure triggers the scientific reasoning about an orientation pattern. Thus far, the interchange when considering last mentioned approaches during knowledge transmission gives shape to the definition of components of diagnosis. In this sense, the components of the diagnosis concept are arguable in terms of they are associated with the relation between science and the world.

[187] Consequently, from the identification of positions models can be generated to verify the reality of education involving a collaborative readiness.

[188] The statement in the written form 'to obtain an approach to the circumstances' can be distinguished in a different direction than the statement about 'an appraisal to steady circumstances'. As regards access to the contingencies presented by the diagnosis concept, I confirm that 'to gain access to the circumstances' refers to an active part of a current state of research from a registered action. In this respect, this spoken statement differs from an alternative written form 'to obtain an approach of the circumstances'. The current state of research of the diagnosis concept yields an active moment of a construct that is equipped to contain a definition within itself through the establishment of recognition. According to possible options on research design, I select to outline the topic of diagnosis as 'analysis concept' from a theoretical framework of a current state of research on the reality of education. Since the reality of education refers to a reflective structure for explaining components of pedagogical action, this structure is impacted by the representation of a complex situation [I seek to confirm whether reality of education refers to this structure or not]. As a result, activities identified as tasks that relate to moments in this situation provide information to speculate on how to organise information from recognition, particularly how the orientation pattern can be presented in an innovative way.

be included to such an access point. Above the fold, on a level involving recognition of the term, 'pedagogical diagnosis' works as the current entry point for analysing theory construction, theory of knowledge drawn from educational science discussed on the basis of epistemology of the natural sciences and the potential of the concept of diagnosis in the area of pedagogy.

Following more recent literature on the topic of 'pedagogical diagnostic', Jäger et al. (2010) showed that this is not a single procedure with only one defined direction. In this way, it is possible to explain how the reflections about the 'foundations of pedagogical diagnosis', which can rule the procedure of diagnostic, have not yet culminated since the last century because they are sustained by controversies and different understandings (Ingenkamp 1977, p. 23). This means, in other words, that they cannot be clear because they consider modifiable circumstances with different intentions. A possible basis for an explanation or supposition on this controversy relies on distinct spheres of action related to these constructs with determined theoretical attitudes. For example, think about the fact that the teacher, the one who is the applicant or the subject of evaluation (Van Ophuysen & Lintorf 2009) each represents a different circumstance, or the students or their competences (Pawlik 1976, p. 23) or the analysis of the situation or of the person (Ulich & Mertens 1973). To this matter belong the theoretical attitudes, positions and frames of different conceptions of science[189] and its manner of diagnosing them (Treagust 1995).

Therefore, in order to define a 'basis' that could allow tracing the next train of thought regarding the current state of research of pedagogical diagnosis, it is possible to draw on the characteristic of modern times in which knowledge is not tied to just one definition but to a program of research (Sandkühler 2009, p. 13). The program of research that I am calling upon refers to the pedagogical approach from the standpoint of philosophy, which should be understood from the knowledge-theories of pedagogy.[190] With this approach appears the need to relate 'pedagogical diagnosis' to different systematisations that are organised according to points of reference. Points of reference within[191] a complex situation, because they portray different landmarks, in turn serve as indications for a next appraisal. Both the systematisations and the points of reference can be problematised with the attitudes directed to the objects of study, the dynamics of the subject-matter and interaction among them in different combinations.

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[189] Science and reality of education appear constantly related to each other. Pedagogy is not [only] tied to the scientific exercise since the action of education can happen in contexts outside a scientific realm. Nevertheless, the systematisation proposed by this work for understanding the reality of education takes a basis on scientific discussions and theoretical traditions of thinking. Moreover, the reference to the division of pedagogy and educational science comes from the theoretical development in the project of pedagogy as a science. With this note, I confirm that more systematisations are possible and that this also belongs to a current state of research about diagnosis as 'analysis concept' for reading the reality of education.

[190] Taking into consideration that epistemology is composed by theories of knowledge and theories of cognition, the task of analysing the basis for suggesting approaches to this problem of definition starts in the realm of pedagogy with knowledge-theories that are also under construction. These knowledge-theories present discussions about pedagogical theory development.

[191] Points of reference within a complex situation are to be problematised with the observations in second order upon the delimitation of a system.

‘Pedagogical diagnosis’ will deal with the history of the concept of diagnosis and its medical heritage, which from its nosological structure claims to discern the difference between what it is to what it is supposed to be (Ritter & Gründer 1972). In this historical stretch, the certainty of the application of the diagnosis concept has come across the influence of the verification of the psychological diagnosis. With this proposition, the properties of reliability, validity and objectivity are considered alongside the measurement of aimed traits (like personality or intelligence or achievement), confidence in expected results and consecutive actions such as decisions based on this procedure. Notwithstanding many of the statistical methods that psychological diagnosis follows, the degree of uncertainty is kept under theoretical inspection. To this respect, in the pedagogical tradition, after the Second World War, the quality criteria taken from empirical analysis has been problematised as ‘applied research’ (Tenorth 2000, p. 279) next to the pursuit of scientific research and profile definition of empirical pedagogy – aka, *empirische Bildungsforschung* (ibid) today in the Germanic fields. This means to say that in pedagogy, a concept that goes to and comes back from empirical knowledge still needs to endure a longer discussion. To this, the philosophical approach of pedagogical science offers assumptions for this discussion.

With the interchange from medical to psychological historical criteria in the concept of diagnosis, diagnosing turns out to be a following point instead of a conclusive one. The advantage of this approach is that it aligns to several reference points of a current knowledge theory development. In consequence and based on the difference between concept, subject-matter and procedure, the ‘declarations or statements of people’ are directed towards an open universe of exercising their potential or their Bildsamkeit because there is no fixed discovery or stated regulation that can rule what a person would do. From this openness, the current state of research begs for a systematisation in order not to get lost in the abstraction. In effect, a person ends up on the side of the patient or of the expert. To wit, this relation can be extended on the action that each one of them are ready to perform, for example, speaking about the researcher who is ready to analyse information[192] or to interpret it or to put new discoveries next to old, established knowledge. On the other side comes speaking about a participant in a study who is ready to be cured because a malady makes life exhausting or because the person is ready to do more once the condition is modified or because he or she cannot stop damaging the own body. Consecutively, after portraying these manifold scenarios, the connection of two persons supports an infinite framework of possibilities belonging to an educational approach – and this can be systematised.

Rooted in the stretch of psychological heritage, it becomes apparent that the application of tests is organised according to recommendations of practice (ZPID 2001). From this condition as a description of the current state of research of psychological and pedagogical tests, I contend that the direction of a test will be founded on its goals, ethical implementations and professional competences of the handler (ibid, pp. 5–7). In this manner, results lead to considering that an evaluation of a student implies a revision of the expert. With this, the 360° range can start to be pondered and located that will sustain the bidirectional relation between people involved and their environment (i.e. experts, learners, surroundings and possible combinations of these), object of study,

[192] In the sense of speculation.

subject-matter's dynamics and theoretical consideration of how they connect to each other.

As a case in point, regarding recommendations about how to proceed, I highlight the agreement between handler and test person that relies on unmentioned words (Appendix B, ibid, pp. 23–24) but which provides a space for reflection on and during the moment in which there is an unconformity, an irregularity or an action that makes somebody question itself. Along these lines, guidelines for practice should not be confining but auxiliary to the foundation of ethical principles (ibid, p. 6). Therefore, these recommendations do not look for global uniformity (ibid). Moreover, the location of universality or generality in the sense of unity might be situated somewhere else, perhaps in the pedagogical act (see Benner 2001, pp. 17–28) [which on problematising the idea that this act refers to, the steps from description to speculation give a basis to understand why a norm is to have exceptions and counter arguments and then to be able to conform why imagining solutions is part of well-thought-out academic design]. Furthermore, the reflection upon the pedagogical act as a complementary choice for generality and confirmation of action between two persons yields a systematisation in itself that later can be used for holding the position of pedagogy and educational science (ibid).[193]

With a distinctly outlined mission statement for the application of tests (ZPID 2001, p. 7), the reasonable query relates to the place where it relies on the differences in measurements, the variance of results from the participants and the way of opening an approach for research that allows discussion of the uncertainty of the certainty. Pawlik (1976, pp. 177–202) as well as Ulich and Mertens (1973) began some time ago to call attention to the conformation of this procedure of estimation – related to the recognition of another person. Despite the portrayal of encounter of opinions within different levels of a situation, the uncertainty needs to be handled in one way or another. In answer to this, the recommendations of practice (ZPID 2001) enlisted some factors that mould a changeable context, such as that with 'social, political, institutional, linguistic and cultural differences' (ibid, p. 10) and that can be reviewed under the dynamism of the concepts of 'diagnosis and diagnostic' as related subject-matters [which I propose to understand from pedagogy]. I identify this dynamism according to its elements in a list to clarify: methods, synthetic constructs, variance on definitions, changeable basis according to update on a conceptualisation, link to uncertainty and dual attribution of participants. This means, in other words, that the dynamic elements of diagnosis and diagnostic as constructs relate to the variety of methods and closeness in the clarification where these constructs can be separated. Due to the synthetic constructs that they portray, they give shape to more than one definition on their own. In this way, they hold a basis under constant discussion because this basis is locked with a conceptualisation, which is tied to a historical referential point. Finally, the uncertainty that diagnosis and

[193] With the search for the location of universality, it is possible to speculate about an integrative position of science that, as I will present constantly, this position should rely on a collaboration of specialisations [as an important hint to say this in simple words and for keeping in mind is that this collaboration relies on assurance of own disciplines since collaboration with other disciplines is what serves to distinguish the boundaries of an individual discipline]. To this extent, I have to this point handled the difference between integrative position and position of unity, if anything, as synonyms. Assumptions regarding unity that are taken by an expert in the process of fulfilling a purpose explain how the proposal of ethic in writings of Schleiermacher (in Nicolin 1969, p. XII) cannot explain a universality of a general pedagogy (ibid), which would be one discipline emerging from ethics and not ethics in itself.

diagnostic contain can be explained by means of the inner dynamics of their epistemological objects for showing that the exchange between expert and non-expert takes place.

2.1.2. Goals of an estimation that turns out to be dynamic

One starting point of a judgement of a person involves the goals previously set for the collection of information.[194] However, goals might appear blurred, and the reason relies on the diverging ideas about *intentions of selection* (Ingenkamp 1971, pp. 26 et seq.). The goals would set the direction of a task, yet for this subsequent step in modern times of the democratization of opinions, several kinds of orientation would arise. Consequently, when there is no clear agreement on the coordinates for guidance, then not only the collection of variables but also the decision on the diversity of methods opens the possibility of an unconfined dynamic in the selection of methods of research.

Regarding this requirement, studies in the area of '*experimental psychology and education*', Campbell (1963) firmly pointed out the place of the goal of approaching a part of truth that should be further confirmed in other contexts[195] for the good of theory construction, which should be part of the responsibility found in the divisions of the tradition of science (see Wallner 2002, pp. 33–58). This means that the social sciences are to be responsible for a part of the truth that would be constantly questioned by other parts of truth in the natural sciences. Simultaneously, the other way around, the part of the truth that is exerted by the natural sciences is to be analysed by the social sciences.[196]

In terms of truth, it must be emphasised that 'truths are relational and contextual' (Sandkühler 2009, p. 29). Once this affirmation becomes entangled in multiple perspectives, the importance of one situation can be obtained, of just a portion of the truth and not of the whole reality. I will call this *a portion of trueness* or as *ideas of truth and what is taken to be true* that are provided by the self and by the world. If I hold to

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[194] To this point, 'goals' and 'purposes' would be handled separately. I want to provide a specific difference in the use of the word 'goals' to refer to the previously defined achievements of collecting information. In the use of the word 'purpose', however, I am speculating from the level of theory construction about the *intention*, also about the direction that in conjunction would include consequences for what would happen first after the execution of an action. Notwithstanding, due to the closeness of the definitions, 'goals' can be identified as being affected by the epistemological position of 'purposes'. About the topic of 'purposes' and due to its wide extension, it will be left as a point of connection for further discussion in future research derived from this work. 'Purposes' reflect a future connected to 'intentions' that have an origin in theoretical traditions.

[195] The work of pedagogues relies on the definition of contexts. For example, two persons can make a context or are within a context for the formulation of hypotheses on the understanding of the world. However, one person can also conform to a context while writing a book that will later be read. Three persons or a group of people form the context in collective studies that can be interpreted later – and to which they will later conform. Contexts are a key for understanding the scope of extension of the work of pedagogues and the dimensions where their work can be localised.

[196] Among the different divisions of science, this work refers constantly to a general understanding between social and natural sciences. This division works as a reference point for problematising the different specifications of methods or disagreements on the way of dealing with an object of study or parts of an object of study. According to defined criteria, the estimation can then be considered on the basis of some methodologies with lack of consistency. The structure of science portrays in itself the potential for being elongated and shortened on a constant timeline as shown in the paragraphs that follow when, for example, mechanisms of reduction and emergence can be explained.

be out of true that whereby an estimation[197] is executed, an interpretation appears, characterised by a process of transformation, at the moment of asking for information, collecting information, answering to this information or reviewing this information for a final evaluation of the other, then I can meet the problem of the reference that is taken. When considering a basis from the natural sciences or from the social sciences, a scientific framework displays rules that need to regulate how to proceed with such an interpretation. However, what happens with these rules when from a synthetic construct they can contradict each other during the estimation? The interplay of positions is marked within a research state, rendering questions to which a philosophical position of pedagogy can reply regarding whether this basis portrays attitudes to be passively followed from beliefs or is to be actively questioned from assumptions. As a case in point, the distinct languages are not immediately transferable from one to another.[198] Unavoidably, approaches from diverse sides in science have travelled in several directions. In this way, a heritage from all the sciences from the times of the ancient Greeks belongs to the composition of observer and object of study (Blankertz 1982, p. 218). This refers to an 'inter-subjectivity' (ibid), which respects the position of maintaining distance from the object.

These borders on the division of scientific work can be historically agreed upon. On this specific item, it is inevitable to wonder what exactly would be obtained with a questionnaire or an observation, to wonder about what belongs to which part of the truth and how the information can be systematised and to what extent it can be localised within a context of change. In this realm, before globalisation involving the movement of people from continents to other places, diversity – but uniformity in ideas in parallel – was disseminated. Related to empiricism and interpretation, two continents founded a modern understanding of science, the European and the American (with a focus on the development of North America). Hence, the reference points return continually to the scientific development within these regions and the frameworks that were stipulated within. Nevertheless, the question primarily arises from differences and alternatives that despite taking similar foundations, modern science as well as educational science do not portray a unity in the explanations of the reality.

Thus, modifications of the constitution of modern science also consist of diaphanous factors of regional cultures. For instance, an international conflict such as the 'Great War' did not happen in the same circumstances for both sides, and even though when on temporality, both parts were wondering about the scientification of 'the matter of pedagogy' (Lagemann 2000, p. 19; Blankertz 1982, p. 210.), one side spoke of 'education' as a discipline, and the other side had in mind 'education' as subject-matter

[197] At this point of time, I hold the place of 'estimation' for speaking later about the concept of 'recognition'. I foresee that before going deeper into the analysis of meaning of the recognition concept – where the concept analyses as a method of analysis of this work take place, the vocabulary needs to have an association with concrete tasks, yet these are problematic to understand (i.e. tasks that concern a conflict). Thus, 'estimation' relates to 'evaluation' but also to 'appreciation'. Coupling more than these two last-mentioned ideas, 'estimation' appears to be used as means of a specific result and as means of connections with dynamic actions. For example, the common understanding of 'evaluation' is that an expert provides a note after performance. On the other side, 'appreciation' is linked to the idea of criteria associated with 'score files of values' coming from moral, aesthetic, hygienic interests (see *Wert/Werte* in Sandkühler 2010, §2973u).

[198] However, this would not mean that they are not translatable, and for this, I propose the position of translation through the individual.

and educology as the place of the reflection on its discipline. Moreover, it can be remarked that every culture was already independent of one another. This can relate to an explanation of a history of almost 100 years in the events of rejection or unification of cultures within the Monroe Doctrine in 1823 (see, one example in Ingenkamp 1971, p. 169), or the dream of Simón Bolívar exposed in letters in 1815 (Semana 2015). This aforementioned example also reveals that in traits associated with thinking about differences, regardless of geographic locations, the evolution of human reflection aimed at consolidating certainty of propositions – but according to the employment or moments of employment of different languages.[199]

While in Europe, the Hegelian consequences appeared with movements of 'Positivism' and 'Historism' (Blankertz 1982, p. 210), America was dealing with a documentation of movements towards independence, class-divided society and discrimination. In this picture, the Department of Education in Washington, DC USA tracked a greater proportion of women in the population of teachers, provoking in consequence a reluctance to pursue the vocation of 'educating' (Lagemann 2000). In two separate contexts, the differences appeared and these could later create wonder under a retrospective observation about how, despite cultures' dissimilarities, they could find an alignment in beliefs – for instance, in the role that 'education' plays within. However, in terms of an external perspective, this mentioned alignment does not mean agreement in all facets. This is why scientists need to discuss where we are standing today. Recently, in 2017, the situation appeared to the young scientists in Switzerland (see Action Plan 2013–2016 in SNF 2017) or to the Early Stage Researchers (ESR) in general in the world (accelopment 2017) in multidisciplinary frameworks quite in a dissenting way as opposed to understanding only two positions for honouring the concept of truth. Additionally, the current style of research targets not only phenomena but an analysis and register of notes in logbooks for detecting artefacts in the presentation of results. It seems clear that the technology affects the principles of research and individualisation for how estimation (this is, for example, examination and appreciation) to determine the condition of a person can be performed (see Schleidgen in Aurenque & Friedrich 2014; Mittelstraß 2005). In this way, under a philosophic, biopsychosocial paradigm, estimations are located within a complex situation under multiple perspectives that

[199] The use of different languages, including theoretical languages, is then a connecting point for further analysis, having taken into consideration that a global perspective of the planet does not imply unification of thinking. Similarities are coming closer and traits are crossing borders; however, the characteristic of a local perspective sustains particular cultural traits and differences. Hence, aiming at general agents (e.g. the internet, technology and the idea of 'world citizens') leads to understanding that ideas travel around the world in present times that display how multireferential viewpoints claim a part of belonging to one shared truth. Notions can be shared but are going to be contrasted, compared, validated or rejected by the representatives of local groups and by the same traditions held as true in determined contexts. At this moment, with a hindsight towards past events, human beings can realise how the movement has occurred. Without a doubt, this is helpful because whether as pedagogues, biologists, psychologists or medical doctors, nowadays, we all are dealing with the understanding that we all live on the same planet and that our differences make us stronger. This can be made into a political message, but it is not! And this is extremely important to mark. Due to dissimilarities, scientists need to defend their own positions, and hence, the process of formation of scientists requires a defence for composing an argument towards other academic positions. In my opinion as an expert regarding theory of knowledge, I am providing a context that I can use to justify reasons for studying more, learning and going deeper into specific topics by figuring out how the reality of education is conformed. Within a consecutive step, I am displaying the position of individuals under a process of change.

concede own beliefs on subject-matters that portray own dynamics. Therefore, a unification of science has yet to undergo analysis.[200]

2.2 State of research of the concept of pedagogical diagnosis

'Pedagogical diagnosis' and 'pedagogical diagnostic' are unexplored terms that encroach upon fields of action of the philosophy of medicine, psychology and educational science (Van Ophuysen & Lintorf 2009; Kutscher 1979; Pawlik 1976, pp. 14–15; Ingenkamp 1977). Both terms are associated with the relation between two persons and a modifiable subject-matter that are under a determined theory. These constructs make possible to discuss the 'pedagogical translation' (Gerónimo-Cid 2017b) that composes the crossing of concepts between a translation of 'disciplinary attitudes'[201] into another language (that goes through steps of the history). Pedagogical translation also intertwines concepts from the theory to the praxis through pedagogical action and from the collective level to the individual one through established recognition procedures [like those coming from philosophical arguments about recognition that I problematise with reference to the practical deed].

Since 'pedagogical diagnosis' has not yet been discussed as a foundational concept of pedagogy, the opportunity arises to observe this construct from a new perspective and in the language of educational science. At this point, it is necessary to emphasise that the concept of 'diagnosis' will be described in the language of pedagogy that is taken within the theoretical problems of the pedagogical tradition for the discussion of the meaning of pedagogy as well (a discussion of the importance of pedagogy in theoretical problems refers to the work of Brezinka 1992). Notwithstanding the concept of 'diagnosis' that has been requested and that has even been executed in the profession of educational science, pedagogy is not yet considered a diagnostic discipline beyond the application of tests (see ZPID 2001). Therefore, I plead for the expansion of the concept of diagnosis in pedagogy to its heuristic facet – this means to the access point of decision of pedagogical translation as part of what gives shape to the 'disciplinary attitudes' (i.e. to the internal process of individuals that acquire own critical positions towards the construction of knowledge).

In this way, 'pedagogical diagnosis' encompasses 'pedagogical praxis' when from existing literature on pedagogical diagnostic the human interrelation is considered with the changing environment within disciplines, values, methodologies and positions towards different principles of reality (ibid). In this sense, the diagnosis concept is taken from its property as a 'container'[202] that holds a working concept of 'diagnostic'. To this extent, pedagogical diagnosis and pedagogical praxis show their connection after pedagogical translation links the practical deed through pedagogical intentions. With a

[200] In the contents of the findings of this work in the fourth chapter, this unification will appear in a clearer manner as within assumptions that can constitute a model within a system that aims to explain a specific reality of a scientific division – but not all the conditions within science.

[201] At this moment in the current state of research, I leave 'disciplinary attitudes' as generally written, with the intention to refer to theoretical beliefs that should be activated after assumption of a person that triggers a reflection. By translating 'disciplinary attitudes' into other theoretical languages, I set forth that an individual adopts these attitudes to objects of study and traditional theoretical intentions according to specific dynamic goals.

[202] The diagnosis concept is a synthetic construct when it relates the recognition concept and process of recognition between the self and the world.

comparative approach, both concepts are to be formulated from the existing theoretical corpus through the 'disease concept' that gives them purpose in order to re-conceptualise them in the field of educational science. Accordingly, in the speculation of the current state of the concept of diagnosis in pedagogy, the concept begins to assume a place within this discipline that requires later validation.

The diagnosis concept can be considered as a cornerstone of the human action in spheres of action related to recognising another person. Plainly stated, the goal of the action of diagnosis is to identify a condition of a patient. Parallel to this is the 'belief' in the concept of diagnostic that should target the explanation of the individual process of how to achieve a determined result (see the difference between selection and evaluation in Pawlik 1976, p. 34). From there, inevitable doubt arises regarding the scope of extension of such a procedure referred to as diagnosis and the confusion of the concept of diagnosis with the measurement of competencies (Knauer 1994, p. 21). At this juncture, I detect the re-entry point for the historical problematisation of the division between natural and social sciences with its dispute regarding methods.

In this matter, the direction of the analysis also plays an important role, whether *diagnosis* may be the result or the previous goal of one investigation or the reference point of a further step, or *diagnostic* is the process of the investigation into a patient's condition or an expectation placed on a student or the information for the anticipated use of determined resources. In this case, these different constructs speak from a slightly different angle within the action of recognising the condition of one person and therefore can be problematised together by contemplating their differences. Putting together two different constructs that were previously related to one goal triggers collaborative purposes[203] in which contradictions might appear. These contradictions open up the possibility to access understanding of how and what leads to a constant repetition of the revision. In this way, collaborative purposes display how the discrepancies need to explain different levels of participation. This also means to explain the originating point of collaborative purposes (as it is speculated and conceptualised in the next chapter).

Before going deeper into the preamble of how 'pedagogical diagnosis' might be and might correspond to a construct for pedagogy, the contribution towards the integration of this concept into the search for an integrative pedagogical method should lead to an understanding of the reality of education; this means an analysis of what the reality of education is.[204] In the reality of education, the distinct assumptions of disciplines and perspectives work with an integrative pedagogical method upon the admission of several methods. Accordingly, diagnostic is an entry point to observing how other methods are related to each other. Thus, the step for moving forward from the application of one

[203] 'Collaborative purposes' are the core of a second-order observation when taking as a basis that one disciplinary language stays in contact with the opinions from other areas. As a matter of fact, disciplinary borders are also composed by establishing limits to what does not belong to one's own realm. In this way, collaborative purposes display the paradoxical indication of being independent while connected to others.

[204] In this second chapter that speaks about the current state of research, I reflect upon the spoken contribution of my work for the recognition of another person. I handle this reflection under consideration of the difference between current state of research and conceptual framework, which redirects me to see the active dynamic of understanding the reality of education. Hence, reaching to give a description of how this dynamic appears under constant movement speaks about the present situation in which researches upon this topic find themselves.

method to the observation of other methods displays that diagnostic is problematised with other theoretical intentions and it no longer refers to one procedure but to a pedagogical diagnosis with an epistemological orientation (to a recognition of the diagnosis concept). This means that, meanwhile, the focus is being returned to the need of knowing the 'condition' of the learner; in a process of education, the contents regarding how to evaluate another person from several perspectives have not been extensively reflected as related to the individual's potential. Therefore, I foresee the position of this analysis on a meta-level for reaching a theoretical discussion on the working procedures and processes in the field of service-based research or research with a purpose [that the work consistently establishes the connection between care research and a 'reliable supply service' by combining the reference to a master's degree programme with the opening of a clinic at a medical faculty].

At this moment, studies that take on the challenge of speaking about 'diagnosis' as a pedagogical category are relatively few or perhaps even non-existent (see, Iwers-Stelljes 2008; Knauer 1994). From these writings, discussion remains to be pursued whether diagnosis increases the efficiency of the pedagogical activity (Knauer 1994, p. 14). An intention that comes from the past in the register of the elements and competencies related to learning (in general terms) displays the theoretical tradition from pedagogy that needs to wonder about the scope of practical knowledge. Therefore, from the 'epistemological' position of educational science arises the core question that addresses understanding how, why and what may be the 'reasons' of this intention and procedure.

In addition to the direction of the analysis, it is necessary to take into consideration the perspective from whence it starts and to whom it will be directed: does society demand the analysis of what one person is capable of doing, or does it come from an analysis of a person that requires a confirmation of being able to perform a determined task? Or will it assess the teacher or the student? In other words: will it bring a benefit to the teacher in knowing how to read the student, or will it bring a benefit to the student with regard to how to easily achieve a determined result? Or both? And why would anyone be waiting for diagnosing? This last query serves as one rhetorical question for the moment when a patient is searching for diagnosis or when a connoisseur hopes to make a diagnosis. In general, these questions reflect the different scenarios in which the place of a person provides an answer as to how actions with different goals are mixed to fulfil a common understanding for one deed. In this way, the direction of an analysis shows the principles of reality as different levels of action within a situation in order to imagine how the confirmation of collaborative purposes becomes viable.

In my reading, after considering what might be the principle of reality that conforms the development of any human being – see also different understandings in Ulich and Mertens (1973) versus Ingenkamp (1976), for example, or with reference to a catalogue of criteria or to a specific context (Van Ophuysen & Lintorf 2009) – and through the analysis of the action of making a diagnosis, the premise of different actions that hang on the understanding of what can be achieved from another person can be settled as a *basis* [basis, in the logical sense of premise as starting point that will hold the interactions that follow]. I take this basis with reference to the term Bildsamkeit or 'faculty of

progress' of another person[205] (Anhalt 2012, 2011, 1999) in order to stress whether there is a limit to the achievement of human potential and then to question how a restriction might be built in regard to further growth.

The function of the Bildsamkeit construct is part of a specific pedagogical state of research that can reveal that different points of observation are working together. To this extent, the topic of research of 'pedagogical diagnosis' relies on a dynamic area or area of conflict in the encounter of theories and results. This is rich in composition as it provides for the analysis of epistemological content, in addition to some aims of psychological research, a combination of fixed approaches and approaches with potential for modification on an abstract level (Sandkühler 2009, p. 83). Such reflection on pedagogical diagnosis might sound unsafe for pedagogy if information is compiled with different points of reference and without systematisation. Up to now, I have not struggled to gather information, but to point to a structure to continue working with common connecting points for analysis. Nevertheless, pedagogy has a clear delimitation of what constitutes a theoretical problem and the questions concerned – such as the question of how to analyse a problem constitution. Thus far, a combination of attitudes and assumptions regarding attitudes presents an awareness of empirical data that is required by the experiential sciences, generally speaking, natural sciences – on the one side. And for the other is awareness based on the deep speculations mastered by supervised arguments in philosophy.

2.2.1. Dynamic aspects of diagnosis of diagnostic

Some dynamic aspects in the blind spot of diagnostic are based upon the meaning of the situation of a disease[206] and upon the expectation of pedagogical diagnostic in its

[205] Placing Bildsamkeit as a basis of consecutive actions to be performed upon the potential of each individual has the consequence for this work of recognising a role of the individual within the equation of observation, observing and being observed. Referring in this last statement to 'observation', in general terms to the action of recognising another person, Bildsamkeit represents a discussion that cannot be removed from the participation in dealing with a disease. Upon the framework of the concept of diagnosis, it will be necessary to locate intentions of achievement and ways to reach specific goals. Here, I have almost closely tied intentions *of achievement* with goals. As I noted and mentioned in one footnote (around four footnotes earlier), this is one reason why connections for 'purposes, intentions and goals' deserve a place for further problematisation. To this respect, these words must be queried on their use in theoretical tradition in order to analyse the composition with other words and how this can affect their meanings. Specifically, and for example, the suggestion of introducing Bildsamkeit into a medical context should first go through the revision of procedures similar to diagnosis in pedagogy, later applied to a disciplinary collaboration that one day can be estimated in the application of medical procedures. Notwithstanding, this path sounds long in extension and promises to require much time; currently, we are living in a period where knowledge and information are spread to layman audiences, pushing in consequence to have a wider perspective of execution of actions. Not surprisingly, patients arrive at clinics looking for a specific treatment – even though they are not the doctors. In a similar manner, students in classrooms demand to read about a specific author – although they do not yet know what material or specific author would be helpful in the development of their ideas. This corresponds constantly to the description of a democratic society towards which we are moving forward. On this basis, this society demands the formation of different scientists, adaptation of old methods, pedagogues with awareness of the contexts and with an increment in their skills – that have been supported since the identification of their talent.

[206] The situation of the disease according to an epistemological reflection refers to the analysis of meaning of the concept of disease.

reciprocal collaboration with other disciplines, such as medicine,[207] neurobiology and psychology. The situation of a disease has a wide spectrum beyond the medical area alone (Borck 2016, pp. 37–41). With reflections upon the influences in the form of social, religious, philosophical and epistemological construction that surround the concept of disease (ibid), the situation of disease that cannot restrict the view of one method is complex. Hence, this situation produces expectations from the side of the people involved that can be explained through assumptions about and from attitudes. In this section, I present the notion of *dynamic of diagnosis* for speculating on the relation between elements of the situation as animated aspects. The dynamic of diagnosis yields a raison d'être upon the pedagogical field from its level of reflection – for the deliverance of a hypothesis on the condition of pedagogical diagnosis.

Anhalt (1999, p. 204) identified that in order that the experience of acquiring knowledge can reach a process of self-transformation, the learner should have gratification in solving unknown requirements. By means of the diagnosis concept indicating also from the situation of disease, the state of affairs[208] is one in which the patient involved is motivated to seek a solution[209] to the composition of elements that cannot be controlled or even sometimes predicted. As I present as animated aspects regarding the dynamic of elements, these elements are various and are located at several levels of a situation. Therefore, the composition of aspects sets a problem of orientation [after prior recognition that these aspects are in constant motion]. To this end, the dynamic of an

[207] Examples of medical actions can be found in pedagogical texts explaining the contradiction involved in examining a patient without going through the self-conviction of working out a medical measure (see Mikhail 2016, p. 146).

[208] The diagnosis concept has several theoretical connections that show why disciplines with strong impact on another person treat the diagnosis as a concept, procedure and task (just to mention a few considerations about the diagnosis, because as such the life of a person can be directly affected). Many statements of this work are difficult to read, because synthetic constructs are put together. In this way, the style of speculative work makes it even harder to speak about topics that require specific definitions or numerical evidence from certain theoretical traditions. The action of indicating and the definition of indication can be separated by dint of theoretical references (see, reference for indication in Schwarz 1993). In this respect, this thesis explains the theoretical reductions through the use of a mechanism (i.e. a function within a system). Nevertheless, when the layman speaks or reads on topics from other expertise areas, an orientation pattern is called for to obtain criteria about how to evaluate that the state of affairs cannot be just a finding, since the diagnosis is linked to other procedures. These procedures are in a situation where the patient is motivated to seek a solution to the composition of the elements. The dynamic of the elements discussed in the diagnosis concept thus fulfil the requirement of a current research state, which must be acquired in other scientific areas. In this way the work acquires a sound knowledge in the sense of a strong argumentation.

[209] The idea of finding a solution does not only speak of a motivation to diagnose a person. The expert is put under pressure by a problematised solution and a necessary search for orientation. This search for orientation refers to the orientation pattern shown in circumstances where the information is extensive and where experts must be aware of their roles. For this reason, study programs should cover the training of junior scientists to find out what it means to be an expert. Experts are in the realm of proven skills, and therefore their development should include a problematic approach to how to earn knowledge without losing the fact of being a person of integrity and responsibility. The distinction between laymen and non-experts on specific topics can be continued to show how characteristics of arrogance and respect have been adapted after learning. In terms of the problematised solution, ethical problems are not the only ones involved, but theoretical discussions about how morality is connected to the world. This could be a reason to bring together ethics, epistemology, theoretical expertise and reflection in conjunction with the development of scientists to achieve a state of responsibility that cannot be compromised by the choice of institutional procedures.

occurrence within such a situation encompasses a clearly unforeseeable outcome of connections amidst fixed knowledge and unpredicted reactions.

On the one hand, fixed knowledge can be fathomed taking into account a health problem – despite a desired certainty, an isolated part of a physical-biological problem, which can come from a monistic position, leads to unpredictable environmental reactions. On the other hand, unforeseen reactions are presented in relation to the means and modes of action[210] that each person stands for and that form a complex situation in the rendezvous of positions. Here, the monistic position is confronted with a bidirectional juxtaposition of perspectives. When these perspectives are viewed from different angles, the corresponding encounter leads to a conflict alongside reflection. The conflict resembles a contrast to the consideration of diagnosis and diagnostics from positions of structured uncertainty in the mapping of transformation processes on the basis of an undefined individual. I refer to an undefined individual based on the synthetic constructs from which the definition of an individual emerges. As soon as an observation of second order and a third place of composition takes place on the meta-level of theory, the single case of a person begins to be problematised as a concrete individual. [Moreover, the aforementioned clash takes place because as I am explaining, despite the disease concept from medicine being linked with physical phenomena, from the same medicine and other disciplines, the biological reasoning needs to go through a process of revision in order to identify a symptom. This process should also be localised also outside of the medical and biological tradition. This is to say that not all the laments that come from a person can be taken as an indication of a disease, and here is where the experience of an expert appears for learning how to react according to the sense of emergency in a situation. Thus, the expert in pedagogy learns how to display situations of interest for many areas that are under training]. The mapped transformation processes show that they can be modified with the interchange of perspectives.[211] An example would be the presentation of a dynamic subject-matter, which can be bound to different contexts and thus counteracts the fixed knowledge [the example of this work can be found with the diagnosis concept in addition to earlier discussions about Bildung made by Rucker, 2014]. The explanation leads to the mutually intelligible position of active participation and concerted purposes in a situation of multiple viewpoints. This situation can display that meeting points occur also without predetermined planning. One entry-point to these dynamic aspects for exposing the current state of the diagnosis concept lies in the concept of disease. I start then with disease as analysis concept in a complex situation.

a) Disease as 'analysis concept' in a complex situation.

In order to address the problematisation of the meaning of the situation of a disease from the pedagogical viewpoint, the bio-medical and the bio-psycho-social models must be introduced. The first considers an impairment on an individual level that aims at the cure of a problem. The second focuses on functional health as a complex gauze tissue of conditions. Both, from social medicine (Virchow in Kraus de Camargo 2013, p. 7;

[210] I state that 'means and modes of action' connect to the tasks from different disciplines that are under the influence of social parameters such as the technology. I presume that these 'means and modes of action', in conjunction with the 'agency of the individual' can exert a current state of Bildsamkeit in modern theory. These 'means and modes of action' take place within the purview of the speculation of pedagogical diagnosis to discuss the reality of education.

[211] Transformation processes have been displayed on the discussions of Bildung by Rucker (2014) in relation to the theory of complexity of education from Anhalt (2012).

Sadegh-Zadeh 2012), look for the balance that science offers to the equation of the functional man. From the side of pedagogy, Benner (2001, pp. 68, 76) wrote that the determination of the human being is not biologically described aside from the pathological cases. Hence, the analysis of the meaning of the situation of a disease[212] is portrayed in terms of reflection and constitution of components because it is yet possible to further analyse what constitutes an unsound condition. Furthermore, the analysis of the meaning of the disease concept in a complex situation yields different ranges depending on types of classifications from specialised positions.

With respect to the topic of medicine in relation to health of 'the idea of man', it can be confirmed that the sequence of getting sick is a process enabled through physical and mental influence (Zappe 1989, pp. 4–7), to which I take reference from the theoretical framework according to the circular causality in Fuchs (2012). With the concept of disease, a discussion arises regarding the measurable and conceivable information of the observation of another person, from which there will be a reaction on the part of the observer since the person is not only an object but a subject (ibid) experiencing impact from human manifestations. In and of itself, from the side of pedagogy, the description of the sick body can have a further explanation from the internal experience of the person once the relation of organic structures can be connected with the activities of the self-reflection[213] (Anhalt 1999, p. 201).

Other constituents to the concept of disease are its 'natural scientific', 'clinical' and 'personalist' organisation (Rothschuh 1965, pp. 127 §§139–130, 145). Under the natural scientific approach, the objective organisation would be considered based on medical tradition; under the clinical, the indications after examination would be taken and under the personalist, the own perception of being sick (ibid). With these three different approaches, the interchange of perspectives comes into sight, from that of the expert,[214] the individual condition and the scientific systematisation. These perspectives do not appear to be separate but part of a whole situation that can yet be systematised.

With the intention of following the division of the two positions between bio-medical and bio-psycho-social models, I relate this division with the problematisation of the 'functional' and the 'dualist' appropriation of scientific knowledge (Block 2007; or as

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[212] In this second chapter that speaks about the current state of research, the analysis of meaning of the concept of disease is already taken from an outcome in a situation as it has been and is being researched. The analysis of meaning of disease as 'analysis concept' could be closer to a work of a specialised position. At this moment, for the description of the current state of research, this specific 'analysis concept' (of disease) helps to present the dynamic aspects of diagnosis and diagnostic in the speculation of the 'pedagogical diagnosis' concept upon which can be developed a system for understanding the reality of education.

[213] At this point in time, proposals of self-reflection from the pedagogical side should speak about the topic of disease, but clearly maintaining that the encounter with other topics of research has the purpose to fasten the place of pedagogy and its own reflective language.

[214] As a case in point of how the current state of research is presented in the division of a complex situation, dynamics of subject-matters and analysis upon both, here by mentioning the expert I am calling upon the opposite non-expert. Both can begin an interrelation in which, in a context of recognition, they refer to a complex situation based on the aspects that lead to the expression of an outcome. Following individual condition has an inner grounding on the agency of the individuals that I problematise with their potential and through a process of transformation. The subsequent scientific systematisation would be possible after considering from concepts of participating sides how they relate among themselves.

problematised in other frameworks as *pluralismus* with *interne realismus* within the 'theoretical correspondence' or within a *context* in Sandkühler 2009, pp. 17–130) among other systematisations of reality. This is done in order to show that such a division is an access point to a wide range of problematisations upon which the reality of education is linked [to this extent, I work from the assumption that the epistemological division takes place in the theory but affecting a system, like a concerted system]. Thus, a problematisation that is too well-known continues to spark disputes in the process of being understood or in terms of reasoning about the existence of a controversy [all mentioned that are also core of the system of the reality of education]. Rather under a reformulation the reality of education presents the problematisation as a search for orientation. In this way, because the problematisation has different controversial moments, which will be taken from many positions that are somehow in opposition to each other, it opens up more spaces for reflection.

As previously mentioned, the clash of positions happens because synthetic constructs are the basis of what can be read in agreement with different contexts; moreover, statements cannot be denied easily when they are well sustained [to deny statements is not the strategy to follow in order to find the certain reality. This strategy lies outside the scope of the purpose of research studies, hence the conflict of clashing statements between each other should be part of a proposal of a model of conflict. This spoken model can be presented in a comprehensible manner after explaining the basics of the models of collaboration, unity and specialisation]. Thus, along with the interplay of assumptions of attitudes in this situation, an intention to try to nullify a counter position could appear as latent.[215] Perhaps this occurs immediately when trying to avoid an attitude of 'anything goes' (ibid, p. 26) and a clear reaction of rejection and scepticism towards what is different. The observation of another person must be within a systematisation that will contain limits, borders and non-acceptable thoughts for a specific case. This means that knowledge of physics, for example, while fixed for different foundations, would not be required in examining procedures for how to treat a person. [As an example, and with the intention of respecting the basis of these branches of science, physics works with external evidences that have gone through a path of empiricism and positivism. Although such discussions have an influence on what a reality is during recognising another person, two branches of knowledge display within one same situation directions that must not reach the same result.]

Within disciplines, historical moments give shape to the current exercise of what disciplines become. This point is a cornerstone from the current state that I am using for the conceptualisation of how the diagnosis concept is active in the reality of education as an outcome of itself as the analysis concept that presents a connecting point for understanding such reality. From the side of medicine, for example, the support of the natural sciences of the sixteenth century gave shape to the questioning of medicine as a natural science (Rothschuh 1965, pp. 7, 97). The physical conditions of the body allowed that the application of rules of the physique, chemistry, morphology etc. (ibid) were

[215] To explain where this latent intention comes from is a connecting point for problematising a model of conflict, which will be dealt with in further works. The model of conflict differs from an epistemological development of connecting points. This model shall contain constructs, assumptions regarding attitudes of different position combinations that can aim to predict what will happen in the context of specific statements that should not be put together. At this point, however, the confirmation of specialisation, collaboration and integration models must be first elaborated in order to add further suppositions.

employable for treating human matters. Rothschuh (ibid, pp. 33, 95) developed his '*Theorie des Organismus*' that addresses the causal connections within the organism but within its relationship with the world as well. In his work, he presented living nature working under bionomics and in an ecological form (ibid, p. 98); this refers to the moment when the person is in agreement with the environment. A clue for understanding the concept of disease within the just-mentioned theory is provided in terms of 'complexity', respectively 'complex condition' from the elements[216] involved.

This discernment happens because this theory relies on the change of position that medicine, as a discipline, can adopt on the bindings of the development of science from time to time (see ibid, p. 6). In this way, the spectrum of medicine is different to that of psychology or any other discipline but that all these disciplines provide a perspective on the conformation of the basis of the meaning of science. The importance of science results from the fact that every area is responsible for their own scope. Since several areas are gathered upon considering a person in development, concepts such as recognition and disease in connection with the human-environment problem approach must be evaluated according to different theoretical traditions. In this vein, disease is different from an impairment, and an impairment is different from a disability (Kraus de Camargo 2013, pp. 7–10). Considering that disease comprehends a co-activation of individual and social factors, but that impairment and disability do as well, educational science has the requirement, as epistemological discipline, to clarify an influence on the analysis of such relationships.

Briefly described, the concept of disease is oriented towards a medical area in which a greater attention is acquired regarding the biological functions. The concept of impairment is considered in both the bio-medical as in the bio-psycho-social model. With this concept will be invoked the disruption that is caused by a disease or by a social conflict. In addition, the concept of disability may be defined as a negative reciprocity between the person and the surroundings (ibid). From this current state related to the disease analysis concept, a proposal of a systematisation is required to investigate how concepts interrelate with each other. The complex situation where the disease concept is located relates the intermediate positions alongside the concept of impairment and the concept of disability with which, in this work, I analyse from the concept of the potential of the person in a situation of the recognition of an own condition [the place of the individual is taken as an axis for further connections that define what the person shall feel. In this way, my interest displays that the discussions do not lie only on one side, but take place in the exchange of assumptions upon which the reality of education succeeds].

At once during this approach in research, the question of the purpose of diagnosis must appear, respectively recognising the condition of another person. Within the mainstream of pedagogical thinking (Benner 1991), purposes are problematised by the theory of Bildung (ibid, pp. 63–92 in Rucker 2014). When the concept of disease is to be placed next to the concept of impairment, a discussion of purposes begins by including the agency that comes from the individual. A consecutive step is to organise the events

[216] The elements relate to the methods, synthetic constructs, variance on definitions, changeable basis according to update on a conceptualisation, link to uncertainty and dual attribution of participants – as previously described during the dynamics of elements of diagnosis and diagnostic proposed for explaining the reality of education.

according to different levels of theoretical pedagogic influence. In this way, the corresponding example shows that from the social level, the theoretical abstraction of this cultural position can be reflected by a person for the purpose of creating a new idea. The theoretical expression manifested here and written from the educational standpoint is not intended as a medical treatise but rather an essay of pedagogy in the language of educational science about the diagnosis as analysis concept and its current status in a pedagogical concrete action.

With the recognition of borders of disciplines, encountering positions within a procedure that portrays alternative purposes and by spotting the diagnosis concept in a pedagogical delineation, the intention to release the potential of this concept refers to an effect that can cause a continuous analysis. The disease concept reveals that the current state of research of pedagogical diagnosis orients to a logic of dynamism: cause-concept, effect/cause-collaboration, effect/cause-diagnosis or recognition, effect-analysis concept. Thus, the logic of dynamism explains cause as event that can be held by concepts, effects that evoke reflections on causes where distinct opinions from a collaboration are required and where assumptions regarding attitudes are to be identified, effects from causes that call for a process of diagnosis or differentiations during recognition since the premise cannot be general, and effects in the epistemological realm that are to be organised according to structures of the analysis concept, which in this case targets to the concept of diagnosis [based on this logic of a current state of research, the hypothesis on the reality of education emerges throughout the whole work]. Enclosed in this discussion, the *potential of a construct* can be a concept in itself that can be consequently problematised for its further development. This spot to which the potential belongs marks a place for the individual development of thoughts and with views to an aesthetic result in the society [‘individual’ because the potential seeks to rely on an inner structure of force, and ‘aesthetic’ because this force is directed to an ethereal place but which must not be a mere metaphysical place]. The added benefit is sought to widen the studies of theories of knowledge of different disciplines when indicating the composition of theoretical construction in more than one field. Simultaneously, a big question mark points to the knowledge theory of educational science and to how the place of the individual modifies herself and her surroundings.

Raising questions regarding the theoretical disciplinary basis from the scopes of the fields would yield a shared discussion to be handled simultaneously by theoretical traditions and guarded under the responsibility of each person. Additionally, philosophical collected data from this study shed light on the construction of theories in contexts of multiple perspectives. A complex situation brings the possibility to observe from different disciplines the position towards the constitution of science that is taken. To this extent, considering that disciplines are not on the same level as that of science, the complex situation has to be reversed in order to formulate hypotheses about how spoken disciplines can work together. Next to such a reformulation, the questions are aimed at discussing how a reality of such disciplines and their actions is constituted, and how a distance can be set between science and some fields of research. Likewise, and in this manner, a situation of this kind lends itself to the sense of how new generations are being raised – according to a frame of reference upon a context [because the example of a complex collaboration marks that relations are not linear as in the raising of a person. Accordingly, this collaboration is shaped by each related element of the animated

aspects evoked by merging of two or more synthetic constructs – as a situation that provides a word picture of the current state of the diagnosis concept when it can be adopted by pedagogy]. This should address the topic of the construction of science that is taken as a basis of consecutive actions can be problematised for sizing up an influence on a general collaboration. I identify this current state of research with the intent to point out that selection criterion is bound to precedents, to wit, previous intentions and future purposes.

b) Expectation of a pedagogical diagnostic as different from that of a medical diagnosis / an explanation based on the unilateral versus bilateral application of knowledge

In the following paragraphs, I present the point of origin of the pedagogical diagnostic from its pedagogical reflection. It takes under advisement the exercise of recognising the condition of another person from and in the area of pedagogy. In contemporary times, it is understood that there should neither be an outstanding methodology nor universal goals in academic circles; however, in the academy, such openness to alternatives did not always happen in the same way. For example, before the time of thinkers on the philosophy of science, like Gaston Bachelard, Ernst Cassirers, Thomas Kuhn etc. (see, for example, Anhalt 2012; Moulines 2011; Sandkühler 2009) knowledge, specifically dispositions from the natural sciences, was to be considered as universal and all-explicative.

Likewise, there should be no superior methodology in the way of 'identifying' the status of another person or an all-embracing purpose that dictates a way of being from anyone. It goes without saying that this last possibility can violate in consequence an inner freedom. However, and in order to be careful with the position of 'anything goes' (see related train of thought about how positions, opinions and beliefs are developed in Sandkühler 2009, p. 26), herein the allowance of opinions is not intended to welcome every idea indiscriminately. The main message here is not to reject without analysing but to analyse before rejecting. Along these lines, conceptions that are related with assumptions of specialisation for specific topics should be reviewed or at least considered, like in the case of explaining from some monistic positions of neurobiology (Herzog et al. 2016) the interpretation and use of models from experts into the field of pedagogy (Gerónimo-Cid 2017c).

The advantage of concentrating only on one part of a process of consolidation of consciousness, like Herzog et al. (2016) presented on the manner for coding attractor or non-attractor states for the reaching of consciousness, is that on the one hand, models are targeted to specific conditions – as in the authors' *Two-Stage Model* (ibid, p. 4) of consciousness. In this way, such models can be limited and allow researchers to focus on the study of specific phenomenon, like *the color phi phenomenon* (Kolers 1976 in ibid, p. 3) in the construction of perception within consciousness and for its explanation in biological terms with the application of techniques like TMS. Notwithstanding the 'isolation of parameters', the concepts are related to the negotiation of knowledge with other fields as in computer vision. Thus, neuroscientific studies hold true for reflecting on a *leaky-integration* with other mechanisms, like *low pass filtering* (Ogmen et al. 2004, p. 2127), which inquires into the perception of 'continuous-motion' on retinal images. This 'knowledge' is specialised; however, it must be consolidated, incorporated and assimilated in harmony with the discussions in the academy for catching a continuous stream of an action.

This last-mentioned monistic example shows how assumptions about a unilateral conception of science needs to be integrated by any means within a wider social environment, even when outcomes are presented to the members of the same community. This is to mention that the one-sided reasoning is not meant for setting in stone as an eternal knowledge that cannot evolve. Moreover, after studies analysing the meaning of science have included the dynamic of the original reflections of a question within groups, programs of research can begin within a competitive ongoing academic model (see Lakatos in Moulines 2011, p. 98). To this extent, the election of methods is another moment where the beliefs of an academic community clash and are set upon further reflection, developing the idea of attitudes[217]. In this sense, elements of and questions about normativity, application of procedures, discussions exploring what is a procedure and what is a research question or what is the subject-matter under analysis take place and show the researchers that the unilateral components are only on one level of the task of their study. Thereby, when continuing the description of the difference between the concept of diagnosis and diagnostic in pedagogy, the contributions from educationists in different areas, opening the 'normative power' of any particular profession, should be kept in mind (Kraus de Camargo 2013, p. 25). This is meant to point out a role that pedagogues can occupy in following regulations established by assumptions regarding attitudes of specialisation.

One example is the utilisation of the International Classification of Functioning Disability and Health, ICF (WHO 2001), which has a practical application in the field of pedagogy. Besides selecting the theory of diagnosis for 'recognising the condition of another person' that depends on the discipline, taking its respective position from where someone is standing, the goals of any procedure of observation must be chosen. On the basis of any of these procedures is written that later, once one subject-specific of these procedures is chosen (continuing with the example of the application of the ICF methodology in Kraus de Camargo 2013, p. 28), an agreement on measures can be followed. This agreement must come about because, for each diagnostic procedure, the basis of the analysis employed in the procedure relies on individual persons, whether the expert who analyses it, the non-expert who faces a personal condition or a third observer who understands the procedure. Agreement of the sort confirms that the diagnosis concept advances with the understandings and controversies of people involved in many of its different facets.

The selection of methodologies pertains to more than one decision and appears in the course of a complex situation since there is the need to consider the condition of a population, demographic conditions such as age or gender and epidemiological rates, availability of instruments for clinical applications or epidemiological studies etc. that will be shaped in reciprocity by the health status and perception of a society (McDowell 2006, pp. 10–46). From the social perception, when relating a health status to one state that can be achieved, the expectations about actions tell people what to do in seeking an answer and confirmation of what is wrong within a situation. This search for certainty

[217] As a clear example of how attitudes can be contradictory, the preference of only one person for one figure or colour to another shows a variation related to anatomical constitution, variables of convenience and expectation, motoric functions like workload memory and many other environmental factors. Eventually, attitudes can refer to an individual or collective positioning towards beliefs. Attitudes come from an active positioning that relates to this statement in terms of the preference for a method.

is where a diagnostic procedure takes place and where a responsibility is conferred for providing solutions.

In the case of pedagogical diagnostic, the component involving decision is based on the connection of the teacher and the learner. During the diagnostic of a student, the previous knowledge and learning style is on the one side as the teaching methods are on the other side (Hopf 1980). The relevance of integrating methods along the lines of the changes of a context relies on a theoretical adaptation, but on avoiding the obsolescence of an action as well. For example, judgements and estimations on a person are expected to be done for a reason and to have a consequence. This means to say that something must be done and the people who are thus interrelated must have an own opinion because otherwise the action would be meaningless and therefore it would not be referring to an estimation. In this regard, I identify an expectation for a bilateral application of knowledge that can direct the attention to more than one perspective and not only to one that comes from a biological area – as was presented during the integration of biological propositions for measuring the registering of consciousness. Assumptions of specialisation, like those of biological proposal, need to fit with advances related to other mechanisms that come from the same biological system [a mechanism like that of selection], and from those that are socio-technological in nature [and others like those of viability and reduction]. This interchange yields positions as models that within the reality of education need to be explained.

2.2.2. Some organising schemes and sources of educational science as participative discipline

Educational science is a participative discipline because of its engagement throughout history with the condition of the persons. Human beings are part of groups and the divergent interests of the church, of the regime, of the family etc. that appear with a different value within sectional views through time. In this view are different levels of analyses and composition of systems; this means that the influence of the parents compared to that of the authorities in a school would be expected to have a different configuration depending on integrated elements. These different levels of analyses point out some drawers that can be opened in terms of the foundations of educational science that would connect it with other disciplines. I identify these drawers as organising schemes and sources of educational science as a participative discipline because the actions in pedagogy are connected with social components. Thanks to the stretch of the position of layman presented in alternative contexts – for example, in the position between expert and non-expert – educational science appears within contrasting fields. Additionally, this position of tension between expert, non-expert and sceptic travels around the world with a Germanic heritage on its shoulders. Simply, the influence from German philosophers cannot be removed from the pedagogical theoretical thinking. In this regard, the levels of the analyses are immersed in the philosophical discussions when considering the appraisals from other disciplines.

The times when just a few parents were committed to the education of their sons is gone at this moment (Lischewski 2014) because more and more folks are involved in pursuing an education of quality for their successors [without touching upon the escalation of political interests, the participation of parents is to be considered as part of a democratisation in knowledge]. A cut-off erupts on the intervention of civilians in

comparison with the power of the state, whether that in the past was a religious power or a hegemonic power of government. From the past, with a retrospective view can now be understood that many actors had an influence on the formation of young people, along with too many factors that play a role in the upbringing of a person. The exchange between society, academic groups and educational actions is not a starting point for the systematisation of the dispositions of control but a continuous parameter for being ordered and understood within the maturation and synthesis of components. These components later yield the analysis for considering what the purposes of traditions are and how these purposes are constituted, whether for control or for seeking an ideal of freeing and self-definition.

For instance, from the spoken exchange, the bipartition of expert and non-expert professionals can carry an expectation of a determined culture. Academic texts reveal a differentiation from the layman public who witness the skilful application of knowledge (ibid, Freidson 1979). Namely, an overwhelming assortment of theories and propositions cannot be digested by anyone who is flying solo. Additionally, with the division of groundwork based on the actions of an underlying subject or those with a transcendental meaning ordered according to God[218] (Schäfer 2012), the persons meet a challenge of orientation regarding whatever is the reason is for our existence in this world. At the same time, a changeable world calls for a special effort from its citizens when there is more than what is to be put together – to wit, some of the hyper-specialisations of knowledge that are designed not to speak among each other but only through the connection of further research [i.e. through a connection established by theory construction]. Thus far, without epistemological tools for understanding how contents of knowledge are composed and performed in interaction with the surrounding world, such contents risk appearing as being locked and to be handled by experts that can exert goals of specialisation.

Humanity would align expectations with the spoken need for orientation. For this, humanity represents different stages of maturation, as the child and as the grown-up imposing influence based on what they want. The older supplies experience, and the younger provides curiosity in the exploration. What anyone can see here in this moment can be referred to as the *rise of tension,* thanks to the manifestation of positions. Accordingly, due to an internal development within nuclear systems in the society, this increment of tension gives rise to a notion in the related manner that a conception of science has earned autonomy and heteronomy (Anhalt 2010). I refer in this context to autonomy and heteronomy as the independence and self-criteria, that on the basis of freeing a person, these two qualities must be defended, and upon which the tension between older and younger generations will emerge in the participation of both sides. Related to this tension, historical questions permit the display of the connecting points for the analysis of activities that correspond to the purpose as a result of themselves (‘*Aus den Vorlesungen von 1826*’ of Schleiermacher in Nicolin 1969, pp. 9–10). Recorded through texts, both purposes of autonomy and heteronomy have shown the

[218] The young Friedrich Schleiermacher in *Über die Religion* (1799) formulated his ideas regarding claims of truthfulness (Lischewski 2014, p. 248). In this book, he explored the free spirit or free mind in differentiating the potential of every civilian from pastoral authority. To this end, he remarked on the puissance of every person being a priest or a layman according the virtues of each (Schleiermacher in Kunz et al. 2011, p. 151).

elaboration of systems, with which an internal dynamic of self-regulation is delineated (see, Mittelstraß 2011, p. 330; and also Daston 2001, in Anhalt 2010, p. 93).

Autonomous systems will control their own procedures, meaning that they will be demarcated by their manner of dealing with the subject-matters (ibid). The purpose of autonomy relates the extent to which certainty of an influence can be exerted on any system that can change to uncertainty by the novelty of elements of another system. Herein, the relevance of the organisation and reorganisation corresponding to traditions of knowledge comes into sight. Usually, what may be a paradox according to different systematisations, I will portray as an *ingenious & ingenuous, sarcastic and ironic form* of different contextualisations.[219] Within the conceptualisation of this work, in the next chapter, this paradox can take reference to the synthetic methods (see Carnap 1996) for being explained in terms of contradictory and contra-valid contents, for example (ibid, p. 55). This should take place according to a system (as in the notion of irony in Rorty 1991, which leads the reader to understand the system) when it is opened to an internal control of own procedures at the same time to a moment of coincidence with other systems. Like this, two systems can suddenly be analogous, but with different categories in other parts of the world, respectively in different organisations.

The different schemes of organisations in a complex theoretical framework (Kuhlmann 2007) direct the theorists to the real possibility and simultaneous impossibility of the philosophical reduction of ideas. To this, streams of thinking in educational science are catalogued according to different levels of influence on the student and abstraction regarding which moment of education is being referenced. Hence, there is a possibility to compose a structure in complex theoretical terms. By way of illustration, Benner (1991) registered the theories of education separated from the theories of Bildung and from the theories of pedagogy. Whether these ideas could be reformulated according to the categories between the theoretical division would rely, according to my proposal, on the inner potential of the human being and on the flexibility of the generation of the theoretical construct. But how flexible should a formulation be? Or better said, how can this flexibility be presented in a congruent and scientific manner?

As such, with the example of the estrangement of the layman audience, the laicism can be considered as the strange paradox of leaving the specific power of the church outside but allowing the influence of hegemonic academic groups. With this modification, the character of social manifestations is shown under social modifications that from the

[219] In contrast to Rorty (1991), I am not using the term 'irony' to refer to one counterposition of his definition of metaphysics. In this way, he also refers to the 'ironist' as a person who has an intention. On my side, however, I do identify 'irony' as a re-entry point for reflections on reality and its possible compositions, also through logic. I use the word 'irony' in its adjective form, i.e. ironic, that gives a substantial difference to the interpretation of vocabulary because it must then be under a specific context. As well, I think that the concept of 'irony' does refer to the alternative of options for the description of the world. I use the adjective 'ironic' because it implies that somebody else thought about a concept for giving a different sense of orientation, but based on a similar internal-dialog, which could be ordered in a logical way. Because I want to invoke a rhetorical figure that does not culminate in the direction of one significance (suggesting more in the speculative sense than in the empirical one), I accompany it with the support of the meanings of other adjectives such as 'ingenious & ingenuous' and 'sarcastic' (invoking a figure that is very smart but childlike in the sense of something that sincerely reflects the events of the world and is influenced by joining multiple intentions of ideas and experience of adults).

knowledge theory of educational scientific side require yet another interaction. The question resurfaces about how to display this other interaction. With the next chapter, a discussion upon this reflection starts with disciplinary collaboration that connects with the findings of the fourth chapter about portraying the concept of recognition from the assumption of pedagogical specialisation. As a referential case in point, the role of the church was not displaced immediately, although the idea of reformation battled primarily to create an organisational structure that could be replaced by the power of the state (Stichweh 1991, p. 39). Perhaps this can be explained by social beliefs that rely on 'heads or tails', used as an expression not implying any sense of luck but as an idea of rules made by one person without any acknowledgement of the power vested in community members.

Detaching from the church did not happen in the same way around the world.[220] The connection between the church and the state continued until the 1800s (ibid). One option for showing how the organisation and reorganisation of traditions of knowledge are not dependent only on social changes is through the display of ideologies or intentions. With the reformation in Europe, the anti-Aristotelian facet sought to benefit the ideas of humanism (ibid, p. 41) that can focus around the individual. In terms of the division grasped by Benner (1991), this scenario can be further discussed according to the same degree of educational mechanisms in social contexts as Schleiermacher described (ibid, pp. 45–63). By separating the interchange of hegemonic positions in society and the transformational intentions of the individual, a controversy is awoken through thinking about the amateur in one profession who may be more professional than the expert but who lacks specific knowledge (see Kunz et al. 2011, p. 323). Thus, in the language of educational science, through the explanation of the exchange of positions manifested in socio-historical events, educational science and pedagogy display their participative character by setting the analysis as a premise of reasoning. As participative disciplines, a relation with medicine and psychology will be set for talking about the current state of research of pedagogical diagnosis.

a) Place of educational science in the relation between medicine and psychology

From educational science, expertise regarding the biology, anatomy, biophysics or aetiology of a disease would not exist if the 'opened spaces of theoretical construction' could not be shown. As just mentioned regarding the previous schemes and sources of educational science as a participative discipline with reference to a theoretical construction as made by Rorty (1991) in a revision of a social structure, I set that by taking the concept of disease from its epistemological discussion (Borck 2016), one meaning of a concept points to internal theoretical control. Thus far, opened spaces of theoretical construction succeed in educational science because knowledge theory of this tradition is occupied with how approaches are generated in a complex situation. Such a situation portrays a connection of the present with the past and future and that is the constitution of what the human being bequeaths following generations. Thanks to the 'connecting points for analysis' or 'joint points' from different perspectives, the reflection can access or re-enter the conflicts in other disciplines that do or do not attain

[220] This topic can be further problematised based on the cultural beliefs differentiated by regions and previous traditions. I will not go more deeply into this particular religious matter, but I need to exhibit awareness to this academic systematisation that can account for a branch of interrelated knowledge with the individual and societies.

interaction between people. In taking as one hypothetical instance people outside the formula, the theoretical level reaches a determined position, which I explain by means of assumptions regarding attitudes.[221]

This access in knowledge development does not happen only in the interaction with other disciplines but in the interrelationship of own constructs within one same discipline as well. In this sense, to ask how educational science has an influence on matters of health would be comparable to questioning how educational science has an impact on the circumstances of participation of people in group actions, which is also a completely legitimate question. With regard to the *theory construction* and *theory development*, the clash of positions could be discussed, although the conflict would persist throughout the problematisation between social construction on a theoretical level and theory construction on a social one. Therefore, explanations within complexity theory can be ordered and systematised in theory construction of educational science. This means that the scope of any action, for this work, the action under 'frames of education'[222] and in more concrete yet general terms the 'practical professional action'[223], extends beyond its own construction – but also beyond its own intention (see Paulo Freire's empowering education theory as an effective approach to health education in Wallerstein and Bernstein 1988). The focus of the conflict, which is caused by different positions, can be directed towards the practical actions that can be discussed as pedagogical actions when it comes to raising new generations. However, reflections upon these professional actions get lost by the impossibility of not having a space where to link the phenomenality to a moral trait.

Educational science has a place in matters of medicine in more than one scenario, always when it accounts for the transmission of knowledge, the reflection on the knowledge that is conveyed and the revision of the principles of reality and research that is used. Likewise, educational science as a theory of knowledge can enlist the recounting of historical evidence in social events, wherein medicine was divided into hygienists and medical doctors (Latour 2016). In such a testimony, a sociological process registered an 'access point' to a border of knowledge development for a specific time. Through this point, 'education' marks out how to avoid the trap of trends and look for manners of providing the younger generation the opportunity of thinking for themselves (see Westermann 2005) because not all the positions within one dedicated discipline share the same vision, and therefore, particular individuals need to decide how to perform according to the élan of a time.

Theory construction and social construction are related to each other. Following the same example on the scepticism of representatives of an epoch, as noted by Bruno Latour (2016), uncertainty can help in discussing the place of educational science in the relation between medicine and psychology but in general with many other disciplines.

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[221] I am not yet speaking from a methodological approach. To this point, from a current state of research, I identify that a scientific position appears that begs for an explanation about what this could be and how it can be ordered in and according to a reality of education.

[222] 'Frames of education' relates from a general description to the 'spheres of action' commented upon as a specific relation with methodical control, theoretical reflection and historical contextualisation. Additionally, I use two formulations in order to display the ongoing two moments of knowledge application from pedagogy, one that encompasses the pedagogical outputs and the other that supports yielding pedagogical inputs.

[223] This action will be discussed using the term 'practical deed' within this work.

While theoretical and pedagogical contexts deal with terms of purviews and are not restricted to actions with real persons, Bildung does not imply uncontrolled pedagogical practice (Westermann 2005). However, not all situations happen within a pedagogical realm. This means that the exercise of pedagogy succeeds despite the intervention of the theorist, but the effects of education can and should be reflected due to its ethical and social character in the consequences outside of pedagogy.

Educational science can be addressed under different topics and simultaneously can be questioned in contrasting directions – and as many of them are extraordinarily outside any typical understanding of that which education and educational science refer to – not surprisingly then, when wondering about what then is 'that', which is taken for granted or rejected and how this reaction could be a process of education, more than one contextualisation is admissible for the systematisation of the answer. This also takes place due to deep reflections on questions about the origin of humankind or being more concrete in questions about how statements can be speculated for the purpose of understanding the world or to detect the places in theory where we can get locked into what is approved in academic groups according to their contemporary parameters. Hence, the requirement to recognise in the pedagogical object its synthetic syntax (here in this work with reference to Carnap 1996) appears to be an important element of the current state of research. Until this moment, the synthetic syntax of the educational object has been mentioned in respect to the contexts when they are ingenious & ingenuous, sarcastic and ironic.

In the face of social attachments, scepticism is not an exclusive concept of pedagogy. In reality, it is closer to a concept of logic. Therefore, scepticism is an illustration of a 'connecting point for analysis' to what may happen in social life when this is connected with the theoretical construction. Upon a sceptical action from a social context, levels of theoretical development are obtained according to methodologies of reflection. The situation can also be explained with an alternative sequence of connecting points from a logical-social component on a theoretical level as well. For example, Anhalt (2012) identified that rejection is not a negation of a proposal but the entrance to one space, whereby a decision will be taken during the process of Bildung (Rucker 2014, p. 200). On the level of theoretical construction, the concept was originally proposed as an exclusion or rejection of two options (Günther 2005). Thus far, the order can change the connecting point from a logical-theoretical level to the social component and vice versa; this allows for multiple merge options are possible. For bringing to light the concept of rejection, I summarise (after the next paragraph, using an example based on roles of medical doctors) a negation in a social construction, wherein the openness of the process of Bildung exerts the rules of orientation towards a new determination (Rucker 2014).

From pedagogy, the concept of rejection starts when a person reverts to a recommendation (Westermann 2005, p. 155). In more than one situation, it is well-known that counsel is not an order or an instruction. This way of operation stays behind the idea that a person must be responsible for what to do. Not only by assigning responsibility to the person, but also by determining the purpose of an action, the formulation of statements shows the change between situations and how they are presented. In this way, with regard to purpose and the responsible person, learning and doing can relate to different combinations. I take that *doing by learning* refers to the possibility of making mistakes and, in contrast, that *learning by doing* refers to the

readiness to seek for an expertise that would confirm whether a goal was reached. In both descriptions, the responsibility is laid upon to the person who performs the action; this means that, whether for learning or for confirming an expertise, a mere focus on the individual does not speak about the potential of the person, which is different from establishing a systematisation. In other words, the repetition of a process is not the same as its constitution, in which organisation according to concepts might originate at any level of the action or of its goal, purpose or intention. To this extent, this way of organising elements on the theoretical level would also differ as to the function of the action [function that is commonly taken in terms of physicality and materialistic approaches. Moreover, functions refer to a part of a system that is not the system on itself].

Scepticism as a social construct refers to *an angle of displacement* (Latour 2016, p. 269). With an example of microbial diseases, at the end of the nineteenth century, medical doctors played a role with two purposes, one on the side of the patient and the other on the side of the government. For instance, they had the trust of the confidentiality of the patients, but simultaneously, they needed to report to the state any citizen who posed a risk of the spread of a disease among a community. This means that they were not only confidantes but informants and protectors of the society (ibid, p. 265). This ambivalence in the role of the doctor portrays the different forces that could be placed on a single individual like the medical doctor as an expert in a historical register. From a previous explained logical sequence, when extracting from the theoretical reflection that areas of expertise do not necessarily refer to assumptions from and about specialisation, the individual is covered by means of speculation with questions about who or what this subject is: a person, not a person, an expert, an element in the theory, a composition of organs and systems. Correspondingly, the singularity of every actor problematised with the position of the individual manifests an own process regardless of whether that person is a medical doctor, a psychologist, a sociologist or philosopher, a patient, a learner or an object. Related to studies from the social sciences, a spot is left for making suppositions on how the pedagogical and philosophical theoretical discussions can be pursued.

On a related note, actors are individuals, groups of individuals, theories and subject-matters. As an irritating subject-matter in connection with this set, ‘the parasites’ emerge as actors also as part of some theories. All gathered a situation of components in which actors, professionals and patients took a place in front of a mechanism of change. The topic must be irritating in the theory construction, because pedagogy is arranged with the orientation pattern of particular subjects [with regard to the individual’s potential]. For example, certain subjects[224] initiate a decision-making process without the influence of a teacher to confirm or reject a portion of the knowledge. With regard to particular subject-matters that refer to ethereal objects, their metaphysical burden is not empirical proven; therefore, the description of actors for related actions referring to coming from a non-logical form must be considered. Logical and non-logical forms occur together in different contexts to which I referred according to the composition of the synthetic

[224] Subjects, persons, subject-matters, objects, individuals, actors refer to distinct constructs that I purposely use together to show the reader an example of irritation. At other sections of work, I explain to what these constructs refer and how they can be understood similarly as connected. In the present section, a confusion requires an orientation pattern that can be activated at the reader.

constructs explained by Carnap (1935) [In this respect, Carnap did not write about non-logical forms, but he acknowledged the *non*-logical constants (ibid, pp. 49–50). Nevertheless, he problematised the pseudo statements, ibid., pp. 58-64, which provide analysis to sentences that were originally meant to contribute nothing; but for what do they come about? As a matter of fact, pseudo statements contribute to speak about the expression of non-metaphysical terms. Nevertheless, he problematised the pseudo statements, ibid, pp. 58–64, which help to allocate the notion of an examination upon sentences that originally should not contribute to anything; however, for what do they come about?]. Synthetic constructs explain the connections between valid statements and 'non-valid content'[225] (ibid, pp. 50–58), which I connect to non-valid logical criteria or metaphysical approaches, such as beyond logical forms or extra-logical rules (ibid, p. 50). As a case in point, actors rejected the charlatans, who improve social confusion through an unclear biological mechanism (Latour 2016). In this situation, charlatans, parasites, and reaction can be used to present an exchange of relations. Nonetheless, without a teacher or a doctor or the figure of the expert, a change of opinion was conducted. The question remains as to how the change of opinion from the joint work of concepts takes place. This example shows the position of this work, which leans towards the ongoing development of the human being and thinking. The presence of this development and its latent existence is an essential part in the composition of a reality of education that without the potential of the individual would not be able to mark its independency.[226]

Without putting the spotlight on any discipline or representative of it, knowledge development happens within a complex constitution that educational science tries to compile for accomplishing one goal from a traditional intention: to grow[227]. By supposing that knowledge is a synthetic construct, relations that should be fixed can be shown as separated. As a matter of fact, advances in specialist disciplines like biology have been ignored within the same medical community in determined periods of time, when the medical doctors responsible for the direct treatment of patients rejected the knowledge of the hygienists (ibid). Historically, medicine has showed that is not restricted to one knowledge of 'natural sciences'.[228] These last affirmations are not irrelevant for the composition of a reality of education when showing that a systematic structure from the side of the different disciplines involved is immersed within processes of transformation that educational science can order while focusing on the individual's faculty of progress [and that medicine can draw on biological products that are not just related to the natural sciences]. Throughout history, more than one phenomenon has

[225] In my own words, 'non-valid content' corresponds to pseudo statements according to my understanding of logical syntax of Carnap (1935), who tried to explain that metaphysical content is not in the realm of science. I state that my position is neither in favour of methaphysics, nor for the rejection of content that can be further developed and analysed. In this respect, metaphysics can frame content for a period of time that may come to light in future argumentation.

[226] Flowing into what can be found, the current state of research displays that the individual represents a connecting point with other ways of organisation that must be clarified. As described above, the individual connects with various constructs that cannot all be empirically supported.

[227] During proofreading the text, my editor had the occurrence of a waking poetic figure that gives another description to the intention about making a man out a person. It states as follows: 'to mould a fully formed adult from the raw material'.

[228] Moreover, beyond my line of argumentation, Borck (2016) wrote about the philosophy of medicine for registering and problematising that disciplines from knowledge theories present factors outside those from biology or physiology that affect medical conditions.

appeared in the activities of medical doctors that display that medicine, as a practical science, shares foundational structures and functions of human beings. In contrast to Gifford (2011, p. 357) and many other theorists, I do not target the structure of the 'healing relationship', but I point to the 'conceptual function' (Block 2007, p. 19) of the dynamic of education[229] within a pedagogical process of transformation when recognising the condition of another; this means an educational form, for example, the place of Bildung when considering the concept of diagnosis. [230] This also refers to the connection of elements in a situation, as well as their reciprocal exchange with the surroundings.

From the end of the 1800s, surrounding the mentioned context of hygienists and medical doctors, on the side of educational science all the studies of the structure and function of pedagogy have been of great importance for psychology. The relation between psychology and pedagogy needs continual clarification. As a case in point in this kind of research, data from pedagogy described how children learn according to events that were previously gained (Langemann 2000, pp. 23–40). In a reciprocal way, the involvement of psychology in empirical research lent to 'education' the aura of 'objective science' that was sought during that period of time. In the German area and with reference to a time almost 200 years later,[231] Torben Kneisler (2015) made a detailed analysis on changes in publications of pedagogic and educational science literature. With reference to one study of Edwin Keiner (1999) about the altered communication in pedagogy, he discussed, for example, modifications in pedagogical thinking with reference to sociological changes – specifically with reference to modifications in traits of publications to the work of Piaget. In a related topic to the aura of 'scientific definition', not only to 'objective science', he gave notice to sociological studies for accounting 'available knowledge' in terms of the division of hard and soft sciences (ibid, pp. 179–183). This shows that over the course of years and years, the human being is still trapped in discussions about how to present knowledge and its relevance. In this discussion, 'available knowledge' refers originally to the hard

[229] Block (2007) did not speak about the dynamic of education but provided a clear preamble on the interaction with functional applications of complex subject-matters like consciousness. With his analysis, I learnt about the problematisation of the encounter of positions as about the consequences from the specificity of them. Since within the work of medicine, psychology and educational science, the topics of consciousness and interrelation with the world are handled, I consider it important to relate contents from this disciplinary collaboration based on the fact that educational science has a strong contribution to the understanding, discussion and spreading of these works [because educational science also moves in the realm of development of topics].

[230] With the statement that refers to this footnote, and bearing in mind that the diagnosis concept in my work refers to the situation and to the subject-matter, I risk saying that Bildung is a function of the inner potential of the individual, because the place of the actor involves ongoing actions within an educational systematisation. However, since I made it clear in the first chapter that 'function' problematises cause and consequence when both come from the individual through the basis of analysis, Bildsamkeit in correspondence could be described as a function of Bildung. A larger discussion relies on how Bildsamkeit and Bildung are linked. Thus, this connection point leaves a task for later research.

[231] My statements make aggressive abbreviations from wider leaps in the history of science. Nevertheless, they must be read with awareness of the longer contextualisation of events and the thousands of works that I cannot reference all at once. With this in mind, I rely strongly on the experience of the reader and on the sources for other works that will lead to an unimaginable number of combinations about how to understand the reality of education. I give a place to the individual, and in this sense, I will remain open to the opinions that the individuals can show. With this, I expect to create an interactive book for a communication with the world.

sciences. Nevertheless, approaches like those in the space of communication were submitted to the soft sciences and first modified into hard sciences once they reached the point of having different ways of being read (ibid, p. 183).

In this context, educational science can detect bridges between disciplines by problematising what keeps a scientific endeavour together. In colloquial words, this can be understood under the question about what is the glue for keeping together different theoretical traditions. Like this, educational science identifies a bridge between medicine and psychology for entering into the relationship between them that is established through the evolution of how the human being performs the recognition of another person. Concretely speaking about the modifications in the concept of diagnosis (Wieland 2004, pp. 63–111), when problematising, the concept of diagnosis in an atmosphere of an unalterable procedure runs into the uncertainty of changeable agents. Thus, the human being as creator of realities can put together the need of collaborations in science that originate in specialisations and limited unities. In the concept of diagnosis, the position of the patient as an individual has a place in the interpretation of the recognition of an own condition, which also comes to light (ibid, pp. 32–44). With this, the main place of the notion of individual within an interrelation of positions takes the highest importance. Thence, by acknowledging the place of the individual as such, specifically as a free person with relevance regarding the own condition, the human-centred positions of science have sparked a new age that pursues an integration with the world on the basis of moral values: accountability, individual guarantees, dignity and respect to oneself and to others. This last one makes reference to the example about awareness of own actions in the handling of other persons and recognition that the other person is accountable for herself.

b) Theory of knowledge of the German traditions of educational science

Educational science meets the problem of a 'practical exercise' that the action of raising the coming generations happens with an influence of different disciplines in different contexts. Considering different contexts where specific attitudes of a discipline rule could risk taking at one extreme the opinion that the art of education succeeds without specific requirements for the reflection regarding possible ways to provide the content of education. A lack of specific requirements of education in a context of other disciplines is not the same to a transformation that is not controllable. With reference to more than one country, interest has been given to specific matters of science without repairing how the transmission of knowledge is passed along (Brezinka 1978, pp. 2–10). Further, the self-fragmentation within the same universe of educational science displays, in consequence, several views of the responsibility of educational science (ibid). In this line, the idea must be recovered that science recognises and constructs knowledge, which explores the logic of causes about the phenomena that is delivered. For this, a branch of German traditions related to philosophy and theory of knowledge have been occupied with questions on what and how the work of sciences grounded on the experience of scientific development will be continued (ibid).

One of the major legacies of German academic tradition is the analysis of the reality given or reality created (Sandkühler 2010, §1026b), a division upon which the frame of science is built. Writings on works *from Kant to Hegel* marked a ramification in academic thought about how to organise the philosophical world (see C. L. Michelet and R. Kroners in ibid, §1027). This has brought helpful consequences to different branches

of natural and social sciences such as brain neuroimaging pictures (Görnitz & Görnitz 2016, p. 349) and the independence of thinking in specific topics of science, as in physics[232] (Görnitz 2017). For this work, however, the interest is focused on the perspective of educational science, from which the reflection on how theory is recognised and composed marks next steps of thinking and action.

In the construction of theories, there must be a way to regulate the contents of scientific work. For this task, the theory of the knowledge of German traditions came into sight with a very appropriate questioning of attribution[233] to words and concepts. Within this use of attribution of the words arise questions on the 'scientifical' part of sciences and specifically educational science. This movement of scientific attitudes has happened not only because of the changing environment that contoured the generation of schools of thinking (Gudjons 2010, p. 29) but also because of the requirement to reflect upon theories regarding the way that humanity has earned scientific knowledge and its content (ibid, Sandkühler 2010, §3056u).

Throughout, this thesis has mentioned the rupture of educational science oriented to the praxis on one side or oriented to theory construction on the other; the beginning of the twentieth century inscribed a dispute about methods between *empirical deductive* or *transcendental philosophy* (Lischewski 2014). The recognition of different perspectives and ways of systematisation is one of the possible first steps in assigning a scientific seriousness to one work. Effectively, Hegel[234] provided a rupture in this analysis with his proposal of dialectic based on social dissimilitude (Blankertz 1982, pp. 135–141). Nevertheless, the contributions openly spoken about the Hegelian mindsets must be further elaborated. In the context of the development of the university in Germany, the question of freedom or domination draws a bead on the self-constitution of individuals. This means that not only the separation of positions but the direction of each of them would turn into a change of a 'principle of reality' according to specific contexts [once the individual is taken as a referential point]. One of the questions yielded here asks: which principle of reality could be modified? And in which direction? Owing to a colloquial use, it can be said that what is required for a big company or in a city is not necessarily appreciated in new ventures or in small towns where the speed of life has a different pace. However, this point esteems care when considering that dimensions of places do not preclude individual residents from commuting every day to work in other districts. The movement of actions suggests that more than one starting point can motivate and is motivated from referential points.

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[232] Görnitz and Görnitz made a formulation on how the notion of 'matter' can be corrected and a treatment of natural science can be given to the consciousness itself. In this work, this perspective will not be deepened further since it portrays one of multiple sides that can be proposed for the solution of the division of mind and soul. However, this approach is of interest for this work since it provides the opportunity of speaking about a problem in epistemology but from another viewpoint.

[233] Sandkühler (2010) employs the wording *Bezichtigungsbegriff* on the discussion of the definitions of the concepts of Idealismus, Materialismus, Realismus, Pluralismus, for example. With this word, he called upon the attribution of the word to the word that has been discussed in several contexts under different intentions –giving in consequence a variation on the meaning that can be understood.

[234] Hegel's contribution to educational science comes on the heels of the participation of Wilhelm von Humboldt during times of reform. Humboldt himself differentiates on this addition from the work of Hegel because of the orientation towards systems of formation, education and transformation of the human kind (in Blankertz 1982, p. 136).

Educational science, on its side, was taken to speak on the reality of education (Nohl 1957) because pedagogy was in the middle of a definition between a minimum objective and the influence coming from empirical psychology (Nicolin 1969, p. XXI). To this end, Wilhelm Dilthey previously began with a systematisation of the questions of educational science; however, his students expanded on these thoughts on the way to provide a scientific character to hermeneutic pedagogy (Lischewski 2014, p. 394). Herman Nohl as one of his collaborators, in this case, reflected on the movements of reform (ibid, p. 408). Wilhelm Flitner, followed by the proposal of 'public education' that could be composed between a critical-argumentative and a consensual interpretation of the reality of education (ibid, p. 416), suggested a philosophical character for pedagogy to have an 'own' place within pragmatic hermeneutic pedagogy (Flitner 1950, p. 15).

Along these last lines, Hegel, Dilthey, Nohl and Flitner are rapidly enounced as representatives of an academic group as presented in the leap from the point of convergence of the people to the individual, from the meeting of 'general progress' to 'existence' within its uncertainty and speculation (Blankertz 1982, p. 211).[235] This breakthrough represents the critical point[236] or 'connecting point for analysis' (see *Haltepunkte* in Anhalt 2012, 2010) that must be taken under the review of a 'knowledge analysis' and that can be found within theories of knowledge[237] in the German tradition of educational science.

Within these theories in question, the coalition of several starting points of knowledge development is reached. Thanks to the participation of more than one author with a position distinct from others, contrasting movements within the same propositions became fertile breeding grounds that generate a new perspective. For example, in contraposition to idealism, materialism had an inner movement against the exclusive position of materialist as an answer to the composition of a reality (Sandkühler 2010, §1026b). Or in repeating a similar idea about the difference in dialectic, one might take the 'general' existence of humanity as the ideal of the constitution of man or, conversely, explain the self-designation as a counter term or antonym of naturalism, materialism, realism and dogmatism (Kant in ibid) – with this, I intend to say that sundry options are available, and for this, a concrete referential point should be taken. This current state of research points out the need for development of a systematisation.

Here comes a rhetorical, albeit surprising, thought: Is it not exciting to realise the number of combinations written to explain the human being and activity of humankind? A quick glance at history is enough to show anyone the outcomes of contradictions and

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[235] Blankertz (1982) does not use the concept of progress (*Fortschritt*) in terms of 'general progress'. However, I need to establish the interpretation of the change in the stress field of the convergence between a previous perspective focused on 'humanity' (*Menschheit*) and the historical principle of progress. In a similar vein, the alteration of perspectives that modifies the parameters of control in knowledge development is understandable.

[236] In the historical recount of Blankertz (1982), I did not identify a systematisation towards this critical *place* of evaluation. However, I see in the writings of Herwig Blankertz a source for further theorisation within this accurate description of events.

[237] Different from 'traditional epistemology' or the German *Erkenntnistheorie* in this context, theories of knowledge are not restricted to the review of methodologies but to the study of what is analysed, and how; this refers to the application and keenness upon the content that is reflected (Sandkühler 2010, §3056u).

paradoxes in theoretical thinking. Namely, Dilthey's approach to social sciences in educational science had a different orientation than that given by Comte and his stand towards natural sciences or within reference to English and French positivism (Blankertz 1982, pp. 216–217). Theories of knowledge are not about dialectics and contradictions but about the development of a foundation that heeds the history, perspectives and positions whence 'connecting points for analysis' can initiate.[238] Bearing on educational science as a theory of knowledge, the historical register on which pedagogy is based reveals an understanding of why an approach to hermeneutics achieves a connection to the world. This takes place with the awareness of the open dynamic that remains in the subject-matter under analysis (see Rucker & Anhalt 2017). Both expressions put together can point to the alertness sought by the program of science.

Thereupon, the relation between theory and praxis involves more than just one level of investigation and therefore a requirement for a reflected foundation. In terms of the reflection of a context from a starting point of positions and perhaps in conjunction with the idea that knowledge is not to be restricted to one group of persons,[239] in trying to present a sequence of facts that happened in history, the influence of the Germans within science and in particular within philosophy and theory of knowledge cannot be denied. As the biographers of Kant, Borowski or Hanks and Hodges have inspired the thought: '*In fact, had Kant died and the manuscript for his book of 1781 gone unpublished, he would be thought of today, if at all, as a scientist rather than a philosopher; for previous to 1775 he had published only one treatise, and that a short one, one a problem of physics*' (Deeley 2001, p. 554). German systematisations within different theories occupy an analogous part in the impact promulgated by the patrimony of running time and time itself.

How events happened over history were not always calculated, and all subsequent historians lack further options beyond reporting the irony in the ripening of incidents. Pestalozzi's influence on pedagogy is well known, but less known is how his thoughts travelled to Mexico as represented by Swiss pedagogue Enrique C. Rébsamen to Jalapa, Veracruz (Solana, Cardiel Reyes & Bolaños 1981, p. 83). It would be too much of a simplification to say that this was the main personification of German thinking that reached the American continent. Au contraire, the immigration of Germanic culture to other continents also took place within other areas of research and over several cases in past events. Should it not have happened in that manner, a participative discipline for social processes and its integration in theoretical constructs and composition of current theories of knowledge would not have been delivered. Effectively, the current time could have and would have been different by modifying the cultural interchange of perceiving

[238] 'Connecting points' refers to a resource for keeping the iterative process of science. At the moment when connecting points are linked to synthetic constructs – or identified next to synthetic constructs – the connecting points present their active side. Namely, the resource is activated. In this way, they can be thought of as 'active connecting points'. In this respect, 'connection points' offer several possibilities of problematisation, as they were first hinted at.

[239] Perhaps here also can be set forth a continuous work on the effects of timelines that modify in definitive terms as well as indistinctively the events that will occur. A methodological approach should be in future formulated here on the basis of connecting time, reported consequences and their initial point. This can be taken as an additional reflection in the application of 'time-lag studies' design in psychology, which register the intent to display cultural differences (Twenge 2013, 2010, 2009). On a relevant matter, the reflection rests upon the problematisation of time, actions performed and effects on the conformation of a reality – or principle of reality from the pedagogical side.

the world, namely by changing the ways of thinking. This can sound logically imaginable; however, conceding that cultural scientific societies (Sandkühler 2009) can ground scientific social systems (Stichweh 1993, p. 235) allocates the questions about the extent to which society founds science in reciprocity. This mutuality shows an understanding of systems that do not work in isolation.

The reception of Germanic philosophies in Mexico and Latin America is usually limited by the literacy programmes of slums under poverty conditions (Kneisler 2015, pp. 161–162). In general terms, Latin America went from a history of colonisation to a period of wars and consolidation of political systems. Determined by centralised countries around the development of their capitals or main cities, plus instability in their economic systems and a strong set of beliefs, Latin America signifies an alternative in approaches of education such as those of Paulo Freire (1973) that focused on distinct roles during the educational process (see also Calvo 2012, p. 135; Wallerstein & Berstein 1988). Nevertheless, by considering the option of reciprocity in social systems and ways of understanding the world of science, German educational scientists and scientists from other areas turn to analyse the perspectives of pre-Hispanic beliefs[240] (Mollenhauer 1977, p. 44) in explaining alternative social orders. Mollenhauer (ibid, pp. 39–45), with academic studies on pedagogy, psychology, sociology and history (Lischewski 2014, p. 442), accredited the mystical employment of herbs. Mollenhauer portrayed a functional role for oracles or shamans and medical practitioners, in the instruments, in the rituals, in the symptoms and showed how a translation according to a specific systematisation is possible despite a differentiation of knowledge and development of specialists. Authors from Germanic educational science recognise that the social form is differentiated between the countries (Keiner 1999, p. 38).

2.2.3. Emergence and reduction

Emergence refers to one translation involving a process of analysis that is unpredictable and entails problems of governance (see Hoyningen-Huene 2007). The concept of emergence is deeply grounded in the theories of emergence of the middle of the nineteenth century (Sandkühler 2010, §491b). However, in educational science, emergence is intertwined with theories of self-organisation (ibid, Rucker & Gerónimo 2017). Based on the reaction of the subject to the world as related to an emergent state, the concept of Bildung refers to this way of thinking out of new challenges (Koller 2011, p. 377).

This last-mentioned concept of self-organisation gains a theoretical depth of field when considering the theory of systems (Sandkühler 2010, §2430) as it is being worked by Rucker and Anhalt (2017) in their reflections. For example, in the context of a social system, science appears as an autonomous system that regulates its own restrictions (Anhalt 2010). In this line, autonomy does not relate to the independence of a system,

[240] To accredit other perspectives, allow the thought of other possible systematisations that can, for example, extend the concept of selection following this work – since I left open that other theoretical organisations can appear behind the use of this 'intentional word' and that can later be translated into a specific direction of a concept. As a case in point, from the ancient *quichés* of Guatemala, the heritage of the Popol Vuh's book can also narrate a story of selection through which a civilisation crossed before giving birth to the city of Santa Cruz (Recinos 1952, and a German version from Cordan 1995). It is my opinion that a narrative of reflections of people selecting people also could have helped in founding the organisation of a population.

rather to the 'combinatorial level' of regulation of its relation with other systems (ibid, p. 89). Similarly, Anhalt identified the real impossibility of reduction among systems in terms of correlations – therefore requiring a systematisation. Based on this requirement, I will continue to try to expand the assumptions regarding orders by confirming or rejecting the concept of pedagogical diagnosis at the meeting point of spheres of action by means of a pedagogical translation of concepts. Specifically, a pedagogical translation takes place in the transition from 'analysis concept' to the 'analysis of meaning' of concepts that resemble a situation in which the translation shows a movement that involves the individual.

My position towards reductionism holds the common explanation found in this topic in which and about how a 'statement' from theory A can be reformulated under the frame of theory B – specifically, that from theory B, the 'statement' of theory A can be produced, but that (will) possess(es) an own 'core subject-matter', generating an own dynamic. However, this is not that easy to defend based on the links that connect any subject-matter precisely with the world. For this, pondering the historical division of traditions is helpful in order to give to each one a place that is independent of the others. As a case in point, in physics, 'reduction' appears for translations of applied rules among levels of theory construction (Hoyningen-Huene 2007) that will not apply for other fields of science. In terms of the problem of translating contents within disciplines, the *fundamental intuition of emergence* (ibid, pp. 191–197) takes place, which would portray the incomprehensibility, unavailability and unpredictability of components.

According to the position of this work, knowledge as a dynamic component is a mass that conglomerates information, its application with respective experience that relies on its interpreter and process of new practice. This process is possible to accomplish once the reduction explains the summary of other theories according to purposes of explanation (see, for example, argumentation related to explaining theories of 'Geisteswissenschaftliche Pädagogik' with complexity theories in Anhalt 2012, pp. 106–107, 120–122) or attempts resulting from suppositions of attitudes. On the grounds that in educational science, a person has an indispensable place within the intersection of explanations, reduction possesses rules and offers strategies for dealing with educational complexity (ibid). As such, theories can be explained as models (ibid, p. 167) that can be reduced to a simpler case (ibid, p. 173) without losing 'the heart of the things' (Hagget/Chorley 1972 in ibid, p. 171) in order to be transmitted within the classroom.

Due to the state of consciousness as a topic in relation to this inquiry, the phenomenal character of reflexivity has been problematised under the topic of Qualia[241] (Block 2007,

[241] Qualia as a concept given to a phenomenal character (Block 2007, p. 124; Sandkühler 2010, §2181) refers to a more complex debate on its definition according to *intention, function or cognitive terms* (Block 2007, p. 501). Qualia represents a problem at the moment when it can describe a 'core subject-matter of a perception'. The problem of Qualia remains current thanks to its insertion into use of high technology and standards of models of measurement as in the *supervenience of qualia on the brain* (Horgan 1994 in ibid). Additionally, Qualia as a name is involved in contemporary debates of what can be discussed in philosophy as a *locus of disagreement* (ibid), or attribution or designation term (Sandkühler 2010) or concept that represents a constant problem (Anhalt 2012) based on its 'points of connection for analysis' within other theories. The relevance of this controversy to my topic of 'pedagogical diagnosis and pedagogical translation' relies on the consequence of defining concepts before applying them (Block 2007, p. 507). Dealing with reduction becomes a more complicated task

pp. 501–510). In spite of the actuality of this problem, other approaches to reduction like vitalism failed due to its representatives' inability to present convincing empirical evidence (Hoyningen-Huene 2007, p. 177) – especially in the preamble of operationism following its previous case on logical positivism (Rogers 1992) – I keep in mind that reductionism can clash with vitalism by dint of the theory of emergence (Sandkühler 2010, §1662). Werner Leibbrand (1956), as a psychiatrist and medical historian, opened with great circumlocution the presentation of his 'Great perspectives' in *Die spekulative Medizin der Romantik,* as a path through time that leans upon any trial of an 'independent world' – i.e. pushed from outside (ibid, p. 12) – as part of its inner natural form. With his explicit romantic description, slanted idealism of an 'endless' reality and as an expression of the modern worldview (Sandkühler 2010, §2344bu), Leibbrand achieved the underlining of the imaginative strength of a process towards the holistic understanding of nature. Unfortunately, within the confrontation of positions, his writings can be also discussed under a vitalistic notion of the world (Lachmund 2009, p. 496) and thus be discredited without deeper reflection.

This last example should clearly lead to the idea that reduction must not mean the refusal of a first existent object. Reduction is an attribution from one theory into another (Sandkühler 2010, §2272u), and since it sets forth the encounter of positions, it opens a space for discussion and negotiation regarding the translation of elements (ibid, §2273). The philosophical problem of reduction contemplates dealing with the systematisation of a specific theoretical position. Furthermore, in terms of reduction, this mentioned systematisation is better understood in retrospect with the historical delineation of facts. This means that (1) reducing the language of a specific discipline comes along with the whole interrogation of the theoretical construction, or (2) it is marked as an ontological reduction that does not require paying attention to previous considerations.[242] Both mentioned cases of reduction involve an attempt to aim to fulfil, in similar ways, a principle that I can refer to as a *principle of conservation*. From a natural and logical inspiration, I identify this as a basic notion of maintaining an equilibrium within the human construction of knowledge.

In order to respect the property of asymmetry (Oppenheim & Putnam 1958, p. 7) in terms of the diagnosis concept seen as means of change, the task is to analyse whether the content of the process of transformation can be reduced in the process of diagnosis. Respectively, this refers to whether the process of transformation can be incorporated within a process set in motion by pedagogical diagnosis, keeping in mind that the diagnosis concept refers to means.

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when is not clear what can be reduced, as in the case of Qualia. Perhaps the definition of reduction must also be deflated and extended as it is elaborated by Anhalt (2012, pp. 129–133) for the explanation of a concept. Like this, the transmission of knowledge would allow further connections and discovery of 'points of connection for analysis' in the further definition of concepts. This would refer to an additional advantage that brings the systematization of knowledge under frameworks of educational science. After all, the concept of reduction in discussions of the problem of the body and soul can be used within a research program after the motto «*lasst es uns halt mal versuchen*» (Schwegler in Pauen & Roth 2001, p. 63) in the sense of *let's try how it works* to reformulate a statement under a different perspective.

[242] From the pedagogical-theoretical approach of tension between older and younger generation, the force coming from new generations presents the benefit of wondering from a distinct place wherein some previous reflections were made. The force of new developments generates modifications on beliefs that can sustain how similar the world is, albeit viewed differently by other cultures.

Considering that neither the transformation process nor the diagnosis process are irreducible with respect to each other because they are defined by different intentions and thus define different processes, even if they are at a similar level in terms of dynamism, the analysis based on their similarities, observes their differentiation. In the same vein, the diagnosis concept is not to be reduced into the process of Bildung because, as I referred to Anhalt (2010) above, a reduction would not be possible in terms of correlations among systems. However, theories of diagnosis can be explained under a reformulation of terms into models of self-transformation when interacting with the world.[243] This is especially possible when theories of diagnosis can be explained as models under other traditions for the purpose of understanding, discussing and teaching knowledge inside medical programs of study. Along the lines of the observation in second order, when this method comes from the theory of knowledge of educational science, it can distinguish that theories of diagnosis possess a description within different levels of action. Thus, theories of diagnosis allow reducing diagnostic models in processes of self-transformation as in the process of Bildung through the explanation of emergent components in these interactions, such as emergent components that come from a changeable social environment.

a) Postulates regarding a collaboration between disciplines in a neurobiological work

In modern times, the excess of possibilities of theorisation leads to difficulty in setting rules about what belongs to which discipline – for instance, the own definition of discipline raises a historical problem about the definition of the transmission of scientific knowledge, correspondingly about the 'traditioning' or handing down of ideas from the past into the present (Stichweh 1993). To set a strict division on what is inside one area pledges some beliefs and the consequences that come with it. This means that there is no way for a theoretical reduction not to imply creating and revealing a new perspective and, as a consequence, stating that specific knowledge belongs only and uniquely to 'a' or 'b' field of study. However, in the momentum of collaboration, experts gather with their expertise that takes a starting point in which every discipline has a position. This is to say that educational science is not psychology and any portion of either can be a neuroscience, as an example of three main areas handled by this work. Notwithstanding, at the initial point of a 'hypothetical' collaboration, disciplines from both sides (following the example of only 'a' and 'b' field of study for ease of explanation) allow connection between knowledge from neurobiology that is oriented to problems in a 'current' definition and the framework of what must belong to psychology, for example, and what alternatively belongs to educational science.

Going one step backward in the review of this idea, by this point, in this work alone, names and definitions of theoretical positions have been written through time and in different areas and contexts. Without trying to scare the reader, here comes even more! Due to the richness of scientific contributions, the aforementioned overwhelming quantity of texts and production of knowledge cannot suddenly exclude one author associated with sociology or philosophy to other areas or a mix in between. Particularly, the elegance of the diagnosis concept includes the writings of semiotics or interpretation

[243] A connecting point from the reduction mechanism appears constantly at this moment since the interaction of the self with the world itself holds an emergent process of transformation, namely, to be able to understand the world from a first time, as during a first approach. Regarding such a process, this work calls the reader to consider caution to prevent a solipsistic formulation.

that can be handled and discussed within the writings of Locke, Hume, Kant, Hegel, Nietzsche and more (for more on the topic of semiotics,[244] see Deeley 2001, p. 543). The reader is directed again to the question regarding 'where to start?' Along with a historical calculation of 'facts', the idea of starting from 'zero' was contemplated (ibid, pp. 540–589). Following the way of reasoning in all the traditions that have their roots in the Greeks, it is possible to wonder what they might have followed if anything had previously been systematised according to the authority of science. This option recalls a modern possibility of starting from null that belongs to the group of the *nominalists* (ibid).

Starting from null,[245] then, is to query how to put under question an own formulation. For this, constructs on 'beliefs', 'opinions' and 'knowledge' (in reference to some ideas of Kant in Sandkühler 2009, p. 96) might help any scientist to turn to discern what a critical eye can do. Here, a common work should be considered, which started with a previous formation of a scientific group outside of an imaginable collaboration (e.g. the compound between natural medical and human pedagogical traditions). From the theory, I formulate the suggestion that the null point is located in the observation but should not be situated simultaneously on the observer or on the foundations of the observation because the constellations of the world are already in place. [246] To this extent, postulates regarding collaborations do not target denial of what was previously done. Alternatively, if the null point can be located in several places at once, then there should be a framework that constitutes and validates this formulation, which is not a position that I am in any event proposing. [247] Due to the purposes of this work, three different entries for observation with different rhythms in their composition – the situation, the interpreter and the subject-matter, under several possibilities of moments – are caught in the current state of research for being conceptualised.

Hence, the aforementioned entries for observing cannot be made without reference to previous theoretical traditions. These different traditions interact in a reality of teaching, and therefore, while observing with a mash of orders, a second-order observation[248] is

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[244] As a matter of fact, Deeley (2001) has not written a treatise on diagnosis concept. However, by problematising the studies of *indications* that take place in a process of recognition, signs and a process of understanding, also known as semiosis (Liu 2000), the diagnosis concept opens a door to enter into the way that theories upon expert and non-expert are formulated.

[245] Starting from zero can be further problematised by considering the alternatives inherent in the intention of the history of science. For example, either moving forward according to research approaches during the nineteenth century by forgetting old knowledge or making a revision of previous content sets a later definition of what actions are to be followed (Stichweh 1993, p. 240). Like this and in brief, I suggest awareness that 'starting from zero' at any point reaches in reality the option for really forgetting all that was previously done. Likewise, this position helps to be careful when using a naïve basket for collecting all the elements with an eye to reviewing or at least supposing about former ideas that have been written applied to fresh occurrences.

[246] In addition, linking the observation with the observer will bring an act of soliloquy closer. Namely, other methodologies of private therapy would be recommended instead of an analysis of theory construction.

[247] The proposal of a concerted system has a clear application to particular cases that are immersed within a complex exchange of assumptions. Nevertheless, although this system has a place for the individual position, the complex description of a reality of education would not cover a whole order explanation extended to all the disciplines or ways of thinking.

[248] The second-order observation is accompanied by implications such as collaborative purposes and definitions of borders from own positions, as in the way that is mentioned throughout the thesis.

necessary in such scientific work of pedagogy. To this end, the collection of knowledge, the recognition of knowledge, the criteria for the selection of this knowledge, the intention and purpose in the transfer of knowledge, the references to knowledge as well as the organisation of knowledge are some of the moments necessary for establishing analyses and the composition of a system that explain the reality of education. In the history of the evolution of empirical and hermeneutical methods, Locke's omission, in terms of repair regarding the difference between the qualities of the things in themselves and the mind, provides one notable example (Deeley 2001, p. 547) of previously overlooked distinctions. Such is an unintentional failure that is considered in the problematisation between mind and body with the intention of learning from past actions as may be proposed by pedagogical contents.[249] The number of trivialities is expressed through participation in the mind-body discussion, and thus, this well-known discussion can be traced back to a wealth of points of reference. Educational science has yet to add further considerations, on the one hand, to contribute to this framework and, on the other hand, to set borders from what is outside its scope.

2.3 Description of different points of observation and what is observed

For describing the foundations of research pertaining to the interface between pedagogy and other disciplines, a common language must be set as a midpoint. Such a language requires the influence of mechanisms of reduction and viability[250] that will awaken other perspectives whose presence in modern times cannot and should not be ignored. This happens because, in modern times, systems can be connected to every subject-matter of another system or to isolated parts of other theories. The requisite property is that a formulation must reflect the knowledge of counter positions or at least awareness of the historical position. Hans Jörg Sandkühler (2009, p. 56), for example, opening an argument on cognisance and representation,[251] went almost directly to the point when he mentioned that assuming a position of cognisance brings a recognition of an external reality in which the cognitive statements can be constructed. On top of that, this would have consequences for the suppositions of 'representation' in general, but specifically for those which Sandkühler (ibid) handles.

Why is this important? Why is it necessary to identify the position of reality and entries of observation upon the reality to which a scientist, an educational scientist, refers? Following the idea of Jürgen Grzesik (2010, p. 152) on the collaborative form of combining research with medicine or neurology, the connection of an object of educational science would be made once the phenomenon of education has taken place

[249] At this point in time, here I mark that to find the place of pedagogy where it may or may not follow an intention from the past could be the opening for a further inquiry under a problematisation with the interchange of the society and the influence from the individual. Hence, I used in this exact previous statement the modal verb 'may'. To this extent, Schleiermacher aimed from Rousseau's focus on individual position to consider a moral obligation with the society (Benner 1991, pp. 48–52). By questioning: 'what does the older generation want with the younger one?' (Schleiermacher in ibid, p. 48), an inquiry started regarding reflection upon ethics, education and society. This can be understood in other words as an inquiry in relation to educational measures depending on the state and credibility of social powers (ibid, p. 64) and in consequence to possibly ensue a purpose that has a historical origin.

[250] These mechanisms are to be extended on other mechanisms as reduction with emergence, emergence with viability and/or viability with selection. These last mentioned, while being only some extensions among others, are to be related to the theorisation of more mechanisms.

[251] *Erkenntnis und (Re-)Präsentation* (ibid)

through the functions of organic processes of the central nervous system. But how might one delimit the 'phenomenon of education' under the plurality of perspectives? With regard to the plural condition, Sandkühler (2009, pp. 63–67) calls upon the 'cultures of knowledge' for describing the composition of knowledge and truth according to compounded frames of thought related to historical and sociological reflection (ibid, pp. 69–70) or following determined borders of knowledge. These cultures of knowledge can be discussed under the frame of 'epistemic cultures' of Knorr-Cetina (2003), thanks to the reflections that she has done in connecting differentiation theory with an example of culture and hermeneutic tradition as with a problematisation of instrumental tasks.

Therefore, the researcher in education should be skilful in many other practices at the same time while portraying the own practice that is under constant definition. Those skills aim to raise awareness about what is being studied in contemporary times and to stay connected with the content of the advances of the academic world related to technology. At the time of writing this thesis with the purpose of addressing the common view between medicine, psychology and educational science, current research in these mentioned fields shows a connection in their work. This means that research has been fruitfully reached despite the supposition of incompatible vocabulary among fields or unsuited methods or dissimilar objects of study. By way of illustration, in successful cases, there is a complementary relationship between the psychological and neurological phenomena that reside in the same physical sites of the brain, and at the same time (Sandkühler 2009, p. 153),[252] which are still problematised in terms of the connection between psychology and educational science.[253] For example, through the problematisation of the concept of consciousness and its understanding for transmission, a synthetic construct presents connecting points for the encounter of methods and definitions. Supporting the development of neuro-topics, educational science contributes to such a task with new research approaches.[254] Educational science reaches this purpose from a systematisation in second order upon the search of Bildsamkeit on neurobiological theory construction. Concretely, educational science helps to formulate the object of education and to identify differences from other study objects. Therefore,

[252] Jürgen Grzesik (2002, pp. 234–239) identified that a relation between psychology and neurobiology can be explained in terms of a methodological collaboration of distinct disciplines (like neuroanatomy, neurophysiology, neuroscience and psychology itself), which in the moment of the methods' application does not differentiate between them. Since suppositions in neurobiology work with their own formulations within the neurobiological field (ibid, p. 235), and psychology looks for foundations in psychical process (ibid, p. 236), they do not collect evidence on physical conditions (ibid) but on and for their scientific character due to the integration and appropriation of terminology (like this, neurobiology employs concepts that come from psychology, for example). In other words, Grzesik (ibid) identified that these disciplines *complement* each other; namely, they are *compatible,* and they *add* knowledge among each other – in the sense of *broadening* their scope of results (ibid, p. 236). Based on the approach of learning, he displayed a connection between neurological and psychological findings (ibid, p. 239).

[253] Steffen Schlüter (2013) studied the historiography of the concept *Wechselwirkung*, in German, from the analyses of Johann Friedrich Herbart, that Schlüter problematised with the concept *Interaction*, in English, from the writings of John Dewey (among other endeavours of introduction, transformation and application of this term). With a deep course through historical positions, Schlüter (ibid) displayed that 'the self' and 'not-self' from Fichte, and taken by Herbart, presents a '*reciprocity of action and reaction*' (Kant 1855, p. 111 in ibid, p. 16) in terms of introducing the physical life into interaction of natural phenomena (ibid, p. 358). He problematises the science from the time of Newton, in which mathematics were employed to present dependencies of the mind to observable objects (ibid, p. 359).

[254] A footnote here is deserved for a deliberate repetition as a rhetorical argument: the problematisation of the object of educational science relates to the systematisation in second order.

the tight correlation of these disciplines, one to another, can be extended, including the question of how one discipline perceives what another misses when looking at the same subject-matter.

With the socialisation of the 'cerebralisation' of statements related to neuroscientific research, a door has been opened for the inclusion of other disciplines. Specifically speaking about the 'cerebralisation of the pedagogical discourse' (Becker 2006 in Schlütter 2010, p. 107), the difference in positions for speaking about a first-person or a third-person perspective has blurred the accuracy of perspectives or presented one only full-position of expertise. Additionally, the position of the universality of the brain in contrast to the position of the particularity of an individual (ibid, p. 106) has unlocked a systematisation that should contemplate the specificity but generality of disciplines. To this extent, a brief discussion of the 'sphere of action' from educational science and pedagogy is problematised immediately in the next section under the concept of 'epistemic cultures' (Knorr-Cetina 2003) where specific tasks, when performed, leave an entry-point to goals – which consequentially can be discussed in terms of the theoretical intentions from whence they come. This sphere of action might consequently link the difference between diagnostic and diagnosis through a specific moment of pedagogical action by means of the pedagogical translation during the integration of philosophical reflections and theoretical positions. The point of observation in this work attempts to discuss how concepts are interrelated and how they are recognised by the self. In this way, I suggest taking a look at the common practice of recognising the condition of another person in order to problematise that every discipline associated with a common action has a place to make a reference to the world.

2.3.1. Brief discussion of the sphere of action regarding educational science and pedagogy

The sphere of action within and coming from educational science and pedagogy starts with the differentiation of theory and praxis in pedagogy. This means that in the dualistic discussion of what might come first, the position of thinking or its location, a sphere of action has a suggestion of its own regarding the praxis (Schleiermacher in Brezinka 1978, p. 11). The consequences borne on this basis will give the theory a more solid place (ibid, p. 18) along with its analysis of the meaning of thinking, who is thinking and how many different combinations of the explanations are formulated without excluding some parts between them. The question of whether we act on specific goals or declarations of intent does not matter, but that we can perform deeds [deeds that can later be analysed within different contexts]. Based on (1) goals, (2) purposes and (3) traditional intentions, the practical deeds offer a space for problematising (1) present, (2) future and (3) history.

In an educational scientific perspective, the theory is the key to containing what would be understood for praxis. Obstacles to the theory's ability to widen its own content are resolved through the constant movement of the individual along with the transformation process. Specifically, the theoretical barriers can be addressed with the dynamic of Bildung in terms of Bildsamkeit (i.e. the individual's faculty of progress).[255] The way

[255] Educational science has messages to deliver on the reflections of self-culture or interactions within oneself. To this point, research on connections within one same system is moving in the development of elegant research formulations in the neurobiological field. Furthermore, many of these questions are

that combinations between theory and praxis might work is related to surroundings, upon which interplay with the self holds together the content of educational action. Thinking of people who perform the spoken combination based on a person's inner potential is part of a pedagogical proposal that can put together social approaches and knowledge theories. A suggested solution works as a 'practical theory' that offers this framework and that conveys the *what is* and the *what should be done* (Brezinka 1978, p. 4). I therefore aim at the tension that creates a connection to the 'structural condition'[256] that must lead to recognition of the actions and that must simultaneously be recognised in the actions for its subsequent indications (ibid, p. 5).

After recognising the conditions attached to the theory, a distinction can be made in the formulation of statements between the 'theories of guiding'[257] and the content that is handled when moulding a new opinion (see ibid, p. 42). This distinction corresponds to an organisation that separates the 'science of education', 'educational science' and 'pedagogy or educology'. In this latter differentiation, the basic equation consists of the 'expert' or 'educator' and 'learner' or 'pupil' – 'addressee of education' in pedagogical terminology (ibid, p. 43). As for the relation between these two parts, a goal is needed to define an action as a pedagogical action based on a structural condition (ibid). On this basis, a systematisation is called into questioned at every moment of starting a proposal for education because many scientific tasks are linked with an educational goal. In this respect, alertness is also called when considering social actions, since historically they can be characterised alongside their moral repercussions. Due to habits formed from the source of repetition of activities, their consequences must be estimated in order to explain the normative problems that are attached to several points of origin [for example, deeds and replication are attached to these last statements, which should reflect different directions from different referential points].

Structural conditions[258] give a basis for world views that can modify the meanings of what *is being done* within a specific academic group. Pedagogy and the science of education are academic groups that I now want to explain with the aid of 'epistemic cultures' as a concept related to the ideas of Knorr-Cetina (2003), with specific objectives for each one of them about what defines groups so that they act in a specific manner, with concrete tasks and for a particular purpose. I explain the condition of these epistemic cultures according to an educational reference through the spheres of action from pedagogy and educational science. For instance, an epistemic culture is tied to processes of change and their contradiction in the development of new directions (ibid,

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accompanied by the employment of fancy techniques that, due to elevated budgets, ranks with the wish of certainty and rigorousness – this is not a criticism of any position but perhaps simply an option to command attention. In counterpart to neurobiological research, the complexity of educational science offers a systematisation that can be employed to stimulate the disclosure of arguments in a disciplinary collaboration. Specifically, the complexity of Bildung presents a connection with the world that can interrupt a dualistic position. Many researchers under formation, from different disciplines, bite the bullet of explaining a proposal of research in terms of effects or direct influence on the surroundings thanks to the direct interaction with the environment. As I previously mentioned, although this work is not so specific about the historical analysis of a concept, it must provide points of connection for analysis with a general idea of theory construction that has in consequence an effect on the guidelines employed for conducting academic investigation.

[256] *Gegebenheit* (ibid).

[257] *Theories of guiding* in reference to the execution of the action but not yet the reflection.

[258] These structural conditions can be organised within systems in attempting to produce explanations.

p. 241). Pedagogical epistemology speaks[259] about 'knowledge development' of connecting points – for analysis and those for further analysis as presented by Anhalt (2012) through the 'circle of problem development' and '*Haltepunkte*' or 'joint points' or 'breaking points' in the theories. I find Knorr-Cetina's (2003) notion of 'epistemic culture' useful, thanks to its systematisation in its connection with 'knowledge society' from some 'structural forms' of the construction of knowledge.[260] Upon some of these forms, repetitions can take place that would support taking decisions based on previous knowledge or alternative approaches. For example, not everything is translatable from object-centred to person-centred and from person-centred to an interaction that is 'object-person'-centred in reciprocity. Therefore, when a theory concerning the complexity of educational science is being worked in conjunction with the dynamic of the complex process of transformation of Bildung or self-transformation, a position of malleability (also flexibility) is given to the 'guide wall' of the structural condition of pedagogy.

This 'guide wall' as the blind spot, where an own disciplinary language can be conformed, would stem from a second-order observation that marks where it can be extended. Thus far, the liaison between different levels of understanding, registration and later reflection presents a proposal of a solution towards the integration of the human in the process of science and of 'knowledge development' – which I present according to the order of pedagogical diagnosis [specifically, as a recognition of the reality of education by means of a concerted system that is composed by disciplinary collaborations]. This is an innovative way of presenting educational scientific programs because of the recognition of the role of the human being, the recognition of the recognition concept and the many implications of this analysis within its surroundings. Whether some content is translatable relies also on the decision of the individual, and here is where the system of educational science is distinguished from other systems because it considers the process of transformation within oneself. Now, in terms of translation, certain concepts must not be translated because they have an origin in determined epistemological traditions,[261] or simply, they do not require any translation. As such, the learner in the object-centred perspective of pedagogy does not ask for a translation – in that the learner *is* the object – when the methodologies have been and are being written by the movement of the learner under consideration. Within the

[259] I am using the term 'pedagogical epistemology' as a shortcut of 'knowledge theories of educational science' in order to leave an understandable statement. Nevertheless, the reader shall come back to the idea where epistemology has own contents and where a long discussion of educational science that is a knowledge theory presents a difference in traditions between philosophy and pedagogy. To repeat constantly the differences detected throughout the text might resemble an exhausting task; however, they boost the active awareness on connections of concepts. In this respect, the tense employed in the statement that connects this footnote shall reflect the possibility and not an affirmation of a present-tense activity – perhaps a better formulation would be written with a conditional modal verb like 'would' or 'should' (i.e. 'Pedagogy epistemology would speak about 'knowledge development' of connecting points').

[260] A construction of knowledge that in terms of Knorr-Cetina (2003) relates to the knowledge society, in which an open participation from several cultures is manifested. To this extent, I can understand that these 'several cultures' are in the line of 'perspectives' from the complex educational scientific approach of Anhalt (2012).

[261] Similar to what Ian Hacking (in Kuhn 2012) wrote about 'Incommensurability' in relation to the different doctrines in the 'Introductory Essay' of 'The Structure of Scientific Revolutions' Fourth Edition (ibid, p. XXXI).

pedagogical tradition, more than one knowledge theory can be problematised with the construct of epistemic cultures since more than one approach have displayed different directions. As such, differing from sociology, the educational theory offers a place[262] to consider the person, *their* interpretation and movement as well as their development[263] – in terms of the inner dynamic of subject-matters that occurs while in an educational process.

The interpretation of the subject-matter of the learner from a person-centred or object-centred perspective would vary depending on the goals from the definition of education that is taken (Brezinka 1978, p. 47). The localisation of goals is one of the advantages that the systematisation of educational science offers, where the contraposition *Against Method* and anarchical 'anything goes' of Feyerabend (1975, pp. 14–19) must not appear as part of the definition of the goals.[264] Nonetheless, the localisation of goals offers an entry-point to a systematisation towards a constant movement and adaptation of its contents. To this point, I have used a blurred distinction between educational science and the science of education[265] (according to the proposal of the translation into English of '*Erziehungswissesnchaft*' of Brezinka 1978, p. 38); this can be taken as a proof of the potential of the wide and stable systematisation that the discipline and its terms portray. As a case in point, this steady-robust but flexible organisation succeeds by virtue of the learner-writer and reader of this work, for example.[266] I link different sections – educational science to the theory of complexity of education and science of education to a theory of second order of observation on the development of knowledge in theories of education[267] – but I am mixing them in an attempt to explain the participation of the

[262] The place opened up by pedagogy relates the knowledge theory with reference to pedagogical authors. I do not give any criteria of value to pedagogy over sociology or the other way around since they are two distinct positions that can improve on their traditions.

[263] Sociological studies in pedagogical tradition would speak about only one part of the information that must be considered for analysing the pedagogical tasks.

[264] I establish a border with the writings of Feyerabend (1975) based on the institutional descriptions he made regarding the topic of 'education' that, although rich in stories, did not connect pedagogues with his philosophical reflections.

[265] The term 'educational theory' is also referenced in the realm of knowledge of 'education' (Brezinka 1992, p. VII). In this order, 'educational science' is often related to the scientific pedagogics (ibid, p. 1) or to the development of a science of education. To this extent, I marked starting with the introduction the way that I handle the difference between these two constructs: 'educational science' on the one side, and on the other, 'science of education'. As a brief reminder, I take educational science for relating the second-order observation for the analysis of meaning of concepts. I take science of education for presenting the project of pedagogy as a science.

[266] After finishing writing the theoretical basis, the current state of research and the conceptual framework along with a draft of the last two chapters of this work, a sketch of presentation of the content of the thesis and a guideline about how to read these reflections was written. In the very last versions of this writing, emphasis is given to the collective composition of the work with the reader. This book is intended to be read by medical doctors, psychologists, educational scientists and philosophers; therefore, a systematisation of the readers themselves is integrated in the intention of the analysis of this dissertation.

[267] Both of which refer to something different from the 'scientific education' that according to Feyerabend (1975, p. 11) would have the aim of simplifying 'science' by the simplification of its participants. In this case, a historical situation can be isolated as if nothing could be associated with a specific subject-matter. However, Feyerabend also identified the place of individuality for its problematisation of human liberty and its role in its composition of rejection. His idea could be yet more widely discussed based on the position whereupon he interprets the phenomenon of education, perhaps as moulding of figures or as a mutilation, as of parts of the body – as he mentioned the example of the

individual in the creation of a reality. With this relation, I intend to develop a concept of a sphere of action from and based in pedagogy and educational science that accounts for the current state of this research, which includes pedagogy as a discipline and the topic of 'education' as active recognition of knowledge. This is an undertaking to show that the sphere of action of pedagogy lies next to the historical report on the re-thinking of knowledge according to structural conditions, epistemic cultures and social systems.

Regarding the sphere of action of educational science and pedagogy in terms of a metatheory of education, the phenomenon of internationalisation of knowledge must be yet discussed. Against this background, the 'principle of reality' in the 'particular sphere of action of educational science and pedagogy' as a general and integrative topic has hitherto been important, because once principles of reality are examined, a consequent ramification would provide a basis for a connection. Internationalisation of approaches can therefore show that the 'pedagogical person'[268] cannot be regarded as a self-evident object of study or subject-matter. Hence, in order to understand the problematisation relating to why this can or cannot be this way requires a fundament [thus, a fundament can be specific and specialised contrasting with the integrative sphere of action about what pedagogy is]. Related explanatory reasons may appear, assuming that the history of mankind is the same on all the continents – a fact that was outlined in this work that cannot happened in that way – when the realm of knowledge of 'education' has been pushed by local factors that later have been translated into global consequences.[269] Like this, by pointing to the problematisation of different epistemic cultures within science, the organisation would differ each time a connecting point is taken from different beliefs.

Scientific questions modify their course according to the goals they can achieve with respect to the available resources. Namely, scientific questions have developed on a path of exchange between inference, induction and abduction (see, for example, Pierce in Deeley 2001, pp. 609–622, 645–650). Once the meaning of what is given and what is built is turned around, for making an analysis of the meaning, then one can wonder about the *anomalies, emergence and crisis* (see Kuhn 2012) of the sphere of action of specific and other domains. In this work, a pedagogical reversal refers to the scope of theories of pedagogy and educational science that have alternative proposals to those made by Kuhn, for example. The reader of this paper creates a proof reflecting what can be achieved. A systematisation coming from a problematisation between pedagogy and educational science interacts with wider suppositions as to the nature of science. Therefore, the localisation of entry-points to one complex system through spheres of action facilitates a pedagogical approach for rethinking about contents for teaching. Those contents modify the system as to where they are inserted and, in consequence, the system can alter the understanding of the reality of education [this system will be referred to as a concerted system at the end of the work]. In general terms, the spheres

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Chinese lady's feet (ibid, p. 12) that is in counter-position to the 'Project of Educational Science' and its valorisation on the potential of the 'ability of getting though' or 'faculty of progress' (Anhalt 2012) of the individual.

[268] In trying to relate to the idea of a person, an individual human being who can be taken out of a pedagogical tradition, I thought of a connection like 'educational human being'. Nevertheless, the focus should aim to the 'person' from pedagogical theories. Thus, 'pedagogical person' also reads plausibly against such a notion. I write this footnote based on the welfare that a person has to uphold.

[269] One of the authors who has laid a special emphasis on this reading between local and global consideration of a term is Ian Hacking (in Kuhn 2012).

of action from educational science and pedagogy connect distinct subject-matters to different fields of action as a current state of research. In the next chapter of conceptualisation, I propose a mechanism of translation for explaining how this connection takes place. The interest coming from different academic groups that can comprise distinct epistemic cultures will contribute with the development of their own perspectives to the encounter and interchange of positions.[270]

2.3.2. Brief discussion of the difference between diagnostic and diagnosis

Diagnosis started to earn a central role around 200 years ago (Sadegh-Zadeh 2011, p. 357) after prognosis occupied a primary place in the interest of healing. Between prognosis and diagnosis, the complex structure of clinical trial and medical research can be localised.[271] In this vein, diagnosis is concerned by the area of tension connecting clinical practice and clinical research on the uncertainty of the '*intersection between epistemology, decision-making and ethics of clinical research'* (Djulbegovic 2011b, p. 1), also known as equipoise. However, diagnosis in the intersection of clinical trial is only one feature, or two when including 'prognosis' as diagnosis and prognosis can be considered together, among many other 'healing relationships'[272] (see Sadegh-Zadeh 2012, pp. 275–298) that define the different tasks to execute. The uncertainty from the diagnosis concept speaks about the ongoing process of research, which must be pedagogically problematised, with the intention of explaining a dynamic subject-matter in the oasis of reflections and concrete actions.

The other features of the 'healing relationship' refer to anamnesis, therapy and prevention (Sadegh-Zadeh 2011, p. 357). Sadegh-Zadeh (ibid) has shown that the

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[270] I am aware that Knorr-Cetina's (2003) approach of regarding 'epistemic cultures' had a direction towards social composition of knowledge and identification of artefacts, objects and specialists such as negotiations upon them and between them. Notwithstanding that I take a brief reference from this proposal for the understanding of the reality of education, at the moment of writing the current state of research for the identification and recognition of the subject-matter with which this research interacts, the construct of 'epistemic cultures' suits the explanation of spheres of action from pedagogy and educational science. In referring to 'knowledge society' and to the integration of different participations, I foresee that this construct deserves a longer discussion from pedagogical theory in order to present an integration with other systems. I propose in this dissertation under the term concerted system an integration for understanding the reality of education, where the 'active participation' must be integrated. As such, this dissertation is only a small step in a wider systematisation of a present timeline on my career plan that must be confirmed with the execution of future research.

[271] I explain this complex structure remotely because I have no medical studies nor of philosophy of medicine that I would otherwise discuss in a larger monograph on specific cases. As a case in point, Sadegh-Zadeh (2012, pp. 711–756) wrote a chapter on 'Medical Ontology' for discussing some connections between medical research and practice.

[272] 'Healing relationship' possesses features that are not only discussed in the medical realm (Sadegh-Zadeh 2012, p. 275). As a case in point, 'healing relationship' is embedded within a system where different components (ibid, pp. 273–274) take part in the interaction represented by two persons. The family is part of the components outside of clinical practice, which correspond to this system in addition to the relations between 'science, professional communities, economics, technology, politics, religion, and others' (ibid, p. 274). On-site components may refer to groups, specific persons like assistants and tasks that may lead to contradictory actions if not trained. I suspect that conflicting situations can occur if the content is not focused on the same goal. Nevertheless, setting a goal or a later achievement of a goal is no guarantee for solving or avoiding problems. A scientific work manifests that a research approach does not have only one explanation but a discussion of multiple location points, including those that are situational and temporary. As such, a shared frame of reference, if achievable, belongs to the diagnosis state-of-the-art held by an environment of directions within a systematisation.

description of the *'true state of the patient'* (ibid) under the usually best-known term 'diagnosis' represents a problem in epistemology and ontology. In my interpretation, this happens due to the bulk of complicated components involved from a pile of perspectives that intersect concomitantly. In a similar vein, on a level of analysis, the different types of possible diagnosis that can be ordered according to a first level of observation or description and a second and third order of inspection or construction[273] must be distinguished (ibid, p. 358; 2012, pp. 845–968). These certain levels of analysis proffer known compartments between the investigation on a patient, or 'diagnostic', and the output of this investigation, or 'diagnosis' (ibid).

Hippocratic doctors appropriated the Greek verb *diagignôskein* and the noun *diágnôsis* (Laín Entralgo 1982, p. 3) to refer to the inquiry regarding the knowledge of the disease. This procedure is based on reasoning, recognition of the other, fundamentals in the recognition of the world, interest in both of them and the faculty of observation of what is 'hidden' (ibid, pp. 9–10). Following the vocabulary of Thomas Kuhn, the medical researcher historian Pedro Laín Entralgo (1982) selected and formulated the term 'ancient paradigm'[274] to refer to the paragon that from the time of the Hippocratic doctors to that of Thomas Sydenham was consistent in considering 'sight' as the most suitable sense for acquiring knowledge of the world (ibid). Keeping in mind that the ideas of one philosopher should not explain the whole world, and that such approaches are to be constantly analysed (Deeley 2001), reflections that connect the outcomes of 'what to see' should appear in areas where the individual, health, dignity and prevention have a direct implication.[275]

The phrase 'ópsis gar tôn adélôn tà phainómena' is rewritten in English as 'that which is clear to us makes us see – thus, to know – that which is hidden from us'[276] (in Laín Entralgo 1982, p. 9), which explains that due to the basis of 'watching', the knowledge of what is hidden would be enlightened. In terms of Greek etymology of the word diagnosis, the action of the word diagnosis can be elongated into a wide story of events. As such, the action of diagnosis requires watching and 'to use the eyes of the head as a window for what cannot be seen but imagined'[277] (ibid, p. 12). *Diagignôskein* implies two senses: 'to know distinguishing' and 'to know in depth'; meanwhile, *diágnôsis* relates to 'faculty of knowing' and to 'the principle from which this faculty depends' (ibid, p. 13).

With this excursus, Laín Entralgo (1982) gave the preamble to reconsidering the diagnosis concept as a moment of reflection towards knowing for what reason the action done is done. Specifically and for example, he asserts that Galeano clarifies that 'the Hippocratic *diagignôskein* becomes the cognitive, technical and medical expression of

[273] This third order of inspection refers in this work to a proposed 'third place of composition'.
[274] *Paradigma antiguo* (ibid).
[275] Moreover, the considerations also aim to understand where the individual as separate concept has a direct implication on health, dignity and prevention. The construction of reflections is continued within a program, with each of the latter having implications on different areas.
[276] From my own translation of the words of Laín Entralgo '"lo que nos es manifiesto nos hace ver –esto es, conocer– aquello que nos está oculto"' (1982, p. 9).
[277] '*Diagignôskein*, en consecuencia, es utilizar lo que con los ojos de la cara se ve como ventana hacia lo que con ellos no puede verse, y por fuerza ha de ser razonablemente imaginado.' (Laín Entralgo 1982, p. 12).

love for the universal nature and for the generic nature of the human being'[278] (ibid, p. 13), suggesting with it a concept having an intersection of cognition, reflection, expertise and technical knowledge. Such descriptions of this concept give access to the participation of other disciplines and in other domains. A hundred years, more or less, after the end of the First World War, and walking through the positivism ages in science, the current way to diagnose can be traced historically up to this time period (ibid, p. 120) and the well-known book of the medical doctor Richard Koch (1920). Koch, recognised by Wieland (2004, p. 17) as an author deserving mention for penning one of the scarce works on the theoretical foundations, reflected on the uncertainty or fiction (ibid, p. 46) of the diagnosis concept as a procedure. Koch stands in modern times for the problematisation of diagnosis outside the description of disease by giving to it the function of considering a therapeutic prospect and the function of means for an integrative self-adjustment between a [biological] condition, an individual case and a model of a disease (Matthiessen 2004, p. 12) – to wit, a theoretical general description.

The realm of 'recognising the condition of another person' confers uncertainty to all the levels of the '*crossroads of basic natural sciences (i.e., biology, chemistry, physics) and technological applications (i.e., relying on the application of numerous diagnostic and therapeutic devices to diagnose or treat a particular disorder)*' (Djulbegovic, Hozo & Greenland 2011, p. 299). And, thanks to this uncertainty, identifying diagnosis as an analysis concept from educational science acquires relevance to the area of pedagogy because it has not been sufficiently investigated in the course of the 'certainty of phenomenality'.[279] As such, the reflections of Wittgenstein (1969) regarding his distinction between 'I can't be wrong' (ibid, p. 3e §8), 'I *might* be wrong' (ibid, p. 80e §606) and 'I can no more be wrong' (ibid, p. 88e §668) for portraying the difference between 'knowing' and 'being certain' opens a contrast with modern scientists on the 'certainty and present state of knowledge' (Nikolaidis in Djulbegovic, Hozo & Greenland 2011, p. 302).[280]

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[278] 'Galeno dará clara expresión a esta obviedad. El *diagignôskein* hipocrático viene a ser la expresión cognoscitiva, técnica y médica del amor a la naturaleza universal y a la naturaleza genérica del hombre, (…)' (Laín Entralgo 1982, p. 13).

[279] 'Certainty of phenomenality'? Is there such a thought? With respect to Hegel (1977), the closest connection is in 'sense-certainty' (ibid, pp. 58–67), which 'appears as the richest kind of knowledge, [but, (…)] proves itself to be the most abstract and poorest *truth*' [squared brackets added by me to shorten an idea] (ibid, p. 58). In my own question about 'certainty of phenomenality', I deliberately mix 'phenomenality' (see, for example, Block 2007, pp. 111–127) with some ideas from 'phenomenology' (ibid, pp. 364–375) in order to point out to the currentness of philosophy in neurobiological scientific educational research. Moreover, thousands of researches have a very close relation between them that yet must be pronounced. Hegel (1907, 1977) left the idea of absolute knowledge that also had to undergo a historical and social embedding process. I attach to the questions made by Hegel, such as 'what is the truth of sense-certainty' (ibid, p. 66) or 'What is Now?' [asked in a dialectic between 'now' and 'here'] [squared brackets added] (ibid, p. 60) or 'what I *mean*' [connecting from the unessential to the essence] (ibid, p. 62 §103) my own questions about why we are doing what we are doing. On the basis of the discussions on Hegel (see the difference between *Aufforderung* or summons and *Anerkennung* or recognition in Williams 1992, pp. 57–94), I identify in the state of research that the definition of phenomenality relates to 'how to have an experience' (see 'what it is like to have an experience' in Block 2007, p. 124) associating the definition of consciousness with phenomenality (ibid). Both can establish connections to the journey of self-certainty (Hegel 1977, pp. 104–111) and to the difference between truth and certainty on the basis of self-knowledge (ibid, p. 485).

[280] With regard to the topic of 'certainty and present state of knowledge', scientists should find a way to push themselves for working with incessant knowledge. Thus, scientists are human beings that shall be

Do we work and have we worked with knowledge about diagnosis throughout history? (Koch 1920). According to Laín Entralgo (1982), Richard Koch says that we have also worked without knowledge of what we were doing. The diagnosis concept portrays a moment of reflection from the doctor's side, once the interest in deciphering the condition of another person comes from the expert and not only from the wish of the ill (ibid), because 'medicine is the faculty of men for doing what is useful in diseases'[281] (ibid, p. 125) [The spoken reflecting moment confirms the physician's active place as an expert and person with a faculty for acquiring experience]. In terms of understanding the diagnosis concept from the proposal of a pedagogical sphere of action, the method to be used has to be considered among several factors, the confrontation with the *terminus technicus*. Therefore, in the theoretical structure, the language in general, but above all language that should separate other interpretations from the strict categorisation of a disease and the transformation of the disease, must be problematised.

The *terminus technicus* draws upon the 'materialistic figure'[282] based on signs and meanings, which are problematised in the *Form des Denkens* or *'way of thinking'* of a logical term (Anhalt 2012, pp. 203–206). Such a figure is immersed in the educational research involving the theory of the complexity of education. In addition, such a figure works as a strategy for explaining the reduction of complexity of education (ibid, p. 219). This figure established a meeting of positions that would need to define what is to be defined.[283] In Gottlob Frege's definition, this figure was thus defined in a 'medial relation' (in ibid, 205). An idea on principles of reality is my proposal to explain how to discuss a *terminus technicus* with signs of a distinction and the meaning of a

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opened to connections from sources of knowledge. Educational science offers some basis for not giving entrance to anything that comes from the imagination, but rather to supervise, to contextualise and to reflect previous outcomes. As a case in point, Wittgenstein (in the analysis of 'sense-certainty' made by Findlay of Hegel 1977) could disagree with the change of opinions of 'speaking' (translated as language in ibid, p. 65). As such, I focus my attention more on the search for disputes that cause scientists to take their own positions.

[281] From the Spanish quote '"la capacidad de los hombres para hacer lo útil en las enfermedades"' (Laín Entralgo 1982, p. 125), in the text, I summarise the ideas of some authors who say that medicine has its own epistemological status that can be linked to a medical education project (ibid). According to my own words, the purpose was to give recognition to medicine that differs from scientific knowledge, followed by attempts to develop content about ways of thinking. In terms of work from medicine to the recognition of a person's condition, diagnosis should not prescribe the definition of a person's condition, but rather be the means to discuss statements. Hence, phenomenology of subject-matters in the pedagogical realm can target to continue working with medicine.

[282] 'Abbildung' in Anhalt (2012, p. 203). I propose a translation as 'materialistic figure' based on the difference made by Anhalt (ibid) in terms of representation, reflection and transcript. He acknowledged that further differentiations of the 'figure' concept can be pursued (ibid). Since this thesis concerns a discussion on non-static concepts, the connection with 'materialistic figure' clearly indicates how thinking is in dynamic processes.

[283] For the sake of clarity, I wrote down with the 'need to define' one direction that can follow reflection on how a task 'would be defined by what should be defined'. This definition speaks of the means by which the formulation of ideas is discussed. Hence, in the third place of composition of the second-order observation, the subsequent combination would attempt to draw attention to the object of the world, not to begin an endless path, but an exercise of thinking and monitoring the following steps. Consequently, the task described by the statement 'need to define what is to be defined' would result in some actions according to the phrase 'plural definition of what should be defined, what is to be considered'. This last idea comes from a figure that established a meeting of positions whose *tasks* should be defined by what is to be considered, or positions that define what is to be defined, what is to be considered [the keyword for reformulating this statement is 'tasks'].

'materialistic figure'. In the development of a logic, Gottlob Frege thought on a 'figure' as a differentiation and order of signs according to the assigned meaning (in ibid).[284] I refer to this figure as the 'materialistic figure', in which spoken signs may share a common 'principle of reality' to speak to each other. During the diagnosis concept[285], the differentiating processes of the immersed principles of reality from different points unlatches an alternative means also for the systematisation of knowledge [during a footnote earlier, I wrote the reference of means telling that the content should be of discussion of ideas. Here, on this previous statement, I aim to connect to the next steps after reflection, which would direct to an organisation of ways of thinking within an iterative figure]. Such a figure needs to accept that it cannot be 100% accurate as long as it attempts the description of a reality that cannot be handled as unique [or completely integrative and static]. As a case in point from a procedure connected to one 'figure', pedagogical diagnostic has also been a meeting point for disciplines such as medicine, psychology, sociology, history and pedagogy (Tenorth 2000, p. 270). Pedagogy has been integrated into the reality of empirical pedagogy for the measuring of tests of intelligence or teaching-related research, such as sociometric studies or live world-studies (ibid). This integration reflects that the combination of methods can show entry-points to theories as well as reflections upon them. Regarding this figure or ways of thinking about a logical term, the *terminus technicus* holds that a concept is problematised for reasons of collaboration.[286] Thus far, a term from specialisation[287] is not isolated from systematisations that take into account dynamic environments that reflect changes and unpredictability [In educational science, this chain of logic succeeds based on the possibility to develop models that can refer to a temporary conceptualisation of a situation].

Anhalt (2012), for example, registered that a 'model theory of teaching' should be integrated into the 'model of lessons' described by Jürgen Grzesik (in ibid, p. 222) that contemplates the perspectivity within the structural principle of classes. In this integration must be seen that the incorporation of perspectives involves analytical and

[284] Due to the speculation about several tasks related to the statement associated with this footnote, I consider 'differentiation and order' within an independent interactive process.

[285] In order not to lose orientation in a current state of research from knowledge theories connected with the pedagogical theory, I write upon the diagnosis concept and think about how pedagogical diagnosis is possible, while I have used the 'analysis concept' and 'analysis of meaning' as speculative methods of philosophical thinking accepted in pedagogy. I declare that this section was reformulated during the edition of the work after closing the research process, so the statements should lead the reader to understand the work uniformly [without previous deliberation, the assumptions regarding attitudes of integration are explained in the exposition of the arguments that confirm that the position of unity is dynamic]. Nevertheless, the brief discussion about the uncertain subject-matter of the diagnosis concept related to the description of different points of observation and what is observed was conducted with fresh eyes on the topic. During the novelty of the topic, I documented and read without any influence to determine what needed to be discovered.

[286] This collaboration can also be explained by general internal processes that occur in the transition between sign and meaning – which then explains a collaboration of own resources. In this sense, later actions related to the *terminus technicus* are problematised by means of the own terminology and mixed with other disciplines. I point out that collaboration with oneself comes close to an internal process that can be better portrayed by other theoretical figures. Nevertheless, after pursuing development of the contents of this thesis, the phenomenology of the educational subject-matter confirms that internal processes need to find more alternative connections with the world. Namely, in this footnote, a collaboration of own resources already speaks of an intention to live in society.

[287] A term from specialisation refers to a term that aims to describe from a specialised area.

logical processes with intuitive ones. The control in handling of situations is weakened by an intuitive part of each person that can trigger an unpredictable number of reactions (see Djulbegovic 2011b, p. 6). In this manner, one of the goals of this section is to approach the problem of uncertainty from its qualitative judgement within the approach of a 'dynamic concept'[288] as diagnosis in order to propose how the uncertainty could be ordered according to the interaction with a *'community of patients, advocacy groups, and lay people'*[289] (ibid, p. 4) in terms of the complexity of educational science, specifically within the problematisation corresponding to the complexity of pedagogical action. For this last-mentioned 'community equipoise', the connection to epistemic cultures from pedagogical spheres of action announces a way for understanding the reality of education that describes a viable proposal of diagnosis in pedagogy.

2.3.3. Pedagogical action for the integration of knowledge development

Pedagogical action would refer to 'take effect' on another. In order to 'take effect', a composition of elements is required. Namely, the impetus to act would be generally marked out by a purpose[290] and challenged by concrete goals of tasks [in pedagogical theory, purpose and goals are differentiated]. Thus, people would act in many different ways. For example, 'they act morally, medically, politically, economically, artistically, legally and religiously – and also pedagogically' (Mikhail 2016, p. 9). Insofar the term 'pedagogical' distinguishes one decisive action from the others. In the frame of contact with another person, to 'take effect' relates a pedagogical effect. If a purpose is connected with a future that has its origin in a tradition of synthetic constructs, then the pedagogical purpose differs from event to event. A pedagogical purpose that extends to a dynamic component of observation explains tasks related to uncertainty, since this purpose has intentions that arise from synthetic constructs and/or a teleological expression. [291] [I begin with this in order to argue that a purpose is connected not only with the future, but also with the past]. On the track of purpose and goal, a pedagogical goal describes contents of tasks. Educational tasks are well defined, but at the same time reflect uncertainty caused by indeterminate events. Indeterminate events are part of a reality of education since pedagogical action can neither rest on the control of a person nor in the dedicated relation of teacher and student (Bueb 2008). Pedagogical effect is to be found and problematised alongside the many couplings inside a pedagogical institution (ibid, pp. 33–63).

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[288] Here, it must be taken under a closer consideration that the distance between the dynamic concept of diagnosis and the dynamic subject-matter of diagnosis is difficult to maintain and to handle in all the grammatical formulations. In this manner, it can be said that the diagnosis concept belongs to the description of the subject-matter of diagnosis but that these two are situated on different levels of reflection. Such an order must leave open a 'connecting point of further analysis' for a later work.

[289] Referring to the 'community equipoise' (Djulbegovic 2011b, p. 4).

[290] As previously mentioned, one place for 'purpose' within the theoretical educational tradition is found in the theory of Bildung according to Benner's writings (see, reference to Herbart in Benner 1991, pp. 66, 63–81). Herbart developed an orientation towards theory of Bildung when he linked the confirmation of education with its purpose (ibid).

[291] With 'teleological expression' I refer to a non-logical form that escapes the frame of metaphysics. 'Expression' in combination with 'pseudo-objects' (see the already mentioned argumentation of Carnap 1935) leads me to assume that a non-logical form in the sense of a teleological end can be problematised – perhaps by means of phenomenological treatment.

As a starting point for the explanation of pedagogical action, the not-dogmatic form of defining within a pedagogical theory must be constantly retrieved. I observe a search for a not-dogmatic position that can be based on the ground that the concept of pedagogy can never be definitely defined (Mikhail 2016, p. 15). As such, historically pedagogical action was not distinguished at first until the dominance of a religiously determined life form (Krüger & Helsper 2002, p. 16). Questions about the success of pedagogical action therefore lead to the integration of knowledge development. Accordingly, the success of pedagogical action remains indeterminate. With respect to the uncertain relation between intentions and questions upon a concept, a bi-directional crossing of meanings indicates that the integration of knowledge development has alternative paths.

This uncertain success of pedagogical action can be traced back to the 'pedagogical paradox', which entails assuming responsibility on the part of the pedagogue but leaving space for the autonomy on the part of the learner (Kant in ibid, p. 20).[292] The educational premise about 'fostering freedom with force' would take place within an institutional frame that would support or restrict specific *ways of thinking*. Such ways of thinking are within a context, that I will refer to as composed by assumptions regarding attitudes. The support or restriction of beliefs[293] from epistemic cultures relates to certain goals and/or directions of the scope. Hörster (2002, p. 38) wrote some examples that give reference to social and factual indeterminate situations that can be ordered according to their structure and meaning (ibid, pp. 36–42). Goals and tasks orientations in terms of structure and meanings adapt to historical approaches without necessarily pursuing a purpose.[294] In an overview, a structure displays epistemic cultures that demonstrates why assumptions regarding attitudes can identify beliefs. Assumptions from different beliefs are not in agreement at every time because signs of distinctions and meaning appear with alternative directions. Thus, ways of thinking need to be uncertain for a time lapse before taking effect. The integration of participation therefore illustrates that beliefs must be identified before pedagogical action takes place. Otherwise, to take effect

[292] I owe to my professor Rubén Martínez that he made me realise that Kant could have impossibly written something like a 'pedagogical paradox' since Kant was a rationalist that analysed how we think. I could go to the original text written by Friedrich Theodor Rink, *Immanuel Kant über Pädagogik* (1944), where the question appears about 'how to foster freedom with force?' (see original quote 'Wie kultiviere ich die Freiheit bei dem Zwange?' in ibid, p. 17). Lischewski (2014, p. 145) noted that from this text compiled in 1803, it is difficult to distinguish which passages were said by Kant himself and which others are from the notes made by Rink.

[293] From ways of thinking to beliefs, a gap should be identified that relates the signs of distinctions and meanings of figures in contrary to as opposed moment for taking the basis of the future. Nevertheless, the close relation between beliefs, assumptions and attitudes makes it difficult to hold their difference.

[294] The statement referring to this footnote illustrates the close connection between goals, task, historical approach and purpose. Namely, the historical approach involves the historical register system according to a historical happening. The historical register system differs from the historical tradition. Both are thus oriented towards being part of the historical contextualization of a pedagogical sphere of action, if they are taken as a reference. Goals and purposes refer to distinct concepts. Goals concern current tasks defined by theoretical traditions, while purposes establish links with the past and the future by reflecting on intentions beyond a historical register system. Tasks refer to the specificity of actions in groups of scientists or in epistemic cultural groups, based on the epistemic cultures as described in this chapter. While the above concepts can give the impression that they take place in different situations, they rather refer to a different type of organisation, so as to distinct principles of reality that occur at the same time.

on another would not respect the autonomy[295] of those involved in the pursuit of the principles concerned. This means that pedagogical action recalls an intention with a purpose aimed at a specific goal. The quality of uncertainty can be explained through the complexity of Bildung (Rucker 2014) and in this manner localising in a wider systematisation how different moments occur within the reality of education. Had pedagogical action occurred without previous planning, the socio-institutional historical demands would have been required to be discussed in their own language for providing contents to the pedagogical theory [this action would refer to a historical register system that could later be problematised in order to take historical contextualisation into account].

In the socio-institutional historical scope, the ideas of uncertainty regarding the execution of an action can be ordered according to the division of planning or imaginative sense of action as one step of the action and the action in itself as the execution of the action (Hörster 2002, p. 36), that is, as the accomplished 'practical deed' of a next action to be carried out. To this, practical deed would attempt to gather the institutional scope with the problematisation of pedagogical action (i.e. its intention, goal and purpose). Practical deed is a concept that I identify from the current research and which I propose to run in parallel to the pedagogical spheres of action in order to reach a viability on the reflections of attitudes from the self. The organisation of these ideas can be thought through as being the basic ideas of pedagogy that need to integrate knowledge development and upon which the question about how to proceed is constantly opened. Benner (2001, p. 19) wrote that the basic ideas of pedagogy are significant in educational thinking and pedagogical action. In this manner, he defined the 'constitutive and the regulative principles of educational thinking and pedagogical action'. As such, the 'constitutive principles' of educational thinking and pedagogical action are sine qua non of the 'regulative principles' proposed by Benner (ibid, p. 62), which would bring an idea of integration and of mutual affection for what is given from what is created.

An integration of 'knowledge development' occurs in a social context, thanks to the problematisation of pedagogical action with practical deed, once the actors are in play, and the basis is switched to the modus of questioning (i.e. reflections on attitudes from the self). As happens in the encounter of two people, this questioning also takes place once there is no certainty of anything that is happening; however, in the execution of this craziness, there is not chaos but a true balance of actions reached through a complex system. In terms of this balance, Herbart would refer to the character of the person that would be manifested in between the morality of a social component and the notion of activity of the self (Anhalt 1999, pp. 247–248). I mean to call upon the re-entry point of the definition of the purpose or the reflection on the interaction between constitutive and regulative principles (Benner 2001).

Pedagogical action in terms of uncertainty calls upon a balance of actions because it commands the 'pedagogical antinomy' between the will of the expert and the will of the learner (Hörster 2002, p. 40). It must also be marked that the doer or the agent would

[295] Here is where the pedagogical paradox appears clear to the front, where the encounter of another is not a requirement of coercion. The statement about 'fostering freedom through violence' occupies an analytical level in theory, since the actions that follow the norms are not isolated from the descriptive, explicative and speculative approaches (as mentioned by Westmeyer 1972, p. 18).

execute the action, considering the position from which this is oriented (Benner 2001, p. 298), and how the action is conformed according to an irresolvable correlation of mutual reliance (Mikhail 2016, p. 17). This happens in this way at the moment when pedagogical action is not only a moment that occurs but also a previous moment that is reflected. As such, pedagogical action must reflect the condition of what is being moved towards and where the action is being directed to; this means to speak about the faculty of progress of the learner or the potential or agency of the learner or the Bildsamkeit for the support of knowledge development as one 'element' within the integration with the social influence.

Endorsement: Bildsamkeit as foundational concept of pedagogy

As a further moment of reflection on the components of a pedagogical action, Bildsamkeit appears. In this, in emphasising the individual dimension of the 'pictorial' of the pupil, for Nohl, the pedagogical interaction can never be the 'subordination of a case to a rule' (Nohl 1988 in Krüger & Helsper 2002, p. 18). This would mean, according to my interpretation, that in terms of contexts, explanations and divisions about what reality, science and the human being are, can be separated from the potential of change in the individual. From a historical perspective to that of hermeneutics (Benner 1991, p. 199), pedagogues of the beginning of the nineteenth century ploughed the grounds for distinguishing individual freedom and an independent place for education as a responsible phenomenon (Lischweski 2014, p. 528). Resembling this happening of events, the way that a pedagogical interchange cannot be subordinated to a case of rule is explained in Benner's systematisation (2001) of educational thinking and pedagogical action. By putting together two reflections, one that comes from the pedagogic hermeneutic (Lischewski 2014, pp. 393–438), and the other from pedagogic praxeology (ibid, pp. 527–541), I want to briefly dwell on the systematisation that Anhalt (1999) worked out regarding the organisation of Bildsamkeit as a foundational concept of pedagogy in order to explain why individual agency problematises the reality of education.

Bildsamkeit as a foundational concept is attributed by Anhalt (1999, p. 10) to Buck including the problem of developmental psychology and ethics. However, I employ Elmar Anhalt's (ibid) analysis concept based on a problematisation from a theory of knowledge with the autopoietic inclusion of the self-organisation of the learner. For this, Johann Friedrich Herbart portrayed the concept in his critique of pedagogical theories (ibid, p. 18), those which attempted to restrain pedagogy to conditions, borders and laws of control of the learner. In this way, the path of construction of the object in pedagogy and its collaboration with disciplines that come from the meaning of science have long since been worked out in the awareness of the particular existence of the division between the inner and outer world.

This trail of thinking can be illustrated by concurrent events of the ending of the 1800s and the beginning of the following century, which serve to justify the formation of educational tasks under the prevailing opinion. On this historical sidewalk, Johann Friedrich Herbart proposed Bildsamkeit as a concept that over time can be put together with the consideration of a society that has evolved towards the recognition of the individual (Benner 2001, p. 128). This would have the consequence in logic that the individual self would deny or accept an own formation. Theoretical proposals, like that

of Herbart, did not happen by chance and hence are not intended to be considered isolated from the world – although pedagogical endeavours seek to rely on exerting the potential of one person. Throughout this work, I am moving constantly along the paradoxical presentation of facts from those sought by society and those others by the individual, wherefore a fresh view of the pedagogic theoretical construction is required. The spanned space between society and the individual belongs to a current state of research for problematising a foundational pedagogical concept such as Bildsamkeit. Moreover, the demand for a fresh view is the other side of this current state.

The concept of Bildsamkeit can be integrated within a system as in the way that analytical philosophy would criticise a lack of explanation regarding foundational concepts of philosophy – for example, the insufficient explanation of what a category is (see *itemisation* of Kant regarding his order of categories in Anhalt 1999, p. 142). Considering the Bildsamkeit concept within complete systematisations, awareness of the definitions of system must be considered because a system has different approaches. In this way, the concept of Bildsamkeit helps to order the interactions of the human being with the world. I employ Bildsamkeit as a pedagogical category according to the recommendations of use (Anhalt 1999, p. 149) for the identification of an educational object of study. Thus, Bildsamkeit provides an orientation and reference in directing researches in the pedagogical area. Since Bildsamkeit is understood from pedagogical intentions and as one foundational concept of pedagogy (Herbart in Benner 1991), this potential of the individual accommodates a connecting point for problematising perspectives of the world and disciplinary scientific opinions and attitudes about the world.[296]

The encounter of disciplines, experts and the learner or affected person suggests that the potential of the individual will act upon the process of transformation considered by the diagnosis concept when it is immersed in a complex relationship with the surroundings. In this way, the diagnosis concept appears clearly for the composition of and composed by more than one moment, more than perspective, more than one purpose, and should discuss how it achieves putting together different elements within a problematisation. To wit, theoretical conversations can start, for example, based on *accountability, responsibility, privacy and security* (Clausen et al. 2017).[297] This theoretical conversation exerts a practical deed from the application of brain stimulation (BI) as a therapeutic procedure based on 'operant conditioning' research (Fetz 1969, p. 955). Had no observations been made on training and operant reinforcement along with a history of non-invasive research (see, for references, ibid, Barker 1985), BI would not have been developed for the benefit of patients to combine intentions from different disciplines (see, for a current research state, Soekadar 2016, 2011). The practical deed is to be speculated at this moment on the basis of the relations between theory, practice, surroundings, and the effect of the individual in the world. Thus, one task for

[296] To this extent, a wider description of the Bildsamkeit concept is required for problematising it together with the encounter of a disease. Nevertheless, during this first approach upon the collaboration of pedagogy with psychology and medicine, the concept indicates a connecting point needing to be expanded upon.

[297] Topics on accountability, responsibility, privacy and security, which are dealt with in theoretical discussions, show that the individual's potential is used to advance the progress of science. The manifoldness of sensorial nature has further connections that are to be developed in the pedagogical realm in order to establish connections between Bildsamkeit and scientific integrity.

pedagogical thinkers is to identify the direction of problematisations and, in consequence, to be able to provide a connection with other discussions in the sense of life where the individual has a voice. From the side of these research studies, they are calling upon the educational framework (Clausen et al. 2017, p. 1338), and thence, the position of pedagogy should be clarified in terms of what is able to be reached when raising attention to singular cases (Gerónimo-Cid *in-progress*).

Synthetic concepts have orders with a wide extension in literature, and this should be clearer at the end of this work. For the problematisation of the orders of synthetic constructs, the referential point sets the sequence of knowledge development since these synthetic constructs would be spanned within different realities outside some that are naturalistic or others that are materialistic. To this extent, writings from the past are taken as reference for marking historical events that can modify the foundation of an appraisal [for example, research made in the field of electricity or in the fields of training and reward, which had clear polarities between different psychological currents, are now being changed on the basis of the research design for neuroimaging]. Foundational concepts, such as Bildsamkeit, meet the 'dilemmas of order' in terms of reality. This means to say that in the process of constructing other concepts and integrating with them, that is the categories with their orders and confirmation within determined fields of action, 'verity and the state of being real' arise in wider discussions (see, for example, Kanitscher 1993 in Anhalt 1999, p. 146). Hence, the current state of the diagnosis concept needs yet to ponder the internal dynamic of concepts influenced by the surroundings (i.e. an analysis of meaning of a situation of an analysis concept for the simultaneous analysis of the signs of distinction and the meaning of ways of thinking). Discussions upon the diagnosis concept portrays a complex situation where disciplines are crossed with their intentions from theoretical traditions. Outside of the medical realm, the diagnosis concept provides a network of components that should be ordered for explanation. In conjunction, this discussion manifests a constant expansion and reflects also on some organisational schemes of educational science as a field of action that develops concepts of participative action – to wit, the pedagogical action linked to the educational thinking of different periods of time. Thus far, the definition of the object of pedagogy meets an independent but integrated moment that is under construction and under the influence of other lores, like those from philosophy, history, sociology and biology. During and after the conceptualisation of this work, these other lores should appear clearer as to their involvement in the development of the pedagogical object. This involvement has to be understood in terms of a problematisation in order to obtain a holistic overview of how a person assumes several positions under one observation[298].With the concept of Bildsamkeit, I want to reflect on the separation between the biological world and the self-determination of the human being. In terms of Benner (2001, p. 126), Bildsamkeit is a constitutive principle of the individual, which 'does not formulate statements about human biological systems nor about a determination from any environmental point of view' (ibid). In this way, questions about decisions that affect practice are not to be defined by any principle of educational thinking or pedagogical action (ibid, p. 125). This enunciation makes sense based on the reflection of Grzesik (2010), who stated that biological measurements are artefacts of

[298] From a medical viewpoint, or from that of several disciplines, reflection on such participation has a benefit for a person who is able to observe what kind of methods should be performed on the body and for which others a person is responsible.

human thinking. In this sense, artefacts are not about what a theory states that should be a change in data collection. Based on principles of practice that are distinct from educational thinking, a different understanding can be given to the hermeneutics in pedagogy, which would not pursue stipulating an ultimate reality. With this perspective, a constitutive principle of the individual accommodates the reality. Nevertheless, the reality does not speak about an undiluted compound but about notions and assumptions regarding attitudes with different entry points.[299]

The concept of Bildsamkeit has a pedagogical function thanks to its potential as differentiator of two different systematisations: the biological on one side and, in my own interpretation, non-biological on the other side. These two positions resemble a dialectic approach that must be contemplated. At once, the discussion on the weight of physical-biological content moulds the shape of consecutive actions according to a collaborative understanding with biological approaches. Namely, the anticipated following step leads to the non-biological systematisation that is going to be ordered in the social processes from the group of forces between the individual and society. These social processes also have the potential to jump into pedagogical theory from reflections on epistemic cultures to pedagogical translation within spheres of action. The biological systematisation adjacent to its hefty position leans towards a monistic posture of biological components. The case of taking both premises, according to my proposal in this work, would be with the intention of discussing 'principles of reality' in the reality of education that is constituted by and under the description of spheres of action of different disciplines, namely, opinions, attitudes and assumptions regarding attitudes that come from distinct perspectives. To this extent, the proposal of this thesis expands the understanding of the reality of education.

Related to a coherent problematisation of bio-social postures, Anhalt (see, for example, 1999, pp. 129, 134–137, 152–156) commented on Herbart's reflection on the foundational concept of educational science that that the task of education is not to be defined by politics [and hence, I assume that is limited either by only one-sided position]. A political stance can be grasped according to the forces of social positions and demands of society. These forces can be discussed according to political interests in terms of elite education, self-determination and national education (ibid, pp. 152–156). In such a case, however, a discrepancy can occur when the society searches for a sincere concern for the individuals in which a subject can refer to an ethereal construct. With this in mind, Bildsamkeit will be presented by the active participation between interested person and expert, in order to present the activities as active participations (ibid, p. 155). Following these related ideas to Anhalt (ibid), I observe disciplinary tasks of a concerted action towards a collaborative readiness to conceptualise activities between interested person and expert. As already mentioned about the implications regarding the treatment of patients, other consequences follow after technological development. The focus given by this work is not in terms of technological advance, however, in the description of the individual position; other research areas point to the place of the person that must be discussed outside the terminology of single traditions. Once the faculty of progress of

[299] Adding to this reflection, reality has different levels of analysis. Hence, this work proposes specifically to speak about 'principles of reality'.

the human being is taken to other contexts, then Bildsamkeit[300] can be addressed to other specific connections that happen in educational correlations, as it is in the questions released when someone has a problem related to health.[301] Pedagogical action makes it possible to bring to bear a problematisation between 'theoretical reflections and concrete conditions' (Anhalt 2011, p. 128) in other contexts that were not thought to be inside the institutional draft of 'education'.

[300] Bildsamkeit refers to the faculty of progress (Anhalt 2011, p. 129; and manuscript translation from Gerónimo-Cid *in-progress*). At the individual level, the 'orientation pattern' results in the individual experiencing a relationship with the world as contingent, like the *Bildsamkeit of the person* [italics added] (ibid, pp. 128, pp. 128–130).

[301] Effectively until now, the relation between pedagogy with medicine and psychology is still more blurred than clear. However, the scope of extension of education (from its different facets as object of study, space or sphere of action, discipline and scientific project) has been called upon its integration with works of theory of knowledge, analysis of content and problems close to the consideration of neurobiological situations, among others. The responsibility of educational science shows that a current state of research from many other areas can be expressed in pedagogical terms. I am engaged with the construction of knowledge that should be acquired before taking a position for delivering conclusions. In this manner, I expect to observe the exercise of educational science and pedagogy when historical registers set contexts for being reflected, analysed and rejected by perspectives of academic groups.

3. Systematised speculation on diagnosis for the educational reality

Opening statements: From the outset, speculations regarding the diagnosis concept gave reference to a theoretical framework of an educational reality. Based on the current state of the diagnosis concept in pedagogy, the proposal of a conceptual framework aims to show a disciplinary collaboration within a systematised speculation while discussing a complex situation in science. In this respect, the diagnosis concept provides an entry-point to discuss the place of the individual in the execution of mechanisms through constructs such as pedagogical translation and practical deed. In addition, diagnosis concept within a systematised speculation stands for conveying a complex notion of action as it relates to fundamental concepts in pedagogy. With the help of a procedure, a path for an explanation opens up: why is there no unique and general theory of 'diagnosis'? This question stresses the purpose of an action and analysis methods from different perspectives.

Within this chapter, the methods of analyses applied to the problem of understanding the integration of the concept of diagnosis within pedagogy from educational science will be depicted. Since the work points out an intention in the realm of theories of knowledge, the portrayal of the methods belongs to the same *analysis level* of their application. This means that specifically for this work, the delineation of the methods, on a level of theory construction, can target its own application and call for collaborative position, which will be explained in the course of the chapter. In this way, I aim to display the methods, next to the description of other elements that appear during recognising another person, that lead to the presentation of models that form a basis for presenting pedagogical epistemology through the reality of education. The outlining of a conceptual framework belongs to innovative research strategies that break out to carry out investigations by targeting only the prediction of effects or composition of the null-hypothesis (Calfee et al. 2006, p. 83) – which, despite referring to a classic procedure, at any moment should infer an easy task to formulate. On the path of a parallel deconstruction and assembled state, the reality of education is encountered by the meshing of positions from disciplines. Reliant on this narration, some points are identified for speculating in a systematised order how events, but also ways of thinking, made an impact on the consecutive steps for the development of works.

First, related to one of these methods, the function of the *position of the observer* within its application on a conceptual framework will be presented. The position of observation belongs to one attribute of theories of knowledge[302] (Moulines 2011), which I address

[302] Beyond the mere position of observation of theories of knowledge, a wider interchange of opinions during the professionalisation of these theories links researches between continents (Stichweh 1993, p. 245), specifically with reference to Anglo and German native countries (and Russia also; however, in my narrative, I cannot extend deeply to material that formed another branch in theoretical thinking). The more specific link taken for this work would be between the USA and Germanic countries. For a deeper bidirectional influence from inside and outside of two positions, sociological and historical narratives provide traits of information about how representatives have exchanged contributions among each other, from which I will merely mention a few of these traits. I employ the formulation of 'knowledge theories' or 'theories of knowledge' as a general construct in a way where I can jump aggressively

at this moment from a general angle. Educational science belongs to one theory of knowledge; in order to set borders with other theories within this philosophical framework,[303] the exchange of views of the theoretical framework with the current state of research of a complex subject-matter presents alternatives that are registered in this chapter. Specifically, and in contrast to a theoretical framework, this chapter is designed to see the interaction of concepts of collaboration of disciplines, such as inter- and transdisciplinarity in a pluridisciplinary conception. The position of second order observation deals with the conceptual framework; inasmuch as it offers possibilities for expansion of what can be done with the theoretical structure, the spoken exchange transport the state-of-the-art compound between medicine, psychology and pedagogy. These fields share a history on the discourse regarding the individual. However, a structure in science and social influence tackles many of the constitutional points about how to reach a common vision in teamwork when the focus on a shared object has not been enough for finding agreements. This is especially true when this object of study (as mentioned in general terms) refers to a subject-matter composed by several internal dynamics identified from distinct frameworks. These theoretical frames have distinct foundations that lend themselves to particular problems[304] as in the case of educational science that relies on the freedom of the individual. Nevertheless, individual freedom in pedagogy is a link to the action of freeing the person undergoing formation, and thus the educational approach contributes with a perspective of social interrelations. The leap from an individual position to a collective conception is not direct, so the last statement

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between positions. Namely, in educational science, the 'science studies' or *Wissenschaftsforschung* from this same field have developed this own branch for knowledge review that recognises the 'critical rationalism' from Kuhn (1976) or Lakatos and Musgrave (1974) (in Keiner 1999, p. 23). In this way, *Wissenschaftsforschung* relies on theoretical constructions of other knowledge theories. This research of knowledge has a connection with international discussions and with other disciplinary frameworks, which I historically conceptualise within this work. I make a slight reference to these other authors in order to localise a theoretical point where after the Second World War, educational science started to earn its own place inside the picture with the rest of the scientific evolution. In passing, I can recognise that effectively, from educational science, the tension of two perspectives relates to the translation-ratio of two problems that can be spanned: hence, its important place in the observation positions. For example, Keiner (ibid, p. 21) places two positions. He refers specifically to 'the history of science, genesis, career and changes of pedagogic theories with regard to the historical and social surrounding conditions, as to social and scientific systems, on one side, and in contrast to the epistemological question of validity standards of pedagogical theories beyond its contexts of origin' (from the discussion of the committee of DGfE science studies with reference to Vogel 1989, p. 429 in ibid). He employs this brief comment in referring to the formulators of a theory of knowledge in pedagogical viewpoint.

[303] For further information on this point, see Moulines (2011) for a history of the problematisation of scientific knowledge construction from influences on theories of knowledge.

[304] Throughout the whole thesis, I come back to these 'particular problems' while aware of the position of specialisation in science that they refer to. In this section, I expect to clarify that this position of specialisation as I understand how it was sought by the Vienna Circle can, at the present time, compose a position of collaboration with other disciplines. From a wider perspective, a concerted system would be constituted not only by considering the discussions in the borders between philosophy and 'natural' science based on avoiding the formulation of abstract or ambiguous statements (for example, for reaching a clearer connecting point) but by giving place to the person in the position of role-player, author, individual, executor or receiver, among others that possess an indistinct number of dynamics on account of the time that passes. I am aware of the difficulties in the philosophical tradition that surpasses the individual in relation to the others, therefore I accompany this writing with references to further discussions upon the transcendental place of a person (see, for example, references mentioned by Williams 1991).

should be kept in mind by following and connecting the content of conceptualisation alongside the proposals I have pursued.

Hence, on the face of the plethora of perspectives, any in particular does not allow the stating of a universal solution for explanation of the world as one. Thus far, the proposal for a unification of science by Ernst Mach (in ibid, pp. 11–18) or some years later Wilhelm Dilthey (in Blankertz 1982, p. 217), according to the current conditions problematised with Luhmann (in Anhalt 2012), spoke about a systematisation that yet needs to be discussed. Insofar as the impossibility of capturing all the relations in which an object of investigation stands (Popper 1963 in Balsiger 2005, p. 54), certain aspects of these objects required an approach or an access to a problem situation (Bernal 1961 in ibid, p. 52). In this section, I lay a basis, specifically of a general conceptual formulation for how the scopes of fields are being designed and how these are and will continue to be under construction in the forefront of the search for an independent place within a scientific structure. To wit, the evolution from the hermeneutic pedagogy or, as I mentioned earlier, from the humanistic approach of pedagogy, supported by Herman Nohl, Wilhelm Flitner, Erich Weniger and Otto Friedrich Bollnow (Kneisler 2015, p. 99) into the communication with other disciplines is one trait for considering the independent framework of the theory of knowledge of educational science (ibid, pp. 91–178) – which in parallel can support the development of the independent frame of pedagogy.

At this point I propose, on the basis of independent elements within independent frameworks, that the human paradox can reach for several scopes of action the development of pedagogical spheres of action from disciplines. Despite a position of deciphering the praxis as a given element that is independent from the matter-of-fact and the temporal delimitation,[305] the humanistic approach of pedagogy connects with other perspectives from a position of specialisation and not invariably from a position of unity or integration. Through the reception of genetic epistemology (ibid), for example, hermeneutics pedagogy showed hints of internal differentiations and openness to a modern process of disciplinary organisations as in the generation of sub disciplines. Hermeneutic pedagogy portrays an example of assuming a belief and how to do it – in terms of a scientific position of unity that can be accompanied with an interest in establishing contact with the world from the development of an own language[306] (ibid,

[305] Anhalt (2012, p. 94) presented an argumentation about how the humanistic approach of pedagogy (or in German, *Geisteswissenschaftliche Pädagogik*) shows an independent place of the praxis that can be differentiated from the theory – and the reality – of education. Specifically, from the position of the pedagogues related to this hermeneutic stream of thinking, praxis factually and temporally precedes theory (ibid). Anhalt (ibid, pp. 83–95) made a longer analysis describing how the way this stream of thinking could yet be enlarged bears upon the differentiation between praxis and reality of education.

[306] Some authors and representatives of hermeneutic pedagogy, such as Spranger, Litt, Weniger, Nohl as well as Flitner participated in the development of the journal *(Neuen) Sammlung* (Kneisler 2015, p. 100), which with the example of the poor reception of Piaget's writings during some years in the 70s displayed alignment to the hermeneutic-philosophical approach. Notwithstanding during these same years, some of the same authors, particularly Bollnow, Blättner, Weniger, Dolch and Flitner, who also participated in the constitution of the journal *Zeitschrift für Pädagogik* (ibid, p. 101), supported in this other publication the presentation of Piaget's work and integration with other topics. I present the difference between these two positions as a conflict in terms of having a scientific position of unity that needs to keep in touch with the world. Thus far, the development of an own pedagogical language offers some nuances that I display through the conceptualisation of the construct of diagnosis – for an ongoing proposal on pedagogical diagnosis.

p. 100). In this way, the general formulation of how to present a conceptual framework joins the intention to exert an influence upon the surroundings.

By calling upon the exchange of the two previous chapters under the explanation of how the concepts already taken into consideration can work together with the tools of analysis, taking into account independent elements, I also intend to bring a systematised order to the position of the individual according to its role of translator. The constitution of the knowledge theory of educational science can benefit from the parallel register of who is giving account to this theoretical movement. In this sense, theoretical references present their mechanisms that are not yet concluded. In the same ingenious but naïve way, I explain in this chapter how reduction[307] meets the 'pedagogical translation' as an alternative process of conversion of knowledge through the placement of the individual. From a philosophical heritage for the analysis of what and who are being studied, the individual from any of the positions, this means that the side of the expert, researcher, teacher or the side of the participant, patient or learner cannot be taken in educational science separately from a context – this means that the reality of education is not about isolated persons, and hence, suppositions about how this can be presented are depicted. At this point of the manuscript, I argue that the position of educational science is not about persons or contexts, but about a broad perspective that looks at different sides simultaneously.

From there onward, an analysis is provided in a reverse direction because it starts on the basis of the dynamic of the subject-matter towards the surrounding world. Thus, the analysis of the subject-matter points to the application of theoretical concepts and founds the multireferentiality of the diagnosis concept and its multiple theories. This option is available thanks to a meeting point of opinions, perspectives, methods and disciplines that the diagnosis concept presents. As was discussed on the basis of the theoretical framework in conjunction with the current state of research of the diagnosis concept upon a disciplinary collaboration and from the observation of the subject-matter and its dynamic components, this possibility can be opened. The methods will be presented as a mixed form from other methods and rotated according to the usual way of presentation. The focus of this work is not on the exposition of methodologies but on their application. Therefore, in this chapter, the reader is required to formulate, using the example of pluridisciplinary collaboration and the concept of diagnosis on the basis of distinction between neural and mental representation,[308] the place of the proposal and for the

[307] In this respect, reduction is part of a theoretisation that, as explained in this thesis, is part of a pause that is considered by pedagogical translation in relation to the individual. Pedagogical translation differs from the term of 'connecting point' or *Anhaltspunkt* of Anhalt (2012) in that the individual is considered within a concerted system related to collaborations.

[308] *Representation* is taken from the analysis of Sandkühler (2009) upon the relation of dependency of phenomenal reality that makes a point not to validate its independent character (ibid, p. 14). The discussion of the place of the individual during the process of recognising the condition of another marks access points for connecting historical events with theoretical reflections under systematic revisions in the case where different perspectives and assumptions of positions gather together in one task (i.e. the execution of a diagnostic procedure). This last statement speaks precisely about the ongoing purpose of this chapter since 'representation distinguishes subject and object while relating them in a fundamental unity' (Williams 1992, p. 33). Representation and consciousness are tied to each other from the search for foundations. As a case in point, the philosopher Reinhold, a contemporary of Kant, portrayed *a notion of representation of representation* by dint of consciousness [the notion of representation of representation is not to the reference written as such, however, but I consciously address the

proposal regarding the circular causality[309] of the concept of 'pedagogical diagnosis' within a situation having more than one perspective.

The interest in drawing the pedagogical independent frame of reference requires gathering different points of reference for showing the problematics that concepts from other traditions have with regard to being understood within the pedagogical realm. To this extent, theories of knowledge can take reference from the pedagogical tradition that has been sampled closer to the knowledge evolution. This means to say that some academic circles allude to engaging the pedagogical endeavours but without a deeper alliance on the problems that pedagogy has lived throughout the historical changes in science. While writing this section, I am aware of the extreme rapidity with which concepts, theories and positions move in time, and therefore, simultaneously, options for the formulation of theoretical steps and their application of ways of presenting their methods should be created. Hence, the problem of the observer about how calculating the modifications that take place in one space meets its own methods of observation upon which these variations would be calculated (i.e. from a second-order observation in a third place of composition). In terms of an example about encountering assumptions while changes are occurring, not everything is known by the time a person arrives at one room (following the ideas of diagnosing, whether in a doctor's office or in a classroom), but during one visit, one action is expected. In a similar vein, this section is not about a description of procedures but about the application of these procedures in the analysis of themselves, for following in parallel, and afterwards, their own application. This is a legitimate action when remembering that the theoretical approach is about how to continue the discussion of the reality of education by giving reference to the complex situation of theoretical construction with the sundry methods on which pedagogues stand today.[310] In other words, in order to speculate how a reality is created, two ideas can be tied together and, hence, to be more specific with the theoretical approach that refers to the discussion of learning the reality of education through the recognition of another

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proposition to follow my argument. Hence, I have marked it with italics.] (ibid). Based on the analysis from second-order observation, I will present that the quest for certainty belongs to a current approach to the problem of recognition from the pedagogical side, to wit, from the pedagogical diagnosis. The diagnosis concept indicates a constant concerning time and register of goals at the same time of displaying the execution of a procedure based on a traditional intention. By localising the recognition concept with a direction towards the world and towards the self, the interplay between these positions supports displaying that, from a concerted action, at least one specialised position would be required. As a case in point, not by putting a place of importance over another but by putting the means of what is recognised and how, in addition to who is doing this and under which frame of reference, the interchange between expert and non-expert will illustrate one possible scenario for entering into the pedagogical collaborative position.

[309] '*circular causality*' of Fuchs (2012) presented in the first chapter of this thesis.

[310] I want to give notice to the topics that are being pursued in the pedagogical realm at the current moment. To date, I presented an exposition at the congress '*10. Schweizer Heilpädagogik-Kongress vom 29. und 30. August 2017 zum Thema Neurowissenschaften*' on the topic of the importance of neuroscience for healing and special education. In it, authentic interest from pedagogues and people associated with the educational system formulated the question about what could be learned from the tools of the neurosciences involving current impairment cases. In this vein, professionals are interested in seeking to understand how to employ the most recent advances. The state of the art therefore shows the relevance of making public the possibilities that pedagogues have in view of the current theoretical problems of the own discipline, which pursue alliances with other fields of action. However, not all the fields of action nor their representatives are ready to work together, and arguments should be composed in the interest of providing options and awareness on how to handle such collaborations.

person. With this in mind, the methodological resources should be questioned in parallel to find the theoretical positions that can reformulate *correlational concepts*. This connects directly with the previous formulations of Herbart in pedagogy about pedagogical causality that sought to broaden the relation of sides being correlated when the link is not linear and when it encounters the self-organisation of the individual (Anhalt 1999, pp. 291–306). This connection helps greatly in making new approaches understandable but is not restricted to only one level of understanding. Hence, I take use of the notion of the diagnosis concept for displaying the mutual relation from Bildsamkeit as inner force from the individual to the moral purpose. In the sense of complex subject-matter and complex situation, one notion is not restrictive to one specialised position but to multiple differing perspectives. This might have the impact of elongating concepts within science and, correspondingly, to find connecting points for further analysis.

3.1 Perspectives of the disciplinary collaboration and the observer

In the previous chapters, the problem statement regarding to the reality of education with respect to a disciplinary collaboration on the basis of a synthetic construct as diagnosis[311] was formulated from the perspective of educational science under the basis of the theory of knowledge of German traditions. Grounded on the interaction between the self and the world, a process of self-transformation can be connected with different perspectives within a contextual situation (see Anhalt 2012; Rucker 2014; Rucker & Anhalt 2017). In this way, from the perspective of educational science, a consideration towards the engagement of perspectives can start with the analysis upon the process of recognising the condition of another person, that is to say, during the process of diagnosis and its conceptualisation. By reason of the disciplinary 'intentions' that this moment of recognising another person portrays, it can explain based upon the streams of thinking of educational science the entry point to encounter between theory and praxis. This entry point encounters the positions from other disciplines also, and for that reason, it presents a connection as beneficial in seeking a conversation with pedagogy and educational science. In light of this section, I will show how the process of diagnosis and its conceptualisation is viable in educational science based on a complex dynamic of a subject-matter within a complex situation from related reflections on education written by Elmar Anhalt and Thomas Rucker (ibid) while it is presented by an external observer at a third place of composition.

A contemporary and current systematisation of sciences displays no clear borders of integration of disciplines or of their approaches in research (Rucker & Anhalt 2017). In the last third of the twentieth century, the escalation of the consequences of changes derived from the environment has generated modifications in systems related to the production of knowledge (Balsiger 2005, p.16). Society thus advocates a solution and anticipation of conflicts within the scientific community (ibid). Notwithstanding that this requirement appears simultaneously in research development, society as a group of individuals comprises a sum of processes that run in parallel for the structure of a reality (Kneisler 2015) and therefore represent another dynamic within the whole composition

[311] Diagnosis as a synthetic construct encounters problems in defining the educational object. Thus far, the problem statement of this thesis relates to the presentation of educational reality and educational object.

of scientific knowledge. This means that this other dynamic corresponding to the society calls for another systematisation in order to be integrated to the interplay of components among science, representatives of it, following of procedures and modifications on objects of study. I propose that this other systematisation mentioned is possible in the pedagogical realm.

This is a current contextualisation that belongs to the modern systematisation of the world. In it, people as single individuals and as members of science keep wondering how to find orientation in this context and in the collaboration of fields of work – such as in the liaison of medicine, psychology and educational science – further, in a 'systematisation of sciences' (Rucker & Anhalt 2017, p. 23), an answer to this question is holding in a frame with different perspectives as within the knowledge and problematisation of an own discipline. From a historical perspective, the differentiation of the spoken disciplines has on the one hand had an effect on the contemporary understanding of field boundaries; on the other hand, this latter differentiation reveals some of the earlier connections (see, for example, Schlüter 2013, p. 11).

One requirement of a disciplinary collaboration is to set the understanding of an own discipline. Relying on the discipline as a unity in expansion within this chapter, the constant reciprocal action from interdisciplinarity to transdisciplinarity is problematised on the basis of the convergence of concepts, such as diagnosis. In the search for orientation within disciplinary alliances, I take this discussion to a pluridisciplinary state of interaction between expert, non-expert and the world. In the interest of a common collaboration, I want to direct attention to similarities while showing awareness to the problems that need to be overhauled. Each one of these ways of collaboration has its own nuances, in which their differences are hard to systematise due to their complexity and circulating environment. Moreover, dynamics exist on the level of a subject-matter that particularly make many kinds of knowledge coming from the experts in the surroundings volatile, especially when the observation of the singularity of a subject-matter comes from different epistemic interests (Schäfer 1999, p. 267). This is elucidated in the next section of the presentation of second-order observation and third place of composition. As part of the comprehension of an own discipline – from educational science, this work takes consideration, from the concept of Bildsamkeit, the process of transformation of Bildung as it was explained in the last chapter. Both of these subject-matters fulfil a function of explaining a structure[312] based on the encounter of different positions and internal dynamics. Both of these concepts open a space for the position of the individual that will be reviewed again after running the theoretical analysis.

3.1.1. Second-order observation and third place of composition

The systemic language presented epistemological resources for setting options of reflection on knowledge development that are supported by an observation in the second order as an external perspective. This moment of reflection refers to different levels of organisation, resembling a differentiation between first order and second order of reasoning (see Luhmann 2001, p. 218). In the second order, it is my understanding that the observer is not part of the activity being developed because this observer can only

[312] In a more specific manner, Benner (1991) took reference from the writings of Herbart and his reflections on the concept of Bildsamkeit for sustaining the theory of Bildung from its purpose in the development of a person.

answer for an integrative language that works as a unit of description. If the observer would target to come inside the plane of actions, the position changes into a language of specialisation since the observer turns into an actor that possesses an expertise for dealing with the situation of interchanges under action. These mentions of assumptions regarding integration and those regarding specialised propositions can discuss the necessity to explain the positions of observation. Primarily because of the conflict and incompatibility of systems (see Zima 2004, pp. 167–175) in relation to their positions, the disciplines need to formulate hypotheses on who they are in themselves and, consequently, to ask questions in order to address what they do and how they do it.

On the side of specialisation, for instance, scientists call upon a framework of knowledge development for the reproduction of methodologies. In effect, this does not avoid the posture of reflection since the assumptions of specialisation are not uniquely determined by the position of the observer in the plane of actions, and hence, the dynamic within the same sphere of specialisation permits the development of other individual processes.[313] Theories can be problematised with the generation of results, and outcomes will continue shedding light on theoretical elements and parts of the object of study that are yet to be rethought. The border to an integrative proposition disappears in this way, while a continuous development takes place, through which all disciplines go, because the specialists are emplaced during certain roles. I formulate some statements that bring the reader into conflict by not understanding the difference between unity of science and specialisation. Preceding this difference, my description of second-order observation and third place of composition in this work targets creating a place for a third option that speaks about the collaboration of disciplines, viewpoints and perspectives. This means to state clearly that neither assumptions regarding specialisation nor those about integration exclude the possibility of collaboration.

This discussion of third place of composition can be based on a point of theory and during a particular moment in history, and with this action, I suggest taking the place of an external observer in order to start a language of engagement for generating a common understanding among distinct viewpoints. By a route passing through the consideration of several languages of disciplinary traditions, pedagogy joins to the effort of grasping approaches of research among fields of action. Hence, the discussion can be oriented towards the development of common spheres of action in the third place of composition, in which different perspectives contribute in an open discussion with approval or rejection of specific outcomes that come from the participants involved. This third place of composition represents a space for putting together components for their problematisation. This does not mean that the components are going to be interchangeable among each other without previous analysis but that a possibility for aligning differences into a conversational level is inaugurated by the involved parts. Thus far, this place of composition also needs the position of a third person that can translate and mediate originated differences resulting from initial intentions and incompatible languages.

[313] At this moment, I estimate that second-order observation can extend to and from one's own specialisation to the discussion of what is being done, namely to consider how the certainties of a discipline have been achieved. In this respect, second order observation requires a faculty that deals with the pedagogical perspective.

Pedagogy is capable of starting such discussions based on its closeness with theory construction and theories of knowledge on the level of observation. In this way, pedagogy can borrow a theoretical approach for the opening of this last-described third place of composition – where a third person can be placed for negotiating a translation upon the willingness to understand or based on being empathetic with a counter position. As a case in point, on the formulation of inquiries, whenever an inquiry starts, a query begins on something that is unknown. Paradoxically and open to discussion, modern times have closed the possibilities of questions once the procedures are fixed and the paths are built for the continuing creation of new *gadgets*[314] – namely, this position would refer to specialisation. This contradiction has a deeper character if this origin is taken from mathematics, numbers, logic and proportions through the consideration of the concept of an algorithm (Sandkühler 2010, §47u), where the rules for calculating outcomes allow applying their own principles to themselves in the sense of iteration and recurrence (ibid, §47b). To this extent (and with irony), I can say, 'All should be easy to maintain as long as we can use our common sense under the conditions of reproducing the tools of the system wherein we live'. However, this is not the case, simply because of the possibility of combinations from any statement that is infinite in open contexts, in which the 'invention and renewal' is located.

The number of combinations may lead any thinker to the execution of the usual 'trial and error'. The 'core of subject-matters' is born with the capacity of growing, learning and generating new connections that are feasible.[315] Therefore, to suppose a current subject-matter is not enough for finding results based only on what was written up to one point of observation. Once the position is taken of being allowed to separate the subject-matter from its observer and its interpreter, and considering that the context would change at every moment, then in that moment, the 'composition of the unimaginable' becomes doable. Furthermore, within theory construction of educational science, the object of study reveals a subject-matter that defines itself.

Conspicuous questions appear conceivable under the proper deployment of agents[316] within situations. But to what agents should any scientist turn to look and formulate

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[314] At this moment, I introduce 'gadgets' as a concept based on its sense of *mechanisms* and its figurative idea of an internal organisation, because despite the reference to machines, the word 'gadgets' is connected to a social level of a virtual network maintained by computer-aided software updates and content generated by users around the world. Based on the technological times that humanity has reached at the moment, I enounce the word 'gadget' because of its potential of mind-location and association with fixed progress. A further connecting point is foreseen to be handled under the topic of artificial intelligence; a topic that that does not currently fall within the scope of this work.

[315] Or as Ostheimer (2008) in the interpretation of Luhmann established as '*Virtual*' being what is 'viable'. In this matter of intertwining vocabulary of the theory of von Glasersfeld, opening a discussion of constructivism exerts a great example of the different explanations that 'constructivism' has received between radical constructivism or theory of systems (see Anhalt 2003). For this work, the theme of constructivism is surrounded by authors and concepts oriented towards a discussion of the third place of composition. In this way, the conceptualisation for this work is in an incipient moment and the interaction between the theories will belong to another phase on a systematisation made possible by this work.

[316] Here the word 'agent' refers to an individual, a doer, a people and/or a human being throughout the rest of this writing. The reason for changing the wording is the need to use concepts to describe the 'individual' and the various theories considered in the development of the proposal of this work. In addition, 'individual' should refer to a synthetic construct and this characteristic should be constantly recalled.

questions based on them? With the intention of taking an answer for this question, modern scientists bear the responsibility of relying on previous knowledge with the awareness of confirming the information. It is in this form, then, that a scientist does not start from zero,[317] but with a position of alertness of the background that sustains the reflections of the null point whence a research would start[318] (Luhmann 2001, p. 221). Luhmann scouts around biological knowledge on one side and social knowledge on the other (ibid, p. 220); in my reading, he proposed[319] an idea of the difference between a situation when a subject-matter is an autopoetic construction and one in which a subject-matter involves an interaction with the world. Namely, this would speak about two different ways of composition, and in consequence, considering two systems within a situation will not help to explain a whole reality (see, for example, Zima 2004, p. 170). Therefore, these systems might yet find a way to speak among each other and to collaborate with one another.

By now and according to the style of argumentation that this work has followed, the fact that there are more possibilities of organisation and division of structures of the world can be recognised. Among other works of logic, but supported using the texts of Spencer-Brown (1972) about a reformulation of logic, Luhmann developed a theory of differentiation (in Anhalt 2012, p. 257) that had a reception in educational science (Lischewski 2014). This theory brings to the thinker the portrayal of true, untrue,[320] meaningless and imaginative content, with what is broadened to a wider systematisation and organisation of meanings. With this, and coming back to the idea of reproduction with the tools of a system, the human being confronts the barrier of manipulation once the possibility of self-reproduction of the subject-matter is taken into consideration (see,

[317] This 'starting as not starting from zero' can be seen as an example of how a previously identified element of a system, or in this case construct, is applied in the conceptualisation of the problematisation of this research, i.e. the identification of the subject-matter of educational science which, despite its constant definition, is applied according to references of its reflection. Thus, this element or construct problematises methods of analysis at a time that portrays a supposition in aligning the uniting of its forces for this work, with regard to the development of a conceptual framework – meaning in the reciprocity of historical to philosophical domains upon a specific construct that relates to a concerted system.

[318] Here the position of Bildung would start making sense when considering the individual in the equation of an interchange of different processes. As such, here, the individual would have the place of the interpreter upon previous reflection.

[319] I deliberately use different tenses to refer to some notions that Luhmann wrote, but which remain current (see, moment of writing notions related to second-order observation with reference to Clinton's campaign for a politicisation of homosexuality, I suppose that in about the first decades of the 1990s, in Luhman 2001, p. 262). Specifically, in the case of coherent statements relating to this footnote, in the case of one, I use the past tense to give note that the proposal was made. Nevertheless, using a present tense, I note that second-order systems continue to be investigated. The use of different tenses recognises Spencer Brown's concept of *form* (see, for example in ibid, pp. 243–246), which is written as *anwesend* in German language that I explain according to my words as non-absent, and which does not have any ontological reference (ibid, p. 245). Hence, my use of various grammatical tenses aims to illustrate a 'perfect continence' (see ibid) in my writing style, which I will maintain throughout the work.

[320] Although Spencer-Brown specifically employed the word 'false', I want to use a translation more in the direction of the concept of Luhmann's 'unwahr' that can also be found under the word 'untrue'. In my opinion, it better reflects the intended meaning of the later analysis on the work of Luhmann (e.g. Zima 2004, pp. 167–175).

for example, Ostheimer 2008, p. 43) because then, the range for control might[321] also be questioned.

In this configuration, any observer is rapidly drawn to the overview of the impossibility of control based on categories of true and false: true, untrue, meaningless and imaginary content. This is because the division of natural and social knowledge do not depend directly on each other but in a historical recount of how the term for science has evolved (see, for example, transformations from Baconian science into methods of measurement in Kuhn 1961). Such a conversion is captured with the modifications in the use of instruments and phenomena from the individual and composed as the individual within a collective. However, this progression has a limit as well, namely with the use of the picture of the road of scientific law to measurement in a forward-moving route (ibid, pp. 185–190), which would be spoken about simply as one direction that can be taken. What about the impossibility of moving forward? This means the moment when one demonstration cannot extend to everything, referring to the moment when the explanation of a connection between two positions is not the bridge in itself but only the way to look for the relation.[322]

This would speak to the task of the science of supervision of its own content. In terms of supervision, one of the rules of science is to be open to the verification of knowledge and according to the proposal of this work to the building of flexible academic bridges. 'Flexible' here is only the adjective employed to compose the narrative figure of the effort given by scientists – in the sense of an accountable person who adapts to changing conditions at the time that does not lose strength. Nevertheless, bridges should be robust in terms of theory construction. With the intention to build upon those bridges, they must be strong enough to hold critics and for staying aside of discussions when they do not fit a particular topic. Theories of observation and of differentiation have in mind the confirmation of knowledge within a systematisation. The interchange of verification tools would allow a wider audience that do not think only in terms of inductive or deductive procedure but on the reverse and combination of chances of reformulating a design of a study. Here, it must be remembered that I am not speaking about the reproducibility of an experiment but about the analysis of the configuration of the execution of an action. From the level of description of what observation in second order can reference, I want to explicitly say that despite the progress registered by science and made through the interchange of theoretical positions, I am convinced that a speculation regarding how scientific knowledge is reached sets forth that scientists are accountable for building academic bridges upon historical contextualisation. This last point refers to

[321] If the self-reproduction of the subject-matter admits measurement norms from some theories, then the possibility of questioning the control area can follow (perhaps according to some empirical theories, because as the argument of this thesis states, empirical theories are not those that are only able to connect to normative approaches). At the moment, however, I am not testing a measurement and therefore use the modal verb 'might' instead of 'can' directly on the sentence associated with this footnote.

[322] I found the notion of this metaphor in a text of Sandkühler (2012, p. 174) and that it has been used repetitively in different texts. I take it that this intended metaphor is recurrently used to give the visual idea of the knowledge as a means but not a solution in itself. As Ostheimer problematized with von Glasersfeld (in Ostheimer 2008, p. 46), the employment of viability as having the key of a lock as well as when this key fits, this would speak of the goal of the key but not about its ability; in other words, it describes the ability of the key but not the lock.

the development of problematisations within a complex situation and not only by the recollection of information.[323]

Luhmann wrote, "*Alles Beobachtbare ist Eigenleistung des Beobachters*" (1988 in Ostheimer 2008, p. 49), meaning all that is observed is an internal activity of the observer, which connects to the discussion of the entangled constructivism with the different notions of how the human being is connected to the world. When taking as a basis that the individual influences the surroundings and that the given reality can be problematised simultaneously with the created one, this would make viable in consequence the discussion of the subject-matter of educational science as a virtual object of selection being chosen. This would sustain redirecting to a cornerstone upon one of the principles of reality that comes from the pedagogical side. Under such methodology, while working in teams comprised of different representatives, engaging perspectives and proposals of 'core subject-matters' is achievable because those are manipulable according to the methodology's complex internal dynamic [manipulable tries here to connect with actions and not yet with specialised tasks that can be measured later].

Second order of observation refers to deconstructing a situation in order to reorganise it under this portrayal of multiple possibilities for its handling towards the reformulation of another solution (see Luhmann 2001, pp. 262–266).[324] The justification that Luhmann (ibid, pp. 266–271) needed to exert required a deeper knowledge of the history of philosophy and previous categories of Jacques Derrida or Charles Pierce (ibid). Although one could follow Luhmann's explanation without further reference to the discussions made about these authors, the reorganisation of the continuity of knowledge development must address a systematisation behind any isolated concept. This systematisation must be spoken outside the goal of historicism that can restrict epistemological consequences (Moulines 2011, p. 84). Therefore, this systematisation is to be extended on the internal dynamic of a subject-matter, in the same way that Rucker (2014) introduced this reflection in the pedagogical field. In like manner, the dynamic of the concept of diagnosis and its differentiation using the concept of Bildung or self-transformation can be called upon with the awareness of the contexts where these concepts have been gathered together, as in the reflection of an individual case or on

[323] C. Ulises Moulines (2011) gave a longer description of the 'historicist phase' that he enclosed within the span from 1960 to 1985. In it, by reflecting on the course of history and on the works of Popper and Kuhn, I detected that he presented a possibility for rethinking the different combinations to be made with processes of philosophical reduction. By dint of broadening meanings on classifications like 'the historicist' (ibid, p. 84), he provides affirmations that can be placed in different contexts, thus establishing that the restrictive interpretation of historicism is not limited to a diachronic account of historical events, but to an interchange on the diachronic structure of science with the elements of original analyses (see Lakatos in ibid, p. 96). Lakatos, basing ideas on the writings of Popper, displayed an attitude of being more focused on the problems than on the solutions (ibid). In this way, the orientation to problems of the theory of complexity of education (Anhalt 2012, p. 81) aims to sustain the circle of problem development in the methodological sense.

[324] As mentioned in a previous footnote, Luhmann (2001, pp. 262–266) employed in the section regarding deconstruction of the observation in second order, '*Dekonstruktion als Beobachtung zweiter Ordnung*', the example of the different positions in the debate about the integration of homosexual soldiers in the American army. The example brings clarity in understanding different positions that are strained in considering a controversial topic.

another level in bringing to bear the place of a single discipline that will work with others. At this point must come the explanation of discipline as viable unity.

3.1.2. Discipline as unity in expansion

The definition of discipline will be taken as the central core of the entire discussion of inter-, trans- and pluridisciplinary work as well as for its problematisation. Every discipline portrays a structure that is conformed by theory and methods (Kneisler 2015, p. 20; Balsiger 2005, p. 67). Discipline from the pedagogical viewpoint speaks about a possibility to organise the entity of knowledge (Stichweh 1993, p. 237), which in its constitution is tied to the division between everyday knowledge and internal differentiation[325] (see Stichweh 1984 in Helm, Tenorth, Horn & Keiner 1993). I bring discipline to the discussion from an integrated and specialised knowledge or internal belonging to a group of beliefs – to another group of beliefs.[326] Like this, discipline is not just tied to the meaning of science, but to the paradox of creating borders at the edges of the holistic knowledge. A discipline must allow the entrance of the scientification of different objects of study, depending on the meaning of science (Balsiger 2005, pp. 52–131). To this end, historical experiences and contexts from different traditions have developed variables for the distinction of methods, concepts and proper languages.

By discussing philosophical analysis from the 1800s, an extensive discussion going through the next century upon the combination of these elements reached a confusion between scientific and non-scientific classifications (see ibid). As a consequence, during the second part of the 1900s, a terminology became required (ibid, p. 138). Due to the varied combination of elements[327] from different perspectives, this terminology effectively should take account of the participation of disciplines but also of possible stages through which this participation occurs. To this extent, pluridisciplinarity is the first step of a disciplinary collaboration (ibid, p. 147). Before presenting what can comprise a pluridisciplinary approach, some terms are presented in analogue words with

[325] Everyday knowledge must not be confused with knowledge of common sense or disorganised knowledge, as the proposal of a scientific-pedagogical approach aims to remain in the field of scientific analysis. On the basis that discipline from the pedagogical viewpoint has an organisation related to everyday knowledge, a hypothesis could be formulated in terms of the integrative position. Simultaneously, by establishing that it bears upon an internal differentiation, the specialised assumption can problematise its place next to how to be part of a world that seeks to yield general explanations as well. According to my knowledge, this has not been shown in other trends in pedagogy. The collaborative position yet remains to be presented after widening the frame to the teamwork of disciplines, taken completely from a general point throughout this subsection.

[326] From the position of unity in science when it is founded on disciplinary characteristics, I point to the possibilities for differences inside same disciplines (a disparity displayed during the second-order observation). Like this, the position of unity in science can be assumed by some approaches in some disciplines while being questioned by other approaches from representatives within the same discipline. Such a characteristic from disciplines does not imply a contradiction, but an openness exerted by the individuals. I present in the fourth chapter how these other approaches are displayed according to assumptions of attitudes, with which the agency of the individual will be more easily seen. From the beginning of this work in the introduction, I gave account of how the unity of science can be divided into these different assumptions for a later development of models. Whether this position of unity can be questioned depends on the scope of extension of a work. My work seeks to restrict itself for the moment to a pedagogical scope – for a theory construction that can continue to be developed.

[327] This combination is considered complex since it can be established in the perspectives' emergence, objects of a study's considerations, a subject-matter's modifications, influence among all of the latter and in later opinions.

the terminology of disciplinary collaboration from Mittelstraß (2005) that Sukopp (2010) classified as follows:

- Theoretical interdisciplinarity: refers to a cooperation based on similar theoretical entities located in diverse disciplines.
- Practical interdisciplinarity: here lies the importance of approaches of research where it is less important to be organised or directed according to the perspective of just one discipline. It is about the structures and not just a resolution of specific subjects of research.
- Methodical interdisciplinarity: located in the approaches that require the employment of different research methods that, due to the non-linearity of confirmations upon interrelations between an object of study and its surroundings, shall be under a framework of agreement and continuity.
- Methodical transdisciplinarity: in which the approach is taken that transdisciplinarity is a research and scientific principle and not a theoretical principle or a methodology. This refers to the methodical systematisation of an interdisciplinary approach.
- Theoretical transdisciplinarity: in which the generation of approaches of research comes from inside the same interchange of knowledge among disciplines.

These terms will provide a frame for understanding the span between perspectivity and the dynamic of a complex subject-matter (see also Rucker & Anhalt 2017). I propose that with the diagnosis concept, when it is connected by the definitions of inter- and transdisciplinarity, the disciplinary specialisation will be challenged by concerted systems.[328] Concerted systems are composed by single scopes of fields and do not contradict the assumptions of unity, for example, because in these systems, the assumptions of different beliefs is considered.[329] This composition problematises the core of what constitutes a scientific discipline[330] and how this can be defined. For that reason, with the conceptualisation of disciplinary collaboration, pedagogy is working to earn an independent place within science.[331] Concerted systems as a notion is different

[328] The diagnosis concept and its analysis provide a scenario for observing the positions of disciplinary collaboration. Simultaneously, in the way that I previously explained, specialised and integrative positions set the basis for grasping reflections upon concerted actions.

[329] Concerted systems are not the main topic of this work, and hence, they will be handled as a connecting point for further problematisation within a wider scientific structure. For this moment, I can briefly mention that this system is reproducible in other scientific areas due to its characteristic of covering different assumptions. This system sets the condition of a systematisation for understanding the differences between beliefs of scholarly traditions.

[330] Such a composition problematises the core of what constitutes a discipline, since this composition is made in and from an already existing collaboration. This means, in other words, that in order to be able to identify a teamwork of disciplines, the definition of discipline must be previously mapped out. The option that this work provides aims to compile problematisations from different traditions on a second-order observation, which can be can be made available through an educational frame. I follow this option by the absurd impossibility of defining disciplines from null. 'Starting as not starting from zero' therefore functions as a guiding principle in the formation of a team of representatives of disciplines.

[331] To this extent, a concerted system can present historical divisions and discussions on the sense of reality. Repeatedly, this would be one only reality taken for granted in order to establish a common reality or facts from specific procedures. However, the reasoning that gave origin to specific schemes is unheeded along the way. Consequently, texts are forgotten or taken outside of their contexts without deeper explanations from where the basic ideas came from. Nevertheless, some outputs must be selected to organise vestiges in previous constructions. Winfried Böhm (2004) briefly explained on the referred text the antipodes from Greek philosophy and Christianity through the work of Erasmus von Rotterdam ('In praise of folly') concerning the angular contradistinctions for a pedagogical

from a collaborative position in science. As already mentioned, to pay heed to the collaborative position as 'systems' raises thoughts upon the position of specialisation in science, where specific disciplines work within the boundaries of their own realm. In this way, this notion of concerted systems intends to speak of an already happening situation of disciplinary collaboration.[332] This sounds self-evident, but it is not when considering two distinct moments. One refers to the description of and within a situation and the other to the happening of events that can be different from what should or ought to be in terms of what is intended for particular purposes before they become collaborative or call those that are collaborative. The presentation of distinct moments shows the gap between norm and liberty of actions, for example.

I am showing that after taking into account evidence of theoretical reflections, the definition of an assumption in terms of proof relating to a basis renders the purpose towards the feasibility scope of extension.[333] With the idea of the theoretical mechanisms[334] related to the *circular causality* (Fuchs 2012 in the first chapter of this thesis) – problematised from a pedagogical reference within this thesis between the self and the world in a complex situation – causations take place in several forms that are located on different levels. Covered by the mechanisms of such causality, the borders between disciplines might start slowly fading when principles are excessively interpolated. On this ground, disciplines can hold to the solid basis of their historical tradition that guides the criteria of how statements under such disciplines should be spoken. Thus far, the historical reference in the pedagogical tradition embarks on conversations about not leaning on dogmatisation (see, for example, Dilthey 1900). Hence, the borders of an ongoing exercise of updating contents, methods, results and reflections upon them is upheld because, from the scientific perspective, contents should remain opened. In this way, with concerted systems, in consideration of the forms of disciplinary collaborations, despite a common interest in one action or in a shared problem, the relations between frames of reference have variations – I state that a paradox in the constitution of disciplinary collaboration occurs incessantly because disciplines are independent, but dependent on problematisations, when concepts require some mechanisms for their application to understand themselves. The spoken mechanisms are related to the individual. Tied to the aforementioned variations, the theory displays a distance from the praxis, or both are discussed according to the methods employed. Namely, the variations have a wide spectrum that goes beyond only one division. Like this, at the moment when not all the positions turn upon the gap

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argumentation (ibid, pp. 34–35). Mentioning this, I can see what is problematic in identifying a position of unity based on the same teleological place: God and reason – this means from a teleological component to a possible particular manifestation. The abstraction is more complicated, but by mentioning such difference, a contrasting analysis confirms the disparity on solutions. At no point I state that Böhm (ibid) took up an idea of religious thinking outside a context, since I merely write on a footnote a relation that displays an approach that helps to understand how a problem of integration can be traced back to a long register in history. Insofar this argument should be sought with deeper analysis in order to collect more connections about the development of ways of thinking.

[332] Disciplinary collaboration bears upon the assumption regarding collaboration for a later formulation of a model of collaboration. The differences between these states are not clear, and hence, this third chapter earns the place to-assign a meaning to where more work is necessary.

[333] The purpose for the feasible scope of extension is what I hold as the basis to define a disciplinary task.

[334] Fuchs (2012) referred to psychological mechanisms that connect to the vertical causality (ibid, p. 334). In the first chapter of this thesis I had reflections on reduction and viability as mechanisms that relate to the individual when this is in contact with the world.

between theory and praxis, to which it is common to limit the problems of education, this fissure still confers a shared trait for problematisation within a concerted systems and between disciplinary collaborations. This sequence of thoughts yields a question about how education may have been limited to one division, when indeed pedagogical subject-matters appear in several divisions of the layer's interpolation.

That being so, the borders between inter- and transdisciplinary frameworks is not always clear. As a consequence, to apply any strategy belonging to any of the forms, whether inter- and transdisciplinarity or the difference between theory and praxis or any other coming from their combination, leads to ambivalent[335] difficulties that sometimes can even represent opposing thoughts between them. Irresolute, uncertain and dissimilar opinions appear starting from the moment when an object can be described as scientific and with reference to the part of science that is taken for considering the meaning of the unity of a discipline. This unity of a discipline can release a conflict when combining the level of integrative assumption of all the explanations with the level of a discipline[336] when it can try to accrue a unity with and over other explanations as well [as in a scientific unity]. This conflict can be better understood in the same way that antipodes from Greek philosophy and Christianity presented a problem when they situated a position of unity in the same teleological place (Böhm 2004), as I am giving reference in the footnote that precedes this paragraph; unity of a discipline and scientific position of unity should be separated before generating fallacies. This means, in other words, that this contradiction is shown when two positions claiming the place of whole explanations cannot be differentiated in their core, for example, on the extent of science or regarding what a discipline is. This division shows how the point of origin from science or a discipline can meet disharmony after setting the criteria for defining the mechanisms for building the borders of 'spaces' and of circular causality (Fuchs 2012) from a subject-matter. These mechanisms refer to the definition of reduction and viability equally as to the influence from the subject-matter in the connotation of procedures, decisions upon

[335] Anhalt (2012) mentioned in the foreword of the first part of his habilitation treatise that, in modern times, 'understanding' is an ambivalent-precarious (ibid, p. 9). Not completely under the description of a modern context, I take hold of 'ambivalent' from a slightly different conviction, based on the ability to go back and forth between two opposing thoughts. I think about the ability of members of a discipline, in that once they can be proficient in specific knowledge, they can deliberately select contents from transcendental and ontological structures for formulating innovative designs in research.

[336] I do not seek to point to more and more divisions that can make the work longer and longer. However, considering discipline as a unity fits this statement to mark that upon this basis can be yet reflected in the representatives of a discipline. Three moments can be further contemplated for this problematisation: scientific assumption of unity, unity of a discipline and representatives from a discipline – representatives who can rely on the assumption of unity and/or in agreement with the assumption of specialisation within a framework of cultural science. Hence, the second order and third place of composition can be examined within a deeper clarification of unity of a discipline as assumption of unity towards science from a discipline. Thus, the last two moments can be represented by a concerted action from a collaborative assumption that makes clearer how different assumptions can appear within a framework of unity. Despite resembling contradictory explanations, the logic presented bears upon differences and suppressions. These possibilities presented are not a game of words but represent titles for further organisations of discussions. With the contents of this work, I am starting to deal with the basis of this structure. As can be seen, the historical conceptualisation of a work manages to detect these possibilities in order to call attention to possibilities that come from the past and that have yet pending work to do with the integration to an updated position of science. By displaying this discussion from the pedagogical side, pedagogy and educational science prove to have a current place within the administration of the academic pedagogical tradition.

its own definitions, but openness and uncertainty regarding how to handle an object of study.

Educational science enters into this discussion by analysing what a scientist does and how the scientist deals with the task of a discipline (Kockelmans 1979 in Balsiger 2005, p. 56). This also means that a pedagogical reality opens an analysis on the subject-matter versus object of study, theory of disciplines and disciplinary theories and methods of the composition of science, research programme and disciplinary content. This happens in this way because, as mentioned above, the definition of discipline presents a controversy between the aforementioned components. Specifically speaking and following a combination of terminology from this work, a disciplinary unity delivers a sphere of action of a principle of research[337] that cannot be defined under only one statement[338] and not under a one-sided direction. In any event, the proposal of pluridisciplinarity cannot be understood when not explained first, respectively problematised with the other proposals of classification for the disciplines that operate in tandem, as it is in inter- and transdisciplinarity. As indicated above, a clue for understanding the differences between disciplinary classifications could rely on the interplay between the meanings of theory and methods. Notwithstanding, this is controversial enough for starting another group of combinations of different perspectives based on the reduction of understandings and knowledge taken from general progress in science that problematises what a theory refers to – as Kuhn proposed the use of paradigm for going beyond the restricted previous definition of theory (in Moulines 2011, p. 87).

I want to mark a need for building a bridge between the analytical as speculative and descriptive language. For this, I make use of the description of pluridisciplinarity in order to open a discussion on a utopic neutral ground that can consider a scientific discipline as the institutional form under constant self-development, dynamically oriented and with a professional position (see Guntao/Laitko in Balsiger 2005, p. 67). At the same time, I analyse the meaning of the diagnosis concept, which dips into the exchange of theory and methods, as it happens in the recognition of another person and the encounter with theoretical and practical knowledge,[339] as well as in the discussion

[337] I employ here the wording 'principle of research' from Mittelstraß (2005), looking for a connection with the composition of ideas that he worked based on the topic of transdisciplinarity, which I am discussing as these ideas relate to the collected problems affixed to 'disciplinary collaborations'.

[338] 'Statement' can be discussed under the shade of meaning of 'idea', 'proposal' or 'explanation'. Any of these last-mentioned can be based on 'observation', 'experience', 'reasoning', 'analysis' for a later 'speculation' and/or 'description' of a reality (see further reference to 'explanation' and 'description' in Westmeyer 1972, p. 18, which were previously commented in this work).

[339] If and only if the responsibility for diagnosis concept is given to one discipline, despite being marked by the medical historical tradition, the recognition of another person risks limitation by theoretical positions of specialisation that cannot explain all the interactions of one organism with the surroundings. This does not speak about a negative characteristic; however, it restricts formulations that in the way I am arguing, other hypothetical formulations would be generated anyway but under a frame that is distant from one scientific disciplinary intention. A scientific disciplinary intention of the diagnosis concept must be preserved and be respected in order not to damage its product. In consequence, disciplines related to the diagnosis concept will be required to formulate options on how to think upon it. Not respecting an intention of recognising another person in order to cure maladies indicates a risk. For example, in the sense of filling the diagnosis concept from its process but without enough scholarly formation, a lack of openness from academic circles would raise in society more inventive formulations due to the absence of access to fixed thoughts. Hence, in order to support scientific standards under the concept of recognition, other disciplines like pedagogy must encourage awareness of such concepts as

and advance between singular and general, or specific and general events (Matthiessen 2004; Schäfer 1999). This means that from the 'analysis concept' of diagnosis, an analysis of meaning is conducted for the purpose of displaying the connections of disciplinary differences that can aim at speaking upon disciplinary fundaments.

Identifying connections in disciplinary differences is a pedagogical task since pedagogy and society have looked for integrated content that can be transmitted to new generations. To this extent, content integration has a bond with a historical evolution of knowledge when conceptualising its pedagogical intention;[340] this means to trace its pedagogical intention throughout history because despite being unified knowledge, pedagogy does not seek to create dogmas. Given that *plurisdisciplinarity* concerns different opinions regarding its definition, but with an agreement on the collective way of problematising a topic (Balsiger 2005, p. 147), I take the nomination of Jantsch (in ibid) for a mutual toehold on the hierarchical level of importance in which the collaboration is open, uncertain and without any previous stipulation. Thus far, I do not try to be innocent regarding the composition of works within science. However, I find useful having found place for a pause, where disciplines can suddenly start, like teams working in companies, an ordinary day for reaching the goals of a project. With the intention to connect with the next section, I call upon the idea of portraying crews or units from different areas that deal with an item on the agenda according to a schedule of the day and the fresh morning glass of water and cup of coffee or tea.

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diagnosis in its interrelations with the self, theory and the world. Eventually, the spread of information for a collective development of solutions refers to a strategy also known as sustainable strategy for social advancement. Thus, sustainability of science should be problematised when it comes from the scientific side or by involving other voices through scientific parameters. I indicate that an integrative work has to come, and for that I suggest reckon with a system of plural participation, namely a concerted system that considers disciplinary collaborations, concerted purposes, assumptions regarding attitudes, a positioning from the individual along the breadth of synthetic constructs.

[340] Content integration is also bounded by historical evolution after conceptualising the different scientific positions towards science because, as exposed above, *content integration* can have more than two starting points (coming from the society or from pedagogy). Different starting points with an interest in integration can be seen as ironic when, from a second-order observation, the nuance of opposites interrupts paradoxical occurrences. Since content integration differs from a united or integrative scientific position, the integration of content speaks of a pedagogical intention because it comes from the interest of connecting positions. 'Content integration' could be under a similar scope to that of 'concerted action'; from another viewpoint, specifically from the assumption regarding collaboration, 'concerted action' aims to make a common work plausible. Namely, 'content integration' can commence from the wider spectrum of science or from the united direction of a discipline (i.e. through attitudes of integration). Nevertheless, the possibility of gathering different definitions for 'ongoing concepts' multiplies the plausible combinations to one unimaginable stretch of new ideas. Hitherto, this tension, which includes the description of society and the united direction on the one hand (as one approach to concept) and the speculations on pedagogy and specific knowledge on the other (also as another approach, but which derives from theoretical concepts and experiential observation), forms an interrelationship which is characterised by the fact that it adds the internal dynamics from each concept to the object to which they belong, whereby the result turns out to be a state of complexity. I recognised a state of complexity due to the unforeseeable dynamics and encountered perspectives, to name only some characteristics of a proposed state that can be handled in pedagogy. I received inspiration from Anhalt's (2012) theory of complexity of education to think about discussing how to integrate and to transfer concepts into the pedagogical realm. Consequently, I had to speak about a wide extension on how to problematise concepts from their phenomenological contents by considering their *functional* 'epistemological side'.

3.1.3. Pluridisciplinarity from inter- and transcollaboration among three areas

When relating educational science with medicine and psychology, there is a merger that must be clarified. In a context without rules of coordination,[341] these disciplines are in search of clear terminology that can be used in a common collaboration, specifically when practitioners are looking to work together. A challenge comes into sight when considering as if these fields could be intertwined with the same subject-matter but from different points of origin; this means the epistemological analyses of the human being from different perspectives within historical traditions. In this way, I identify two moments on a common display: the first should refer to the interest in a common subject-matter while the second can be localised in defining and in aligning the definition of how to take this subject-matter within a reality of education.[342] For this, the already-mentioned theory of knowledge of pedagogical German traditions holds the basis for such reflection. During the observations of how the studies of theory of knowledge have evolved and following current discussions on how to define objects of study, the subject-matter of *recognition* appeared in the execution of tasks from disciplines when dealing with a new interest. Notwithstanding, disciplines from the viewpoint of their representatives have own beliefs, and for this, as I have already mentioned, for the easy exposition of an argument, disciplines need to find a way to speak without any barrier in communication.

Pluridisciplinarity (Jungert 2010) is taken due to the possibility for disciplines to speak on the same level of hierarchy and with a common influence on a shared topic as in their connection with the subject matter. To what extent is education in the 'wrong picture' in the interchange with the treatment of patients? A definite answer to this matter will not be given by this work, rather a discussion of the involved components according to a theoretical framework of 'perspectivity and dynamic' (see, for example, Rucker & Anhalt 2017). Specifically, based on the theory of the complexity of education (see Anhalt 2012), the interrelation of fields leaves a 'dynamic object of study' (Rucker 2014) that can include concepts within a complex interchange of opinions, e.g. the concept of diagnosis. In this manner, definitive answers to the recognition of another person, and inwardly the own-self, cannot be given by any approach after taking the freedom of the individual as the cornerstone of a reality of education. The reasons underpinning the lack of definite answers consequently should be under investigation.

To wit, a distinction is made between the dynamics of transformation and the progressive state of a situation, like the situation of a patient analysed by a set of several disciplines. Within this set of fields of action, a meeting point is constructed that helps to develop the work of a later 'disciplinary' collaboration, which attends to a social demand, an intersection that for a moment and in brief words can be handled as a pluridisciplinary

[341] For the sake of clarity, I state that, in my understanding, the context in which the diagnosis concept takes place is influenced by irresolute, uncertain and dissimilar opinions. Hence, not due to lack of a systematisation, but on grounds of a dynamic subject-matter from a theoretical construction that is plural by dint of perspectives, the values from scientific traditions that relate to the human being are directed to respect an opened transformation of a person.

[342] Speaking to the point of a reality of education, the other disciplines are interested in this reality when they are immersed within a study programme like, for example, the master's study at the University of Queretaro (Master in Sciences Neurometabolism) among different study programs executed in the global world, in which their practitioners are interested in understanding, discussing and disseminating topics from their disciplines.

work. With the intention of reflecting awareness on the problematic nature of this hypothetical disciplinary collaboration, it could be further elongated according to the terms of (1) practical interdisciplinarity and (2) methodical and practical transdisciplinarity in addition to (3) theoretical transdisciplinarity. To the first two, briefly mentioned, belong the scheme of putting disciplines to work together without previous problematisation on a common reflection.[343] To the third term, in contrast, would belong a theorisation that can be formulated more precisely or more easily within a second order of observation. This is feasible as this 'transdisciplinary' option includes the fact that knowledge can be generated from inside the same disciplines; by definition, transdisciplinarity incorporates the voice of the society.

Such a moment of exchange can be described as functional, once the word 'functional' is given sense based on the accomplishment of the integration of social, biological and technical components of a common task (Sandkühler 2010, §755bu) as it is executed during the task of diagnosis from the perspective of different disciplines. I take that functional reflects the epistemological level, in which the facts are not tied to the perception of the things themselves (see, as well, Sandkühler 2009, p. 22) or according to my reflections about questioning the things only from their physical side. This exchangeable functional moment can be explained in terms of educational science as it is, for example, in the explanation of pedagogical causality. With the pluridisciplinarity approach, a pause can be made to think on the contributions that come from each side of the disciplines involved. Nevertheless, this theoretical halt should consider that theoretical problems or formulations of theoretical problems lie in wait, according to the basic principle of science, which refers to a constant inquiry. I understand that whoever traces this line can be empowered to question the scope of the problem. Stopping at some points in history, I want to rely on some proposals of Johann Friedrich Herbart, who detected an exchange that takes place: in particular, the 'pedagogical causality' where relations and persons involved within can be considered. With the pluridisciplinarity approach, I foresee the possibility of gathering inputs from the hermeneutic pedagogy to the project of pedagogy as a science.

Johann Friedrich Herbart wrote that 'pedagogical causality' refers to a mutual situational and influential relation of interacting people (in Anhalt 2012, p. 129). With this, he opened a stream of thinking in which the human being reformulates the meanings of realities since 1 and 1 do not produce 2 until they are linked by a methodological procedure – being, in this case, a mathematical procedure expressed by the 'summing' of real numbers 1 plus 1 that does produce 2 as a real number. One of the constant questions regarding the collaboration of disciplines relies on the integration of the opinions of experts and non-experts about a topic, respectively the specialist and the society. Often, this problem will refer to some definitions of transdisciplinarity because of the situational social meaning of the impact of the matter at hand. To this first moment of common display of disciplines, the interest in the demand for a diagnosis and of its product renders clear evidence that a search for certainty is shared. Scientists and laymen on a topic, in other words, experts and non-academic representatives are willing to have an answer to one problem. In principle, the methods and channels that they have pursued

[343] As I mentioned previously, a systematisation for a common agreement does not elude the ongoing dynamic upon which participants in a situation would adapt to a changing environment. This means that a situation upon the diagnosis concept cannot be held perpetually in the same way.

can be different, and therefore, the second moment speaks about alignment or calibration of a common understanding, about which the methodological procedures would dispute among themselves.

Coming back to the second moment in the aligning of the definition to the reality of education addressing how to deal with a subject-matter, it remains necessary for experts to clarify to what extent fields of action can share the formulation of meanings. In order to shed light on how a meaning is composed, the first step along the way concerns that a conviction according to one 'principle of reality' must be established. In the second step in this thinking, convictions[344] do not fall from the sky, but they are grounded on human activities, needs and interests in cognitive and practical interaction with the world (Sandkühler 2009, p. 91). Specifically, in academic circles, these interactions are sought for the purpose of regulating them according to determined standards. This can be grounded on the level of the individual, but in the counter reaction involving the way that society came to the idea of participating in problems of academic circles, which belongs to a foundational question that can also be postulated based on the 'genetic epistemology'[345] of Piaget (in Apostel 1970, p. 134) in terms of the construction of meanings.

From the attempt to explain knowledge from its social beginning (Piaget 1970), to what is referred to 'genetic epistemology' in general terms, the socio-historical development of knowledge can be included in the analysis of the outcome of knowledge. This last intends to say that an epistemological analysis can be extended up to and including the influence of the society and history.[346] Balsiger (2005) wrote an introduction, for example, about the interplay between groups of people who nourish each other according to the contents and demands that they produce. Mittelstraß (2005) wrote that inter- and transdisciplinarity are in the realm of a principle of research that includes feedback by societal systems of information at the very moment of integration with alterations of other systems, in which every perspective is irremediably connected to all others. For this, every perspective in a human system can be said to belong to a neighbouring system which, from the position of the observer, does not necessarily have to correspond to the way another acts. A presumption can be made on the basis of the large number of viable conformations corroborated by the formulation of such statements as in this case.

Educational science, for its part, has a systematisation that includes the participation of the people because the field of education portrays a moral value. Hence, taking account of philosophical works as the considerations of Hegel upon Fichte is important in order to extend how moral actions can be tied to social ones (Clarke 2009). The sphere of educational science contains some distinctions that speak about how norms are described, or about the philosophical notion of the development of the human being or an empirical science that defines how goals are reached (Brezinka 1992, p. 7). This

[344] In terms of 'convictions', there is another level of systematisation, depending on scientific or everyday convictions, whether intersubjective, 'tacit', pretheoretical or unspecific (Wingert 2007 in Sandkühler 2009, p. 91). However, at this moment, this is not a differentiation that I will try to follow.

[345] From the integration of this approach, in the development of social problems, a formulation of reality based on biological and social components is achieved.

[346] I show that my understanding of reason and knowledge is based on the notion of 'intention', which is aimed at means from synthetic constructs.

systematisation speaks not only about philosophy or education but about how other disciplines affect each other in a way that will disentangle what these disciplines set down as common activities, like from neurobiology through the localisation of brain areas responsible for learning motor activity. Namely, not only education and reflection must be put under a shared historical framework, but *arts* or ways of executing other actions must be as well. Here is where the 'practical deed' in education can compose a category with application in other fields because this first-stage combination in an incipient situation succeeds within different disciplines as in the examples of practical medical action and pedagogical action that are to be discussed in this work. First, however, the mechanism of pedagogical translation must be exposed.

a) Pedagogical translation

I propose as part of this work that *pedagogical translation* refers to a general interplay among different processes. Within this subsection, the relationship of 'pedagogical translation' will be explained with a logical attribution that is under construction but reflected from the exchange of collective contents to the individual ones, and the other way around. With this in mind, parallel to 'pedagogical translation', 'pedagogical action' refers to the exchange between theory and practice having a pedagogical purpose that approaches the problem of theoretical integration.[347] Theory and practice come into conflict since there have been moments in the history when 'pragmatic actions' have been of more relevance to the people than rhetorical speeches.[348] One of the most famous historical modifications in this respect relates the 'realistic turn' (Kneisler 2015; Keiner 1999) and the 'empirical turn' (see *empirische Wendung* in Tenorth 2000, p. 276) with authors in sociology and educational science who analysed topics on 'influences' within educational contexts (see, for example, Kneisler 2015; Stichweh in Keiner 1999; Wingens in Tenorth 1990). These well-known 'turns' in the academy display a problem of translation that cannot yet be surmounted. Pedagogical translation is intended as a concept that I root in pedagogy while on the lookout for a middle point where the individual freedom can be displayed. At this point, I am also considering to pay attention to different trends of thinking which go beyond unsolvable resolutions when implementing specialised actions. Hence, attitudes towards specialisation must become involved in a conceptualisation geared both towards collaboration between disciplines and towards the unity of science.

The option of translation is valid as according to a systematisation, it seeks to open discussions while searching to set a common language. Caution is noted by differentiating that social orders were translatable in religious denominations during the sixteenth and seventeenth centuries (Stichweh 1993, p. 235) until the hegemonic power of the church and state was dissolved. This was an event that, as I mentioned earlier, did not happen as a fluid transition (Stichweh 1991, p. 39). Precisely to this historical point from its theoretical side, the intentions and conceptions of science as unity experienced friction because the conflict against religious power had an influence on how a new order

[347] The construction of 'pedagogical action' helps the development of goals within determined spheres of action. In this way, from a pedagogical traditional intention about raising one person, specific tasks can be analysed for purposes of problematisation and development of understandings of a situation.

[348] Despite the fact that reflection is required for the development of ideas, suppositions on the higher importance of the execution of an action have surmounted opinions since the division between praxis and theory (see, for example, Böhm 2004).

should not rely only on unified structures[349] but on the recognition of a plurality of approaches. This raises an alert about how a translation might represent a dangerous scenario if an intention of control and power accompanies it. Remaining, however, on the side from the theoretical construction, the alert warns against crossing between theoretical levels without a systematisation. Such a systematisation should hold manifestations of actions for the development of assumptions within a sphere of action for also fulfilling specific goals.[350] In this way, I can speculate that a reason for cause about how all these changes have come across difficulties relies on the accountability of the place of the individual that rejects or accepts proposals. In terms of this speculation, the individual appears within the picture to which a place must be assigned. Here I present the individual as a synthetic construct for problematising from the consciousness the accountability of a person. Consciousness as a construct has often been studied alongside the discussions about mind or sprit (Hegel 1968, 1962). Without unique solution, along authors from the German idealism, my opinion about the accountability of the individual fits to the disruption between reality given or created.

With this in mind, and in the interest of setting a basis of an individual action within a well-thought systematisation, I take from the writings of Rudolf Carnap (1935 reprinted in the 1996 edition) that a translation of philosophical and analytical contents is possible. I do not follow the *logical syntax* procedure suggested by Carnap for my analysis because I identify that he took the *objects themselves* (ibid, p. 72) without further consideration of the impact after varying the way of dealing with the objects[351] (in contrast, I am taking reference from the writings of Mittelstraß from 2011 and 2005). An impact upon the object attends to the disciplinary work within a concerted system that explains how reformulations are located within a complex situation – correspondingly, how they are ordered to multifactorial movement of dynamics. Carnap had an influence on the way of thinking of the Vienna Circle and left a legacy for the theories of knowledge of the twentieth century (Carrier 2007). From Carnap's (1996) stated position against metaphysics (ibid, pp. 15–38), I want to return to his argumentation for pursuing a logical syntax from philosophical and analytical content. To this respect, I account for a systematisation upon the reality of education based on a historical portrayal of disciplinary spheres of action from analytic and philosophical traditions. Carnap delivered a path for making statements from philosophy into science 'of facts' – or according to a general perspective and more common terminology, from

[349] The claim of universality is registered and discussed in the history of universities and the stability provided by *disciplines* through the writing of Ramus (1562 in Stichweh 1993, p. 237 or Stichweh 1991, p. 18).

[350] Later, this systematisation can be presented in models that give shape to a concerted system in and by which the notion of unity can be problematised by means of actions. For this, content integration and concerted action will be presented from this point until the fourth chapter in order to display the intersubjectivity made evident during the replacement and exchange of assumptions – for further differentiations made by the individual. The manifestations of actions relate to the connections with reflections that trigger the replacement of beliefs (i.e. to update and to reorganise an assemblage of knowledge that confirms that is no longer useful in relation to the application).

[351] Carnap (1996) mentions, for example, that questions on the sense of statements have to do with experimental methods of specific disciplines as he referred to questions within the psychological realm (ibid, p. 57). Therefore, while I take inspiration from his method, I pursue to problematise further on pedagogical aspects.

social to natural science,[352] as long as logical syntax ensues[353] for a reliable problematisation. For this and throughout this work, I have gathered biological information from historical references and a current state of research, which will be taken into account in my proposal for identifying the place of pedagogical translation.[354] I take reference to Carnap's work by connecting the search for robustness and reliability (see, for example related intention with Wimsatt in Stichweh 1993, p. 243) that the historicity of educational science has gone through. As a case in point, empirical pedagogy from empirical research has left a heritage in matters of application of tests and pedagogic diagnostic procedures (see, for example, Ingenkamp, Jäger, Petillon and Wolf 1992). By presenting a translation problem, I expect to extend this empirical bequest into the pedagogical realm of theory construction.

Some of the problems of translating between natural science and social studies, among others, rely on the focus given by each side and how they establish this as the nature of their results or on the formulation of inquiries and outputs that cannot cross bridges related to phenomenality of subject-matters.[355] The borders from both sides are not always clearly delimited since the sharing of methods has been mixed throughout time. Additionally, regarding some 'theories of methods', the opinions on them are split and constantly showing a lack of consensus (Tenorth 2000, p. 288). In the production of knowledge – merely in the language of engineering of knowledge or knowledge with a practical orientation – the object of study belongs to a theory or a method that may sometimes be incompatible with others. This happens because many times, this practical knowledge has a concrete pursued application or, as I will explain, because of a concrete goal in a different system. However, once this knowledge turns into information and cognition, then it shows that it has transformed.[356] Close by the construction of beliefs,

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[352] In his treatise *Philosophy and Logical Syntax*, Carnap in 1935 did not mention a division of natural and social sciences. I refer to this division for understanding the interchange of positions here for the exposition of translation. However, he identified the *philosophy of biology, philosophy of psychology and philosophy of historical and social sciences* [italics added to refer to a section dealing with some divisions of philosophy of science] (in *'What Physicalism Asserts.',* ibid, pp. 88–93) as a delimitation to, according to his perspective, *natural philosophy.* Evidently, my division is not general but systematised as I have shown the argumentation of the problematisations and of the encounter of positions through historical examples.

[353] Extending to formal theory (Carnap 1996, pp. 39–50), philosophical propositions can be examined according to statements of logical analysis in order to make the logical syntax method possible. Consequently, this procedure helps to differentiate valid and analytic contents from contravalid and contradictory contents and from indeterminate and synthetic sentences (ibid, p. 55) for bearing contents that are either true or false (ibid, p. 53).

[354] Nevertheless, pedagogical translation can fit also according to statements' construction of logical syntax. For this, statements from theoretical proposals could be collected from historical registers in order to present in formal theory (Carnap 1996) synthetic contents that can be further problematised within a pedagogical frame. Synthetic contents for pedagogy are important because they can present the challenges of pedagogical thinking, namely, to problematise how to educate upon the human liberty under the plurality of approaches and interests of a newly born or young researcher that exerts a self-orientation in the world.

[355] In order to respect the conformation of different realities, I do not pursue cross-application of a translation from natural to social sciences but a translation of contents from both sides, for example. Such translation succeeds within the presentation of a concerted system as I establish in the fourth chapter.

[356] *Means* need to be identified after contents go through a process of transformation: where does a change into information and cognition take place? For the localisation of these means, I propose to

in spite of the power of social structures, a transition succeeds.[357] Such a process challenges positions of science as unity or from a specialist viewpoint because then a question arises as to why valid[358] knowledge is difficult to fasten upon. In parallel, this process arouses wonder about what and how is further integrated into the relation between unitary and specialised assumptions. Herein, it is possible to speculate about how this change develops and about the elements involved in such a 'transformation'. Speculation in the way that it is referred to here would be a valid philosophical resource since there is a design regarding how to consider knowledge that was previously defined with respect to the current point in time.[359] I composed such definition points to the systematisation of educational science under the spheres of action. Hence, the scheme of teaching and learning offers a plane for analysis that happens at a present moment even as it problematises a reflection.

During knowledge development and the process of teaching, learning and acquiring information, based on the curiosity of the learner, among other things, the 'pedagogical action' will not stop unless there is a pause in the generation of a problem. From an institutional point of view, pedagogical action repeats itself every day when students come back home and start school projects and chores. For example, despite the institutional space has been almost untouched by this thesis, the argumentation on pedagogical action now sparks the idea regarding how the mentioned pause can be taken into account. The collision with new 'findings' can create the spoken pause – this means the appearance of novelty in the sense of new inputs based on interaction with other people – as I have referred to the immersion of the individual within the collective and as I have referred to the option for taking or rejecting knowledge. If pedagogical action ties together theory and practice, one option is to think on how synthetic concepts follow philosophical discussions to locate referential points to these constructs: whether in practice or in theory. By way of example, the concept of consciousness as holder of the

predicate on the integration of the individual within the system. From the individual, such a transformation will be kept as constant.

[357] From Latin American cultures, the modification of traditions in rituals of beliefs is clearly detected. By now, a mix of representations appears in traditions that find their roots earlier than pre-Hispanic times. People celebrate *Día de muertos* in Mexico with similar traits to Halloween, for example. Like this, behaviours are modified, and without any precedent inside the same ideology, *ofrendas* or altars and temple-offerings as individual manifestations are not the same in Mexico as those of a Mexican living in Switzerland, like Gerónimo-Cid (personal communication, November 1, 2015) shared to his colleagues at the institute of educational science in Bern a report about how cultural traits change, while congratulating on one 'nice day of the death'. Enough material can be found on the internet by searching out a wider narrative on this fiesta. Every altar will be different from another by noting the portrait of the person to whom an ofrenda was collected. [The English word Mexico for the reference to the country is written without accent in this footnote, since it is not associated with the name of a university, for example. Nevertheless, in this work, according to the Spanish syntax, the word was written with an accent].

[358] Valid statements (Carnap 1996, p. 55) that cover a range of content that can yet be a determiner of truth or falsehood.

[359] Speculation is also recalled due to its feasibility as a method that can be located on a second order of analysis from the place where knowledge theories work. In addition, speculation supports the dialectical status required by the object of educational science. The object of educational science presents a synthetic construction that, despite its attachment to the daily basis, must remain separate from common sense. This work has pursued various approaches related to the diagnosis concept, especially within the speculative approach that connects this chapter with Hegel's work (see, for example, 1962a, pp. 21–25), further discussions between philosophical and pedagogy are triggered by the analysis of the diagnosis concept in pedagogy.

'explanatory gap' (Block 2007, p. 507) between *representational content and phenomenal character* (ibid, p. 537) appears in the area of tension where no clear aspects for its description are given. These aspects as constructs can handle the composition of philosophical reflections upon the self or can handle raising the question about whether the aspects counted up-to-date for their description are indicators for working with impairments.

Thus far, the integration of pedagogical action to the pedagogical translation is where aspects that hold a dynamic of subject-matters can also be detected for the purpose of analysis and in the process of interaction with their surroundings.[360] This happens thus because the way I propose pedagogical translation as such takes place through the individual in connection with the world. The following paragraphs present how 'pedagogical translation' when considered as a core element of 'pedagogical action' is differentiated from reductionism.[361] Pedagogical translation as a process of 'self-transformation' in relation to a third person or position[362] is not yet linked to the purpose of recognising a person's condition.[363] In this sense, pedagogical translation would set one basis for the problematisation of pedagogical diagnosis by considering the difference reflecting the inclusion of the relation between expert and non-expert. In referring to the place of expert and non-expert, I call upon the person who perceives[364] the process of recognition. This would refer to the interchange of positions, ways of proceeding, intentions and purposes within a situation and that are linked together within the portrayal of a system when a pluridisciplinary meeting takes place.[365]

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[360] In this third chapter about a conceptualisation, I need to continue with the assemblage of how actions have composed a basis for the development of attitudes of the self in relation with the world. This means, in other words, that synthetic constructs have a scope of extension that is not only valid but indeterminate (according to terminology of Carnap 1996, p. 55) when modifying the place where an intention is directed.

[361] In this statement, the synthetic constitution of pedagogical translation appears when this construct can come from the individual to the interrelation with the world, parallel to reflecting an interrelation among other aspects of the world where individuals can translate their positions.

[362] Here 'third person' refers literally to another person and 'third position' to the surroundings and their encounter. For the sake of clarity, third person and third position are distinct from the third place of composition proposed from this world. Nevertheless, the third place of composition seeks to connect and to display the junction between the process of self-transformation in relation with the world.

[363] The link would be established after an action is represented by a construct with goals that are specific and general with long-term and immediate effects within the constellation of the self and the world (i.e. of a concept like diagnosis). The construct connects with other constructs that can be speculated. These speculations conform models for the constitution of a system. This system problematises the contents of recognising a condition, and in this way, a process of transformation can be distinct but localisable within the recognition concept. With my work, I am linking contents to the *Geist* synthetic construct of Hegel.

[364] At this point in time, by naming only one action (e.g. perception), I leave open other actions that can be integrated within this process. Namely, the person can execute this action for recognising the condition of another or the condition in itself. I identify in recognition an access point for problematising how to integrate reflections into the pedagogical realm. Recognition must be taken from its quality as a concept in order to find connections with other theories. In the exercise of identifying how a term is composed (i.e. to identify its elements), in this third chapter of conceptualisation, I am listing these elements that appear during the theoretical construction with the purpose of adding consistency to the constitution of models that can explain how a reality of education takes place. This means that models based on tasks can concretely display the scene of people interacting to give reference to one action upon which can be learnt – once as well as after actions are reflected upon.

[365] System here is identified as 'concerted system' portrayed and problematised in the fourth chapter.

At this point, it is important to keep in mind that 'pedagogical translation' encompasses several moments: the linear or one that attempts to exerts the common sense according to one known scheme, that is, adapting of one concept to another from the same or another discipline and the complicated and complex as they appear within the 'core subject-matter' of a concept under a 'second-order observation and third place of composition' that is part of the interaction between two persons, taking into consideration an individual process of developing an idea. Since it can be contemplated from the points of view of the executer and the receiver of the action in the transmission of knowledge, 'pedagogical translation' captures an amalgam of concepts that will later be built upon the encounter of perspectives according to a locus of disagreement or 'constant problem' for discussing the 'points of connection for analysis' based on the relation of concepts and persons who interpret, transmit and share them. Hence, this situation constitutes the conditions of a reality of education.

In reference to this basis of the level of theory construction, logic is not the only element to guide the development of new perspectives or the understanding of those previously set, nor does it cause a 'self-thinking' that rushes to jump from the cause to the effect (see fallacy in Salmon 1973).[366] Instead, logic alludes to an area where the construction and translation of arguments can be reviewed and different contents from related perspectives can be translated into their own theoretical buildings (Keiner 1999, p. 62). Logic does not cause an isolated self-reflection because the output of a logical procedure will be connected with the world's physical laws. In this way, scientists might find methods to control the production of knowledge that do not oppose the validation of other ways of seeing the world – as long as these belong to a proper systematisation. Or in my interpretation from the texts of Carnap (1996), as long as they are possible to be systematised (see approach of logic, psychology and metaphysics in Carnap, ibid). But if logic is not the only tool for reaching the truth, then what place can be given to logic? For this, I might suppose that the place for a logical attribution within a social context can appear to be accompanied by a controversy when logic is merged with reflections upon these social contexts as when it happens during the transmission of knowledge. This refers to the moment to create an argument with any resources that may be available that from a scientific approach should be possible to inquire into.

Not clearly resulting from a systematisation from an external perspective to science, speaking as a layman or from society as a general group outside academic interests, reality usually refers to one and unique one as a state that is rendered from an aprioristic idea. Conversely, within science, in a perspective that may be of specialisation or of unity but is scientific from knowledge theory, a methodological procedure of observation second order makes clear that not all the theoretical positions are in accord. To this end, not all the academic stances speak the same language or have the same starting point. In this order, I can at least imagine counting on an interpreter capable of composing statements that are muddled by the plurality of proposals in science. With the positioning of the accountability of the individual in connection to the world, I

[366] Furthermore, following the exposition of my argument with reference to Carnap (1996), logical analysis leaves space for recognising contents that are valid but that can also be determiners of truth or falsehood upon state of affairs (ibid, p. 53). I can extend upon conceptual frameworks that are yet opened, where overlapping of disciplinary interests is to be directed towards a search for orientation for a later proposal of solution.

consider that the concept of consciousness, with the positioning of theories of consciousness linked to the reformulation of ways of measuring its manifestations, the critic made by Rudolf Carnap (ibid, p. 18) to the solipsist next to the realist and idealist doctrines, can be skipped. While on the subject, this point illustrates the importance of taking knowledge from a current topic, like from the literature of consciousness research in showing an application for the problem of translation and in consequence the importance of its problematisation with complex concepts. From the same formulations of Carnap, the 'formation rules' (ibid, pp. 41–47) included reaching determinate or indeterminate[367] outputs of thinking in what he labelled formal theory (ibid, p. 39). Carnap presented an ambivalence towards science from specialists and science as unity; still, he was convincing enough in differentiating between scientific content and non-scientific content. By manifesting knowledge on the work of Kant (ibid, p. 50), he formulated options for considering that there was yet something that was able to be transformed.

The assemblage of knowledge is tied constantly to references to outcomes from reflections, made upon the meaning of science, for example, or to the intention towards where this meaning should lead. With the purpose of determining whether these reflections would have a direct impact on the daily life as an exercise derived from a 'practical science' viewpoint (as noted by Flitner 1991 in Keiner 1999, p. 67) according to a unity of science (ibid), I propose for educational science to set awareness on the assumptions of specialisation and unity for problematising those of collaboration. In a moment of plurality of science, giving attention and recognition to specialisation and unity should avoid a collaborative position that can refer only to mediate or moderate contents within a linear exchange. Along the path of thinking development, the evolution of approaches in research breaks the non-logical relation of individual to collective, general to particular or that from theory to praxis. Hence, the idea of how objects of study of dynamic subject-matters can identify assumptions of attitudes, which integrate a complete meshing of participation with subjects, theories and methods, should preferably be discussed in simple terms but without losing the complexity of relations involved. By taking a stance outside the position of the individual but in connection to the world, I endeavour to empower the particular instance that can develop criteria for deciding whether to take a specialised or an integrative assumption of science within a later problematisation.

i. Distinction between simple, complex and difficult in the example of the studies of consciousness

The topic of consciousness continues to provide landmarks for reflecting on what is registered in terms of activations of the brain and how the application research detects contents that are not related to consciousness.[368] A look at consciousness research

[367] A reciprocal interchange between determinate and indeterminate is one of my interpretations assigned to his term 'synthetic' (Carnap 1996 reprinted from the 1935 edition, p. 55, for example) according to his method of logical syntax.

[368] The methods for registering the activity of consciousness do not refer to the aprioristic approach of what is consciousness, but to the way or the idea that consciousness can manifest itself alone and/or within a larger discussion that can be manifested or registered. To this extent, consciousness is a complex topic that from the pedagogical side expands a reflection not only upon the methodology for collecting it or its manifestations but upon the discussions that are related to how to make a theoretical construction from it.

borrows advances from sundry elements and their combinations, which show how divers logical orders[369] are given for the consideration of a problem. A look at consciousness research borrows progress from various elements and their combinations, which show how different logical orders are given for the consideration of a problem. With the basis of the study of disciplinary collaboration between the areas involving spheres of actions in medicine, neurobiology, psychology and educational science, I find that in reflections upon consciousness is a shared object that serves as an example for discriminating among the categories of simple, difficult and complex according to the theory of the complexity of educational science (Anhalt 2012). The strength of studies regarding the concept of consciousness provides sufficient argumentation with respect to the expression of a particular existence within a mesh of positions. This, in consequence, seeks to give an idea of the composition of elements constituting a complex situation. As such, consciousness is selected for this explanation, thanks to its composition as a '*process or a stream that is changing on a time scale of fractions of seconds*' (Tononi 1998, p. 1846).

The connection between two neurons can be isolated for the purpose of explaining the basic functions in an easy-to-interpret diagram. However, since the basic function of any two neurons should not lead the observer to conclude a correlation with consciousness (Zeki 2003; Tononi 1998), the deconstruction of abstraction on this basis should not necessarily reference consciousness as a whole (Tononi 1998). In contrast, on the grounds of a 'theoretical position', the seemingly simple relation – complex relation – of two neurons might imply encountered arguments. They will lead either to disagreement about the composition of the results and their founding or to agreement depending on the functional cluster of the brain to which they might belong (ibid). As a consequence, it could be settled that understanding the difference between simple and complex is difficult – with a strong tendency to jump into a complex differentiation at the moment of observing the interrelation with a determined 'factor' that can disrupt any possibility of order.

In other words, this means that a model with a linear arrangement of neurons from one to another can suggest a simple connectivity without specifying the kind of consciousness referenced (Herzog 2007, p. 1055). Nevertheless, the connectivity of the neurons will produce a change in the understanding of its behaviour (ibid) and, in consequence, difficulty in taking the decision for the mathematical norm that is sufficient for the determination of a 'state of action' (in this case, consciousness, according to Moody 2003 in ibid). As Anhalt (1999, pp. 237–238) pointed out from the reading of Herbart, the 'reflection of a train of thought' or the 'notion of activity' is the neuronal organisation of the organic activity, which by definition comes from a net of nerves. This neural network is built upon the plasticity of the nervous system according to the 'coherent thread' of the self-preservation of all beings (Herbart in ibid, p. 238). The neural system connects the 'chain of simple beings' that form an indefinite union

[369] Logical orders, even those that can be confronted with old terms, are reflected after or during the execution of an action. Actions refer to a-posteriori moments that in a synthetic presentation can challenge logical formulations due to their complexity. Having accounted that my research is not about a specialised position on consciousness or about a way for measuring its manifestations, I will not provide evidence for the purpose of confirming doubts about what is being measured in this respect. Nevertheless, I refer to complex clinical pictures of seizures to show the difficulties and confusion involved in taking consciousness as a marker of an impairment (Fisher et al. 2017, pp. 532–539).

(ibid), a shapeless component as can be seen nowadays through the identification of 'functional clusters' in the brain.

As shown above, I am trying to organise the explanation of the categories in the order 'simple-complex-difficult'. Basically, the jump from simple to complex is miniscule, and understanding the reason why this happens is always complicated when taking into consideration that *common sense in the modern era* provides one 'right' order of problems by hesitating upon it, and therefore, a need for agreement is sought regarding the proper organisation. Usually, this comes at the cost of making things difficult since there is no rule that controls the 'real' and only meaning of any explanation.

Following from this point, the attempt to present an example of the 'simple' category does not imply reduction to a minimal component for any kind of procedure.[370] The problematisation of the category of simple, in the context of neurons, is complex in itself when taking into consideration that a significant quantity of information is integrated and differentiated (see Tononi 1998) by *functional clusters* that, depending on novel tasks or automatic tasks (ibid), would unify a neural process according to a particular scenario and depending on a permanently changing scan pattern.

ii. Educational and neurobiological frame in a scientific collaboration

How can the 'complex case of orientation' inside neurobiology be displayed in terms of educational science? I will try to explore a hypothetical situation in which the orientation problem can occupy the place of one of two positions or one of any other position that may create a condition of guidance and a reference point.[371] This exploration entails, along with the consideration of the question, 'What is it like to be a bat?' (see Nagel 1974), my interpretation of what it is to be the other from the coordinates of an 'own' position. Innumerable reflections arrive at the moment of transformation of the content from one position into another and from oneself into a state of change.

For this, theories of consciousness (see Block 2007), where there are problems of the self, of the world and of the interchange between these two among different theories, provide an example for discussion. One option for discussing them is to present the 'problem orientation' (Anhalt 2012) along with the *faculty of progress* (Anhalt 2011) of every single student and scientist that may account for the state of reasons relating to what it is to work from the uncertainty of a concept, such as of that of consciousness, to certainty within the scope of the area of research. This means, in other words, that theories that seek to explain consciousness possess different interpretations because they refer to a dynamic concept and are constantly under construction, and therefore, they

[370] Mainzer (2008, p. 69) presented a diagram that tempts us to fail by way of a fallacy when reading the hierarchy of the dynamic of complexity and placing at the top of the 'pattern of connections of the brain' the category of complexity as the sum of 'circuits' of synapses and neurons. Nonetheless, he problematises his own argument with the presentation of a creative idea (ibid, p. 71) that directs its *governance* onto problems of planning and temporary stabilisation (Rucker & Gerónimo, 2017) – onto abrupt chance and fixed regularity.

[371] One of the logical orders proposed follows the presenting of a situation, assumptions upon this situation, epistemological analyses, elements of theoretical construction such as connecting and entry points to one problem. As I have presented, this structure is changeable and does not represent a unique approach to speaking about the theoretical order. On a related note, during this presentation of a possible conceptualisation, I am ordering a scientific framework by accounting for the role of the individual. To this extent, I recommend keeping in mind that the situation is about a moment of teaching contents – which unavoidably brings with it academic problems that need to be encountered.

display a dynamic subject-matter ideal for reformulating the goals of study within a classroom. The question leads to wondering about how to reach goals based on teaching a changing topic. Any answer would take as a matter of fact that this is not an obstacle to designing a study program.

On this topic, I want to centre attention on the pedagogical translations that are drawn on the intersection of the self and the world. A translation appears within the moment of using different languages. In this case, it is useful to imagine that in just one process, more than one conversion appears; that is to be referred to a 'pedagogical translation'. 'Pedagogical translation' differs from the 'complexity of Bildung' (Rucker 2014) in the sense that I am stating that this translation refers to a direct relation established, for example, with another person or between two concepts. Based on the writings of Rucker (ibid), here an exchange between persons who are in a collaboration between disciplines will be added to 'Bildung' (as a complex process of transformation), basically because not only one discipline or even one unique frame of reference can be assigned to a dynamic topic, such as the one that refers to the concept of consciousness.

In this matter, complex problems operate within the nuances of scientific behaviour. This means, for example, that within the interaction between educational and neurobiological questions, the relationship is mediated by more than one actor, more than one situation, more than one object of study and by more than one method. Thus, a complex problem in a 'pedagogical translation' becomes evident at the moment of sharing knowledge – as when knowledge is considered to be a system of transformation (see Piaget 1970, p. 15) – because it is destabilising to share *what is* going to change or *what has a current* counterpoint as in the example of the concept of consciousness within theories of consciousness. Heretofore, in knowledge construction, more than one position and more than one situation may have been involved in every stage of the process of acquisition of information, and hence, there is a problem – as in the identification of a problem; there is someone to identify the problem and there is someone with whom to share it (whether the purpose is teaching or being taught or learnt, or to confirm the existence of the problem by oneself). For all these positions, the 'pedagogical translation' refers to a *complex interaction* implied within the 'pedagogical action', both of which happen when achieving a practical deed.

3.1.4. 'Neuronal' and 'mental' representations using a practical historical example

Trying to follow the discussion about why the organisation and confirmation of the topic of consciousness is highly problematic, it is worth taking a look at the way that methods for analysing neural and mental representations[372] have been questioned since their initiation. 'Diagnoscopie' refers to one method, created in 1904, that tried to cure headaches with electrical current (Walter 1927). Somehow, this method endeavoured to explain the electronic relations of the brain. However, the attempt failed since, according

[372] For example, representation is already counterintuitive in terms of what consciousness can refer to. On the one side, 'representation' can denominate a state of dependency–independency to the world (Sandkühler 2009), and on the other side, 'consciousness' can refer only to the phenomenality that is separated from physiological studies (Chalmers 1996). The historical reference thus contributes to represent the current state of recognition of another person by thinking on philosophical studies from different times and with different selected objects. Thereby, historical reference helps to form a conceptual framework for disciplinary reliability that can later be problematised for an identity and development of an own disciplinary language within a disciplinary collaboration.

to my reading of its reviewers, it gave an impression of mightiness that continued to require discussion during the next 100 years.[373] Dr Zachar Bißky as the inventor of this method brought the machine to Paris in 1927 (Meywerk 1930, p. 292). To what extent could this method and machine be wrong in terms of the haste that led to forced conclusions as perceived by Walter (1927, p. 314)? Berger (1929), as the official founding father of electroencephalography (EEG) (Michel et al. 2009, p. IX), discredited Bißky's research in which Bißky himself left some loose ends as his idea of *brain frequency*[374] was taken incoherently by himself as the starting point of his whole methodology (Walter 1927, p. 315). [mainly Bißky's method was not applicable due to the contradictions it presented to the medicine knowledge of his time. Moreover, it relied on a given existence of brain frequencies that were not associated with the practice of the physicians, ibid, pp. 315–317. Regarding the assertion of the current medical knowledge, the premise about the function of the time, which problematises the progression of disease and the state-of-the art of medicine, should be taken into account, see Gross 1969, p. 6]. Back in the time during the 1900s, electricity was a resource for testing hypotheses and observations of the connection of body parts (Berger 1929). 'Heat, light, electricity, and magnetism' became a source for giving sense to the structure of science (Hacking in Kuhn 2012, p. xiii), electricity was awaiting the work of Coulomb, Gauss, Poisson (Kuhn 1961, p. 188), all of which took place during the 1800s – '*and only realized its full potential in the nineteenth* [century]' (ibid). Nevertheless, progress was required for the steps before giving asseverations on the association of energy within the human being (Berger 1929, p. 567). Some traces of this trajectory '*lingers in a "twilight zone" and appears to have some aspects in common with the experimental paradigm of parapsychological research during that period (Beloff 1993, Coon 1992)*' in Borck (2005b, p. 83).

Borck (2008) reflected on the accomplishment of the studies of electroencephalography (EEG), taking into consideration the further work of Edgar Douglas Adrian. Borck mentions how Berger's research was supported by Adrian, Cannon and Putnam with their nomination of Berger for a Nobel Prize in 1939 (ibid, p. 370). In my short interpretation, I wonder whether if Adrian had considered in the same manner Bißky's research rather than Berger's, the interrogations could have been further extended on both works because, at that point in time, the most valuable outcome, on which Adrian focused, relied on the 'reflex integration' of the mind within the brain (Adrian 1946 in Borck 2008, pp. 371–372), which somehow was covered by the 'reaction fields' of Bißky also referenced by Walter (1927, pp. 300–323). However, as I am writing, my formulation is yet insufficient for further explaining this journey in history. Nonetheless, this historical register is an entry point for theoretical confirmation of 'analysis concept' and 'analysis of meaning' as methodological applications. With the example of the controversy between the works of Bißky and Berger, I expect to show that neuronal and

[373] In my opinion, the judgement in the interpretation of Bißky's method belongs to one characteristic of research that continues to the present time: a controversial topic that speaks of the current term 'scientific integrity', which has no clear initial point of analysis but some evident consequences (i.e. a case in which some ideas in need of further development were rejected). Furthermore, to a first impression, Bißky's work seems to have skipped some problems that could have been tackled later by reflections on epistemology (see Borck 2008) and that could have left distributed starting points for their organisation in a systematic form.

[374] '*Hirnrhythmus*' according to Walter (1927, p. 315) or '*physiologischen Rhythmus*' according to Berger (1929, p. 567).

mental representations do not describe a fact but rather a reality grounded in this case on technological specifications. Through the historical testimony, I can present a retrospective view for observing that concepts of localisation, such as the reflex integration or reaction fields, link theoretical reflections with methodological applications on an epistemological level of second-order observation.

Criticised and without clear agreement on the identity of the father of the electro-*constitution*[375] *of* the pulses of the brain, this story illustrates one of the problems in the differentiation of theories and methods. An external glimpse of the first papers of the description of this method showed that they were oriented to be more methodical than theoretical. Here is not to say that one orientation has a priority over the other, but the aim is simply to highlight that, as argued by Shadish, Cook and Campbell (2002, p. 28), a programme of research is more testable than substantive theories or single studies as happened at the beginning of the 1900s in the development of a method. As such, Hans Berger presented a whole programme (Borck 2008, pp. 81–83) and Zachar Bißky some substantial but substantive experiments that were easily destroyed by the community of the time.[376] From a retrospective in this example, the intention of the experiments can be assumed by looking at the material obtained at the time of the occurrence of these situations (be it in the case of a bigger programme or for more specific achievements that could be based on the planning of the work).

Cause and effect is a supposition that has kept investigators trapped in circles; not biting the bullet of the idea of reaction is almost impossible. Ned Block (2007) suggested that the later definitions under what is considered a specific action would rely on the concerns of the scientist who is at work. As such, for example, a *physicalist* would only care about a fixed definition based on a causal role; meanwhile, a *functionalist* would be open to questioning what was within the context where a pair of things are situated in a counter position.[377] In understanding all the classifications presented up to this point in this work

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[375] At this point, I want to denominate a discussion under the name of electro-"*constitution of*", based on the register of pulses of the brain under translation of an image, 'encephalograph' (Berger 1929), or over the translation itself of the idea of diagnosis with the name of Diagnoskopie (Bißky in Walter 1927). A report about the method of Bißky (Walter 1927) can be shown to have been directed towards showing the connection between the psychological and physical functions (ibid, p. 309) that happen inside the body. Nowadays, this could be contrasted with internal and minimal invasive procedures that in a certain manner have a relation to this original idea.
An interested reader could follow a lead on the current evolution and relation done under these first research studies for the application of specific procedures using a different framework and evidently under a trademark registration: https://trademarks.justia.com/788/14/diagnoscopy-78814008.html [retrieved on 19.12.2017], http://www.kneeguru.co.uk/KNEEtalk/index.php?topic=35906.0 [retrieved on 19.12.2017].

[376] In my reading, until this moment of redaction in this thesis work, I did not find a deeper comment about the documentation of the work of Bißky. On the contrary, I discovered an iterative criticism of his assumptions. I noted only some slight comments that do prove how Bißky rushed into his conclusions; however, I would put in doubt if it would not be a reflection of the obstacles in technology of the epoch. I hope to leave a space for a 'point for connection of analysis' in a later research because I feel from a short interpretation that the work of this scientist has not yet been honoured by another perspective. I do not possess the reasons, but deciphering them is not the topic of this document.

[377] A clear explanation of the *counterfactuals* that grounded a functionalist approach can be found in Block (2007) that provokes thinking beyond a reality of inputs and outputs even as it provides such a definition. On the other side and in this explanation, Block (2007 p. 19) shows how from ontological or metaphysical claims, the physical answer of physicalism would be, for example, a 'subject-matter or a position' (this according to my interpretation).

– but in understanding even more the divisions regarding the mentality of the history of human beings – an analysis of counterfactual reasoning pertains (Shadish, Cook & Campbell 2002). By reason of hazard and of such multiple perspectives and so many other elements, factors, dynamics etc., a causal relationship does not suffice to render an explanation of how a phenomenon is connected to the environment. With this can be said that as a result of this scenario, the level of 'action and reaction' is not enough to explain events, and thus, cause and effect do not pertain to a problem of action and reaction.

By establishing that cause and effect do not lie in the line of action and reaction, the possibility of thinking beyond a dualistic approach is opened up. During the presentation of a dualistic approach, questions may arise about what is presented with such a mindset and how it is presented, including the logical but historical order in which they are also immersed. One of the salient points is that the discussion, since the dualism of Descartes, lies beyond the fragmentation between body and soul.[378] This happens due to the systematisation of differences with which humanity has constantly been able to imagine and reconfigure the world. This will be a 'connecting point for analysis'[379] with further reflections once the theory needs to be submitted under the methodical control of specific cultures of knowledge (Sandkühler 2009, p. 179), in which their own members can share theoretical beliefs but speaking towards contradictory directions.

Namely, the anatomical argument regarding the size and comparison of the organs of animals and people is not of importance for Descartes (in Hagner 2008, p. 28) because that was not the composition of his main thesis, but it was rather the relevance of the mortality of the human being. As such, this was later discussed with the conception of the homo-duplex (ibid, p. 41) as another 'point of connection for analysis' in another level of reflection under another position and perspective – using terms in the theory analysing the complexity of education of Anhalt (2012). Descartes, however, offered one focus-point for interrupting the constitution of a 'soul organ' or of a 'moral brain' (ibid). To this extent, a moral brain has a different proposal and, therefore, a different argumentation. As presented up to this point in this section, the question of whether the brain is handled as organ or as recipient for logical explanations will alter the outcome of a statement formulation. Thus far, the cerebralisation of theoretical discourses puts into practice the explained disciplinary frameworks of collaboration, where specialists' statements should still face the challenge of explaining the forces of assumptions of unity in science and society.[380]

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[378] *Körper und Seele, Leib und Seele* and history of the constitution and rejection of the *Seelenorgan* towards a homo-duplex (Hagner 2008). By looking at the brain as an organ and thus investigating the connection of the inner force with the surrounding world, the presentation of a localisation point became an epistemological approach for the means of organ research.

[379] At this moment, I introduce the variation of the concept under the formulation of 'access point for further analysis' once the 'connecting point' has been localised with a supposition to the next reflection (i.e. from the 'connecting point for analysis' to 'access point for further analysis', one step indicates a change that should have been achieved). For this purpose, the point becomes a dynamic point providing 'access for further analysis'. This note would be important when commenting about the paradox of the 'observation in second order' and its configuration as content of 'theory of knowledge', which will be submitted under a following classification.

[380] This combination of science and society has been discussed in this work based on the reflections of Stichweh and Böhm. Stichweh raises some comments on the difficulties of hegemonic transitions, and

In the beginning, I was not able to find a passage connecting me to the idea of why Bißky's work had less weight in comparison to Berger's. Maybe it can rely on the constitution of Berger's experiments within a programme of research, I thought. The wide documentation that Berger accumulated awarded him the privilege of donning the crown of the inventor of the EGG. Nonetheless, the reader is encouraged to look for the reports of Walter (1927) and Meywerk (1930) in order to find clues pointing to the effort of another scientist who worked on the difference involving movements coming from the stomach or the hand as well (Walter 1927, p. 300). Bißky's method was not totally incomplete in terms of suppositions; for example, the requirement of 'centers of the brain'[381] that could work as a basis for psychical properties can be considered as a steppingstone for a monistic position. Such a mindset required a preparation of researches that started putting together technology, objectivity of pulses registered by waves, an interpreter and reflection. All of these latter might together explain what the *form* is in terms of a community, for example, what the metaphor of a 'noisy crowd' could mean (according to Adrian 1946 in Borck 2008, p. 371) in consideration of work that supported Berger's programme but that Bißky's conclusions could have been acquired according to notions of the epoch under his terms 'rhythm of the brain' and 'frequencies of the brain' as was written at the beginning of this section.

In terms of forms of argumentation according to a period of time, an enunciation of Wundt in Walter (1927, p. 310) can be found outlining the impossibility of proving a hypothesis on the localisation in cortical areas of sensory perceptions in conjunction with their conceptions and recollection of memory. At the present time, this interlude would be more trustable based on the language of the technology rather than on the analysis of the components regarding what can be proved or not. This means that any scientist would certainly be trapped at this period of modern time if an argument that was supported on a technological basis were not shown. Accordingly, in the moment when numbers and images could be presented, then any other statement would be invalidated on the grounds of being 'too abstract'. In the natural sciences, 'too abstract' reflects a popular term for anything that is not based on statistical data. Due to the strong tendency towards statistical procedures in the presentation of reality, a certain attitude can be assumed – in this line a task comes to the fore in which the type of attitude must be discussed. This attitude can point to the orientation that many disciplines represent as a methodological legacy in dealing with study objects. 'Too abstract', as a popular expression in the natural sciences for describing everything that does not have basis on statistical data, reflects the orientation of many disciplines and their methodological heritage with which they handle objects of study.

I presented here an argument of neural and mental representation based on controversies generated by a historical example. To assume one of both positions would require justifying how to deal with the counterpart because, at the moment a statement is made, it would be at that same moment that a position would lie under different perspectives and their consequences. An example of the repercussions includes applications that

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Böhm refers to the heritage from teleological power being aligned to the scientific perspective. With both authors, the basis for the problems after placing the same source of explanations on two different systematisations widens the discussion in terms of uncertainty within theoretical directions; this means ideas can be directed towards scientific theories based on different perspectives and intentions.

[381] *Gehirnzentren* (Walter 1927, p. 309).

would be stronger when they belong to a programme or even conform to an own programme of research, like neuroimaging. Neuroimaging reflects the culture of knowledge more than a clear subject-matter (Sandkühler 2009, p. 179) since, as it is said, neuroimaging currently represents on its own a programme of research that bears up varying positions and perspectives.

3.2 Conceptualisation regarding to the historical context of the topic

Philosophy, history and sociology are disciplines that have something to say to educational science. Educational science, for its part, possesses a systematisation from which the studies of observation and analysis of human actions can benefit. As has been written throughout this work, such systematisation includes the integration of the individual within the interrelationship among the expert, learner, world and dynamic subject-matter (see, systematisation of education based on the theory of complexity of education of Anhalt 2012). Namely, the way of such a systematisation of construction of a reality that comes from the social description can be not only descriptive but constructive in the sense of conceptual and architectural as in the historical case described by Lachmund (1997, p. 16) on the path that the action of diagnosis has made and followed. On this path, the participation of the individual occupies a role throughout the procedure.

The area of application of the academic research in the field of educational science in conjunction with other disciplines meets the problems of the definition of disciplinary collaboration – as it is reviewed throughout the first part of this chapter. Simultaneously, the teamwork of disciplines provides an opportunity for putting the positions together with the application of their knowledge: that is, to employ the strengths of some disciplines that are the weakness of others. This is to say that sociology might be less interested in dictating the norms of a society, but pedagogy on its side can have an interest in describing the normative content of what is transmitted from one generation to another. Normative content as crystallised reflections from groups needs to be reviewed back and forth based on the actions that people perform and which they confront. Pedagogy can analyse a situation for the purpose of reaching to establish that a person can acquire new information, and hence, the support or modification of a norm is integrated within the scope of the pedagogical viewpoint. To this extent, pedagogy offers the possibility of developing conceptual frameworks with the aid of an account of historical events. History, from its side, yields registers of events according to and for the portrayal of actions throughout time.

On this point of normative contents and regulations, the spoken disciplines concur but with a different take on orientation. The diagnosis concept meets the psychological diagnosis along empirical evaluation – as was already discussed – and the physiological examination.[382] Physiology is not a topic of educational science as long as it is not

[382] Reasons regarding how the development of hospitals and the change from the private consult to the public-institutional one can be traced in socio-historical works of medicine (Lachmund 1997, pp. 52–62). Among the most famous analyses of the description of the 'modern' clinics are the well-known accounts of Ackernecht (1968) and Foucault (1976) (in ibid, p. 54).

related to an educational object.[383] However, once a physiological condition, when not in a pathological state, encounters and affects the object of educational science and its goals, then it is at this point when educational science and educology need to be prepared with a systematisation for adapting the assumptions taken upon scientific action. Specifically, in terms of pedagogical action, the pedagogical intention relies on dynamic interplays at several levels of a situation. Like this, the inputs that come from historical research can initiate a process of translation through the individual for the formulation of 'best recommendations' or 'best ways' of acting while giving credit to acquired experiences.[384] At this moment and from the side of the observer, the individual starts attracting attention as interpreter for a further action. In the subsequent relation between experts and/or non-experts, the individual would take the direction of interpreting information for teaching it – applying it, or for learning from it – and being able to follow it. The pedagogical moment does not happen under a crystallised notion because the teacher is a learner in an exchanging of roles as in the way that the doctor can be a patient. In this sense, the individual would slowly be validated according to characteristics that can be described by the same two positions of learner and expert in another context.

According to an open context or diversity of contexts about which can be spoken in sundry situations, the way that I propose for validating a performance is through the register of viable processes. The category of 'viability' of Ernst von Glasersfeld is taken due to its feasibility of considering the application of any kind of instruments that are executable thanks to the experience of the individual (see Von Glasersfeld 1995). The example of the history of diagnosing some other person portrays how the opinion of the doctor – this means the assumption of one individual – is vital, based on the conglomeration of cases (Lachmund 1997, pp. 45–47). At the same time and during the same time of diagnosis, however, other moments are combined – like the orientation of all the positions within one systematisation, such as the biological understanding of the disease. In this way, from the faculty of progress of the individual, several viable processes must exist for when the individual is the patient and/or the doctor and when an object that belongs to the surrounding world (i.e. a biological impairment originated by different causes) appears to have an independent influence on the sum of factors. This brings, in consequence, a moment in which 'the discursive interaction between physician and patient' is displaced by the clinical picture of the disease, showing a clear structure by which any case can be divided. Thus, the individual inner faculty of progress shows independence from dependence on constructs in which pedagogy can have biological approaches to rearing persons in a complex world. In this moment, the synthetic constructs as that of disease challenges the order of appraisal by searching a hierarchy a priori or a posteriori.

Returning to the historical description of 'taking effect' on another person through the analysis of the concept of diagnosis, several passages are to be found reflecting the pressure and urgency from the layman audience for a proper answer and consequent

[383] An educational object that is usually presented through a pathology that affects the performance of the learner. In such a moment, educational science and other disciplines are to be prepared for being affected by each other and work in liaison.

[384] To this extent, when procedures are written, they reflect having gone through a process of thinking, upon which another person can transform.

solution (see Holtei 1898 and Ploucquet 1797 in Lachmund 1997, p. 47), that is, of the thing that people want to hear. As such, historical references to ordinary beliefs should not be confused with evidence that can completely explain a current medical application (ibid, p. 49). The historical path in relation to the actions of diagnosis traces proposals of the movement of the complex dynamic of diagnosis as a subject-matter that evolves with society. The development of pedagogy accompanies changes in other disciplines; otherwise, in a dissimilar position, the content of education would be without reference of a happening of events, in which human action is isolated (see Sandkühler 2010, §298), and then it would be possible to wonder in consequence about the purpose of education when it is not connected to the events of a human life.[385] This work defends such a position as possible but only when it comes from a determined, previously defined perspective, which means I propose that on the many and varied levels of a situation, space appears for theoretical discussions. From monistic position, for example in modern times, these theoretical discussions can thus be connected with a bigger picture of integration as in a concerted system. Moreover, isolated positions are dynamic, containing and extending the possibility for awareness of the world's existence.

More than just in the name of ascertaining a philosophical socio-historical construction, the diagnosis concept is possible to work outside its efficacy or failure if it is elaborated by a person who reflects its epistemological content in a particular context. The circularity of the interchange of positions enables the systematisation of this work, which can be inserted back into the analysis of a historical narrative. This train of thought is not new on the path of 'education'; for example, the cultural philosopher Johann Gottfried Herder pointed out already that *history and nature* can validate the choice to believe in a formation of human beings against *their* bestiality[386] (ibid, § 299). In this way, the method of analysis portrays in itself the faculty of different applications once the knowledge and place of the applicant is recognised, meaning the individual as expert or learner. A contradiction is feasible when considering a context that describes the principles of reality and history jointly by the individual, since an argument of educational content can be based on what belongs to the foundations of thought, should be independent of the history of the individual.[387] (Mikhail 2016, p. 129). In this sense, this stretch refers to another connecting point based on the encounter of argumentations and starting line to further analysis.

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[385] Anhalt (2007, p. 117) also mentioned that it does not make sense to settle a convergence of arguments on a concept of education that is independent of theoretical positions (I assume the same is true in other fields of action).

[386] In my opinion, this perception was fruitful as the control and manifestation of pietism form the hegemony of the church.

[387] Independency to the individual-self would direct the attention, constantly, inside and outside of discussions upon ontology and transcendental philosophy (for example, see Williams 1992). Other connections to read on this topic would handle the difference between metaphysical knowledge and synthetic knowledge (Schütte 2015 in this work) from transformations and expansion of thinking ways that vary according to time, place – epochs – and cultures. In the search for certainty to validate scientific knowledge, throughout this work, the importance of disciplinary collaboration will be constantly retrieved, based on the reflections that philosophy can contribute to the natural science, particularly in language of examples from the natural science to the translations in social sciences. In this way, pedagogical translation earns a place through the systematisation for the transmission of information from different areas of research.

3.2.1. Dynamic of the diagnosis concept

The diagnosis concept relies on the effect that one person has on the other. This relation involves practical effects that go beyond a clinical-biological problem. Sadegh-Zadeh (2012) explores the morality and ethics that should not be barred from personal influence in order not to risk removing from the concept of medicine their goals of *science* and *practice*. From the pedagogical side, the diagnosis concept should start to be taken into consideration for the purpose of clarifying the associated tasks in connection with the procedure of recognising the condition of the other to which pedagogy contributes. Specifically, from the effect upon which the diagnosis concept relies, pedagogy seeks to respect human freedom by freeing the individual by dint of own actions. This mentioned effect targets a healthy life in terms of preventing instead of fixing damage.

In teaching and learning medicine as a discipline, however, one element that should be extended during the formation is 'clinical reasoning', in which 'decision-making and clinical judgement lies at the heart of clinical practice and thus medicine' (ibid, pp. 2, 278). At this point in time, discussion could examine whether a lack of theoretical knowledge for generating hypotheses can be confronted by the self-interest of the individual during formation. This point opens the opportunity for clarifying the difference between a political constitution of programs of study – which this work does not approach – and the clarification of the systematisation regarding the consideration of the individual as a person with talent for modification of the own work. This is made through the analysis of the diagnosis concept from the perspective of pedagogy, and therefore, it merits further reflection on the dynamic of this concept as a process of transformation.

The diagnosis concept refers to a modifiable inspection. On its basis, it relies on the verbal as well as on non-verbal data, obtained respectively from an interview as well as in the physical examination (ibid, pp. 282–285). Sadegh-Zadeh (ibid) explores, upon the activation of a dynamic, alternative actions, depending on the appearance of indications (ibid, p. 283). On this basis, I speculate that the consideration of alternatives[388] could avoid the production of misdiagnoses based on rigid criteria that oddly enough lead to multiple diagnoses. To this point, I must highlight that the existence of multiple diagnoses is not a mistake, rather the lack of application to specific conditions. Within the dynamic of a concept like diagnosis, which I seek to consider from the characteristics of the dynamic of a 'practical deed', exists a clear adaption to situations and different goals. Accordingly, this reflection sustains the sensitivity of pedagogical action (Patry 2012, p. 31); this is in reciprocity of the dynamic that pedagogical action seeks to reach. The pedagogical intention does not appear to be random within a medical procedure at

[388] The alternatives can be released in discussion with the interested party, whom I have referred to the patient or to a non-expert. The patient may hesitate when talking about different scenarios in which her or his regular life takes place. In this way, attention is drawn from the clinical picture to the conditions that brought the disease state or the clinical picture of a syndrome to the fore as a composition of a whole problem. From the epistemological viewpoint, the notion relating to syndrome needs to be expanded to present concrete examples of how a combination of situations develop a medical problem. At the beginning of my participation in the project of the Clinic of the Nervous System (UDIESN), metabolic syndrome was contemplated as an approach that had to be addressed from a pluridisciplinary collaboration (Gerónimo-Cid 2016). Thus, the metabolic syndrome has several causes that explain how it is manifested (González Chávez et al. 2004). The contribution of the social sciences aimed at a participation in philosophical analysis.

the moment when the process of transformation from participating individuals takes place.

The modifications that the concept of diagnosis itself has made throughout time are shown in its parallel adaptation to the influence of different theoretical positions. That is to say, from the Sydenhamian semiology to the anatomoclinic one, towards a later physiopathological mentality (Laín Entralgo 1982, p. 73), the development of the diagnosis construct at these different moments and the execution of diagnostic showed the adaption of the human being within a dynamic of the connections between theory and practice. In the same manner, the advancement from speculative metaphysics to positivist science was manifested in empirical observations (ibid, p. 74) in different disciplines, including those from the natural and social sciences.

Following this trace of marks, the way that the clinical phenomenon started with the quantification of signs and indications (ibid, p. 75) can be conceived towards the second half of the 1800s. In this moment of application of empirical methods, these signs appeared by effecting physical alterations from the body into the disease and in reciprocity from the disease to the corporeal metamorphosis. This shift of interpretation sounded magical from a layman's point of view, but the spread of knowledge in modern times makes it difficult to imagine that somebody cannot pay attention to lifestyles[389] that have consequences for the quality of life. Nevertheless, and related to this topic, a little more than one hundred years later, a work was published that presented the structural aspect of the clinical indication (Schwarz 1994) as a 'temporal dynamic network of interacting indication systems' (ibid) by means of physical examination being helped by technology. Systems both technological and theoretical interact in a modern world made of machines; this is not to set a homologation between empirical data and technical equipment. Completely to the contrary, the point here is simply to highlight that the interchange between information and technology made evident a dynamic relation that existed during the recognition of the condition of a person – information related to knowledge in this dynamic relation clearly shows that old and recent approaches keep a concerted system alive.[390] Thus, empirical data has been

[389] In modern times, 'lifestyles' associates habits with ways of living that society defines as healthy. Nevertheless, the idea of lifestyles should be challenged by the concrete portrayal of concrete cases. From many points of view, 'lifestyles' is not a concept that should be associated with brands and attractive names for eating, sleeping, doing exercise, taking pills or other activities that suggest magic – like in the time back to two hundred years ago explaining that lifestyles can be sold in a cookbook. In this day and age, a person goes shopping and finds offers of teas for heartwarming, or pills that are good for heart and brain, or exotic fruits from various places that are a trend towards avoiding health risks. Ways of living differ from ways of thinking that are connected respectively with lifestyles and mindsets. In this context, lifestyles talk about habits and mindsets about positions. Both are not clearly defined by a statement, but one is sold in a package, while the other still has to be worked out through reflections. With this short footnote, for instance, two concepts can be presented within a person that might make visible that from the position of the person a differentiation has an entry point to further connections and discussions. Nevertheless, the entry point should not be the connecting point that directs the later reflections. The mindset of the scientist shall change of place constantly, while a methodology for analysis remains constant.

[390] Technology connects to technical matters that are developed within a specific time frame. Human invention is built on steps that continue to lead to new horizons. In this sense, these new horizons refer to the development of knowledge that can be provided for the packaging of favourite products. Thus, an analogy to today's commodity trading can problematise how mechanical assistance has priority over thought growth. However, this footnote can also be a trap if considering that a mechanical coating has

discussed in this thesis as being part of the explicative and descriptive approaches before becoming a norm (see Westmeyer 1972 in this thesis). The technical equipment is considered as part of the instruments with which the expert seeks to make a next observation.

Theoretical knowledge can serve for a heuristic basis of the application of a technological procedure (Schwarz 1994, p. 162). This referred theoretical knowledge stretches the problem of applied knowledge by reminding of the fundamental unity that can also come from specialisations where the transcendental character of knowledge does or does not risk playing a role[391] (see controversies from Reinhold over Kant through the concept of recognition in Williams 1992, for example, p. 33). The work in conjunction between technology and knowledge as information is a source of the practical medical action that in this section I will strive to expose within the construct of 'practical deed', which conforms a moment within different spheres of action that aim to explain phenomena. These phenomena have been localised within the scope of performance of cognitive situations that are independent from a situation where they are developed (Patry 2012, p. 33). However, as Patry (ibid) detected from the enunciation of Mischel (1968 in ibid), such phenomena are at the same time specific to the aforenamed situations where the action takes place. The connection between phenomena and situations present the synthetic construct of consciousness, for example, where transcendentalism is allowed but avoided. Dynamism of this kind is captured on the execution of the concept of diagnosis that can be read by philosophers, sociologists and epistemologists under the constant actualisation through educational science on the transfer of knowledge. An educational medical programme aimed at carrying out such sharing of knowledge can be composed for forming new generations of professionals when circumstances are explained under terms of complexity.

3.2.2. Possibilities for theory development regarding the observation of the diagnosis

Whenever possible, retrieving the invitation from Sadegh-Zadeh (2012, p. 278) to write on the argumentation for opening a 'theory of clinical reasoning' as an entrance and as a connecting point for further analysis of the structure that a theory must include when examining the observation of diagnosis is recommended. As such, I want to support the development of this sort of theory regarding the observation of the diagnosis concept, taking into consideration the actions of pedagogical translation as part of the analysis of the practical deed – as a middle point and connecting points for further analysis on the

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an origin in one-sided thinking. To this extent, mechanical assistance in locating causes dates back to the 1800s, when instruments were used as stethoscopes during a normal procedure procedure for the initial recognition of a patient's condition (Lachmund 1997, pp. 76–82).

[391] Regarding the transcendental character of knowledge, the extension of specialised knowledge and the expansion resulting from its acquisition must be questioned. This means that the position of a specialist can be exposed to the point where the person becomes a non-expert in another field. One characteristic that can be set for criticism relies on the specialist that does not exert to be specialised in one area. Oftentimes, professionals under formation cannot know all the contents of a study programme. The action of graduating students involves the trust of not having prepared a person in all the spheres. Nevertheless, the person becomes a professional and should seek for an own development. Study programmes are designed in such a way to deliver suppositions on further steps and experience that the student as individual will go through. In this way, experience becomes a component to be pursued during the scholarly formation.

development of collaboration between involved disciplines portraying own perspectives.

Currently, a proposal could be identified regarding 'clinical reasoning as a method of *information-seeking by questioning* based on a *dynamic branching clinical questionnaire* or branching questionnaire for short' (Sadegh-Zadeh 2012, p. 283). This method contemplates the place of the expert as crucial in the reading of a 'patient's problems, complaints, symptoms, and signs' (ibid). Thus, the method explains why there could be differences in diagnoses that come from more than one doctor.

In this method, however, one basis appears clearly supporting why a general theory of diagnosis cannot be from different disciplines – not even from the same one – and this is because different positions exist that cannot be related to each other or that cannot be supported by each other. For example, from the medical perspective, presenting the patient as a 'black box' (ibid) that must be explored might be allowable. In a counter position, the idea of the 'black box' would be counterintuitive[392] from the viewpoint of educational science, since by presenting a person as such might problematise wrongly the relation of the individual with the surroundings – as if from a behaviouristic position of action and reaction. The medical approach, however, must be understood from the perspective of the medical doctor at the moment when information is being collected for diagnosing from a medical viewpoint. At this moment, the doctor as individual expert acts as a physician and not as a layman.

The doctor gathers information from the perspective of a physician (ibid, p. 284). Here, it should be distinguished that the layman or social person and the doctor are not identical, even though they are parts of assumptions made regarding the same individual. Under such modification, the doctor as a layman would not have a place during the interrelation of the strained individual to the surroundings (at least not as a doctor and not, unless both expert and non-expert meet in a context outside the medical praxis, which by definition would not occur because they would not have a reason for speaking together. People do not confide in strangers about their medical history – or if they do, then they would violate a social convention). In this way, the individual can be understood as an alienation of perspectives that is differentiated from a person made out of flesh or composed of body parts. Almost connected to this point, it is evident that body parts would never be from any scientific perspective, in terms of dignity, isolated pieces of a puzzle. From a scientific point of view, in order to take isolated elements of a composition, a specialisation in the sense of a one-sided intention can be conceived, such as in a monistic approach. Monistic approaches are problematised by an observation of second order within a larger system in terms of possibilities.[393] The sundry possibilities of viewpoints speak about the diversity yet at the same time about the flexibility of being one and many simultaneously and many but one under different circumstances. This is to say, the individual can be situated in more than one systematisation. In particular, and challenging a wider description, assumptions about

[392] Counterintuitive related to pedagogy here means: contrary to the specialised knowledge regarding a pedagogical expectation that has reached the place of common sense, according to pedagogical intentions.

[393] In this respect, the second order of observation confirms that it does not belong to the approach observed. In any other case, a monistic approach cannot be described as such if the content relates to an array of dimensions. Foundations of the monistic approach are respected within a concerted system.

specialisation can be connected with other specialised positions or can be taken from an understanding of unity within a discipline.

3.2.3. 'Practical deed' regarding a position, situation and subject-matter

'If you want to see, then learn to act' (*ästhetischen Imperativ* of Foerster in Ostheimer 2008, p. 45). The reason this is given such an important place in the execution of an action is due to the variability of concatenation of the concept of 'action', namely, due to the potential for discussion within the organisation and problematisation of the execution of an action. Speaking about the pupil as a passive container of actions is no longer possible (Sandkühler 2010, §298b). However, the question remains about how then the individual as a learner under consideration can be treated from its active position.

Through a historical trail of the theories of educational science (Benner & Brüggen 2000), the 'practical deed' that I propose to consider from pedagogy – since it happens during the pedagogical action and grasps a complete interaction of elements – is immersed within discussions of contradictions with regard to principles of reality and definitions from an external or internal world (see, 'emerge of strategies from the pedagogical practice of hypostases of natural or social entireties aimed at instrumentalising pedagogical practice' in ibid, p. 244). The world at the ending of the twentieth century has learnt to be presented with social mechanisms from a consensus instead of contradictions (ibid). Humanity is presently living in a new epoch. Significant changes have been occurring over the last years, and the human being of educational science should be prepared to deal with these modifications of contexts and as a consequence of principles of reality.

Usually, whenever the changes that humanity currently faces are spoken about, in the same moment, an explanation of modifications is required. The layman audience exert pressure for an explanation that from a scientific community should be organised and treated with critical questioning (Patry 2012, p. 11). The presentation of a normal interaction between two persons outside an educational context can be restricted to the one only goal of delivering and obtaining something – or justified by chance because they are together for a defined moment, as is the case with random groups in clubs, for example. Meanwhile, within the educational portrait, each person having a position, a role, own experiences or undefined and defined goals that can be rethought would be detected due to these factors' particular influences on the individual.

In this sense, here a practical deed would refer, as Patry (2012) mentioned and spoke about, to the fact that a concrete action that can be an action in itself, independent from the theory, is not an answer to the theory but an action, and theory is not an action but a means for being used by the person within a situation as an action that can be theorised (ibid, p. 13). This requires the understanding that the action itself must not be an action of education (see, for example reference to medical action during the presentation of Bildsamkeit's principle, in Mikhail 2016, p. 146); but it must require an understanding to what and upon what 'education' speaks. Thus, education, object of educational science, pedagogical action and other terms are differentiated from each other, nevertheless, the discussion upon them supports their definitions. A connection with other theories can be established during their period of definition. In the context of discussing the object of educational science, Anhalt (2012, p. 112) displays an example

of the alienation of the object of educational science from a situation described by perspectives, which could refer to different situations. In this way, I interpret that the object of educational science cannot be restricted to one moment only, like in the institution, but to many other events that can be systematically handled in a particular way and that can be oriented to pedagogy.

In terms of a disciplinary collaboration, Anhalt (2012, p. 33), for example, points out that concepts can offer a way of rethinking and can offer a constant formulation and problematisation with other approaches of research. This would mean that the 'practical deed' as a concept of orientation leads to problematising perspectives under determined or different circumstances.[394] In this sense, I propose that a practical deed can be taken as a construct and subject-matter of education once the dynamic inside it encounters an educational view. Nowadays people are surrounded by events that can be handled in a broader way, wherein areas involved have influence on the environment and on the people self. Many of these intended events, however, are taken over only by their practical application without further thought regarding how they could represent a benefit for humanity in many other contexts. Hereafter, specialised positions are to be compared and contrasted when they have different purposes. Since assumptions about unity do not necessarily connect them, the differences between individual specialisation models show that collaborative positions in concerted systems are reflected in the need for setting and visualising bridges – to wit, assumptions regarding attitudes of integration aimed to connect with assumptions regarding attitudes of collaboration.

Accordingly, the practical deed concentrates on moments resulting from a pedagogical intention that would be executed within a situation where the relation between general and particular is linked to the relation from theory and praxis, a relation that comes from different traditions. In this same realm, practical deed is the construct that explains the situation in which an action takes place and the situation that stimulates the content of sensitiveness towards the completion of the goals. A practical deed is an attempt at trying to explain in a varied form the relationship between theory and praxis with the problematisation of general and particular. Thus, the interrelation between theory and praxis is not an isolated relation; this means that while immersed within a context, it can expand from the observation to its modifications. Practical deed exists accompanied by the challenge of suggesting thoughtfully how the immaturity of the human being is moulded by the inner potential of the individual (Brüggen 2009, p. 4) engrossed in societal systems. Therefore, it is not bewildering that philosophy of science has consorted with sociology and history (Carrier 2007, pp. 16–26) after considering that human actions are not limited by frames. Hence comes the need to take a look at how contexts have been developed and how they develop human beings as a result of the influence from the individuals.

a) Pedagogical tact

Herbart refers to 'pedagogical tact' as the intermediary connection between theory and practice (Patry 2012). In general terms, the tact would refer to the sensitivity of the action; this means the sense of how the action is directed. Therefore, tact must be considered as an attribute of the action and not as the action itself (ibid, p. 6). Like this,

[394] In the fourth chapter, a part of a sketch would make clearer how practical deed can come from assumptions regarding integration that interact with those of collaboration within a concerted system, where different perspectives try to communicate with each other on the level of a complex situation.

‘when the action is based on one or more theories’ is a characterisation of tact (ibid, p. 7). To this extent, pedagogical action can be spoken of when the social action is in a frame of pedagogical and educational goals (see Brezinka 1992, pp. 42–45).

I have already exposed how pedagogical action can be presented as a means of uncertainty. Now I will try to highlight the place of a human reaction in the frame of reliance (Heitger 2011 in Mikhail 2016, p. 135). By dint of confidence, the reflections on ‘as if’ of the philosopher Hans Vaihinger influenced medicine and educational science, through the work of authors like Laín Entralgo analysing the texts of Richard Koch and Thomas Mikhail while also taking into consideration the writings of Martin Heitger (see ibid; and Laín Entralgo 1982). Due to the idea of *fiction* in the Vaihingerian sense of the term, the practical deed, specifically drawing on the pedagogical tact with sensitivity regarding the progress of the individual, expresses the structure of the particular reality of a possible accepted own mission: to do from the self what is useful and to make out of what appears *the one who* of what exists. In broader terms, this mission calls upon the self to do what is useful and to take what appear to be the basic components of the self and use them to make a new formulation.

With the example of the work of ‘as if’, the authors problematise how human beings make plans without depending on whether life would still be there one or more days later. Who would ask if there would be a life for being lived in (suddenly passive, as in a fixed situation), or for being lived for (active, as within an intention)? As a complementary question, wondering about who would provide the answer to such an interrogation is important as well. This redirects the reader to the endless debate of the sound made (or not made) by the tree that falls in the forest with or without anyone around to hear it. In the same way that an argument can be handled in favour of one answer to this question, the realm or the sphere that the pedagogue would have as a space for working on the possibilities of achieving goals and the potential of the individual could be argued (see Mikhail 2016, pp. 140–145).

From a reflection on the existence of tree within a forest without any human existence in its surroundings, a reference of the presence of perspectives, suppositions, assumptions and reliance should be taken. Pedagogical tact possesses a critical point in the process of encountering perspectives since it must rely on the fact that reality is not a *literal transcript* (William James in Sandkühler 2009, p. 103) of the world. However, there is a part wherein the people who appear during the execution of the pedagogical action depend on the circumstances that could be as real as the way that they manifest themselves. As Mikhail (2016) wrote precisely on this matter: ‘education is not about nature but about culture’ (ibid, 143). In this sense, pedagogical tact, with the help of philosophy, would be in the frame of *how can* and *how should* a goal *be* reached and not only about whether corporeity confirms this goal. Pedagogy can work with science in general and the natural sciences in particular in expanding and problematising its own understanding of the world of possibilities.

By taking the pedagogical position independently of the intention of the relation between theory and practice, whether uncertain or reliable, pedagogy as part of a system allows the independence of facts that could be required in supporting a self-reliant action. This means that reality, be it for the purpose of distracting another person or for diminishing the content of abstraction or for bringing one person from one position of reasoning to

another, would show itself as one of these during the moment of execution within the position of the individual.[395] The individual in the centre of the action, having a pedagogical sensitivity, does not ignore that the potential of the person is inserted within a context. For this to take place within the pedagogical tradition, a systematisation of organisation is given by the function of the concept of Bildsamkeit.

b) 'Bildsamkeit'

Bildsamkeit is proposed as a foundational concept of pedagogy (Herbart 1835). From the German sense of malleability-formability, the word denotes the condition of a person being malleable [in the spirit of what is viable, imaginable, supposable]. Not as a word, but as a concept, Bildsamkeit is considered from its function within the systematisation of integration between self and the world. Bildsamkeit is therefore understood as the willingness of the human being to be oriented by the same person (ibid, §181); in a nutshell, it will contain the earnestness of being 'beyond' oneself in terms of what it is being now. Bildsamkeit cannot be denied (Mikhail 2016, p. 152) because when considering the possibility of forswearing it, it appears as something that cannot be destroyed but that can be discussed. On the basis of the human potential a systematisation is carried out.

Bildsamkeit means, in effect, a constant of educability of the person (Mikhail 2016, p. 145), a state of being that should not be corrupted by the disposition or wishes of the society, which Herbart (1835, §181) formulated in a different wording within a list of mistakes to be avoided during the execution of an action (ibid, §177). From the condition of change, of modification and of growth in which the human being is inserted, a needfulness of upbringing exists in the continuity of life. Hence, this educability is to be considered as the 'thirst for education' (Anhalt 2012, 2011) that is stretched thanks to the potential of self-creation (Anhalt 2011, p. 125). This means that the human being must ideate *their*self as flexible or capable of learning, in order to make pedagogical action possible (Mikhail 2016, p. 146). This notion of formation opens the opportunity for a pedagogical sense in human actions (i.e. of pedagogical tact specifically oriented in a pedagogical action) when a practical deed is related to a frame of betterment of the individual.

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[395] At this point, I am mentioning for the first time what would happen if the teacher were a bad person or a person with bad intentions. So much has been written on the position of the newly born as good that is damaged by the influence of the world in contrast to the position of the newborn as evil that is cultivated by the environment. Likewise, there is a space for carrying this point in the position of the expert. Since there is no standardised Hippocratic Oath in pedagogy about aiming at the best for the sickness as it exists in the realm of medicine, to date, pedagogy is open to wondering about what possibilities remain to one learner who puts up with, or in an extreme case, who suffers under a teacher working in the position of a detractor. This would be a topic to extend in a discussion of scientific integrity and of contents in pedagogical normativity. Also, this would be a point to problematise with the feature of morality in modern times, specifically in which the 'drive and ease' (Anhalt 1999, p. 250) are ruled by economic values. As appraisals or estimations in a logic of 'supply and demand', those should not necessarily follow the well-being of a group. Thus, the position of a teacher as a detractor would succeed with the impact on the well-self-being of a person. For an updated general reference, here are three links with opinions about this kind of educator oath: https://medium.com/age-of-awareness/socrates-oath-for-teachers-ae71fb227926 [13.02.2018], https://mrmck.wordpress.com/2014/10/12/for-your-consideration-the-socratic-oath-for-educators/ [13.02.2018], http://www.bbc.com/news/education-29482160 [13.02.2018] Google search done with keywords: 'hippocratic oath for teachers', 'hippocratic oath for scientists', and 'hippocratic oath in pedagogy'.

In order to give continuity to this point about how the concept of practical deed can work in conjunction with the concepts of pedagogical translation, pedagogical action, practical medical action and in general terms with a professional action, some reflections are taken from more than one timeline. This happens due to the richness of modifications along the way of thinking that are not confined to one only moment in history but to the continuous exercise of actions of the human being – hence the proposal of the practical deed as a category that extends in the historical recounting of events – in which different theoretical authors have invested time from different perspectives with access to different theoretical resources. Then it is not unimaginable that when reading about the concept of Bildsamkeit itself, more than one author from different theoretical divisions have written something vaguely offbeat that complements the core idea of this concept. In the same vein, I have intended to stretch the coalescence of models concerning their attitudes next to situations and regarding subject-matters of an action (according to the terms resulting from the theory of complexity of education by Elmar Anhalt 2012) in explaining how the concept of diagnosis emerges from the inner potential of the individual in the observation of historical events of human momentum (at this moment, not yet paying attention to whether the concept of diagnosis could be the ideal for its application in pedagogy, since a theoretical construct from medicine counteracts many postulates of educational science).

The elementary notion of pedagogical praxis, relying on a systematisation of the inner potential of the individual, allows for pedagogical knowledge that is not exclusive of one system in science and society but is to be found in other expressions of science (see Brüggen 2009, p. 4). Hence, this implies the output of a practical deed that can be conceived from Bildsamkeit of the individual and that can be spanned in other contexts, like in the pedagogical tact and practical medical action. Nevertheless, Bildsamkeit belongs to one characteristic of the possible human being (see Mikhail 2016, p. 147) or to one possibility in which the possible human being already exists; otherwise, there would not be anything left for calling us people (ibid), at least not in pedagogical terms. Next to this, the systematisation of Bildsamkeit commands a principle in which the human being needs to be presented as independent of the world (ibid, p. 150) while linked to it.

With the presentation in the happening of a moment of freedom, as in the subjective recollection of vivid imagination or the potential of the individual through Bildsamkeit,[396] pedagogical action can feasibly take place (ibid). In it, both the educator and the learner are part of the achievement of a goal (ibid). The basis here states that in order to make something out of something, something must exist that can be worked with. For this, the example of the stonemason who can presuppose a statue within the marble block (ibid) helps to put a name to the tools that can be used, to the material that can be worked and to the moment of exercise of vivid imagination on the part of the sculptor and the sculpted. Because, as in a magic tale wherein the embossed imprint can come outside the picture and add more paper and select her colours for the drawing process, Bildsamkeit is a constant of the process of education.

[396] According to Benner (1991, p. 70), Herbart was careful not to think on a factual freedom that comes as an ontological predicate from the human being. Hence, the potential of the individual through the concept of Bildsamkeit can evaluate the striving and drives of action from oneself.

c) Morality and self-reflection

The social place of formation, study, and training is evident in the history of the formations of doctors (Lachmund 1997, p. 37), in which charlatans needed to be distinguished from the professionals of reasoning out the indications of the body. Before presenting how morality and self-reflection have their places within a structure of the interrelation between the individual and society comes the recognition that alongside the problematisation of the human 'practical deed' exists a moral practice that becomes viable in the differentiation of pedagogical tact and practical medical action. This moral practice can today be systematised in educational science, being itself aware of two strategies of rationality of pedagogical action, meaning from an internal or an external (Benner & Brüggen 2000, p. 244) definition of the reality.

Having respect for life is a premise that becomes evident within the collaboration with medicine. As I commented above, clinical reasoning belongs to the realm of execution of medicine that other disciplines must take extreme care not to pretend to know it and trespass the borders of a specific domain. However, from the epistemological viewpoint and reflection on analysis of concepts (i.e. analysis concept and analysis of meaning), educational science can deliver an output of performance from its philosophical tradition. In the context of respect for life, clinical reasoning must be assigned to a foundation if it is problematised in the formation of medical doctors. In the case of this work, the foundation relates to the realm of educational theory in the way in which they are connected with the world (i.e. through a portrayal according to the reality of education).

Based on such a basis for further strategies, facts related to the healing of ailments show that every order of argumentation would be altered by the greater good of being in balance. Balance or stability is problematised in terms of morality and self-reflection by the own character of the person (Anhalt 1999, p. 248). To this life-respecting premise belongs an ethical praxis that is accompanied by a reflection on the dignity[397] of the human being (Mikhail 2016, p. 147) under the positioning of a third place of composition in the constant problematisation with another concept.[398] Therefore, it can be made clear that the malleability of the human being is accompanied by morality and self-reflection as was written by Herbart (1835, p. 69) about 'the support' of the will of the learner, fundamentally because the 'what for' of the individual's growth process corresponds to the purpose of having an effect on another person. This means that although differences

[397] Since the concept of 'dignity' is not clearly established as an idiosyncrasy of Latin-American cultures, I discussed directly with Dr Javier Garciadiego Dantan from *El Colegio de México* that one possible translation into the normative of the Mexican society could be through the concept of 'Constitutional guarantees' that cover the integrity of the human being and, in consequence, a similar conception of the dignity of the human being. This conversation took place during the session of questions on the exposition of the topic 'A cien años de la Constitución de 1917' in 2017 at the 6° Symposium CONACyT in Europe at the European Parliament in Strasbourg, France. However, I am aware that a normative concept such as the 'Constitutional guarantees' could direct the reader into a different angle on the work and into a different discussion. I must therefore point out that the concept of 'dignity' is a cornerstone that can lead to further discussions.

[398] Mikhail (2016) set a constant problematisation of the concepts with the 'three moments of organisation' of Johannes Schurr that Schleiermacher identified as a 'technical triangle' of pedagogy, that is, the 'what' or the 'eidetic' aspect of the pedagogical art (εἶδος), the 'what for' as a 'teleological dimension' (τέλος) and the 'how' as the methodological part (τύπος) (in ibid, p. 121).

among people and social systems can be traced, a constant that remains in defining a healthy status of a person is the state of being about to take aim to reach something.

One of the reasons why morality and self-reflection should be included within the systematisation of the differentiation between pedagogical tact and practical medical action relies on creating consistent systems. Pedagogical theory accomplishes this consistency by taking into account means available to address the potential of the person (i.e. by sistematising Bildsamkeit). The systematisation of Bildsamkeit involves working within consistent systems (ibid, §3). This consistency reflects a hold on the individuality (ibid, §4) and self-reflection of the learner. For this reason, it can be understood that pedagogy would not suppose a limitless potential of the individual (ibid, Mikhail 2016 p. 146) because the potential must be worked on something and by the self-person. It is also in this way [respectively by means of activities] that the reaction of the *Organismus* with the possibility of self-reflection and anticipation of future behaviours can be the essential material with which any act is located on the grounds of Bildsamkeit (Anhalt 1999, pp. 211–212).[399] One consequence of putting together concepts from German traditions into a mix of languages of other scientific cultures is that crucial concepts can be detected that are worked under a different perspective. On this point, one goal of science can be retrieved regarding work as a means of freeing the human being from self-immaturity (Carrier 2007, p. 26). This would be a purpose achieved after promoting the ability of self-determination (ibid).

I can interpret from Anhalt's systematisation that the self-reflection or self-determination of 'an affected or interested person' is organised in terms of the 'notion of activity' and 'morality' (Anhalt 1999, pp. 197–199). Herbart's proposal for a solution to explain the approach of Bildsamkeit as a category considered to devise the 'notion of activity' or 'reflection of a train of thought' and the 'morality' of the individual (ibid, p. 197). The 'reflection of a train of thought' is stimulated with the orientation to the internal organismic activity of the learner that comes out of the difference between the internal dynamic and the stimulus from the world. In this way, the '*internal notion of activity*' animates the self-referential organisation of the own faculty for generating thoughts. All this happens with the aim of cultivating the faculty of progress of the affected person (Herbart 1964 in ibid). With this systematisation, identifying the activities that evoke the self-reflection of the individual is sought, like – according to this work – the exercise that happens during the activity of recognising the condition of another person.

Morality would thus rely on its function (ibid, p. 245). In this function of morality is found the assessment of the representation of the organismic activity and its hierarchical organisation that form the basis of the relation between the self and the will of the person as relates to her or his practical judgement (Herbart 1913 in ibid). This practical judgement is tied to the moral criteria of own activities (ibid, p. 252). Herein lies the kernel in the analysis of the social intervention during any praxis, medical also, wherein the interdependence of the expert (on a social system) and non-expert (from internal dynamics of the body's own reactions, but from reflections on them) appears to be clear.

[399] Concepts relating to activities, actions, morality, self-reflection and individual inner potential are interrelated because they correspond to the organisation, the modifications according to development and the possibility of one person influencing another (see, design of Herbart presented by and in Anhalt 1999, pp. 197–244).

In general terms, the social-, organic- and psychic- systems are what Anhalt (ibid, p. 253) identified in the composition of self-organisation in explaining the function of morality in conjunction with the notion of activity. To this extent, the person will show a faculty of an own decision based on a selection of a self-understanding of a situation. Had the situation not appeared as external, the social component would be missing while leaving the internal reflection for readiness of a reaction (see Anhalt 1999, pp. 253–254).

d) Practical medical action

Practical medical action is a highly complex construct that involves specific knowledge of medicine and other disciplines. Since this is a work of educational science, I will not even try to describe the execution of this action. Nevertheless, in the same manner that this work intends to speak about concepts that can be translated in terms of pedagogy[400] and from an epistemological approach, this work takes consideration of the caveats of the theory. Sadegh-Zadeh (2012, p. 278) canvasses a 'theory of clinical reasoning' that can transform 'clinical practice'. Such a theory relies on the application of logic as a method of inquiry for reflecting on the framework of the relation between action-theory and theory-action in reciprocity alongside clinical reasoning (ibid, p. 283).

Although logic can be questioned as an approach that might have an effect on some formulations of educational science, logic is not a topic that belongs explicitly to the realm of the topics of education. Anhalt (2007, p. 115), for example, formulated the circular idea of the influence of logic in the development of alternative approaches of research in terms of 'possible worlds of education'. Within this 2007 text, he left a footnote in which he recognised that up to that moment, such a work had not been undertaken as a systematic object of study in educational research (ibid). Under this point again, I consider it necessary to think about how to explain an object of educational science. For example, the individual might not be an object of educational science since the individual per se can only be a container of theoretical knowledge that systematisations have put inside of it. Hence, the function of the individual is described with regard to the problematisation of the recognition process of the self throughout speculation about the diagnosis concept by means of the diagnostic process.

Accordingly, in this subsection, the goal would be to bring to the fore the participation of the patient, as an individual, in the outcome of the process of diagnosis, in order to show how the individual has a position not only as a concept but as a living unit. For this reason, until now, the relation between theory and practice has mainly been problematised, but now the time would be right for discussing the application of knowledge from the general to the particular and from the individual to the multiple cases. I call upon the intention of diagnosis but primarily upon the function and purpose of the tension between the general knowledge of the individual with the influence from single case research on the common traits within a population. To this extent, this intention should be taken into consideration with the practical deed. This relates to recognition of the condition of another person that not only includes seeing the disease,

[400] This succeeds, for example, thanks to the knowledge that is required for teaching topics of research in the medical area in a master programme of study that collaborates in conjunction with the Clinic of Nervous System of a department of medicine at the University of Queretaro. The development of this work originated in this collaboration.

with respect to its implications and consequences, but playing a role in the therapeutic prospect while taking a perspective of a specific case (Matthiessen 2004, p. 12).

Subjectivity was not always considered within the propositions of diagnosis (Laín Entralgo 1982, p. 97), and therefore, some time was needed for the problematisation and questioning regarding the place of the individual while putting her and his own process into effect. This kind of interrogation is not and has not been separated from the rest of events and positions of systems in science along with its discoveries. The cellular theory, for example, displaced the Galeanic doctrine of temperaments (ibid, p. 98), bringing a modification in the way of perceiving the corporeality in the sense of physicalness of the own body. 'Could science have granted new validity to the concepts of *temperament and constitution* without any translation to new proposals?' (ibid). For supplying an answer to this question, the idea also goes through philosophical terms within the discussion of what 'constitutional' means as a theoretical construct and where it places the individual according to the 'dispositive cause' of a disease. On a parallel note, the difference between the constitutional and the individual construction[401] implies the constant problematisation of the meaning of the individual (ibid, p. 100).

In summary, Laín Entralgo (ibid, pp. 97–101) proposes a division of thinking according to 'biotype and pathological inheritance' – among others – in order to benefit the 'diagnostic judgement' (ibid, p. 100) that is based on the 'causes, predispositions and consequences' of the concept of faculty (Moreno Rodríguez 1987–1988, pp. 25–57) and not the cohesive capacity of the organism and the causes for illness (ibid, p. 57). With the 'pathological inheritance', Laín Entralgo (1982) gives thought about the phenotype that is constituted in conjunction with the environmental factors (ibid, p. 100). On this basis, the move of internal and external forces that sustained the intuition in Goethe's sense is organised, overcoming the dichotomy between idiographic and nomothetic research methods (Matthiessen 2004). As such, the individual has the place of defender of the own body with determined structures that defend themselves against external agents. In this view, the individual is not only a reactor to experiences, but an active living entity (Laín Entralgo 1982, pp. 103–104).

In the systematisation of a clinical process, it is important to know what is going to happen after the diagnosis; this means knowing for what reason an analysis of the condition of a person is given. The primary importance is to estimate the subsequent events after diagnosis as the individual may or may not follow the prescriptions of treatment; therefore, awareness of whether the perspective of the diagnosis concept is for a prognosis or for therapy is recommended. The individual has the place in this equation on the side of the doctor and on the side of the patient because the doctor earns experience throughout the knowledge of cases, while the patient has empathy and feelings towards the own decisions taken (Matthiessen 2004, pp. 13–14).

In difference to a philosophical construct of individual and its discussion on a field of action, foreseeably, one goal of pedagogy is not to wonder about what the human being is but about how the human being is believed and viewed in order to make pedagogical action possible (Mikhail 2016, p. 123). Bringing together the goals of pedagogy and the goals of educational science, with reference to the reflection on the theory of pedagogy, enables the discussion of topics other than institutional education, which could

[401] From a theoretical construction when speaking in specific terms of pathologies.

consequently allow returning to speak from the same educational viewpoint now in own pedagogical and educational terms. This means that in the proposals regarding the concept of medical diagnosis, the age and chronology that affects the nosological status of a person according to their development can also be localised to speak about a wholeness during a recognition process. This gives rise to a specific interest in pedagogy that distinguishes it from paediatrics as well as psychic and social human realisation (Laín Entralgo 1982, p. 101). Furthermore, from a philosophical point of view, the particularity of a person can be modified in a manner corresponding to a general value of epistemic interest (Schäfer 1999, p. 268), according to different perspectives (Anhalt 2012). Thus, pedagogy does not ask what a human being is but asks how the human being must be introduced in order to make pedagogical action possible at the same time that it differentiates itself from the fraternity of disciplines as with philosophy.

e) Anamnese

The idea of the subjective recollection of vivid imagination can also be termed anamnesis (Sandkühler 2010, §574u-b). Herbart made the metaphysical idea of anamnesis in Plato a domestic idea of pedagogy (Mikhail 2016, p. 150). During the time of Hippocrates, five activities were identified in clinical practice: anamnesis, diagnosis, prognosis, therapy and prevention (Sadegh-Zadeh 2012, p. 275; Laín Entralgo 1982). Next to the interpretation of the disease, the anamnestic task collects information in the form of indications for the purpose of understanding the causes that produce it (Lachmund 1997, pp. 31, 72). On a level of importance, however, and according to Lachmund (ibid), prognosis is the most important task in the interpretation of the disease. The difference in taking up one activity above the rest is related to the conception of the achievement of a discipline, in this case medicine [because medicine has the place for direct contact and treatment with sick patients]. Nevertheless, but as a core point, the activity has to be associated with the notion of the sensitivity of a reality when taking a principle out of it.

In this sense, the strong criticism to the propositions of Koch about an analysis of the relation of the doctor with the patient and about the way of grounding arguments during a diagnostic procedure can be explained previous to the perception of medicine as a reasonable therapeutic action. Such criticism was established based on the ‘real’ conduct of the expert (Laín Entralgo 1982, p. 126) because the term ‘real’ should remain in question. To put it simply, Koch disturbed the academic groups of the epoch by taking reference to speculative knowledge to suggest, contrary to the generally accepted understanding of his time, that there were no diseases but diseased people (ibid, p. 126). To this respect, the current conceptions regarding the relation between theory and practice can be traced back as the formulation of the concept of diagnosis and of the concept of reality of scientific knowledge that started bringing novelties barely suspected first after the end of the First World War (ibid, p. 182). In concrete terms, the conception of medical diagnostic the way that it is known to date began during this same period of time (ibid, p. 119). Nevertheless, one of the activities that survived within the canonical pattern was that of anamnesis in conjunction with the innovative physical examinations of the time.

Anamnesis occupies the important role of attributing the description of the patient’s condition, paralleling diagnosis (Sadegh-Zadeh 2012, p. 276). Anamnesis would comprise the ‘verbal component’, while by way of the examination, the ‘non-verbal

expressions' of the patient are acquired (ibid). Both together elicit information for deciding '*what should be done for this patient*' (italics in original text ibid, p. 277). To this extent, this historical description of 'taking effect' on another person through the 'examination' becomes relevant. Had the participation of the patient not been involved, the conventional diagnostic procedures such as anamnesis or feeling the pulse of the patient would not have been enough (Lachmund 1997, p. 72). Examination is a proper procedure of the doctor and her medical background, but the concept of anamnesis can be described in reference to its epistemological constitution without dealing with specificities of the medical arena.

The activity of anamnesis shows the relevance and importance of the interaction between expert and layperson since, depending on the different authors, it can lead to 50% to 70% success in the diagnosis (according to Bauer and Lauda respectively in Gross 1969, p. 27). Regarding clinical reasoning, Sadegh-Zadeh (2012) mentioned to consider the anamnesis in the physician's *procedural knowledge* during the experience for how to come alongside a patient in order to localise and to distinguish propositional knowledge in the clinical process (ibid, pp. 288, 296–306, 384–387) [within a longer description, physician's procedural knowledge relates to a basis to localise and to distinguish propositional knowledge in the clinical practice, see ibid]. In preparing the argument for the pedagogical diagnosis, considering a philosophical influence, the anamnesis marks a discontinuity of opinions as to whether the physical examination should be considered a separate process or not (see, for example, Schulten's agreement to choose the physical examination instead of the meaning given to anamnesis, mentioned in Gross 1969, p. 27). Although this argument has a reference date of sixty years since today, the attitudes regarding its assumptions from positions are marked on statements that cannot be clearly classified under a certain action. Up to a current point in time, statements are at all times taken as a basis for dealing with a topic and, in the absence of further reflection, bear the risk of not being separated according to the respective situations and moments (i.e. situations and moments when they should be considered during emergency situations and when they should be adapted to longer-term treatment).[402]

Anamnesis requires the participation of the patient, and herein lies the importance of being taken within the context of educational science in the frame of reading the condition of another person. When recognising the clinical reasoning between the interaction of expert and interested person towards getting better, a place is given to the responsibility of both parts: one that can listen properly and can apply experience, and the other that trusts in the generated guidance. In this way, a practical deed can be determined to be different in the realm of a medical context than in the pedagogical realm. This is not to affirm that the two can be compared but to explicitly show the communalities that both have in the influence that the two parts in the juncture between expert and interested person have in a relation that seeks after an achievement. With the word 'achievement' is associated with the result of a match. In the sense of a competition, however, no rivalry should exist between a medical or pedagogical approach, as mankind is milliards away from a material to be defeated. The contention

[402] A discussion of practical and theoretical knowledge in medicine can be continued to capture some of the problems that arise in distinguishing what I present as situations and moments (see Sadegh-Zadeh 2012, pp. 250–258).

should rather take place in theoretical arena and with the search for collaborative arguments. In this way and although an essence should not be possessed by anyone, scientists from different areas continue to struggle to clarify the idea of a message or to reject it by ambiguous means. The resistance to disregard statements is part of a modern transition of theory construction that can be incorporated into the organisation of the components of what is to be taught and how.

4. Brief diagnostic findings

Opening statements: Relating to the complex situation of science in respect to different pedagogical schools of thinking, and drawing from discussions upon hermeneutics, the constructs proposed by this work support the phenomenological character of the educational object. The concept of recognition presents a result as a supposition of what can be extended to the means and modes of action, such as to procedural measures. At this point, the diagnosis concept can be confirmed as a synthetic construct having several definitions with which it can be re-read. Procedural measures related to 'pedagogical time' based on synthetic constructs can lead to a prospective situation for pedagogy and educational science that can be included in an epistemological agenda. From the pedagogical side attesting diagnosis, the pedagogical language gains strength by proposing a common reality that other disciplines are sharing.

In this chapter, reflecting from hermeneutics,[403] I provide closing arguments[404] for this work about how educational science benefits from the notion of recognition from discussions on Hegel (see treatises on the Hegelian system and discussions on the concept of recognition in philosophy, for example, in Wood 2014; Williams 1992) within the exercise of testing whether the portrayal of some models based on assumption of attitudes can discuss the *recognition construct*. Namely, a connection in pedagogy between the concept of recognition and the diagnosis concept is a finding yielded by my analysis performed. Recognition as a construct goes beyond executing a procedure, and therefore, I seek to compose a formulation of diagnosis that can display the reflection in the process of one's own development (i.e. regarding its own recognition in pedagogy). The correspondence between assumptions about scientific positions and the reality of education depicts a system consisting of the exchange of the relations. Thus, theories problematised within the pedagogical realm and dialectic such as theories of recognition

[403] I take the notion of hermeneutics from Dilthey (1900) who sought to organise scientific conflict, the multiple directions of scientific works and the need to formulate rules regarding the meshing of plural results (ibid, pp. 188–190). With reference to the Greek notions of rules (κανόνες) and laws (νόμος) (ibid, p. 194), in German, he described 'interpretation' (ἑρμηνεία) as an artistic activity for classifying the world (ibid, p. 191). I am aware that hermeneutics also refers to a scientific method that was necessary to include in a human cultural system where social and historical analysis alone was no longer sufficient (Lischewski 2014, p. 401). I am also aware that for this thesis, I did not pursue establishing a discussion of the extensive hermeneutic approach (as method, theory, disciplinary program and so forth). For this reason, I have been aiming to discuss the differences between assumptions of positions (of specialisation, of integration and of collaboration) but, most importantly, to highlight the independent place of pedagogy. Hence, in the description of the scientific conflict related to the writings of Hegel (1977) and portrayed in the notion of interpreting from a teleological unit, hermeneutics help me to give 'collaboration' signalling an 'integration' state. Whether a collaborative position in science would fall into an integrative position is something that this thesis is not ready to confirm.

[404] According to the development of the work, these arguments must be related from the models for and of understanding the theory of knowledge of educational science to diagnosing the concept of recognition (i.e. a diagnosis of the diagnosis). I am providing in reality, according to the terminology followed by this work, active connecting points (i.e. connecting points of and for further analysis that I problematised within the other chapters). The work will be read by other scientists that might skip sections relating to different theoretical traditions; thence, I continue to make an effort in terms of reporting with common grammatical syntax that awakens interest in returning to the rest of the chapters.

in theories of Bildung (Stojanov 2006) contribute to, but also come from, the description of pedagogical inner processes [that, as I write, such statements lie within a system that should be commented upon]. The connection between the reality of education and dialectics in the theories of Bildung helps to present such a specific reality in the development of a theory, which remains in contact with scopes of other disciplines. On the grounds of the constructs proposed by this work, I present in this chapter why and how the educational object earns a phenomenological treatment for its localisation within a disciplinary collaboration when presenting it under the frame of spheres of action (i.e. from the a priori and experimental exercise of replacement and exchange of assumptions for further differentiations). The principles of reality related among proposals of Bildung and dialectics from different authors display, for example, how disciplinary collaboration connects to the self-reflection of one person. In a list of questions and assumptions for their explanation throughout this chapter I have arranged the following arguments on dialectics and disciplinary collaboration:

- How from assumptions of unity, can scientists earn an orientation to speak with other disciplines? If the understanding targets to one common point of origin, then why insist that 'to look at one only truth' will not bring up the formed idea of 'good citizens'? [to this question, the constructs of censorship, reflection, and critical analysis should be kept in mind].
- Assumptions coloured by unity, specialisation and collaboration are different from each other. If these assumptions could be taken as transcripts for the development of models, then a construct of pedagogical translation should guarantee a transfer of contents. However, this is not the case because assumptions can be contradictory and several positions exist within and beyond one only concerted system. Ergo, the assumptions are not frameworks and should not be mistakenly taken as the models of positions [to this extent, the differentiation between assumptions regarding attitudes from and about the position of individuals with assumptions of scientific positions should be retrieved here].
- The notion of recognition from discussions on Hegel boosts intersubjectivity (Williams 1992). The interchange between attitudes[405] regarding unity and collaboration are supported by 'intitudes'[406] that require specialisation. Such interplay opens bidirectional reflections by wondering: Can the interchange between logic and phenomenology speak about the recognition concept for

[405] Attitudes relating the individual with the environment (Sandkühler 2010, §474bu). From my understanding, attitudes and assumptions refer to an active individual, differentiated according to two sides. On the first, assumptions are related to suppositions in general and suppositions sustained by logic. On the other, attitudes are related to experience in general and controlled experiences. In this connection, the construct of beliefs appears relating to attitudes and assumptions; however, I am taking beliefs from a passive channel for replicating opinions and for holding a way of being that in parallel can sustain attitudes – but specifically assumptions. To this extent, several mechanisms work to be in effect in the structure between beliefs and scientific practice. The passive character of assumptions was suggested at their first mentioning in this work.

[406] I select the reference of *intitudes* from Coopersmith (1969) based on his proposal on the implications of 'studies on self-esteem for educational research and practice'. I identify that reflecting upon contents is inserted within. In contrast to his writing, I do not pursue attention to the individual in and from a particular basis, but to insert an idea regarding effects of interactions between models wherein the individual has an influence. These ideas could be pursued for collecting data according to other methodologies, like those from empirical research.

discussing pedagogical assumptions? (see related reflections in Stojanov 2006) – by drawing awareness to critiques of Stojanov's composition of philosophy of Bildung from Anhalt (2014), in order to take caution for not mixing theoretical levels and to make clear the specificity in the scope of a determined sphere of action. The spoken interchange between logic and phenomenology, Hegel's notion of recognition – according to Clarke (2009) and Williams (1992), can be displayed for effectively yielding intersubjectivity.

- The recognition concept with its basis in the discussions between Hegel and Fichte (Clarke 2009) highlights the activity of the self as process of individual genesis – similar to the way that Stojanov (2006, pp. 111–114) recounts intersubjective relationships.[407] With this individual genesis, the processes of transformation and of diagnosis (can) sustain an ongoing structure of science and, in this case, draw on educational science to collaborate with pedagogy. [That is to say, the spoken processes can benefit from educational science and pedagogy by using their tools of analysis]. From the question about 'how can the pedagogical work be taken from the individual to exert on other areas?', an observation in second order yields how to identify disciplinary borders (including those of an own discipline).
- On the basis that an argument can follow desiderata, the argument can seek to maintain the recognition concept (Hössle in Williams 1992, 1991). An effort to speak upon the educational object from Hegelian reflections validates the place of Hegel in pedagogy (Nicolin 1955) at the same time that this weighing keeps pedagogical problems alive by dint of constant problematisation. Does it become foreseeable in the sense of viable that diagnosing the concept of recognition will continue to validate the assumption about pedagogical specialisation? (since the intersubjectivity must be spoken from one point of view). This should lead to support of the own pedagogical language that can connect with other disciplines.

Based on two models[408] and using assumptions and logic-based arguments, one of unity or integration and the other of collaboration, pedagogical diagnosis stimulates simultaneously the exchange of these positions[409] – to wit, one of the findings of this

[407] In terms of intersubjectivity, the discussion of the place of the individual within a relationship with the world refers to a longer conceptualisation between the outcomes of philosophical researches and scientific work. Therefore, I rely on the grounds of the problems related to orientation for exerting that the individual is capable of reading the scientific systematisation of self-control by oppositions (as in my opinion Elmar Anhalt encourages to be developed with a program of complexity that considers dynamics of subject-matters and understanding of complex situations). Despite the fact that the extension of collaborative assumptions, as handled throughout the chapters of this work, are not intended to be argued outside of a system, I propose that their problematisation is feasible on the basis that the recognition construct can be held within different spheres of action.

[408] For presenting the results of the work, I offer from assumptions explained in the contents: theoretical models of integration, collaboration and specialisation. Within this chapter I give attention to two of these models of the three.

[409] In this chapter, I commit to developing models from a speculation on assumptions for and of understanding the theory of knowledge of educational science. Positions relate to models, and hence, I lay forth the assumptions that guided me during the work that now might be useful to yield models with the intention to clarify the positions held. By portraying these models within the spheres of action, the models turn out to be the cause, and the outcome would be the diagnosis of the recognition concept in pedagogy. In this way, the application of the models would confirm whether their conceptualisation upon a disciplinary work with medicine, psychology, neurobiology and educational science would be useful for setting a pedagogical diagnosis. As part of a scientific systematisation, assumptions must be

thesis is that pedagogical diagnosis offers a basis to one specialised assumption with which a third model of specialisation can be composed or, in this case, explained since the assumptions of specialisation have already been determined.[410] With the concepts of pedagogical translation, pedagogical spheres of action, practical deed and principles of reality (all constructs I have proposed and explained in this work), the conflict of an interchange on the different levels of a situation invites reformulation into pedagogical terms.[411] This reformulation as exposed in this chapter displays that not all the assumptions should appear during the same situation at the same moment. Furthermore, this reformulation as recognition of statements in the sense of modification does not result from previously standardising all the concepts as pedagogical constructs, but from presenting the problematisation caused by the assumptions made (i.e. after the dynamics have been allowed to circulate). Such a transference resembles the assumptions of unity, which in order to prove their existence should be constantly problematised. As such, assumptions of unity need to be spanned by the portrayal of assumptions regarding attitudes of collaboration.

Upon assumptions regarding collaboration, pedagogy as limited by the frames of the participating disciplines has an attitude of interest towards censorship, supervision, reflection and critical analysis aimed at the speculation method; however, when working with other disciplines, pedagogy must speak from its own terminology while understanding others. When confronted with integrative assumptions, pedagogy states that a difference between theory and praxis must be handled and problematised [in a similar way, Schurr in 1975 formulated from Schleiermacher's attempt to develop a *Wissenschaftstheorie* or theory of knowledge that can be problematised beyond a Hegelian dialectic, whereby hermeneutics supports the 'what' and 'what for' of an action]. Hence, in contrast with the model of integration, pedagogy has an attitude of translation, organisation and action (attitudes that I have related in the model described in figure 4.1 to pedagogical translation, practical deed and principles of reality as constructs presented in this thesis). How can the mix of this difference be explained? (Figure 4.1 depicts an excerpt from a diagram of a concerted system in which only some assumptions about the interaction of the self with the world are presented.) This difference has historically traversed through theoretical perspectives, which sometimes could have shown a tendency towards one basis in order to explain following actions. On the basis of praxis, for example, authors from hermeneutics pedagogy presented clearly that theory [should] 'accept the imprisonment of reflection in educational

differentiated from positions and other trends that tend to stipulate a course of action. Thus, a diagnostic labelled as pedagogical has a different place beyond that given to the psychological diagnostic.

[410] The assumption of specialisation is taken in the process of recognition by the expert when, on the grounds of a social and moral integration (as Williams said that Hegel proposed), the recognition has a purpose. Would the specialisation be feasible without collaboration? With this question, I keep in mind that I proved specialisation, but I am looking to give reasons for assumptions regarding collaboration that can sustain a pluridisciplinary work. The question might be redirected to: how is collaboration possible? For this, in Fig. 4.1. a dynamism should be reflected by thinking about movement from attitudes to positions. Implicit in this figure are the speculations on the models that reflect a second-order observer invisible to the normal eyes.

[411] In order to follow the terminology presented in this work, this spoken reformulation into pedagogical terms refers to a viable presentation of the conflict displayed by differences within a situation. The term 'viable' is selected from the proposal of von Glasersfeld (1980). The presentation of the conflict reveals that 'assumptions' are made, including those arising from the individual's position.

practice' (Weniger 1950 in Anhalt 2012, p. 97). Therefore, I problematised the pedagogical paradox as a latent paradox on a theoretical level from educational science through the mechanisms of viability and reduction with authors like Ernst von Glasersfeld, starting from the theoretical framework that places actions from two viewpoints (i.e. actions in pedagogy and educational science that at different moments can manifest contradictory resolutions).[412]

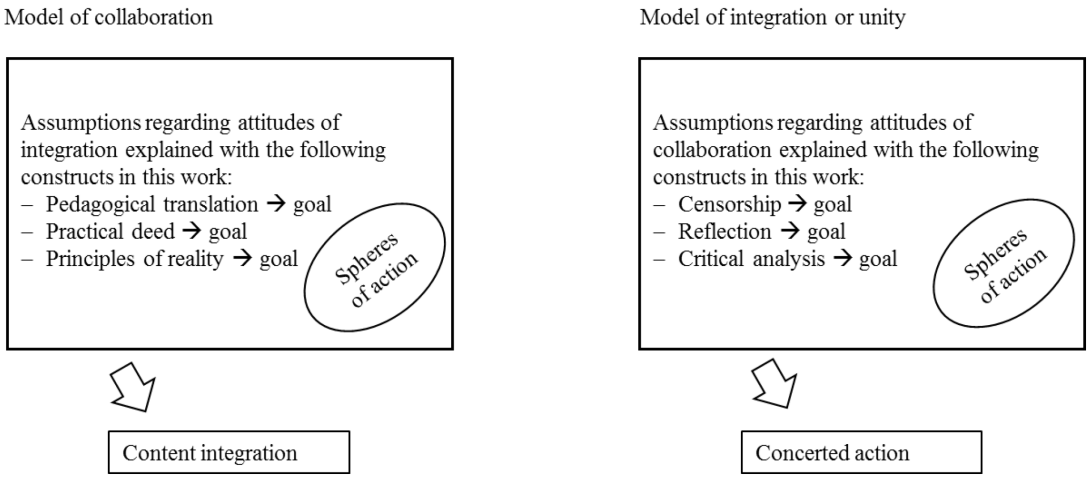

Figure 4.1. This figure portrays that the grounds of different assumptions can be taken for showing opposing sides. The presentation of counterparts should be integrated within a historical context that can explain how, in separate moments, the modification of beliefs into assumptions is unpredictable or aleatoric. With the use of the adjective 'aleatoric', I do not refer to not-well-thought notions, but I call upon the constitution of a situation with different perspectives (in line with how Anhalt in 2012 incorporated the description of *perspectivity* into the theory of complexity of education). By showing that attitudes manifest in theory by way of some constructs, I assert that the frame of intentions from individuals would exert a *function of orientation* (Sandkühler 2010, §474bu) that can alter the place where their opinions direct them (in the sense that Sandkühler connects the explanation of opinions with individual intentions in a social context). Thus far, the model of specialisation complements how positions change from one side to the other by dint of causal forces of specific theories taken. With this change, a hypothesis can be generated for a future research about how a specialised model moderates or/and mediates other possible assumptions. This points out to the model that does not appear on the figure and that needs to be adjusted by taking some attitudes according to the requirements of the context with reference to the construct of selection. Models and assumptions need to have a crossed correlation for corresponding to what they refer to; this means to identify an object of study with commonalities that permits measurement of how they affect each other for explaining a situation in order to accomplish reflecting a wide scope of perspectives within one positioning.

At this point in presenting findings, I employ the mechanisms of viability, selection and reduction contained within spheres of action for including the assumptions regarding collaboration while running an integrative model and assumptions regarding integration while running a collaborative model. This is done with the intention of showing that assumptions regarding different positions are not fixed (i.e. that these assumptions do

[412] Moreover, by presenting the two strained viewpoints on the same level of action, the classical dualistic approach between theory and praxis can be further broken and problematised.

not happen according to fixed manifestations with one only direction). Repeating the idea, this means that I am putting into action the proposal of the descriptions of my reflections on concepts mentioned and related to attitudes of integration within a collaborative model. For instance, reduction follows rules and cannot be separated from previous outputs of statements in other contexts. This is how an epistemological latent paradox displays that states are uncertain when the control is missing in some states within a situation, when results from former circumstances were inconclusive but are to be tested under new parameters. Nevertheless, this position of unity can be problematised by taking into consideration the fact that reduction comes with the concept of emergence that would raise the question about how assumptions of unity were originally conformed. For instance, the inner dynamics of subject-matters within an open structural scenario, as it happens with the recognition concept, which displays its condition within a complex situation, the movement of scientific attitudes can be confirmed [In this sense, this situation draws attention to its characteristic that aims to remain open to what may follow]. With reference from the theoretical framework to the mechanism of selection and by identifying nuances of it, I am setting a relation from a concerted action[413] into a specialised position (under the basis of the classic speech that can also be understood outside of a theoretical basis that one needs better self-knowledge to be able to offer more to the other, the assumption on specialisation can bear upon the readiness for awaking an attitude of being a good partner)[414]. From the current state of research[415] on the concept of emergence, a speculation exerts the optic of integrative

[413] I take 'concerted action' as an activity upon a scientific collaborative position that can be part of a concerted system. I explained the context of concerted actions during the historical conceptualisation of the work, in the third chapter, within the composition of unity as a discipline from its problematisations within its own traditional constitution, by handling the internal dynamics of subject-matters and the methods and ways that discipline portrays for dealing with inquiries. Thus far, concerted actions present in themselves a problematisation in their composition by giving reference to a differentiation with 'content integration' that comes from integrative assumptions manifested in a model of collaboration.

[414] The mechanism of selection, when viewed from the position of specialisation, continues to appear alongside other positions in a situation. Nevertheless, through collaboration, the contents and concepts that are to be worked on by the positions of specialisation are to be transformed into new possibilities that can represent an open horizon. In this way, the situation shown by the concerted system captures only a moment of an ongoing progress. Based on the analysis of Koch's diagnosis concept (1920), systems are not integrative for the entire scientific realm, neither concepts that refer to the existence of a living being should all be explicative, but built for work on them.

[415] I expect to show from the structure of this thesis, and from a systematic structure of pedagogy, the interplay between assumptions that I have spoken throughout the contents. From a theoretical framework to describing a current state of research, I have provided the basis to the next conceptualisation, where from the clash of discipline and subject-matter, the reality of education can be regarded as being under parallel development. Since the concept of recognition has a philosophical foundation for explaining a reality, I needed to understand how to present this concept in terms of the categories handled by this work, bearing in mind that the approach of 'categories' is aimed at an integrative composition (see, for example further description of the concept of category and its history in Sandkühler 2010, §§ 1216–1216b). Hence, my analysis of the different assumptions grants me this option for explaining the place of the individual as constructer of means to be deciphered and problematised. The epistemological latent paradox, or a simply called 'paradox', comes into sight when contemplating an interpretation that targets one unity of knowledge. Nevertheless, I am asserting that the decoding of traits from means is not dependent on something written but rather on something that is. The moment of integrating history is within an epistemology – pedagogical epistemology of educational science – and not within an intention because this knowledge is under constant

assumptions where a latent force on questioning how the context is conformed appears in a constant manner by giving place to the rules that regulate the whole world.

As a second outcome of this thesis, I state briefly that a specialised position when taken next to the assumptions of unity can deliver how a pluridisciplinary work uncovers concerted actions. These concerted actions occur within the requirement of disciplinary collaborations such as during the execution of the diagnosis concept. Diagnosis concept cannot be easily included within the pedagogical tradition; therefore, educational science with the position of second-order observation offers analysis that I am reflecting upon in this work and further in applying this work for the development of a collaborative agenda. I referred to this step in the analysis as a diagnosis of the diagnosis in relation to diagnosing a procedure for recognising the condition of another, which is different from diagnosing a condition in itself [as Richard Koch hinted in 1920, p. 10, this rupture of the diagnosis concept and presented it as the realisation of a procedure]. The procedures are different from the person who executes them and from the processes that take place together with the person. That being so, I compelled myself to access different processes[416] that I did not compare one to another but that I problematised by means of the individual who self-transforms. Therefore, the concept of recognition offers a viable option for aiming to discuss how the reality of education lies in a concerted system – whether it is technically feasible to explain or not – because it would require that the disciplines involved might be aligned to the same referential framework. With a hypothetical same referential framework could be seen that the pluridisciplinary approach described in the third chapter is a theoretical framework, which in order to be executed would require, beyond its systematisation, its acceptance of limits within a system. This means that limits are presented by moments coming from the interactions within the models of positions that carry their own execution of beliefs.

In this vein, the reflection on the work of educational science yields a recognition of what takes place during the reality of education. At this point, the reality of education works as a key for connecting several points that have dealt with problems on their own, like those from philosophical tradition where intersubjectivity has not been sufficiently exerted in terms of the self (see, from a philosophical work, Williams 1992). My reading on the concept of recognition considers that an analysis of integration with a society and based on a transcendental concept in itself raises from a specialisation a conflict between unity and collaboration because, at any point, one position cannot be isolated. I have exposed this conflict on the assumption of a discipline when it is taken from its principles of reality composed by the activities of individuals. Throughout this work, I have validated the contents of the diagnosis concept from several perspectives (while establishing distance from the diagnosis concept in medicine) for detecting an access point where educational science opens a space for speaking about collaborative assumptions towards science. The explanation of these collaborative assumptions holds that concepts formulated in educational science can serve pedagogy in understanding other disciplines. Notwithstanding the alienation (from Wallner 2002) or estrangement in the sense of disconnection between diagnosis and diagnostic, pedagogical diagnostic

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construction. In this way, a purpose that can usually be taken from a specific pedagogical school of thinking or a political trend might earn a place of an intention from a theoretical tradition.

[416] I refer to the following processes tackled by this work as the construct processes of Bildung as a process of transformation and process of diagnosis as process of recognition.

provides learnings from educational science that can be employed for pedagogical theory construction. Thus far, brevity and concise work are among the contributions taken from this procedure for displaying the outcomes of this research.

Brevity is good in presenting findings and results. Grounded on the idea of particular results, when providing personal feedback to each person, conciseness makes more sense than accumulating thousands of files on every student. Nevertheless, this spoken conciseness is proven to require a foundation; otherwise, concreteness would be empty and lacking in content. Concreteness in implementation of diagnostics was one trend suggested for taking hold of individual learning requirements (Jäger in Ingenkamp 1992, p. 135). Namely, by applying a procedure, the foundations upon which it is sustained must be retrieved. Like this, throughout this work, I have shown that a general application of procedures relates to the place of the individual in the later systematisation of explanations.[417] Briefly stated, this last statement means that somebody needs to continue setting a structure involving what someone else wrote earlier. These actions do not refer to a logical sequence but to an entrance to conflicts in movement by considering the phenomenology of individuals and communities as inception from the writings of Hegel (1907) up to current neurobiological research. Neurobiological research was taken from an initial portrayal of consciousness that has been problematised at the theory construction level for earning knowledge about who human beings are.[418]

Theoretical reference about Hegel for relating to integration

I have decided to take Hegel for the presentation of the results because Hegel in pedagogy is able to state the educational object from its phenomenology (Nicolin 1955, pp. 1–44) – this object is difficult to grasp because it has to do with a transcendental state that is often confused with metaphysics (ibid, p. 34). Therefore, the educational object earns a place in a double effort to connect several levels of a situation. The educational object lays claim to deciphering[419] a complex situation. I speak from the

[417] This was shown in chapter three, about the conceptualisation of the work, when taking into account the interchange of assumptions and positions as a collaborative representation of science when the collaboration comes into play with somebody – in other words, when it receives influence from participants of the society. By speaking about the individual in such a collaborative framework, different concepts from pedagogical tradition needed to be analysed according to the proposal of pedagogical diagnosis and composition of the practical deed. In order to provide the theoretical structure of the work and a systematic structure for the reader, such concepts include discipline, disciplinary collaboration, perspectives within a complex situation, structural difference between educational science and pedagogy, pedagogical tact and Bildsamkeit. To this extent, I presented my proposal for discussion under some concepts including the following: historical context from spheres of action as well as pedagogical translation and pedagogical action, both part of a practical deed. In the next chapter, the pedagogical diagnosis is broken out as a concept proposal from this work.

[418] As another point, on this side of theory construction, the system of research deferred by the spheres of action of this work has proved to remain under constant development. In this chapter, the outcomes are explained as findings of some of the elements that hold this conformation.

[419] In a brief mention, here I state that with the use of 'deciphering', I can take the shortcut to understanding that authors from hermeneutics pedagogy were, during wars and in post-war times, simultaneously dealing with social forces of change and maintenance. To this extent, the critique towards the work of Flitner (Lischewski 2014) from Paul Oestrich (ibid, p. 436) were upon the distant place of this pedagogy towards the praxis (i.e. critique of a pedagogy on the fringe of the praxis). In my own words, I can understand my surprise when thinking that, in reality, hermeneutics pedagogy pointed to a praxis – quasi-independent from theory in the first place, previous to the theoretical development. Then, where does the point of the criticism lie if the pedagogical viewpoint was looking for an effect on

diagnosis of the diagnosis that there are several types of recognition, in which, for example, specialists show that they can be laymen in other areas and may themselves be patients in the hands of others. In terms of my proposal from a theory construction from the reconnaissance of another person, with the observation in second order and third place of composition, I have presented that educational science offers theoretical space for possibilities in formulations. From the individual come opinions developed within a frame of hermeneutics that have sundry orders.[420] After discussing the scope that individuals can reach, for example, in the composition of larger systems, the decision that the individuals take for selecting preferences in positions is now to be presented here in terms of *integration* (different from an integrative model). As part of the results that this chapter yields, the self-organisation of the individual appears for crystalizing points that can further be elaborated in previous and future access points.

Integration, made by the individual as a self-organisation in this work, means that a historical pause[421] occurred in the process of the pedagogical translation in order to imagine how to organise what is happening (around the person) and how to connect with the others (how to make it understandable to others).[422] The topic of this work has

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the praxis? Or, reformulated, how is it that pedagogy was not able to reach an extension outside of some frameworks when not setting a differentiation between frameworks and positions (for example)? To this extent, a framework from sociology would manifest another intention that can lead to a different position. With the concept of recognition, I can problematise that within spheres of action, a concerted action relies towards a concerted system; in this way, confusions of places in the theoretical construction give reason as to why hermeneutics relies on acting rather than on deciphering. A confusion that can perhaps sustain the opinion of some critics?

[420] Within the realm of conflict for a philosophical work, I use the resource of connecting with the individual that allows me to speak about the problem of recognition of another person, while I am aware of the possibility of handling a philosophical problem in terms of notions. Nevertheless, I have shown through this work that pedagogy benefits from the contact of notions with the surrounding world – for this action, the notion of the individual remains active and useful.

[421] 'Historical pause' refers to the integration of a particular process within an integrated assumption next to specialised and collaborative assumptions. The description of a historical pause has a general extension from pedagogical spheres of action, wherein punctual processes of transformation can be described. This means that the 'historical pause' is the entry point to further reflections from different traditions. Additionally, and at any point, the description of the individual would be taken as a universal starting point because this delineation should be marked within the framework of a situation. As an important consequence, by removing a universality of integration from the individual, related attitudes towards solipsism would be avoided because a situation is particular but composed by several elements. Hence, a situation is not composed of just one person.

[422] At this point in the presentation of results, I want to state clearly that the diagnosis concept is not yet validated within the pedagogical realm. Therefore, having presented in the chapter about the current state of research on the dynamic of diagnosis, I want to explore how as a result of this interplay between the self and the world under diagnostic procedures, two positions can be marked: 1) the process of diagnosis as independent manifestation [independent manifestation would be caught in the middle of a phenomenological representation and an internal reflection; hence, it has a place for being discussed in terms of a philosophical tradition] and 2) the action of the individual as interested or encountered person. To this end, within the contents of this thesis, the different combinations of these two positions have been problematised. In this chapter of findings and results, as part of a work under conceptualisation, I will elaborate on the effects that the place of the individual has taken back and forth for creating a reality of education. I can understand that the statement, for example, that refers to this footnote almost unavoidably can be read in terms of a first-person pronoun. Notwithstanding, I remind the reader that for the conceptualisation of this work, the position of observation in second order and third place of composition was presented for thinking constantly on a change of scenarios where a first-person pronoun can direct to a reformulation of different principles of reality and, according to requirements, delivered within a situation.

displayed the encounter of disciplines when focused on a common subject-matter when its communalities need to be sought, making clearer a differentiation between attitudes and assumptions when a description is required (i.e. self-reflection on beliefs and suppositions related to concrete actions that are open). Thence, the moment arrives to illustrate that a result of the design of this research lends itself to speaking about the individual as a transcendental and ontological figure connected with a procedure.[423] By requiring the position of integration as a basis for considering the individual, I set a multi-referential position within a system (concerted system holding spheres of action) that is systematised for supporting counter-positions in science.[424] In terms of such organisation of knowledge and from disciplinary development to scientific modifications, Stichweh (1993, p. 238) alluded to a self-organisation in the scientific system because disciplines seek to rely on the opinions of their experts as in the problematisation of their scientific referential framework. Hence, self-organisation of scientific systems and self-organisation of the individual are not intended to be homologated but to sustain the autopoetic basis that appears in the formulations of structures that later will be taken by someone for the integration in the world with the burden of an interpretation – at this place, a hermeneutical use would make sense for displaying affinity with that of Dilthey (1900), as mentioned at the beginning of this work, in which the clash of forces comes after not having reference to one only reality.

The consequences of bringing attention back to the individual rely on the importance of the actions that the individual can perform. For example, the skills that particular persons bring into a common work such as the time that one person needs for formulating an idea will vary depending on the physiological body. In contrast, from a general viewpoint, pauses in history do not necessarily happen by bringing the world to a stop. Pauses in history come about by a referential point, where an individual decides to stop and to observe. Due to a social interaction, the individual within pedagogical theoretical construction is beyond corporeity. Thence, the plurality of approaches in modern science permit thinking on another position that is neither limited to natural explanations due to experiments nor to teleological ones due to inner forces. Plurality offers such a wide extension of means that can turn the means themselves to a generation of self-organised

[423] Diagnosis as a serious task in medicine connects longer discussions of humanity to how to relate empirical actions with *art* – in the case of this work, to 'pedagogical art' of people living. The option of taking the individual is for localising means in the action of recognition of another person. Means are beyond the instruments employed in collecting data; as Hegel (1907) wrote from analysis of how science is being performed, the truth holds notions, objects and *criterion* in the sense of standards or full scales for testing (ibid, p. 56). Hence, I want to reclaim that the notion of the individual has a content that can be problematised as an independent figure but also as a figure connected with the world in a process of recognition.

[424] The counter-positions in science are taken with the basis of a connecting point in writings from previous ideas, like those of Hegel (1907), and that are continued in later formulations after the examination of putting together later writings. These consequent formulations seek to scrutinise complementary ideas about gaps as Williams (1992) later reviewed the focus that Hegel set on the formulations of recognition. Namely, differences inflicted upon the individual, as an intention during tact and with the effect of differences upon the individual, as an action, which Hegel took from Fichte and by problematising the existence of the self towards and within the world. Respectively, Williams (1992, p. 87) opened the option – in which Hegel presented the concept of recognition as a synthetic construct for regulating but simultaneously for containing – what a community states (ibid, p. 81). In this way, the position of the individual can keep showing that counter-positions have several orders; whether from theoretical perspectives or from analyses in scientific communities, the position of the individual portrays a viable option during times of plural knowledge and democratic confirmations.

knowledge[425] (as a similar idea of what was discussed on the tension between objectivity and subjectivity in Habermas 1973, pp. 18–19). I expect that readers in the academy can see that with discussions after the 1950s about the individual, objectivity-subjectivity, self-organisation and the surrounding system, among others, these topics have a longer agenda to fulfil. This is not a trivial finding since it leads to making inquiries about the discussions that have been handled regarding these topics and in consequence to mark that there is more to explain about a solution coming from the individual that cannot be generally extended. Thus far, self-organisation invites the extending of notions not only in the experimental area but also on the background with which other scientists can build on the works of other disciplines. To this extent, self-organisation imposes a restriction for being used specifically while assumptions are and can be modified (i.e. when the change of assumptions is on its way to transformation).

To this respect, I use the example of consciousness for displaying the difficulty in ordering studies on this topic and theories upon it. This discussion was required for this work in taking reference from controversies that in the middle of the twentieth century did not yet raise enough attention to define what belongs to the free will of a person and what else might pertain to specific activities from the brain (Libet 1999). Then, in 1965, an electrical change was suspected to be the 'readiness potential' (Kornhuber & Deecke 1965 in ibid, p. 49) that aroused interest in the scientific community for wondering about what belongs to a scientific unity and what belongs to the assumption of specialisation. Had Popper not upheld the falsification of theories (Stichweh 1993, p. 240) as an attempt to establish knowledge democratisation, the suspicions about the brain would have gone straight forward to technological numbers. In the project of democratisation, scientific explanations of unity bestowed a project of plurality that was interrupted by wars and technological advances. However, by taking experimental descriptions and further organisations of contents, such as the difference between *awareness*, *content* of awareness and *deliberations* (Libet 1999, p. 53), the discussion can be clearly localised in epistemological structures beyond a register of brain oscillations or in the certainties that researchers sought to deliver. Strictly speaking, with these multiple options in terms of changing the direction of study, the rationalist approach of falsification proposed by Popper cannot explain all the verity of a proposal[426] (Habermas 1973, p. 22). Along the same lines, and in order to visualise that discussions about the individual are rooted in a space beyond an isolated frame, reflections from medicine during the early 1800s (Hufeland 1836) appeared to be trying to formulate that manipulation from physical manifestations were distinct from the inner force of nature. However, a multiplicity of years has shown the difficulty in displaying this inner force in terms of a reasonable approach for research. In my opinion, this has to do with the connections from a subject-matter that unavoidably display a fragile link to an explanation of a whole composition of the world. Hence, a reinforcement of beliefs appears on the sides of specialisation and

[425] With the problematisation of the self-organisation, I have targeted to speak upon the constitution of the place for the individual within the recognition of another person at the same time that this individual is integrated into dynamics from subject-matters from different positions. With my work, I contribute to the construction of the individual at the same time that I am heading in that direction.

[426] Hence, and corresponding to a project of democratisation, the approach of falsification would not have sought to explain the whole reality but parts of it, according to an openness to plural opinions.

in the other position of requirement for collaborations. This collaboration calls for a content integration after recognising conflicts for building upon them.[427]

Without leaving the matter of integration, the individual as is conceived at the present time – this means as an independent figure and sometimes as independent object of study – has taken many years of effort[428] in appearing under the influence of the environment. As a case in point, without the critiques from Habermas to social functions, the French influence of philosophers would not have exerted the same impact on the development of self-organisation theories (like that of Edwin Morin explained in Keiner 1999, p. 87). Specifically, and for example, in systems of educational science, the self-referential dynamic has been misinterpreted (Kneisler 2010, p. 128) and has required as a consequence to be explained by other fields in science. Reasoning related to this misinterpretation has to do with the approaches of thinking that are difficult to separate from the object of study's burden that must be controllable under experimental conditions for yielding exact numbers. Or as another explicative option, the individual *per se* is difficult to systematise, since Descartes' dualism has been overtaken by researches from the natural and social sciences, based on the fact that approaches of input-output hardly generate a structure in research[429] that can deliver solid results. To this respect, however, at the present moment, the formulation of questions of research is under development in seeking alternative ways of posing questions that can put together influences and movement in factors for registering modifications on and from actions that can also come from the individual. Now the acquisition of results from lectures describing EEG in terms of its incipient employment could be clearly seen as monological[430] if any individual had not interpreted the content of the outputs (as

[427] The recognition of conflicts is intended to localise connecting points of and for further analysis. Since the connection with points of previous thinking should not refer only to established orders but also to alternative positions, the idea of building upon conflicts needs to assure that conflicts can also be created. Thus far, specialised positions that are opened to the world sooner or later would require formulating a collaborative position that will activate the dynamism in the statement related to this footnote by recognising and building on conflicts for reflecting and working on them.

[428] Winfred Böhm (2004) refers the development of the person to Augustinus (13 November 354–28 August 430). According to Böhm's description of Augustinus' work, the characteristics of the individual come from the nature that is different from the person that comes from the moral quality (ibid, p. 40). Moreover, the human being carries the creation of the world from the self (ibid, p. 36). However, there was and is yet a long path of controversies to walk – from some of them, history shows us a glimpse of many that have been walked through. Aristotle's idea of unity of science (with a deeper explanation in the writings of Deeley 2001) linked a teleological explanation to the nature, a position that caused an impact on the development of scholastic (Böhm 2004, p. 41). Since these approaches were directed at divinity, briefly written, Böhm (ibid, p. 43) registered also that Bildung would cross through an exhausting time; he also pointed to the descriptions of Hegel that draw a breaking point on further considerations of Bildung's construct. In my opinion, the ongoing path of Bildung and individuality earned a current problematisation first after the beginning of the twentieth century based on a general differentiation of approaches – those that support the plurality of argumentations in science and upon which I seek to propose a systematisation. The path of individuality and Bildung runs alongside differentiations that go beyond frameworks contained within a concerted system.

[429] *Cogito, ergo sum* – also known in English language as *I think, therefore I am*, written in the 'Principles of Philosophy' of Descartes (1644 in Schlüter 2010, p. 108) has been analysed and criticised due to the lack of a teleological argumentation on a pre-stabilised harmony, as done from the occasionalism of Leibniz (ibid, pp. 101–112).

[430] Habermas (1973, p. 207) argued on the content of the situation when targeted to be independent from the persons' interpretation that such understanding is a monological one. This could be a trait or part of an assumption of specialisation that will be proven by means of problematising the assumptions

exemplified by the controversies between Berger and Bißky presented in the historical reference of this work).

In order to cross the border of the evident – and the borders of the evidences that can be taken as bases for new reflections – modern scientists rely on the option to follow the methodologies of an own group. Alternatively, as another option, modern scientists are thrown into the horizon of controversies that are created by counter-arguments.[431] To the same degree and as a case in point, by thinking on the reception of works, Kneisler (2015, 2010) presented qualitative and quantitative analysis of citations of how the studies of Piaget have gone through the relevance of psychology, pedagogy and biology due to the interest in approaches of research that can take the analysis of the subject-self to the analysis of the subject in description of an environment. To this extent, the cultural approach of pedagogy (Nohl & Flitner in Kneisler 2010, p. 138) gave access to Piaget's investigations, but with difficulties for localising how they refer to the pedagogical object. As a matter of fact, the definition of an object deals constantly with the foundations[432] of how it is to be presented to the world as independent[433] in contrast to its experimental side.[434] Like this, I return to the division of ways of thinking about how to present an ontological state in the direction of phenomenological contents.[435] I have

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of unity and collaboration working together. Assumptions of specialisation are required for mediating and moderating the other two assumptions from the other models. This last mentioned is a hypothesis for a later work, where at this point of time, the focus lies on realising that the individual would be the point for collecting data. Gathering neurobiology and educational science presents a problem of principles of reality because their situations cannot be standardised. Hence, I propose grabbing their description from a place of second-order observation within a common frame in and from a system; this is during the moment where the reality of education occurs. Specialisation in this way is only one side of the many-sided scientific structure. Specialisation will portray an evident understanding within and for the scope of a group. The advantage of specialisation relies on a composition that is possibly non-dialectic yet is concrete. To this extent, the scope of a group or the handling of truth is not the unity of knowledge but a unity of a specificity – to wit, a truth captured by attitudes described through conceivabilities and constructs.

[431] Counter-arguments can come from counter positions (explained above) or can come from the same positions but from a different positioning or from a different assumption of attitudes.

[432] Here, regarding 'foundations' in terms of the definition of positions for their later presentation, Williams (1992) presented the consequences after laying the groundwork on foundations from Fichte, Reinhold and Kant. A transcendental program would rely on phenomenological grounding (Reinhold) or would fall into an absolute idealism within a critical philosophy (Fichte) coming after the terminology provided by Kant (ibid, pp. 32–35).

[433] The presentation of an independent object in pedagogy works in parallel to the idea of pedagogical tact that refers to a sensitivity of an action but not the action in itself. This also has something to do with the fact that research objects are representations of an object and are linked to the world but can be constantly taken under analysis for thinking about how much they reflect a reality that they are speaking about and that can be later set under inquiry. By setting attitudes from researchers towards a reality, the objects of study pursue theoretical intentions that can be explained in terms of the models being applied by an individual for the description of an object.

[434] I am presenting a problem that can be reflected on the theoretical level. This approach can be problematised at several levels by thinking about such a problematisation that can come from the theoretical, experimental level – theoretically from the experiment and experimentally from the theory, so as from the teleological reflection that is immersed in the faculty of the human being that cannot yet be explained as a composition and as oneness. Thus far, experts on recognition come from a many-sided contribution of the human sciences, which offers the utmost place for conducting research on this topic and where dialectic, phenomenology and ontology are enmeshed.

[435] The ongoing efforts of science aim to bring a benefit to humanity. Researchers from specialised positions are aware that their inquiries are not a universal explanation of all the reasons. By portraying an ontological state, the scientific intention from specific communities relies on a knowledge that is

problematised such divisions with the explanations of unity of science, almost from teleological positions, because they refer to a whole composition, to the specificity of experimentation that I propose to analyse from the assumptions of specialisation. To this, the experimental side is in history sometimes connected to transcendental explanations (see discussion of Lay and Meumann in Benner 1991, pp. 139–154). The character of specialisation shows here that discussions on phenomenological contents are required for selecting an entry point in pedagogical theory.

In several writings, an invitation to tackle the spoken integration appears by problematising from aprioristic to experimental approaches. Nevertheless, the options for performing such an exercise are vast and open. Namely, the approach that this work has pursued traces the encounter of educational science with the proposals to the present point in time from different scientists of several research areas. Thus, the list of authors that should be quoted in the opening statement of this paragraph should include basically all the authors who have commented on the development of pedagogy that were already mentioned throughout the thesis. Stichweh (1990) recognised that science *had to be a self-organizing system before it could become* (ibid, p. 195) one that creates its own knowledge. Nowadays, this sequence can be followed thanks to the basis that Habermas (1973) discussed with the positivist posture of Comte and Mach and reflected by Peirce in his logic of research (ibid, pp. 88–178), according to which, in my own words, a methodological form proceeds when it distinguishes reflections from facts that include the influence from the person, which can later be problematised in terms of the individual and from the individual exertion.

Modern science is supported by technology and individuals that live and work during a time of incessant and never-ending progress. Simultaneously, the development of ongoing results endows contributions to the permanent scientific scope.[436] These last two statements refer hopefully to the self-engenderment that scientific systems follow. In the 1990s, Stichweh (1990) formulated that *each progressive state of the (self-)organizing system is therefore the most complete »description« of the system available up to now* (ibid, p. 195). I know that with the phrase ‘up to now’, he referred to the sample of the self-organising system in itself. However, I establish the purpose of reviewing current and nearly ultimate steps for progress, that with the current technology, recent experimentation on neurotechniques is also able to yield connections

localised in a context. I take the phenomenological direction from the effort to connect a useful knowledge to the world as the way that publishers of the work of Hegel (1977, 1907) analysed the sense of Hegel’s writings. Findlay (in the English translation of Hegel 1977), for example, related phenomenological phases of Hegel with a ‘logical growth of notions of notions’ (ibid, p. vii) that can free contents of concepts from viable conceptions. Accordingly, Lasson (in the German foreword of Hegel 1907) stated that phenomenology’s matter is science (ibid, p. XCVII); according to my understanding, he meant that science does not produce complete explanations and that speculation can take scientific contents to what is beyond an analysis. Effectively, many researches will be conducted without awareness of phenomenological states or their categories. Nevertheless, with my work, it is possible to consider that the goals pursued in science can be organised from different traditions in different situations. To wit, from the pedagogical tradition, Hegel’s system enriches the theory of Bildung (Böhm 2004, p. 89), in which according to my reading, with the speculations on development of processes such as the process of transformation of Bildung, the notion of Bildung can problematise the elements that are related within this process.

[436] This speaks upon an epistemological position that is difficult to change within the same scientific structure. Unsurprisingly, revolutions in science, as has been spoken regarding studies of Kuhn (2012, and in Hoyningen-Huene 1993), happen only every aeon.

of methods between systems for comparing effects from previous paradigms into new application of experimental research (e.g. Garcia-Cossio et al. in Soekadar 2016, p. 1). With the presentation of scientific self-organisation, another option for describing realities lies in the self-organisation in itself as an impasse between pairs of positions or models according to the concerted system – educational reality is affected and included as well for describing the connection from old to new, unity to specialisation and integration towards a circular causality, natural to social, biological to psychological, among so many other combinations. This self-organised system speaks about and is based upon the structure to which reality of education is aligned.[437] The influential consequence for following this passage comes back to the integration of self-abolition of the critique of knowledge that philosophers like Hegel made (Habermas 1973, pp. 88–92), which speaks of how the reference to Kant was no longer necessary – as Habermas mentioned. In this way, by discussing the problems of hegemonic power of experimentation, the aprioristic approaches entered into the realm of validity of judgements and genesis of conditions (ibid). Alternatively, Hegel (1907) himself wrote about the times of birth and transition to a new period (ibid, p. 9). A new period is based on the old one upon which young researchers can continue previous efforts and upon which they can develop approaches that are currently not viable. Here, I present some considerations that must be taken into account when aiming to reach a moment of scientific recognition.

4.1 A priori and exchange of assumptions for further differentiations

If I have proposed to give accountability to the position of the individual within the interplay of society, the position of the individual should be localised on a syntactical problem of integration with the society (Schütte 2015, p. 21) – meaning with this that the reflections upon the individual are grounded on a systematic structure. This structure is referred to as a concerted system of pedagogy where a priori and experimental exercise of interchange of assumptions are represented by models. Following the origins of theories of knowledge with the reading of Habermas (1973) on Hegel, an approach to the individual needs to be posed next to the self-reflection from the individual and the systematisation of knowledge. According to Habermas, Hegel avoided the critiques of metaphysics by removing the aprioristic approach in his phenomenology of the mind (ibid, p. 29).[438] The theoretical constitution of the individual is not a solution to consider alternatives for the way that contexts are modified. Rather, the construct of the individual offers an instance where spheres can be systematised for avoiding metaphysical approaches that can easily be destroyed by not taking into account updates of other researches.[439] In this way, Schütte (ibid) advised on the efforts that Sloterdijk made

[437] With the intention to portray the mobility of this system, the statement is bidirectional, causal and correlational between system and structure. In other words, the self-organised structure sustains the system that holds the reality of education.

[438] The aprioristic approach brings consequences by displacing it from a starting point into historical conditions (Williams 1992, p. 9). Within this brief diagnostic of findings, I am presenting that upon the conceptualisation of the diagnosis concept, recognition of another person moves the a priori position into a problematisation of moral practice, specifically by identifying stress moments between ethics and freedom through the pedagogical translation from the individual.

[439] 'not taking into account updates of other researches' is a brief attempt to speak upon a significantly larger conversation. Metaphysics goes back to a problem of object of study that Deely (2001, p. 313) situates in the Latin Age with *the doctrine of analogy* that I want to understand for this footnote as a

during a part of his scientific project in order to give foundations without falling into the realm of metaphysics (ibid, pp. 23, 52).

Metaphysics, as room for reflections, appears in the rejection of knowledge that is apparently ambiguous (Carnap 1996). Metaphysics can be a resource for differentiating what is from what is not as was displayed during the controversies of consciousness, for example, where a border was set for all the contents that could not be measured (Chalmers 1996). In the language of educational science from the human approach of pedagogy, collected data should illustrate a contribution to the society and culture[440] (Schütte 2015, p. 34; Lischewski 2014, pp. 393–395). This contribution is never free of interpretations. Herein, the interpretations point out the place where the a priori and a posteriori positions give rise to differentiations for understanding the world. Those, for example, which with the modifications of science, with the passage of time, change of approaches, modification of methods, technological evolution, etc., can suddenly not be supported or remain unreachable from other approaches between them. Namely, Leibniz's monad is not compatible with the inner potential of the individual of Humboldt[441] (in Schütte 2015, p. 49), and Humboldt's cannot be used to uphold the post-metaphysical proposal of Sloterdijk (ibid, p. 43) – because, as Humboldt sought to avoid the description of Bildung as a process, he left room for thinking about the inner force of the individual as something given to the person.[442]

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confusion of the consideration of analysis hierarchies. A mix of orders in the hierarchies of 'who states what' is easier to see in the development of a metalanguage (Salmon 1973, p. 121), which by definition can lead the thinker to a state of ambiguity when no criteria are set (As a simplified example, I can think on the question: Is the German text book considered a book of a foreign language or of grammar? That is, if the reader is Swiss from the German part of the country living in Mexico and studying in a Swiss college). The *liar paradox* (ibid) orients upon statements that can be contradictory among each other. Hence, according to my understanding, the importance of the stance and assumptions towards a reality happening, respectively a position that accounts for pedagogical principles of reality, is highlighted. Nevertheless, located in the history of humanity in the fulfilment of several theoretical schools, the rejection of metaphysics is due to explaining the real being as unit that is not. To this account, Deely (2001, p. 559) recognised that Kant himself stressed 'the rejection of traditional metaphysical claims'. To wit, he identified 'the appearances in their contrast with "the things themselves unknowable in themselves"' (Kant 1783: §33 in Deely ibid).

[440] Wilhelm Dilthey, who coined the term 'human approach of pedagogy' or 'hermeneutic pedagogy', contemplated not only the social and historical phenomena of education. Nevertheless, his work and that of the other pedagogues included in this division of pedagogy formulated an interest to bear relation between teacher, student and culture (Lischewski 2014).

[441] Schütte (2015) writes accurately that the inner potential of the individual from Humboldt is more than the windowless monads of Leibniz and that, completely at the opposite extreme (ibid, p. 49), according to Humboldt, the individual would be *equipped with several windows to the world* (ibid).

[442] At this point, the judgement on a metaphysical approach should be understood as not relying only on the formulation of the author but on the interaction with the reader. Evidently, the author can build a metaphysical approach with or without knowledge of what is being created. Therefore, the position of adviser on writing statements can be situated within the position of the expert, following the terminology of this work, who discusses the orientation of an idea. In terms of the recognition construct of this chapter, pedagogical diagnosis in this action of supervision gathers principles of reality and discussions among disciplinary spheres of action where pedagogical translations are performed. Thus far, at no point do I estimate that the writings of Leibniz or Humboldt or of any other author mentioned in this work portray a metaphysical stance. I collect information that displays the iterative process of research parallel to the passing time. As Findlay (in Hegel 1977) explained after the analyses of Hegel's writings, the scientist must be aware of the times in the context of living. This awareness will support

Along these lines, the diagnosis concept refers to an exercise of connecting a particular case within a situation where perspectives can be assumed. One option to keep in mind for considering the diagnosis concept within the pedagogical realm was placed on the level of theoretical construction as in the way that I proffered within this work the basis that pedagogical contents must be reflected throughout a context. A basic approach already mentioned is that not all the statements can be translated on all the levels of a situation (like those that are confined in terms of time[443]). On a related note, the proposals that cannot be supported by previous programs have a place to be redefined. Like this, along with the speculation of the diagnosis concept in pedagogy, the possibility of a next advance can be propounded: the transformation process of the inner potential of the individual is presented in the display of collaborations in need of a systematisation.[444] For this purpose, the process of the individual's inner potential is required within, surrounding which other elements can be organised since the agency of the individual has a foundational place. With the development of theories in several areas that meet the individuals in terms of their human traits, like in the technological advances for problematising the topic of consciousness,[445] the questions on how to reach a human being in pedagogical terms are also challenged by the composition of the way that a person can be delimited. The presentation of a concerted system targets also to display that the person under formation would be able to exert the potential of an inner force while staying in contact with the environment.[446] Thus, another outcome of this thesis states that the reality of education, as repetitively found in pedagogical texts, speaks about an encounter between positions. This outcome displays the chain of logic of this thesis argumentation, where the recognition of assumptions follows the concept analysis, upon which a reflection is continued by the effect of diagnosis.[447] In such a way, the dependency on or independency from the environment is one of the many different levels where a pedagogical diagnosis from the process of transformation can take place.

Nevertheless, this outcome from my own work can be extended, based on the discussions of topics related to consciousness and postmodern notions in other fields of

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that metaphysical approaches cannot be formulated when considering that metaphysics is bordered by an ambiguous frame.

[443] In this work, some examples of situations confined by time and by contexts have been mentioned, as those related to Humboldt, Leibniz, Leibbrand or to Bißky himself.

[444] This systematisation contains, among others, the need of transfer of knowledge within a complex situation in which individuals are handling subject-matters with internal dynamics.

[445] Consciousness as such is not a human trait. However, from the phenomenological, ontological and epistemological side of consciousness, it proves to be a unity of contents that counts with a duality of positions where the problematised individual has a place. This unity of contents is further explained in the paragraph following the one in which this footnote is situated.

[446] Dietrich Benner (1991) remarked upon the reflections of Herbart's writings how Sauer asserted that without the thrust from the interaction with the external world, the inner force of the rational being would not be exerted (ibid, p. 95). The proper quote in German is as follows: 'es ist… nicht zu begreifen, wie sie (die Kräfte des möglichen Vernunftwesens, D.B.) von sich selbst ohne äußeren Anstoß in Wechselwirkung treten könnten (…)' (ibid).

[447] To this extent, this outcome is offered as a fixed evidence because, in the interchange between disciplines related to pedagogy and educational science, the tasks of medicine, neurobiology, psychology, biology or others are not to bear on what the reality of education is. Here again, this is any trivial outcome when calling on epistemological studies that must be further developed in the realm of philosophy of education.

research, where the interaction can be restricted to one side of the interplay.[448] As such, consciousness related to transcendental freedom is problematic because of its phenomenal distinction (Kant in William 1992, p. 29), which since the end of the last millennium has had yet more problematisations to deliver in terms of actions.[449] For this, the portrayal of complex translation from natural to social sciences (see Kuhlmann 2007) through the problematisation of complexity theory in education (Anhalt 2012) provides a space for a solution, and consequently, discussion of proposals for solutions. On account of the complexity theory of educational science (ibid), on which Anhalt worked with an original influence from the text of Herbart (Anhalt 1999), pedagogy and educational science can currently stand on nourishing the modern pedagogical theory with the updated problematisations met by the project of pedagogy as a science.

Returning to the idea of the diagnosis concept in itself, this concept portrays a process that can be presented according to unitary cases and in an independent manner; this means that the action of diagnosis would take place under a complex situation despite the different perspectives exerted by the surroundings. As another way of saying this, whether or not the outcomes are expected, the process described by the diagnosis concept will succeed in one way or another after presentation of its requirement, like the appearance of an annoyance, displeasure or ill humour. Therefore, I propose that as an action performed by the natural science, when it is explained on the basis of human science, the action of diagnosis portrays means, from an inner dynamic of the concept, problematising a complex situation that can be organised in terms of the complexity of education[450] (with reference to the writings of Anhalt 2012). Reinforcing the idea of independency of a subject-matter, despite the outcome of the diagnosis process that could be right or wrong, the process of transformation would take place on the account of the immersed individuals – to wit, the non-expert/learner/patient and expert/teacher/or doctor.[451] Considering the delivery of outcomes, a systematisation that follows upon this transformation speaks about a deconstruction and constant supervision of a prognostic given. Such follow-up will be grounded on the experience of a doctor with the participation of the affected person and not merely on the biological condition of a patient. By recognising the power of the experience from assumptions of specialisation,

[448] I deliberately used the word 'postmodern' as a means of criticising a limited knowledge that could only play a role in some contexts.

[449] The statement related to this footnote deserves clarification from its general formulation. The discussions derived from German idealism and Kant provide a wide heritage of arguments. The keywords to be held in this footnote are: action of recognising another person, transcendental philosophy and ontology. Williams (1992) stated that Fichte and Hegel analyses were pioneers in the impasse for inserting the concept of recognition in the crossroads of transcendental philosophy and ontology. Evidently, so many more discussions are yet to touch on this point; nevertheless, recognising another person must engage that in no event does an institutional requirement or a total result come from an individual opinion.

[450] In reciprocity, the explanation of a natural science can be rephrased after problematising from a pedagogical complex situation, but this reciprocity might come in a subsequent research presented at this moment as hypothetical pluridisciplinary collaboration.

[451] Thus far, the process of transformation and the account of immersed individuals within a situation are put together in fulfilling an extensive process of recognition. The individuals are not to be taken without acknowledgement of several problematisations within, bringing attention to the idea that different positions have been developed up to the moment of stating what the individual is. In addition, the independency of the subject-matter in pedagogical terms would not mean an isolation from the world.

the place of the individual earns a place outside of the framework of a system as the individual can be located in frameworks of other traditions. With the idea of the individual that moves beyond several places, the reality of education proves to be transportable for being taken under other circumstances.

At any point, these last ideas are counterintuitive to what I have exposed within the content of how the diagnosis concept takes place. I commit to the idea of social influence and interplay of actors, both weaving through the development of time and technology. However, at the point of this chapter of the thesis, I need to highlight my position, mentioned earlier, in which the diagnosis concept refers to an independent procedure with which I have sought to validate the transformation process that occurs with the individuals under consideration. I am in one point of time where science optimises itself, meaning that specialisations are recognised, and, from their viewpoint, science moves on and continues. This does not mean that at the same time, science grows distant from the part of a unity or integration in knowledge, but that in a scientific project, pedagogy has yet to participate by detecting the place where stimulating collaborations may be required. The project of pedagogy as a science is alive and can be continued. I propose to tackle the reflections upon this project based on the pedagogical theoretical construction. Hence, I have not gone so far as to speak upon the institutional integration that would require working in conjunction with sociology, for example, and in general terms with a social research design.[452]

In this manner, pedagogical subject-matters must not be shown as restricted in terms of definitions of and for individuals or institutions, but by means of questions of what the individual can do as being part of these definitions and actively working with them. This position can be presented in the modification of the sense of what a priori refers to. Benner (1991) suggested shrewdly that the work of Kant needs to be taken into consideration in the development of pedagogical thinking after pursuing the ideas of Fichte. However, I imagine that spaces for reflection can come not only from the work of Kant based on the space that he left opened upon the transcendental philosophy and constructs that cannot be known (Williams 1992, p. 8). Since the state of conflict between ontogenesis and transcendentalism is formulated in philosophical traditions, I read in pedagogical texts that they can provide reflections on the current state of philosophy in reciprocity. This two-sided influence, where the problems of specialised science from monistic positions are repetitively called upon by describing human beings for their betterment in conjunction with the society, is where pedagogical theory of knowledge from a collaborative model has a direct effect. Additionally, this could also be the place where pedagogical diagnosis takes place[453] by confirming three models

[452] Specifically, the social dimension of the problem of pedagogical diagnosis would portray an interchange amidst transcendental abstractions of social events, like love for another (Williams 1992) and execution of social actions supported by the pedagogical systematisations of the individual through collaborative positions in concerted systems. The description of constructs like love helps to explain the combination of attitudes presented in different models that would not be rational but phenomenal. Nevertheless, throughout my work, I did not speak about love because, as I have shown, the problem of scientific orientation in history has a critical position regarding ambivalence. Therefore, I consider that a footnote should be enough for this mention. Evidently, the pedagogical systematisations of the individual will represent an ongoing quarrel with reflections upon what positions have been taken into consideration for writing down the theoretical foundations.

[453] Perhaps, the search for specialisation can explain the attitudes that appear in models of unity and collaboration that sustain how a balance is sought by dint of knowledge from experts whenever they

from assumptions. Searching for a basis for pedagogy and philosophy, with the development of educational science into different branches, ideas employed in the search for the pedagogical definition (Hönigswald in Benner 1991, p. 109) feed the understanding that more than one philosophical approach from the past has been employed.

In this work, I have maintained the proposal that pedagogical diagnosis can portray a notion for approaching the reality of education. Another way of saying this would be that not by social means alone but by encounter of collaborative assumptions[454] with those of unity and specialisation, the daily life of teachers and students is extended towards what they can do, counting on their own actions. In many moments, when pedagogy and educational science are restricted to institutional education, the topic would be politicised in terms of achievements – and this is usually accompanied by criticisms of a position. Suddenly, in this political scenario, any opinion might be declared superior to another. To this extent, the weight of practical medical action brings up how to talk about politics that do not belong to the way of exerting the action because the purpose finds itself in healing, and frequently, in stopping a pain condition. Like this, for example, from subject-matters in medicine can be learnt how they compose an integrity of a discipline that has less to do with the persons that exercise the contents than with the warrant of not killing people.[455] The comparison between these actions can display that losing the leitmotif of an educational action has effects when considering the influence from others as linear relations for obtaining a good grade on a test while forgetting the individual influence on others.

When Meumann spoke about the children that lacked care and that turned into thieves and murderers (in Benner 1991, p. 141), he could have been speaking about opportunities that are missed for raising, as a case in point, a philanthropist for a community instead of an evil person. Hence, to restrict the reality of education to one object in a given status hampers the possibility of an open condition that theoretically is

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could be aiming for pure knowledge or for a unity of contents (which is different from assumptions of unity). Since pedagogical diagnosis is a category not yet recognised in the pedagogical realm, the two-sided influence from pedagogy and philosophy can be described as a possibility and not as an action performed. However, since moral actions towards a common well-being occur in both theoretical frameworks from the aforementioned disciplines, a process of transformation that happens after acquiring an expertise from one specialisation remains viable. Hence, I state as a fact that the contents of pedagogical diagnosis take place that are yet missing systematisation within registers of medical and psychological procedures.

[454] This encounter of collaborative assumptions speaks of formulations based on reflections and processes of scientists. Different processes coming from distinct models are executed when, from the foundations to the applications, finding a way to work together with other perspectives is needed. This encounter of collaborative assumptions was spoken of in depth during the third chapter.

[455] I know that I am going too far with this example by stretching extremes on positions and by apparently going outside the pedagogical realm in speaking about another discipline. I have been very careful not to cross the border of my own knowledge, and hence, this statement must be read within the context of the argumentation for portraying outcomes of this research in pedagogy. Nevertheless, I am taking the stance of not killing people as the poorest perception of common sense that will become a little more elaborated by connecting this statement within the implications of practical deeds. Thus, I am not speaking about medical tradition or its concerns but about how to elaborate upon reasoning as a way to keep the highest value of a discussion alive.

sustained in pedagogy through the presentation and systematisation of Bildsamkeit.[456] Human lives across countries and epochs have been lost when actions have been neglected. In different cultures, children represent a new life, with which the environment would stay in contact. How is it possible that despite many cultural traits, if a child is embellished by expectations, the same desire of conforming a person as a whole would make a mistake out of this? My narrative now does not seek to be romantic or rhetorical. However, the presentation of the findings and results trace how events are registered as facts: this means upon consideration of humans as good or bad, with inner-potential or being cursed after the moment and place of birth. Due to the intention of speaking from a pedagogical perspective, a newborn can be perceived as subject to a wide range of possibilities. The scientist then needs to show commitment that when it is being taken as hypothesis of professional behaviour, the pedagogue underpins its problematisation as a connecting point for further analysis. On the other hand, adults from non-expert areas also manifest responsibility, which I understand as an open path for doing something good based on common sense from a particular epoch or for acting in ignorance of what they do. With these statements, I assert that the quality of scientific collaborations is differentiated through systematisations. These last in consequence should correlate previous and current knowledge with future possibilities in research, perhaps with viable differentiations that in some contexts remain latent.

4.1.1. Path from pedagogical causality to viable alternatives

From the title of this subsection, pedagogical causality is one key for reformulating what has infinite directions; this means content that has several alternatives for perspectives. Based on the notion of pedagogical causality, the way in which these several alternatives are to be unfolded is through experience. Pedagogy has a systematisation to provide in terms of broadness – versatility of the interest as written by Herbart (in Anhalt 1999, p. 292) that accounts for a moral purpose. In this work, I have presented how a moment of interaction between two persons affects the consecutive development of a person and how the person has a place for counteracting.[457] Following the line of thinking from Anhalt (ibid, p. 295) in terms of a dynamic interplay between two persons, Bildsamkeit and pedagogical causality are not to be limited according to characteristics restricted to a label. In this work, Bildsamkeit and pedagogical causality have respected the position of the learner or interested person and the expert on the side of the contact person. Within this subsection, I pursue reasoning about how the individual inner potential refers to a specific faculty of progress[458] of the person who may suffer from a condition.

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[456] The reality of education benefits by considering synthetic constructs that can be constantly problematised. Bildsamkeit, as such, delivers a potential that goes beyond logical and synthetic analysis. Thus far, restricting the reality of education to the definition of one object needs to be chained to speculations on theoretical beliefs.

[457] From the concept analyses upon Bildsamkeit and pedagogical causality, I ran the analysis of meaning that yielded the constitution of models for explaining the reality of education. In these models, I am giving the place to the person through the manifestation of assumptions on later attitudes towards tasks. The model of specialisation can hold assumptions regarding attitudes that direct to the position of the expert. The interchange between the models helps to obtain a better understanding of the tasks assumed by educational science.

[458] Anhalt (1999, p. 303) mentions that this faculty of progress or Bildsamkeit of a person refers not only to an absolute genesis, or absolute becoming, in the sense of infinite dimension which the educational process counts on. I understand that Anhalt (ibid) thought the synthetic approach of the individual's

From the pedagogical side, pedagogical causality seeks to be problematised in more than one scenario. Accompanied by pedagogical causality, the individual's inner potential bids for an action. In the chapter about the conceptual framework of how the diagnosis concept appears in the reality of education, I presented that Bildsamkeit corresponds to one basis of the scientific pedagogical project that gives orientation to the pedagogical work.[459] By presenting the common effort of Bildsamkeit next to the pedagogical tact upon practical deeds made by individuals, consequences from professional actions that come from the individual cannot be denied.[460] Nevertheless, they can yet be limited. This might be read as an available and discernible result, but it portrays in itself the pedagogical systematisation that seeks to establish that pedagogy can manage to work simultaneously with complex situations and complex subject-matters. For example, in considering the technological advances of contemporary times, the scholarly pedagogic group provides an analysis of the collision of dynamics between complex situations and complex subject-matters. I identified that natural sciences might have a problem regarding how to ensure that procedures can be followed. A pedagogue can recognise that this refers to the basic question Kant raised about how to ensure that somebody can do something under a scope of freedom. Bildsamkeit as a pedagogical core concept has been problematised parallel to the theoretical development. I am repeating, as a rhetorical resource, the idea that technological improvement challenges not only mathematical computational difficulties and configurations in the same direction as theoretical design but the traits – part of a human being portrayed through speculation – that can be explained in this way: what a layman or non-expert needs to do in following a procedure is a pedagogical task.

One supporting pier that was tackled by thinking about the pedagogical causality in the conceptual framework with the collision of Bildsamkeit and practical deed belongs to the reality being formulated from its plurality or diversity of positions and to unveil an argument that imagination extends beyond corporeity. Corporeity alone cannot ground educational praxis due to the absence of what the individual as a learner or patient can influence in the own situation of what the same person may do in attempting to get better. Pedagogical causality relies on one integrative mechanism of self-organisation and influence upon and from the surroundings. In this work, this mechanism was

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potential should not be limited to one specific condition, just as it should not be limited to one restrictive description based on a natural science, but that it also should not be restricted on the basis of a unity of knowledge. Hence, Bildsamkeit should be problematised according to self-reflection and moral value (see also in ibid).

[459] I can add that Bildsamkeit provides orientation for the pedagogical work from German pedagogical traditions. Notwithstanding the German language of many of the references, as I have argued: Bildsamkeit belongs to one construct that needs to earn recognition in other languages. Due to the wide content of this concept, if I propose to exert the inner potential of the individual, I need to rely on the accountability of translation – pedagogical translation as a parallel internal process of transformation that the reader can make as an immersed participant for the development of a reality from an observation in second order.

[460] In this statement, I am aware that I am pulling the general composition of pedagogical action to its extreme when it is executed as a professional action from a political and institutional viewpoint – and I am aware that I can risk turning a pedagogical action into a broadly characterised action with loss of pedagogical meaning. However, I am also alert that after clarifying that a professional action in general terms is to be problematised with a referential point, in this case, the pedagogical reference, professional actions are on the same level of practical deeds-with-a-pedagogical-purpose that effectively have pedagogical consequences.

problematised by the mechanism of circular causality (Fuchs 2012) that portrays a person in coordination with different levels of her integration, specifically in relation to the world but also with herself. On this basis, an integrative mechanism is composed by the self-activity and the self-determination of a person.[461] This last statement can be problematised according to the presentation of self-determination and self-activity in the interplay between Bildsamkeit and pedagogical causality in Anhalt (1999, p. 306). This interplay from the pedagogical viewpoint has a space for systematising the place of the individual within an own progress of transformation as was done by Rucker (2014) with the analysis of the concept of Bildung.

Effectively, the individual will be the one who decides upon the next steps to be taken.[462] Since the generation of a pedagogical context relies on an open construction, pedagogical causality attends and lies in the expectation for alternative formulations. These formulations are made by the encountered-between positions. These encountered-between positions explained through pedagogical causality clarify that human development meets criteria on several levels described and designed by a group of perspectives. This plurality of perspectives can generate wonder on the problem of orientation that a person portrays by having many alternatives. Therefore, self-organisation and external mechanisms can work together, like in the position of the teacher that helps the student towards reaching one goal and drawing different purposes. Or on the other side, the doctor who seeks to heal. In any case, the counter side of the non-expert must achieve an action to continue with what could go on. When the side of the non-expert cannot follow next actions, consequences would follow that are to be expected or not.

4.1.2. Purpose of the recognition of another person

My proposal, presented in this thesis, sought to discuss the diagnosis concept within the pedagogical tradition. I started writing repetitively that the diagnosis concept refers to a process of recognising another person. In the work of reviewing theories and with the problematisations that have been presented since the theoretical framework (i.e. reduction and viability upon the theory of complexity of education of Anhalt 2012 when taking reference of Glasersfeld's writings as well as those of Wallner), 'theories of recognition' help in testing and describing in depth the term of diagnosis. These theories are of assistance after identifying the scope of action that an individual has on the integration in running procedures. By localising procedures, the purpose of an action can benefit in clarifying the steps that need to be done. I establish as an outcome that this path for making pedagogy accessible to a disciplinary collaboration is viable on the grounds of a concerted system. Other paths are still in abeyance, but many of them have not yet found points for conversation. For example, with an influence from the writings

[461] 'Integrative mechanism' relates to 'unity of contents' while differentiating that this integrative mechanism occurs during a moment of self-composition that need not necessarily take place within the frame of a discipline.

[462] In 2016, after a visit to the clinic of the nervous system in Queretaro and from a presentation during a colloquium in the department AAE at the University of Bern, I gave reference to the action of patients that know the recommendations to follow according to their specific conditions, for example, to avoid eating spicy food when they have a disease pattern of gastritis. Nevertheless, some persons cannot break some habits and continue hurting their bodies. In this picture, neither the doctor nor a procedure has control over the freedom of the person as in the untouchable element of what the person does and will do.

of Hegel and from philosophers of the German traditions, the topic of recognition has been spelled out in terms of social and moral theory but less so in the theories of Bildung (Stojanov 2006, p. 108). I am speaking about those theories when Bildung is taken as a philosophical concept related to the pedagogical theory development, in which other theories of Bildung have found discrete points for discussion. To this extent, *the problem of the other and the related problem of the otherness first becomes explicit in these philosophies* (Williams 1992, p. 2) ['these philosophies' in relation to those of Hegel and Fichte, according to my reading, Gerónimo-Cid], on which are grounded the recognition of the other person.[463] Thence, at this point, a reflection upon the procedure described by the diagnosis concept, when the action of diagnostic portrays – as a matter of fact – a practical deed at the occurrence of recognition, diagnosis as a concept implies the enhancement of responsibility from the particular positions involved.

After the presentation of the connections in the complex situation where the diagnosis concept is located and during an encounter of disciplinary collaborations from a pedagogical perspective, the reader now possesses sufficient and important background of theoretical discussions. Namely, the decision of taking the German pedagogical tradition can be understood in terms of contributions upon specific concepts. To this extent, *Bildung, Bildsamkeit, Weltanschauung*[464] and others as clear German words should be handled by giving reference to the texts where they have been continuously reflected and treated as theoretical constructs. In the sense that they are not only words, they should not be translated without leaving the reader room for curiosity about deeper considerations exercised upon them.

The reader will be responsible for going after the research of any of these or other concepts with greater problematisation in original languages. Naturally, this is not only oriented to the German area, and other scientists have shown the importance of discussing the concepts in the way that they were written. In this thesis, the work of the Austrian, German native speaker, Fritz Wallner (2002; Lan et al. 2013) was mentioned, who as a matter of fact went deeper into Chinese symbols in aiming to know the meaning and alterations of semantics and phonetics[465] with which the concepts of health and

[463] As another example, by taking reference to the writings of Habermas (born 1929) that started having an impact in the last third of the 1900s, by which Hegel has been further discussed with a deeper understanding of his work, I consider that the current attentiveness to embark on conversations about these authors of philosophy and upon concerted systems is only the beginning of clarifying the purposes of and for being together in society.

[464] These three words have been problematised within the contents of this thesis. Furthermore, as explained in depth, these related concepts do not have a translation independent from the theoretical discussions. In this way, as linguistic signs, they also portray an independent meaning in English and other languages within concrete epistemic cultures.

[465] Although the separation of semantics and phonetics is also part of the linguistic structure of the Chinese language, Lan and Wallner (in Lan et al. 2013, p. 13) explains more accurately the division between pictographs and sinograms into signific-phonetic and associative compounds. The latter pertains to the components, also known as radicals, written by Xu Shen 许慎 about the Eastern Han Dynasty. Lan and Wallner (ibid, pp. 11–35) deepened the analysis of health (Jiànkāng 建康) and disease, illness (Jíbìng 疾病), that due to associative compounds and pictophonetic cultural development of the language both concepts have several connections with actions and state of these actions. Lan and Wallner (ibid, pp. 28–31) makes reference to the Chinese historiography of the physician Bian Que, who visits the kingdom of Qui. The story is revealing about a marquis who was ill but did not want to take action, and about his illness, which has grown into a critical condition that led him to death. The context

illness are extended in this Asian culture. In like manner, I mentioned my roots from indigenous words with reference to the Mayan culture through the narrative about the creation of the human being in the world with the formulation of the Popol-Vuh.[466] Stojanov (2006, p. 28) also bequeathed the differences from the Russian word *Vospitanie* that has a distinct meaning from the word *Erziehung* that also has different daily applications than to the word in English education, which in Russian can be employed along with the preparation for the needs of daily life with each other. Exactly in this point, the sense of community collides with the approach of freedom handled within the English language. In other words, ethics next to freedom (Williams 1992, p. 11) establishes that by selecting one of these two positions, as I explained in the last section by taking only one of both options as an aprioristic approach, a scientific position is prioritised over any other proposal, and this would bring a limit. In the terminology discussed by this work, unity cannot rely on specialisation without making the mistake of extending something in a general manner that is supposed to be particular. [In relation to this argument, Wallner (in Lan et al. 2013) explained in more detail that, according to Chinese medicine, the concept of disease has a more individual orientation than that of the wholeness of Western civilisations, where the definition of disease is determined

in the evolution of these concepts is taken to problematise how the simplification of language still has a solid reference to the way of thinking reflected in words.

[466] As the author of this thesis, I hereby confirm that I am part of the Zapotec culture that emigrated to Mexico City after the period of reform. The cultural groups of Zapotec people arrived to the areas of Nezahualcóyotl and Iztapalapa in what were strictly speaking suburbs on the border with Estado de México. The Zapotec culture is an important group in Mexico with different variations on its heritage. Zapotec is also the name of the language out of 23 indigenous languages that the national constitution has been translated into [https://www.inali.gob.mx/bicen/constitucion_nacional_lenguas.html, retrieved on 18.2.2019]. In this way, Zapotec groups come mainly from one state called Oaxaca, but from different places in an extension of around 95,000km^2 [https://www.oaxaca-mio.com/atrac_turisticos/infooaxaca.htm, retrieved on 18.2.2019]. Another recalled migration from Zapotec groups happened from the valley of Oaxaca to Tijuana, a city located in the north of the country (Espino Torres 2015). In this thesis, I mentioned briefly how the thinking of Pestalozzi reached the harbours of Veracruz in Mexico through the arrival of the Swiss pedagogue Rebsámen. Also, I mentioned that the pedagogical thinking from German traditions was oriented differently in Mexico and after its translation into Spanish; precisely, I gave reference from Kneisler (2015, p. 161) to the well-known poverty conditions of slums that demanded literacy programs instead of ongoing problematisations. This means, in other words, that 'working and eating' or 'starving but thinking' have a different priority. How to set priorities is a complicated task in 'emergency' situations [for instance, emergency and risk are concepts linked to a contextualisation and therefore lack a unanimous agreement on a single measure, see for example, López Cerezo and Luján in Lan et al. 2013]. Here now, I link the happening of such a controversy to the situation of reacting in response to an emergency, which is a commonly shared priority among medical doctors. Upon emergency situations for saving a life, stabilising comes first before reflection. Nevertheless, my point is not to diminish any reaction or to justify a bigger context where support to cultural and philosophical development should be and should have been given as well. My point to direct within this footnote is connecting an argument handled during this writing upon translations not properly made, while also upon the potential for correcting them by giving voice to the role of the concerned individuals. I do not refer to errors in translations made into languages due to bad work, but precisely because of the complexity of the meanings a word could have, translations can be taken to other levels of theoretical thinking – as established in pedagogy and educational science. Correspondingly, I expect to make clear that with the reduction of translations to the rewording of languages, the words leave so much behind that must be rescued. Along this line of translations, Williams (1992) mentioned that one who reads Hegel in English in the context of recognition or *Anerkennung* needs to go back to the original texts in German because the English translations already have an influence in terms of the modern changes and new expressions of the world that simply make the works of Hegel unreadable.

by the expert]. Hence, a systematisation with openness to alternative conceptions is required.

Pedagogy has the option for placing morality and self-reflection into the construction of theory. The previous marked argument in the last paragraph points to the mistake of putting in the same place two different, incompatible positions. However, this does not mean that making this faux pas would have impeded humanity's propensity to move on. A confirmation of the time that continues relies on the change of status that makes one day different from another – this is not a rhetorical statement but one that connects anyone's experience to one daily fact. Naturally, from the particularity of specialist perspectives, the change of status or plural condition of a person is organised in the same manner according to variations in mindset (or following the scheme of figure 4.1., interchange of positions and movement into a different reality of a different tradition). As I discussed in the third chapter, morality and self-reflection from the pedagogical attitude can be presented related to the traits of moral practice leading to the understanding that not everyone needs to think in the same way. Thus far, pedagogy presents questions to philosophy and scientific positions by including the individual within the systematisation of Bildsamkeit – as Anhalt (2012, 1999) has sought with his research program.[467] On this basis, pedagogy has the faculty to offer moments, to identify those moments and to provide content to them where neither freedom nor ethics is the goal but both are the means for an active action starting from the recognition of assumptions – this means for freeing the human being from self-immaturity (Carrier 2007).

Self-immaturity on the recognition of another person prompts a deeper discussion, which I can just briefly allow to sprout, as in the sense of beginning and indicating a connecting point for further analysis, how to validate that the individual can grow after a process of recognition. Throughout the work, I have reviewed techniques that can help in delivering information about a person. I set this revision under the optic of discussion of the diagnosis concept, in order to extend and to keep in mind that a universal translation of data has two paths: it would always be translatable as 'unity of contents', or it would translate specific content that tells something from only one side as 'integrative mechanism', in the sense of not being universal. Moreover, during the application of procedures, two persons (according to my scheme for organising a procedure[468]) appear for giving substance to the educational reality: they have

[467] Evidently, the coalescence with the individual and her inner dynamic is not the only task reached within this research program. Taking into consideration that serious research programs take decades to display some outputs, I have mentioned that an agenda can be composed with a retrospective perspective of pedagogical theories and with a prospective vision to be integrated in concerted systems. I foresee that detecting the traits of the collaborative position of pedagogy will continue to reinforce its own development, proper terms that can be acquired from the world but that in essence are formulated from a pedagogical perspective. Later, pedagogy will be able to harvest from the reflections of educational scientists that a project of cultural democratisation confirms actions by way of systematised results.

[468] According to the basis that I lay down for organising a procedure, I refer constantly to the appearance of two persons within a situation. Other organisations of procedures apply to the systematisation of mathematical calculations or deciphering of written data, for example, and these other ways of organisation of the individual from my proposed concerted systems would be part of them. In this way, the process of recognition would be extended on the grounds of purposes and intentions for connecting with principles of reality inherent to a situation.

expectations, and they can recognise each other. In the middle of this encounter, by observing and describing this setting, two persons interact as individuals since in the exercise of the disciplines mentioned in this work, the moral value of respect towards another person, approaching human dignity, is part of the scientific foundations.

Many statements written in this thesis resemble a *jeu de mots* according to an external judgement affixed to narratives, which I discussed in the introduction with respect to their scientific positioning in the academy. Nevertheless, a scientific structure from a discipline holds the connections from several moments as outcomes in other researches that give shape to the ongoing development of ideas, namely vocabulary within a theoretical tradition. This means, in other words, that the own language of a discipline guides the next steps that are supported by scientists in charge of reviewing the connections from where and how this language is grounded.[469] Based on the language of a discipline, a purpose can be composed according to its terminology. For instance, the pedagogical purpose that is directed in the recognition of another person enables differentiations to be made and that these differentiations are possible. Sustained by the philosophical reflections that have boosted pedagogical thinking, the action of recognising another person speaks about recognition and request.[470] The pedagogical purpose takes form not only by differentiating but by indicating that a presupposition is within the relation of expert and non-expert (such presupposition is inserted as assumptions within the sketch of a concerted system. See one part of this sketch that is displayed in figure 4.1). This presupposition is nowadays treated as the expectations that are kept before, during and after meeting somebody in a professional framework involving any of the disciplines mentioned in this work.

My speculation on pedagogical diagnosis as action of recognition when recognition can be problematised so (for further information, see the argument of Williams 1992, p. 61 about taking recognition as an action) indicates a procedure that promotes taking current knowledge from other perspectives to reinforce the own pedagogical language. To the point that concepts are audited from a pedagogical perspective with proofreading of a pedagogical theory presumes more than merely adding a 'pedagogical' surname, prefix, adjective form or word to other concepts or to other notions as well. For example, pedagogical diagnosis will not refer completely to the concept of recognition in philosophy, but it will also not be held by the diagnosis concept of medicine.

[469] By being connected with a community, from a literature viewpoint, for example, the narrative of a discipline does not refer to aphorisms, which Nietzsche (in Sandkühler 2010, §1171b), for instance, employed without intention to contribute to the idea of theories of irony developed by Rorty (ibid, §1172). I take the idea of aphorisms in order to recognise that a technical language is restricted to a community and that, as a consequence, dialogues of a scientific group can resemble narratives that do not fit other places. Thus far, *connecting with others* is an important message that continues appearing, despite the development of an own language for differentiating a field of action from inaction of communities.

[470] *Aufforderung* from the texts of Fichte (in Williams 1992) is translated with the word 'summons' for clarifying the differentiation from *Anerkennung* or recognition. From the reading of Williams (ibid), 'summons' does not refer to an action but to an ambiguous transcendental fact (ibid, pp. 60–62): 'Consequently, *Aufforderung* is not simply a transcendental condition a priori, but a fact, given' (ibid, p. 60). 'Anerkennen, in contrast, is concrete. (…) the concreteness of Anerkennen is most evident in the fact that the term refers not merely to a concept, but to action' (ibid, p. 61). Building on these last quotes, I consider that he develops an argument on different readings from the texts of Fichte. For this, Williams (ibid) wrote a complete book, in which he enlarges the concept of recognition by taking reference from the texts of Hegel and Fichte.

Nevertheless, pedagogical diagnosis can be nurtured by the writings of medical tradition, psychological discussions and readings from disciplines upon related theoretical constructions. With regard to this action, during chapter three about the conceptualisation of the current state of research, some systematisations of disciplinary collaboration were discussed. In this way, the purpose of the recognition of another person is specific to several disciplines. This means that this purpose is changeable and modifies itself according to the theoretical tradition taken into account.

4.2 Reality of education appears within the encounter of positions

In this section, spheres of action will be presented by dint of models. Although educational processes are not restricted to a relation between two persons or positions, the argumentation pursued by this work reveals that an encounter of positions conformed one explanation about the reality for exerting processes (such as in the meeting point of disciplines for collecting data via neurotechniques). This data collected on the encounter of positions is to be handled as means within pedagogical theory.[471] *Means* accordingly equates to the description of what is between models[472] that is part of the reality of where education might work – perhaps even to yield speculations about what education might be or where it is constituted.[473] By following how approaches change (as the way that cannot be avoided that they will be transformed by the influence of several disciplines), for example, during the exertion of the individual's inner force in a situation of requiring something (like requiring and selecting information to evaluate in a diagnostic process), Bildsamkeit has proven a connection with social processes through programs or positions of older generations (Benner 1991, pp. 64–80). But for all that, Bildsamkeit can be discussed under the process of transformation from a non-metaphysical position that Bildung is able to argue as it has been presented through its deconstruction as an open process of transformation.

From the introduction, and during the current state of research for studying the pedagogical diagnosis, I have referred to the pedagogical action as the space conformed in the variability and viability of actions to be performed that come from a plurality of ways of responding to the adaptive world. I gave notice to the reality of education that is created in more than one frame of reference in different contexts, according to some formulations that I took from Anhalt (2012) and rephrased in my own words and according to the current state of research of pedagogical diagnosis in the section of *openness to alternative conceptions* of this thesis. As a matter of fact, this is observed in a present moment when references to the world are coming from more than one position or model, perspective, discipline as well as from outside scientific contexts on a daily

[471] For the sake of clarity, I state that the data that I am speaking about are not the numbers related to the result of chemical modification during times of measurements T1 and T2 by aligning electrodes (Faro & Mohamed 2010; Fillipi 2009), but to the means provoked during the clash of theoretical thinking. Thus, when a semiotic analysis takes place, like during the process of diagnosis that requires it.

[472] At this point in time, the chain of logic or logical sequence of the work reveals that the concepts that lead to the development of models, upon which a diagnosis of some 'analyses concepts' is performed, cannot be radically split as two moments in the sequence. Since the ongoing production of new contents is based on these analyses of concepts, *means* in this respect will also yield in a constant manner a reformulation for the basis of how a concept like recognition will be revaluated.

[473] This can be estimated as a relevant outcome of the work because, as such, it states that the reality of education is not definite and that it appears to be actively intertwined with dynamic constructs.

basis. The philosophical trends of the post-war period have discussed that we live in a world of uncertainties. In consequence, certainties are proposed from specialisations of specific truths that will be located with reference to intentions, pursued directions, background or rejection of previous thinking.

In terms of intentions and attitudes, a key point relies on seeing a difference resulting from specific goals.[474] This means that so far as goals are concerned, pedagogical action does not have a specific place where it can occur. As a case in point, from the historical evolution of brainwaves, the goals are under constant modification and in relation to different systems. Hence, pedagogical action is analysed by contrasting assumptions regarding intentions and attitudes with goals and not leaving its systematisation to one side and from one side of the analysis. In trying to formulate the findings based on the conceptual approach of this work, one problem triggered by speculation is that the understanding can be limited to what is wished to be considered. Often, scientific discussions give the sense that two positions are speaking about different topics. In this way, in order to give proof of one argument that meets the difficulty of being spoken in another language – theoretical language[475] – necessitates openness by the figure of listener-receiver / connoisseur-host[476] that can make an effort to understand. Usually, when a counterpoint side has insurmountable categories, relying completely on the own knowledge, the *translation of a theoretical language*[477] will not happen.[478] From an external perspective, without a doubt, a responsible work needs to take into account the historicity of the leaps in thinking. Thus, educational science and pedagogy cannot escape from the theoretical discussions of scientific development. A point of tension comes into sight by putting the intention of speaking from an own language of pedagogy next to the historicity of one outcome of this language where goals were defined, because intention, goals and their register refer to different stages in a theoretical formulation.

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[474] Intention or attitudes are ordered according to scientific traditions that go beyond a specific goal in a developed scenario. To this extent, goals are differentiated by precise requirements that occur within a context. Inasmuch as two assumptions – of intentions or attitudes and goals – reflect an interchange between levels of a situation or principles of reality, they make visible the contending of forces that help in understanding how pedagogical action does not refer to an application of concepts.

[475] 'Theoretical language' has a reference to starting points from specific theoretical traditions corresponding to their intentions and goals. To this extent, theoretical language taken within a problematisation presents an organised option for discussing the later interchange between theory and practice, corresponding to possible problems within a translation.

[476] With the presentation of this figure as listener-receiver / connoisseur-host, the dynamic idea of non-expert and expert can be situated within a same person that is translating contents from other positions back and forth with the world. In simple terms, the expert in the model of specialisation can turn into the evaluated in the model of unity or when positioning this person in another concerted system for explaining another reality. This movement in the same person gives the vertical dynamism that the interchange between models of assumptions requires in order to get closer to a description of the surrounding world.

[477] With the 'translation of a theoretical language', I foresee an extension of the term of pedagogical translation that I have proposed in this work. Translation of a theoretical language would be distinct from pedagogical translation by returning to the means of the theory. Translation of a theoretical language would be executed by a person in connection with others and the surrounding world, as in pedagogical translation, but with a greater attachment to the theoretical impediments corresponding with respect to specific theoretical constructions.

[478] Ironically, sometimes scientists speak about the same subject-matter, under the same tradition, reflecting the same referential point, even with the use of the same word, but portraying different positions that cannot be translated. To this extent, one consequence, put in terms of a positive trait, refers to the possibility for problematisation of the content of this situation.

The historicity of a language requires an organisation of events and actions that I have explained as doable in terms of the practical deed.[479] Therefore, when localising the practical deed in a model of specialisation next to an outcome of a model of collaboration, translation regarded as a problematisation yields that different models, when they are within a same system, can be reworded. However, on the other side, when models are located in different systems, the contents of practical deeds awake a problem of translation that will not be surpassed – at least, not by dint of concerted systems[480]. In the middle of this conflict, another solution needs to be pondered.

Pedagogical intentions claim an own place for adding content to the constitution of educational reality. This is similar to the way Mikhail (2016, p. 10) opened the reasoning of his dissertation about extending this content directed to pedagogical action. One of the characteristics of current works, perhaps including mine as well, is that so much information is being consulted that it can hardly be systematised in a coherent manner for displaying a position. Most of the materials for current studies are required to be brief and concentrated in a few pages. Thus, not for lack of responsibility or interest, many scientists are hurried to take a glimpse of a position to settle a scheme of reasoning. This does not have specific advantages but shows the level of plurality that, despite efforts in putting ideas together, the works stay fixed on finding an explanation reflecting this alignment while failing to go deeper in taking one of all the positions for making a theoretical commitment. Thus far, my commitment was not thereby affected thanks to the support of my advisers in Switzerland and in Mexico. With the development of academic events in France, Germany and Austria, I was able to set purposes grounded on theoretical intentions that have corresponded to the meeting of models. Had it not been this way, intentions of pedagogical theory would have stayed undiscovered for understanding the outcomes of goals following a pedagogical writing.

I have constantly clearly stated that the reality of education includes the position of the individual, and I have substantiated this statement. Parallel to this idea, from an intention of a scientific pedagogical project and in the current understanding of what is science, the place of the interpretation of the scientist is decided by the judgement of the scientist himself (Polanyi in Russell 1984, p. 491). I see that the position of the individual and of interpretation links to the questioning upon the object of science and the pragmatist proposals of Pierce (Sandkühler 2009, pp. 99–102) about how and what are the steps or the habits for making knowledge. For this, I discussed how knowledge has several roads through which it can be accomplished over time, but what is time in this statement? Methods for discussions and development of new approaches can be traced from ancient epochs. The Greeks provided a heritage for conflict of statements in reaching new reflections based on the method of maieutic (Mikhail 2016, p. 21–32). At that point in time, the individual had a different place, but the constitution of a reality displayed itself

[479] In this sense, when pedagogical action can be theorised in different contexts in history, pedagogical action would show that attitudes, in contrast to intentions, change. Therefore, the intentions should not be generally spoken but rather be localised with evidences of contexts in a later empirical work. Thus, by localising theoretical intentions and outcomes of goals within a context, the scope of a practical deed can be limited to a timeline or proofs of events, like documents, letters, recognitions, celebrations, festivals, etc.

[480] The notion of concerted systems does not support translating models from outside a particular system into statements from another system. Therefore, pedagogical translation refers to a process of the individual whose abilities are limited by a professional position.

as a reorganisation from the development of conflict between opinions. Aligned with the engagement in reaching a commitment, pedagogical intentions are grounded on this stance that I designate to be taken as a pedagogical value. The pedagogical value as such, in the reality of education, relates the individual to the different opinions that may go beyond the changes made over the time. Accordingly, the individual is the commander in spheres of action where an intention relating to the world exists. This means that pedagogical tools and methods, the environment and other disciplines are ready to respond to specialised content that can be addressed by another person. Here the figure should convey the idea of a student who cares about learning, acquires new knowledge and expects to apply it; at the same time society has an expectation of the student who can formulate innovations on the basis of what has been taught.

4.3 Diagnosis of the time is also a pedagogical task

Situations, people, people as they relate to situations, institutions (Sutherland/Mitchell 1986 in Stichweh 1991), methods (Jäger 1992), time or epochs can be diagnosed (Beckmann 2009). But these constructs can also diagnose. For example, space and time[481] diagnose what the human being does. This last statement can appear almost poetic because it does not have an observer, nor a procedure or explanation about how 'notions' can measure nor a clear definition of what the object of study is here to recognise. However, this last statement is emphatically not poetry. It displays the setting where reality is speculated upon at the same time that there is not an independent existence that can unify all the explanations towards the world, where only through one body of specific procedures, this reality would be achieved.[482]

The portrayal of one reality has been a repetitive state that the human being has made. When time is captured by logic, 'time' is found not only as an expression of temporal events but as a means for speaking about what comes previous to the theory.[483] I speculate that when time can be encompassed by experience, then 'time' can exert its phenomenology as disciplinary object. Anhalt (2012) discusses pedagogues that considered praxis as a given (see reference to Buck 1973 in Anhalt ibid, p. 94). Whenever praxis has been given, a path could have been opened to an 'independent reason' (ibid) that would seek to validate what is being done. When taking that given

[481] Space and time appear in order to propose concepts that resemble more closely the quantities that can be synthetically converted and, as a consequence, are more accepted by other scientists. To this extent, in effect, this work has consistently maintained that constructs of this type are required in discussing what otherwise might turn into aimless eternal discussions. The purpose in this work has constantly striven to awaken opinions about what human beings do in reaching a connection with another or for keeping a shared understanding within a group.

[482] Thus, this work displayed several subject-matters that can be stretched within their contexts, theoretical intentions, history or, in other words, within their situation, encounter of theoretical conflicts or future possibilities but background or theoretical basis taken. For example, 'consciousness' presents a philosophical and physiological discussion when trying to unify two states in the same recipient or according to the terminology of the work: different approaches, different concepts within the same word (related to the basket construct).

[483] In terms of theory and practice, Anhalt (2012, p. 94) offers a description on the difference between reality of education, praxis and theory. Based on the use of the concepts 'reality of education' and 'praxis' (ibid) without previous differentiation, Anhalt identifies an access point to the theoretical problematisation upon which 'praxis' is taken as a 'quarry of theoretical discussions' (*Steinbruch theoretischer Rechtfertigungen as* mentioned by Tenorth 2002 in ibid, p. 95) or as a universe of discourse of the 'human approach of pedagogy' – *Geisteswissenschaftliche Pädagogik* (ibid, pp. 83–95).

reality is the premise to follow, the action of calculating how many paths are being created leads to the question about what it means 'to calculate' and the risk of commencing a never-ending story [because only one side of an analysis is accounted]. However, by taking this point as a point of access for systematisation, the question can be located not on 'calculating' but on the 'independent reasons' as a process of analysing what is being done. By moving the place of the connecting point, the consequent relations can be followed. '*Reasoning and following*' is my proposal for continuing the reflections of Hegel (1962) upon the fight between reason and understanding that leads the current state of pedagogical research to label time diagnosis as an anachronism of reality of education. Respectively, it can be taken as an anachronous construct that can be opened to systematisation or to be integrated as a constant.

Related to the body of constructs of time, the historical register of scientific and philosophical discussions explained that the provision of *a minimum of ideal quantities* (Eisenhardt & Linhard 2007, p. 19) has evolved through several advances in analysis and experimentation. This resembles the way that Mach's analysis helped to detect dynamical mechanisms in the principles of Leibniz regarding matter (ibid, pp. 22–23). Despite Mach's position aligning to positivism approaches, here is to be seen that defining the problem of time in terms of matter's mechanisms portrays one boundary in handling a wider extension of the topic that is also composed by self-reflection and moral integration in the society. Consequentially, a threshold of complexity of the subject-matter is required for composing an understandable approach of research. With regard to this point, North (1993 in Beckmann 2009, p. 3) described how Luhmann explained that complexity goes through the abbreviation of time (ibid); alternatively, according to my application, brief discussions of extensive controversies can consider the difference of opinion between the interplay of positions or models from social and natural sciences and their reciprocity. Following this dispute, the contention of the individual from the inner potential exerts an influence that may constantly be accounted for within the analysis of a complex situation. In this order, the person yields information that can be employed as data and that the person *themself*[484] can use for understanding their position as individual.

Since the human being is social from the day of birth (and earlier, from the time of conception and all the related cultural traits with which the world covers us), the freedom upon which pedagogical theories discuss their object of study is immersed within a delimited world. This would mean that from the one window that is opened to our eyes and the connection with the rest of former activities, the truth presented can be different from that seen through the windows of our neighbours. However, coming from a social construction according to the theoretical reference of this work, these windows speak from models, the same as I propose in a concerted system, and do not speak from what

[484] Pronouns are grammatical elements of a sentence that can vary according an intention. In Jamaica, as a case of a phenomenon that occurs in societies where two languages coexist (Castellón 2017), creole and English compose a variation on the use of the pronoun 'I and I' for replacing the first personal pronoun in singular. As a related note, I owe to my editor from her current knowledge about the English language that a neutral gender singular pronoun can be expressed through the use of 'they'. Despite being discussed as grammatically incorrect, according to historical registers from 1881 and going back to the late 1300s, the up-to-date neutral use can be discussed under an intention of gender or origin. See further discussions at https://www.merriam-webster.com/words-at-play/singular-nonbinary-they [retrieved on 17.2.2019].

the human being is but direct attention to spaces for carrying this discussion. By not taking the human being as an object of study, a motivation for connecting with cognitive approaches has been due to the certainty sought as is recognised by scientific models that can almost present the reality as oneness – I refer not only to this research but, in general, to many other theoretical works from other scientists in the past [insofar the attempt to connect unity with cognitivism has been discussed as untenable, see Westmeyer 1972, p. 49]. In my case for showing the vertical dynamism from one person towards one only reality as a constant of time, I present a situation that is to be taken by the complexity theories – at no time do I propose to think of a person as the one solely responsible for a composition of aspects. I am practically jumping into the ocean of cognition with nothing more than the tools provided by experience and studies over the course of my academic career. I was lucky to not find a rigid program where I should be confined to following the scope of research of a specific department.[485] As a matter of fact, my question of research could have been forgotten, even in my own mind in dealing with specific methods, because sometimes the strong methods cause people to draw a blank on the own inquiry and get lost in the inquiry of others. This gives credence to the question of how educational science reaches a collaborative model in the face of debates between different positions because, as I did in this work, educational science can align different programs of theoretical traditions from a pedagogical language in the process of starting an inquiry (from one's own window, following the example of the own among those others of the neighbours). One strong boundary to overcome involves the systematisation of history and recognition of the other – in social terms and philosophical reflections, when in pedagogical terminology, my goal is to contribute to the synthesis of the pedagogical object (i.e. to present the characteristics as a synthetic construct that stem from its traditional intention).

Within the diagnosis of times, effectively, *'the social order matters'* (Schröder in Beckmann 2009, p. 7). Beckmann quoted this line of Schröder to illustrate the systematisation that an object of study demands and that is connected with the world. These problematisations can also be presented next to the reflection of a modern society that can control (ibid, p. 4) or that can seek to monopolise the production of learning (ibid). I will not say that it is unlikely that some societies have pioneered this control, but I must rely on the fact that not all nations have shared the same vision simultaneously. As a case in point, Jäger (1992, p. 132) referred to the example of the different intentions that the US government and Germany portrayed with the application of pedagogical diagnostic after the Second World War. I understand that one needed to

[485] From the statement connecting to this footnote, I am not speaking from a private perception on a personal level but from the characteristic of how research programs can be composed. Now, in the footnote, I do speak from the description of a particular place of the researcher. After running methodologies for building career plans in my professional experience from 2007 to 2008 in Mexico, I know that not all the steps can be calculated. In this sense, what is being called 'luck' or 'randomness' plays a role in the conformation of decisions. For example, a person that seeks for leadership vacancies needs to have gone through several jobs within an organisation in order to have broader expertise in a company (but this is only one path among many). Thus, the person starts during the first year without acquaintance with all the areas. On more than one occasion, due to interest, but also due to coincidence, employees stand in the correct place at the right moment to begin going up the ladder. This is why I take that such constructs with several definitions, when not taken by only one referential point, refer to the core discussed within this thesis, since not because of luck, but because of plurality in problematising the orientation towards many principles of reality, the scope of actions turns unreachable and multidimensional when it may be imperative to be concrete.

maintain control and the other needed to heal scars affecting human dignity. This is certainly no surprise to anyone that has had access to who was against whom and who won a conflict. In this way, different sides of positions can be identified. Nevertheless, by focusing on positions when the object of study should require of and for itself a systematisation, the social order will develop a tension between object and environment (i.e. the vertical, horizontal and circular dynamism also presented in this work). However, this social context will not fully define the object, so that a system containing the social and the individual components will benefit an analysis of 'reasoning and following'. The social context would remain an element to consider in theory construction, but it will not determine the object because the object participates in its own definition. This distinct but parallel theory development can be confirmed in the progress of human dignity or respect[486] in general terms, which appears in several parts of the world. According to this example, the path taken by the objects of study is problematised by the 'options of action' from the selection mechanism, such as the control of some social contexts.

From the social conflict to the synthetic constructs going through objects of study as subject-matters with own dynamics, selection and control are points of controversy from assumptions of specialisation. Nevertheless, by requiring a reference on which the execution of these points of controversy can rely, these assumptions are not isolated and therefore will have a connection with other systematisations. Thus far, parallel to the synthetical methods, I have presented that it is viable to transfer points of controversy into a translation in itself of different conditions (and I have also introduced the constant of the boundaries surrounding every translation). This way of translation of a method in itself within a concerted system makes it possible to expose results to further analysis. For example, the conceptual formulation of this work presented a way to put together disciplines, purposes, actions, theories and alignment on differences in traditions through the potential of the individual, leaving thus a space for a definition of tasks. The term tasks would properly refer to the specificity of the elements that are involved (Gerónimo-Cid 2017) and, in this manner, to be able to speak from a specialisation model composed within a wider system. In several texts, I have read that to work on the object of pedagogy is an accepted and valid task, advancing through an ongoing progression.[487] If the idea of working on the object of pedagogy from a process of transformation is accepted after the encounter of positions, especially from a phenomenological treatment, the elements that are related to the diagnosis of time and space and space and time in reciprocity can also be left to a pedagogical perspective for a synthetic approach[488] of dynamic mechanisms. The latter in relation to those mechanisms that connect with aspects of time and epochs according to a historical frame. As I have mentioned in other parts of the text, this last statement can resemble one methodological approach by considering that some steps are described. Despite this

[486] Human rights as a universal aim speaks upon an encounter point where different nations have met together.

[487] The bibliography that supports this statement takes basically all the pedagogical texts referenced within this work.

[488] Not as a logical consequence in pedagogy, but as consequent application of the concepts, by analysing the recognition of another person through means of objects of study, the synthetic approach would be attributed to the specificity of collaboration from other specialisations. In this case, the object of study as a dynamic subject-matter also participates in the referential point for being taken and that is taken.

appearance, after presenting the conceptualisation that the individual translates logics of different languages, the result considered at this point calls upon recognition of a scientific structure that cannot be restricted to one procedural definition. For this, I summon the time of a scientific structure of ontological states with a transcendental character that matches the pedagogical intentions.

By claiming that in an ontological state, the pedagogical intention can problematise the reality of education; ontological objects like 'time' (see, further connections with phenomenology made by Husserl, in Röck 2019 or in Sandkühler 2010, §3096) should be examined in order to discuss the frame of reference from where the origin is taken. *Pedagogical time* is another frame of reference from another system to study in terms of a pedagogical task from knowledge theory of educational science. Like this, the idea *Institutions matter! Ideas matter!* (Beckmann 2009, p. 8) is part of a systematisation that speaks from a task yet to be problematised on a pedagogical basis, considering that the individual would be the one responsible to state those expressions. Institutions have been diagnosed as relating to their level of hierarchy between state, courts and university (diagnosis by Oberman 1984, for example, in Stichweh 1991, p. 11), upon which pedagogy earns a place within a social context [thus far, the entry point of the social viewpoint can be retrieved repetitively, to which pedagogy develops theoretical contributions]. To problematise the diagnosing of time helps without a doubt for bringing to the fore what is the position of science and its disciplines towards the development of scientific thinking because a systematisation is required for a problematisation and for the task of diagnosis.[489] As a case in point, Paul Natorp (1911 in Mikhail 2016, p. 17) spoke about the 'unity of knowledge' in the capacity of time independency. Mikhail (ibid) identified that such unity still does not aim at the conclusion of knowledge because relating the unity of science with a dependent moment of science – a time in science – would not refer to the conclusion of generating new approaches. With the problematisations of new advances in research and through the discussion of developing scientific thinking, the human being is at a point where the result of such reflections are to be understandable for coming generations.

The definition for future generations places some tasks of pedagogical time in a prospective situation. Throughout this entire work, I have been giving a primary role to the place of the individual within pedagogical construction. I am aware of the theoretical problems that cannot be solved by trying to give relevance to the individual within a pedagogical interaction, like the risk of presenting a solipsist reality that is not connected with the rest of the world. Therefore, I have taken into account that the approach of the inner potential of the individual must be embedded within a reality of education systematised according to a process of transformation by recognising another person's

[489] With the enunciation of 'diagnosis' as a task, for this work, a pedagogical task, it can be more clearly seen that the diagnosis concept as a process is commanded by the circular causality (i.e. also by forces from the surroundings that are tied to the inner force of the subject-matter) when a specific purpose is established. Furthermore, diagnosis as pedagogical task refers in a more transparent way to the ongoing formulation in a second-order observation of a task to be reflected. Next to the idea explained in the last paragraph, the assumption of diagnosis as a task exemplifies again that specialists are tied to one explanation focused on the integration of a concerted system when diagnosis problematises a transcendental object. The interchange of diagnosis in several scenarios can risk the committing of fallacies from objects of study to actions. Hence, the exercise of localising the consequences of diagnosis within principles of reality should help in setting differentiations and not homologations.

condition upon the collaboration of different disciplinary perspectives. The topic of pedagogical time clarifies a clear application of the concerted system at first sight, only to identify the starting point for further problematisations. To this extent, the specialisation of disciplines takes the chance of displaying a conflict between and over ratings of importance. Nevertheless, by taking the role of the individual as controller for further actions, the time diagnosis appears along the way for a conceptualisation upon how relevant it is that one disciplinary approach should be valued over another. This is not a new idea in pedagogy, but here in my work, it is an output that I have obtained from the conceptualisation of reality of education and pedagogical diagnosis. As a case in point, Hönigswald's (in Benner 1991, p. 108) 'determination' as a synthesis of the sense and time is one of the principles on which educational science can rely for sustaining educational philosophy. This last outcome reinforces the effects that pedagogy can provide to the further definition and spreading of concepts because pedagogy helps in the consideration of a scientific basis to be executed. Related to the philosophical basis that Williams (1992, p. 29) states, philosophy follows human interests and not [only] views from nowhere. By connecting pedagogy to philosophy, the proposals from the critical idealism of Fichte (ibid) should present a dynamism in the presentation of realities, just as I have been seeking to present principles of reality in a disciplinary collaboration. The phrase 'principles of reality' speaks about a situation where I see that the position of the individual revolutionises the levels in considering recognition with the influence of time as a changing constant.

5. Conclusion and outlook regarding educational object and reality

Opening statements: The conclusion relies on the disposition of the object of educational science for its continuous development. With reference to a reality of education that involves a collaboration of positions, the scientific contents underpin the iterative world view. Diagnosis as a scientific construct does not refer to ascertaining assumptions but rather to recognising them. Throughout the argument of this thesis, the diagnosis concept as an entry point to reflections has proved to bring content to the forefront for discussing a theoretical exchange of perspectives. Such an exchange that formed a complex scientific situation has origins that elucidate suppositions about how to initiate a systematisation.

The released work has spoken about an interdependence of dynamic components, the interrelation of propositional concepts from educational science and an outline of intertwined factors seen in more than one discipline. This was a thesis that was written in the domain of pedagogy. My writings bear a resemblance to the combination of dynamic subject-matter and complex situation, in a pedagogic theoretical construct, taking inspiration from the work of Anhalt (2012) and Rucker (2014) and Rucker and Anhalt (2017). Current research being performed within the Institute of Educational Science at the University of Bern contributes on the topics of children's rights, or theory construction in pedagogy, or pedagogical causality or professional interchange between career and learning, among other topics (AAE 2018, 2017, 2016). In educational science, the scheme of thought on the strength of components coming from different positions is still under construction. However, a consequence of writing this work is a clear reassurance that educational science has not stopped working on the development of its own history and frame of reference. This work clearly shows that educational science can start speaking from its own template about the problematisation of concepts for integrating them into its theory of knowledge and social studies. This mentioned idea corresponds to the conceptualisation that the reality of education and the phenomenality of the educational object is to be inserted within an ongoing development. In the academy, this is not the first work to be limited in terms of time and to conclude with uncertain results. Namely, in the historiography of science (Kuhn in Hoyningen-Huene 1993, p. 12), such a relevant work as that of *The Structure of Scientific Revolutions* (1962) needed to be revisited more than ten years later in *The Essential Tension* (Kuhn 1977 in ibid) for the purpose of broadening a differentiation of theoretical implications from a theoretical application.

As I have stated, my theoretical construction contained in this work should reflect a step towards further development. Since the topic of research is ample and the concepts for this dissertation must come from the side of educational science, in this concluding penultimate chapter, I have selected one of my concepts proposed for portraying the explanation as a practical display of the merging of spheres of action, practical deed and principle of reality. I refer to the pedagogical translation to instigate the validation of the concept of pedagogical diagnosis as applicable within the frame of the project of pedagogy as science. Several topics of research are interrelated inside this structure. This work has made an effort to highlight that they originate from distinct reference points.

Before it becomes obvious that each represents an independent perspective, the connections from educational science that these viewpoints portray and that can be displayed must be marked. This is done with the intention of aiming to provide open conclusions.

Following this argument and with reference to the connections established by educational science, I first highlighted 'pedagogical translation' as a contribution of this research. After that, pedagogical diagnosis appeared initially as an option in the absence of a theory of diagnosis in pedagogy; within this section, I sought to mention some points that problematise the concept of pedagogical diagnosis that cannot be automatically inserted as part of a category within other fields of action. Finally, thanks to my encounter with the German traditions of educational science, I earned access to a particular area of science that, in addition to appearing over a span of more than two hundred years, continues to garner facts and reflections on the direction that humanity could take with successive generations, meaning pedagogy that, as a profession, earns a place with a language developed by its scientists.

According to my experience and discussions through workshops on scientific writing, there must be less dependence on literature in these last two chapters. Since they present the outlook of the theory and the application of historical methods, the conclusion and the discussion must invest in being an academic source for further connection. Notwithstanding this convention where I will try to reflect my own position and process of thinking in these last sections, I will continue giving credit to the authors who have inspired my pen for their setting of a hinge within my own thinking. Accordingly, following the argumentation of this work, there should not be a particular standard that encases the description of reality as universal. In this way, the reader must make the effort to compose a principle of reality in conjunction with the content of this work. In due course, the outlook of this work reflects its position from its own epistemological proposal: an open circle with points of connection for further analysis. In this manner and according to the whole preparation of the work, a discussion should be set following the conclusions and prospective points of view.

On the other hand, trying to address the issue of topics that are not being handled in pedagogy would refer to a social question related to hyper-specialisation of technical knowledge that would restrict any kind of opinion and that in consequence would close the path to a scientific philosophical reflection. Similar to this matter appears the case of constantly attempting to relate an area of learning with a topic of educational science regardless of the problematisation on its meaning or its complexity related to the foundations of research (Anhalt 2009). This means, effectively, the development of concreteness in history, accordingly the effort focusing on only one plane of reality, has swerved to catalogue maladies into diseases and remedies for approaching them.

Notably, pedagogy inhabits a field where options are available. In spite of social questions that are different in and from pedagogical matters, signs of actions – signs of social actions and social signs of actions – exhibit material that can be interpreted. Not directly in a circular manner, from the pedagogical side, this means not parallel, but in the same rhythm and direction while also parallel and not under the same circumstances, a social assignment remains to provide suggestions on what is happening between two persons, particularly when they are in a professional environment. Hence, common tasks

can be divided according to particular origins. For example, a task of pedagogy is to cultivate persons in the realms of different perspectives. This means, in other words, to educate with the goal of understanding distinct languages, in terms of their positions, their references and consequences, including such perspectives and concepts as the existence of counter-positions and how to problematise them and to reformulate them according to new terms under other circumstances, scilicet translations out of pedagogical thinking. The diagnosis concept problematised under the optic of pedagogy, this means as pedagogical diagnosis, suggests the starting point for the order of a complex composition of a situation on the basis of at least two sides, which can be connected with tasks that have to be recalculated. By reading how the argument was designed, the goal at no point is to establish a dualistic position, but to find commonalities within the same framework that refer to an origin from a dynamic subject-matter.

5.1 Contributions of research: pedagogical translation

For instance, in the relation between 'two persons', I identified the sides of the one who has more knowledge regarding a specific topic and the other who wants to receive it. For this purpose, I lay stress upon the relation to a person affected who is seeking to 'get better', accordingly the formulation of this work: the non-expert or patient.[490] Thus, the position of the non-expert, layman or non-intellectual illustrates an instance of a leeway that can or cannot be previously systematised in an isolated manner because it would need to come from a reference. In this way, this margin or space of freedom in pedagogy gives robustness to the process of transformation of the 'self' that remains connected with another person because no real-life layman is in the position of knowing nothing. In this case, people always know something, and figuring out what might be (i.e. what is known in addition to what they know) is a human responsibility.[491] Irrespective of the culture of knowledge of the expert and the beliefs and certainties that this one possesses with respect to the observation of the world, every person would feasibly go through a course of introspection. This was proved through the observation of consciousness as complex subject-matter with an internal changeable dynamic or by means of the observation in second order that this inquiry employed. Upon this self-analysis, a cluster

[490] Evidently, the positions of 'non-expert' and 'patient' are not to be homologated and handled in the same way for the purpose of universality. 'What about the case of a doctor who gets sick?' Of course, the same doctor as a patient cannot be a complete foreigner in regards to medical language. Therefore, a footnote of warning deserves to be written: if the argumentation was followed according to a pedagogical intention, clearly the question about how to recognize a doctor as a patient does not even belong to the theoretical construction of this work. However, it is located on the level of a 'theoretical construction', where this work takes place and whence different examples out of the 'daily scientific basis' help to make sense of the analogies and identification of 'universes of discourse' (according to Dewey in Anhalt 2009, p. 27) or from direct inspiration on John Dewey, where opposite sides have inconsistences that accordingly can be created into aesthetic objects (1925, pp. 43–63). In this manner, analogies also call attention to watch different situations and point to the question: do I need only to go, sit down in a doctor's office and receive directions for what to do? Then, where does the problem lie in the development of guidelines – where have we failed in instructing human beings on their goals? Naturally, the argumentation of this work says out loud, 'Take access to pedagogic-historical moments', and in a repetitive manner, it indicates that this was never what should have been intended.

[491] 'responsibility' is a concept that relates to the sequence of actions taken (Sandkühler 2010, §2860b). To this extent, 'responsibility' links the problematisations between decision, freewill, moral and norm, among others.

of concepts, events, elements and new ideas will be arranged among other theoretical and not-theoretical approaches.

This last-described context requires a position of adaptability. Pedagogical translation can be adaptable; this means that it is consistently adjustable to the modifications and to the generation of alternative organisations, respectively systematisations or a 'simple' chain of events. With the portrayal of events, in general, pedagogical translation welcomes the idea of a systematisation of a construct beyond science within the language of science.[492] This happens because, at the moment of triggering an own understanding of any construct, the previous knowledge of what has been discerned is also retrieved – whether for rejecting it or for building upon it, but it exists for being taken under consideration.[493] I would like to stress, however, that in the field of educational science, any knowledge can be differentiated because generations from different cultures of knowledge will look to their heritage for what was previously acquired.[494] On this basis, the combination of components that can be stressed in- and outside the scientific context with regularly and frequently updated information supports learning as a moral social value.[495] After systematising these components within a concerted system, the daily and commonplace experience can be contrasted with scientific facts because also scientific methods are executed by persons[496]. Scientific advances from other viewpoints, where some practices are not viable or where some scientific outputs cannot yet be applied, are part of spreading knowledge under different terms of dissemination. These spoken terms are to be sought and recognised after pedagogical processes take place.

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[492] On this enunciation, although I am explaining in the rest of the paragraph what it means to welcome the idea of a systematisation beyond the scientific language, here again in this note, I want to explicitly write that pedagogical work does not refer to a systematisation of constructs outside scientific parameters in the sense of not paying attention to methodical supervision, control and regulation, theoretical reflection or historical contextualisation. This matter deserves attention since pedagogy works in the realm of processes of self-development despite – and according to – scientific parameters. In this sense, this characteristic of pedagogy becomes a core of the pedagogical paradox of educating within a space of liberty and freedom. I have given heed to this feature from the onset of this work as a part of the introduction.

[493] This might sound counterintuitive against the position of 'nominalism' that was stressed within this thesis. However, this mentioned problematisation helped to give a basis to the structure of possible systematisations within pedagogical content. On the other side at the current time, a responsible work of science should contain awareness of ongoing research. Besides, as part of a well-performed work of inquiry, it should reflect that the documentation of literature-collection belongs to a systematically researching scientific process (Kopp et al. 2017).

[494] On this point, there is a risk whenever picturing the idea of having knowledge in the wrong hands or wrong knowledge without previous reflection; consequently, here knowledge with ill intentions also applies. Hence, the importance and another benefit of disciplinary collaboration would be that disciplines can attempt to regulate the direction of their content among one another's efforts.

[495] To this extent, not only the combination of components, but also having as a possibility the inclusion of the individual within the context, a complex systematisation can ensure composing a description of a reality of education in which learning as a moral social value can be targeted.

[496] Since phenomena do not take place automatically without observation, for example, they are not directly inferred by experts to be symptoms that can be indicators of a system for being diagnosed (see, for example, Schwarz 1993, p. 8), phenomena go through a translation process that I have problematised within a concerted system. The criteria of an expert, in this case a physician, take into account experience and procedural register protocols – which were shown in brain imaging acquisition that varied depending on problems of standardisation problems (see, for example, Soekadar & Haslacher 2019, p. 22).

In this work, for example, I gave heed to the field of mind, brain and education. Nevertheless, I offered in addition a problematisation that justifies another course for this meeting of disciplines. If successful, I have credited the intersection of experience of fields of work and advocating for the generation of a new language from the side of pedagogy in participating with other experts[497] – and from the side of the disciplines involved, which would provide their own specialists the demand for a description of their own composition of tasks in their own terms. In the realm of pedagogy, this would speak about the foundations of the research in educational science that at this moment is being conducted at the institute for educational science of the faculty of human science at the University of Bern.[498] However, besides the efforts of presenting a description of an object of educational science in contexts outside the traditional institutional places, the object as a complex construct must be extended in more classic educational contexts in order to avoid a methodological error of what should be spoken in terms of education.

Whether 'translation' is a problem of pedagogy or not should be problematised with such autopoietic concepts of the order of *reflection* and *thinking*. However, these two concepts in this work are not to be solved directly but amidst the concepts of pedagogical translation, spheres of action, practical deed, principle of reality and perhaps also with the concept of pedagogical diagnosis performed by the individual. Specifically, this work suggests the concept of pedagogical diagnosis and/or recognition process to be composed by the force of action of all the other concepts previously discussed. To this aim, the concept of spheres of action was organised according to its area of extension described as spheres, where the term spheres of action considers its pedagogical part and methodical control. Practical deed concerns the connection between theory and praxis in addition to the connection between particular and general procedure, as I presented in the brief discussion of the spheres of action of contemplated disciplines. This explains its length on practical medical action and pedagogical tact. Principle of reality would engage the different levels of analysis of a situation and pedagogical translation that comes from the individual process of transformation and the connection with another person.

Basically, this work proposes retrieving events organised by sociology through a historical[499] contextualisation, which, in the spheres of action of the disciplinary collaboration between medicine, psychology and educational science, appeared as an interrelation between expert and interested person. Along such formulated lines, I searched for a differentiation of a social situation from its technical construction in order to localise the interaction of two persons within a pedagogical process.[500] The noted interplay appeared almost automatically through the process of diagnosis. The same

[497] An own language opens possibilities to connect to other disciplines because, from my theoretical analysis, the own pedagogical language is meshed in the composition of collaborations by pursuing the definition of educational objects. Moreover, the representation from the side of other disciplines confirms the problematisation based upon human beings by dint of the individual's place.

[498] An analysis on the foundations of the research of pedagogy began to be developed by Anhalt (2012, 2009) following previous responsibilities at the Institute for Educational Science of the University of Bern. In his writings, his position towards a pedagogy that takes into account the claims of other possibilities and traditions can be detected (see, for example, Anhalt 2012, p. 115).

[499] With the recounting of events in theoretical literature, I gave proof that actions leave reminders of pedagogical goals that can be inserted within a system for spreading knowledge.

[500] This would prove that, effectively, pedagogical processes succeed also within more than one institutional condition.

interplay can be reflected from the pedagogical side as one pedagogical object similar to one established as a theoretical excursus in the place of diagnosis concept. If it exists or not is another query still pending discussion and problematisation. To this point, diagnosis was detected as an ideal subject-matter because of its internal dynamic and by reason of its own differentiation with diagnostics, both handled as two separated moments, regarding consequences related to distinct positions from representatives who apply these procedures and effects on a non-expert who receives them.

As a matter of clarifying this basic principle, the social situation was differentiated from the technical situation in order to localise the interaction of two persons within the process of diagnosis. This process of diagnosis can be reflected from the pedagogical side as a pedagogical object, but with some intention of trying to speak from its theoretical side, not from a medical opinion. Hence, a contribution from the recognition concept appears as a viable focused point for continuing pedagogical research. Effectively, diagnosis is then an ideal subject-matter because of its own dynamic. Having its own differentiation between the process of diagnosis and the process of diagnostic, it will present playing fields for the portrayal of the relation pictured by the general and the particular, by the theory and the praxis. The aforementioned interplay can refer here to single spheres as domains that as a result help the pedagogical tasks in defining the object of education – giving a basis to the proposed concept by this work of 'spheres of action'. This would mean that persons appear in the context of social interactions, where the transmission of knowledge implies a mêlée of momentary principles of reality, including those set by the own individuals as well. An alternate motion can be explained in terms of concerning parts of a situation that should be systematised according to and from the point of connection by analysing possible directed intentions (i.e. by dint of a concerted system).

A conclusion of this work is that the sphere of action was described under the awareness of a pedagogical context in pedagogical terms. It can portray, however, a concept that can be applied by psychology or that can be proposed in the medical arena. Effectively, it would require a further elongation and description of specific researches under construction. With the goal of using spheres of action in the realm of biology, for example, it would be necessary to document the interaction with objects of study, or among components of such with the researcher, who through the endeavour of writing a paper makes clearer to the academic community that a potential process delivers a particular result, source for thought and point of connection for further analysis.[501] This bears some resemblance to a methodical suggestion; however, it is a theoretical construction establishing how to offer a space of and for problematisation of scientific topics to be handled by pedagogy.[502] A pedagogical object is beyond a social interaction,

[501] This speaks about an interesting point, because on one side, every researcher could reply with a self-evident smile of certainty over all the procedures that are registered with care for own activities through protocols and logbooks. However, ethical matters keep awaking ambivalences or negligent practices in the execution of inquiries. Trying to be congruent with the position of this thesis, it would be too difficult and naïve to submit all the responsibility to one only explanation – nevertheless, spreading the potential of the individual over general consequences would contribute another orientation on how to improve the research work.

[502] The main idea relies on making clear that 'sphere of action' is a legitimate means that can be spoken from pedagogy about science and related domains. A pedagogical object will not have an application as in biology or psychology (Nicolin 1955). To this respect, according to the extension in this work,

a transmission of knowledge or a frame of reference based on the fact that it must invest in a pedagogical intention.

With my work, I have tried to confirm the complexity of a pedagogical object that necessarily relates several perspectives. Such drift, in the sense of being forced out of a straight line, is thus out-of-the-way of a single composition of components that in consequence cannot only be handled as simply content exclusively for being taught within a class.[503] This conclusion extends the idea of reflection and thinking, which cannot be separated from the subject-matters and of presenting *signs* while they are being observed or being manipulated (at least, this cannot happen under a speculative argument before introducing a micro component such as those handled on topics of consciousness). This involves an ambition of scrutiny from subject-matters that do not belong to a 'one to one' corresponding idea.[504] Such a mindset is necessary in modern times when technology is immersed in our daily lives or when we are primed by immediate reaction and complete availability through our automated network. As it is a system into which the human being is inserted, the network does not operate by itself but with our participation; therefore, we are still owners of our lives. Because of this, it was necessary to problematise the possibility of pedagogical translation when it appears related to the development of texts, for example, in order to wonder and supply reason to the author who translates processes through an own process of understanding. This is an attempt to say that, despite the fact that during a reactive modus, this can be easily forgotten, in reality, it should not, and writings that aim to develop along this direction are necessary for holding an idea of a pedagogical humanistic approach. More simply stated, the science of the mind or the spirit, depending on different translations of Hegel, has a different goal than delivering results and reacting to situational conditions. Studies on time reactions, for example, are of high relevance for many disciplines and for calculating scenarios that might not be necessarily connected with philosophical reasoning; however, pedagogy to this extent has an own place to analyse the human being from a complex situation. Effectively, 'in a world where everything is complete, nothing requires anything else for its completion' (Dewey 1925, p. 64). However – and

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pedagogical constructs differ from those of neurobiology or medicine. Nevertheless, when in a possible collaboration, the idea is clear as a rule that pedagogy, when in mutual work with other disciplines, does not seek to compete but to contribute to the development of people. Consequently, a task involving scientific integrity and responsibility can start to take a fixed form.

[503] I owe the formulation of this statement to my editor Jean Hall, who made me realize that in her native language, the composition of components portrays different moments. To wit, they can be handled in other ways; for example, concepts learned in the context of on-the-job learning; or principles that can be applied outside the classroom as opposed to abstract ideas that are apparently taught for the purpose of appearing on a quiz. Also, components that in consequence cannot be handled as only content to be taught in a class (while suited to be presented in a class, they might be considered something more than class content in terms of curriculum). And finally, components that in consequence cannot be handled as content only to be taught in a classroom. In that sense, they are a part of a body of content but are not restricted to academic endeavour.

[504] The ironic and sarcastic reference that I identified within this work applies to the explanation of this idea of 'one to one' that I used on two occasions within this work. With reference to Piaget (1970, pp. 37–40), since he problematised the '*correlative implications*' based on Russell and Whitehead's propositions of numbers as unities that integrate operations and their classifications, I gave heed to the paradox of 'being without being' but only under a specific circumstance. As I said in the development of the work: 'ironic' because somebody else thought about a concept for giving a different sense of orientation. Perhaps in this way, it would create an irony more in the sense of Rorty, at the moment of suddenly having a person who can state this with a different intention.

fortunately for us – as John Dewey properly developed through a long argumentation, even this world would be *necessitous* (ibid).

5.2 Options in the absence of a theory of diagnosis in pedagogy

In this work, pedagogical diagnosis was handled from its epistemological possibility as an existing theoretical construct that refers to the application of an action through the execution of one or more pedagogical diagnostic processes within a frame of pedagogical intention and operation (Jäger 2010, Schuntermann 2009, Van Ophuysen & Lintorf 2009, Ingenkamp 1997, Knauer 1994, Kleber 1992, Kutscher 1979, Klauer 1978, Döscher et al. 1977, Pawlik 1976, Ulich & Mertens 1973). In this sense, the epistemological position of the concept of diagnosis in pedagogy as a subject-matter posits its own description depending on the frame of reference based on a selection process from different pedagogical intentions. Hence, it has proved to highlight a controversy in the encounter between scientific perspectives. This happens because of a viable description of the construct itself. Notwithstanding, or perhaps even because of the existence of an established description made through the diagnosis construct in the sense of recognition, this epistemological analysis illuminated a controversy in the encounter between scientific perspectives. This section yet demands consideration of how pedagogical diagnosis portrays a procedure with an imaginary certainty that, even though the diagnosis concept may not yet be included in pedagogical construction, it is to be integrated within. 'Imaginary certainty' can be assembled or rigged up such that the consequences on a person from the relation with another and the environment is opened, uncertain, irreducible to problems of planning and governance – as Thomas Rucker likes to explain in the description of the complexity of Bildung, his theoretical reflections and writings – see, for some examples, Rucker (2014) and Rucker and Gerónimo (2017).

On that foundation, the concept of diagnosis in pedagogy cannot be forbidden because it does not cross the border of not providing help to the pedagogical construction. On the contrary, theoretical statements must be made, reviewed, executed and verified at every turn on this topic. At the moment of dénouement, when this text foreseeably has returned to the restatement of formulating according to own pedagogical language, the concept of diagnosis in pedagogy might awaken a reasonable doubt. As has been repeatedly mentioned, pedagogy does not account for medical knowledge, in the same manner that it cannot be assumed that a medical doctor is familiar with the philosophical educational traditions for how to transmit a message.[505] However, because the doctor can teach – in a context that can require having skills for teaching – then it is really not clear why the concept of diagnosis should not be integrated within the pedagogical realm. If I aim to use the theory construction of complexity in education from Anhalt (2012), I would be able to stipulate that in a second-order observation of theory of

[505] Here, using the formulation of 'in the best possible way' could fit perfectly in this moment, according to the business language that permeates contemporary societies. Likewise, the ideal moment could be in this passage for stating that, found exactly in the recognition of the difference with this other 'style' of languages, the one that 'pedagogical translation', as a concept, is aware of creating. For this purpose, another extensive discussion could be started for recognising the importance of educational science and the place that it inhabits, about how it is a meeting point for speaking with other disciplines. Additionally, educational science has a direct access to a theoretical tradition of how to recognise the condition of the learner. By its virtue, educational science accurately problematises topics of scientific knowledge.

knowledge, the concept of diagnosis can be incorporated into the pedagogical domain and will then elicit the division of natural and social sciences. In any other case, the diagnosis concept effectively takes place under unforeseeable circumstances proceeding from a complex situation.

Much has been discussed on the extension of fields of discipline involving the social and natural sciences. After conducting research for this work and after writing it, it is now time to show that in the face of the absence of a theory of diagnosis in pedagogy, options exist for following up, which can suit themselves to making diagnosis a 'connecting point of analysis'[506] in pedagogy. In this manner, 'diagnosis' is not a concept that can be purely integrated in pedagogy – because there are so many procedures and positions – but it can be an initial point for a further connection of analysis. Hence, the diagnosis concept must be linked with the notions of recognition. Like this, the conception of this varying construct from its pedagogical viewpoint of theory construction would have the advantage of bringing a notion from its constant revision that can be taught at the time of being employed. This is not a proposition of a method, but a clear step of progress in the development of experience. Clearly, in order to appreciate and highlight this advance, a structure in pedagogical systems must be formulated (like in the concerted system proposed within and from pedagogy). Then, the activity that cannot be stopped and that should continue belongs to one engaged process in order to keep an interdependent contact among people and to give sense to one social idea: to live in community (or from the theoretical construction language: to confirm the collaborations and the alterations sustained and the alterations they sustain).

Within organised humanity, groups of people are assigned socially to activities, responsibilities, expectations, roles and functions. On a related note, the medical doctor should cure and the teacher should teach. If the elements of such a coexistence among factors were easy to distinguish, to describe or to handle, the medical doctor would only need to provide a pill for pain and fixing a body. In this same vein, the teacher would only have to repeat the schemes of ancient societies and to insist that the students memorise new knowledge. However, this has been proven as something other than the state of being. 'Pedagogical diagnosis' turns out to be helpful for the description of a practical deed where pedagogical translation and a pedagogical action coincide, once the diagnostic process is exerted by pedagogy within the structure of a concerted system. As such, this interrelation facilitated by pedagogical translation makes evident that a connection with another person succeeds and that, under complex circumstances, it is also possible.

In this same way and coming back, on the other hand, to the second-order observation and third place of composing a reflection, pedagogical diagnosis – as a not completely

[506] 'Connecting point for further analysis' differs from the 'connecting point of analysis' that refers to the point regarding connection of analysis in the initial position that is taken for the connection with and development of next ideas. In this case, the concept of diagnosis proves to be a point of connection for further analysis that is already bringing an analysis of a performed action. 'What to do next?' is a question that is tied to and follows recognition of another person.
The change in the expressions implies a dynamic and a process of transformation that was already performed (see argumentation developed throughout this manuscript), such as 'conversation points as active connecting points of analysis'. I recommend deepening the theory of complexity of education (Anhalt 2012) and complexity of Bildung (Rucker 2014) to increase an acquaintance with the terms of *perspectivity* and *dynamic* (Rucker and Anhalt 2017) as to its causal thinking.

finished concept and category in pedagogy – becomes a moment where different systematisations can be interpreted, namely, where signs of distinctions can be analysed in the sense of indications from various theoretical constructs. This means that when holding the position of the individual within the confluence of elements from a situation with a connotation characterised by a dynamic subject-matter, the person itself is a way to an end, a container, but also an author of its own process of socialisation and purpose. Before leaving a message regarding the options in the absence of a theory of diagnosis in pedagogy, structured over the course of this work according to practical deed, pedagogical translation, sphere of action and principle of reality, pedagogical diagnosis should expand on itself about how to explain through the means of other disciplines and what a theoretical construct may be. Similar to the way that Stichweh (1991, p. 203) exclaimed that science must accept variation, I state that collection from other proposals of knowledge affixed to the action of diagnostic can alter the extent to which the diagnostic itself is to be reformulated in the pedagogical interest. This would be achieved by granting space to pedagogy for the formulating of theories of diagnosis under a pedagogical interest.

5.2.1. Subsequent entry: Pedagogical diagnosis

In order to understand what is interrelated with the concept of diagnosis, as varied and unpredictable as the reasons for something that affects the body, it was necessary to analyse the supplemental discussion on topics of consciousness, reflections in terms of certainty in neuroimaging, philosophical and epistemological positions of frameworks of reference, and socio-historical anecdotes of how to approach the human being, among others topics, in favour of determining that diagnosis is not an appropriate category for pedagogy. Without a direct entrance into the diagnosis procedure of the medical area, pedagogy provides spaces for establishing connections with concepts discussed throughout the historical theory.

Scientists of pedagogy and educational science have invested energy over the last centuries towards achieving a place of credibility in scientific circles. For this same purpose, it is also a time to recognise the content of scientific programmes of study in pedagogical outlines. Pedagogy comprises a systematisation, whereby scientific substances are to be elaborated and discussed. With the advantage of a general transmission of content of information in a pedagogical design, that is to say, according to a psycho-diagnostic strategy of a teacher in a programme of study (see, for example, Knauer 1994, pp. 26–31), many topics of specialisation can be adapted to the needs of groups of experts.[507] From a perspective of specialisation, concepts are an entry-point to ensure that scientific assumptions support the development of up-and-coming researchers. To this extent, statements organised around concepts have characteristics in

[507] In this transmission of content, the pedagogical intention is a remainder along with a reminder to be constantly questioned and analysed, with the aim of reviewing if there is a purpose in teaching-learning specific topics of study in the realm of topics for experts. Within an affirmative answer, the definition of 'purpose' would portray a problematisation in itself when observing that more than one viewpoint is available from the point of defining the orientation of such a purpose. This possibility in the definition of 'purpose' would be a point of connection for further analysis generated by the spheres of action contemplated in this work.

epistemological analyses. In this way, one statement with more than one concept has different queries.

As a case in point, here are two queries at one blow: (1) How could a container-concept be displayed that infers a basket-word that is questionable due to its meaning? (2) How can a basket-word grab and/or describe a process of transformation in a changeable environment without losing contact with scientific educational parameters, respectively the pedagogical intention of self-transformation? One example in terms of these 'basket-concepts' would be the word 'functional' in a theoretical context of consciousness, in which a theoretical position can deflect itself against a physicalist theoretical position at the same time that another position can provide an argumentation towards the physical connection of neurons. Or to what extent would the controversy of such wording be viewable without the use of a specific context? Since 'to diagnose' in pedagogy is oriented towards a specific task of goals to be fulfilled within a group, it will rely on the definition of a neighbouring field to execute its individual and particular deed of diagnosing, ergo deed of making a diagnosis. This is counterintuitive to what pedagogy and educational science are looking for, because from the German pedagogical tradition, pedagogy and educational science do not look to prescribe ways of acting but to reflect on theoretical foundations in education. Certainly, here is where it lays down a controversial topic in terms of a layman, which in a possible future would provide inputs for the translation of common knowledge into one that is scientific, and vice versa. Because, as I already wrote, the layman is not an ignoramus in all fields. Hence, from a different expertise or even from a different viewpoint, any person would be able to formulate and add to a specific point of view with a novel result.

Additionally, as discussed in the presentation of the concept of diagnosis, the theoretical traditions involved during the analysis for this work require a pedagogical translation within and among themselves before they can start being applied. This means that they have theoretical positions converging from different viewpoints that might even be incompatible, one to another. Hence, the requirement is established for an individual who can make the effort of translating and aligning 'positions tête-à-tête' through an internal systematisation that can be explained in terms of Bildung. Among other arguments, this could be a reason why not to rush the integration and formulation of the category of diagnosis, as in pedagogical diagnosis, within the domain of pedagogy since diagnosis as a concept reflects an intention with a bio-psycho-social angle. Therefore, this bio-psycho-social integration should find other paths. In this way, a structure must be built for explaining an action from a pedagogical viewpoint, like in the teaching of biological knowledge in a master study – just as this thesis did from the reflection on a second level of observation. Looking forward, this dissertation seeks to connect with further research on the construction of specific applications of biological knowledge, for example, in a biological realm where not everything has been spoken.

With this aim in mind, this study sought to lay out in more precise terms the scope of pedagogy by giving definition to the 'spheres of action' that support the transmission of knowledge within controversial situations while exercising the potential of the individual. The topic is extensive, and according to this work, it would be resolved by beginning only from one perspective in order to lead to opening others. To this extent, and on a related note, educational science starts from its own language, which is constantly confronted by other opinions. In the search for problems in research, seeking

a collaboration among disciplines, the discussion turns to how concepts are created within disciplinary frames, just as the diagnosis concept is proposed to be subject to continuous rethinking. This means that the concepts can refer to notions that are alternative, even as they come from different beliefs. By starting from the concept or from the search for orientation, perhaps related or perhaps unrelated, concepts display the search for orientation regarding the individuals as in the search for answers during reflections, summons, recognition and research formulations. A theoretical construct as a concept with a historical heritage, like diagnosis that comes from different traditions, displays an example of this problematisation within the search for orientation. Such a conceptualisation of thinking about a problem involves not only the differences among research approaches but also the participation of the individual within this construction. At the current time, science can aim to search and identify those constructs that would ensure a constant theory development and robustness outside an exclusively statistical domain. The first step in pedagogical reflection is to look for concepts, to identify them and then to apply them. Accordingly, from the positions of specialisation, disciplines focused on specific traits of own traditions would follow specific procedures that differ from a pedagogical proposal. This means that disciplines from specialisation would follow their own course of actions by not being affected by pedagogical observation. Keeping this in mind would be an important caveat in the development of theories. Furthermore, this implies a pause to make – and to necessarily consider within the structure of programs of research – a moment that is more and more difficult to contemplate within the engineering of producing results. Hence, the development of pedagogical translation is a compelling recommendation.

5.2.2. *Re-entry* to possibilities and boundaries of the concepts

The plan of this work was not a comparison between neurobiology and the medical relationship connecting doctor and patient or expert and non-expert but a way of entering into the manner of understanding both areas of study in order to teach them: in general, to be able to continue working with them from the side of the *social sciences* in pedagogical terms and with pedagogical purposes. Contents of these areas are unpredictable and controversial in the way they are understood, mainly due to the changeable progress in their own internal dynamics and evolution of methodologies for comprehending them. For this, one should be aware that pedagogical matters are not restricted to a scope of teaching and learning, but to a wider extent of the development of a 'purpose'. Thus, drawing on the ideas of *purpose, wisdom and prudence*, I will close the discussions in this work in the next chapter.

The flow of the text has steadily directed the reader from the start to come inside a reflection on the portrayal of a given reality. Once connecting points for further analysis are detected, different purposes within inquiries on the topic of empirical and hermeneutical science[508] can be encompassed. The interrelation of neurobiological, psychological and pedagogical disciplines offered a space for identifying communalities

[508] Hermeneutical science should be read here as 'science of the sprit' in the way that Nicolin (1955) explained a possible perspective upon the writings of Hegel in pedagogy. To this extent, and in extension to the topic of hermeneutics and questions from Dilthey relating to an anti-dogmatism of interpretation, purposes in this location deal with statements of theoretical traditions. As a case in point, the diagnosis concept would reinforce the clash of different opinions upon the condition and recognition of one person.

among topics including, for example, the one of consciousness relating representations to recognition. Within this last-mentioned topic, it was shown how the internal dynamics of the subject-matters have to do with a pedagogical problematisation. The above-mentioned connecting points have already been enounced in the works examining the interconnection of concepts as conversational and active points, when concepts are used in a repetitive manner by 'spheres of action' in scientific topics. The importance of such discussions was shown, thanks to the gist that when it is applied, it demands a bond with actions and next steps for being built up. In matters of pondering whether steps for a general progress are required, the historical documentation confirms that the strengthening of human beings cannot be stopped. People will seek for a changeable environment that facilitates an accumulation of facts towards making themselves better, whatever this may mean in different contexts. Changeable environments are involved because it is well known that the action applied yesterday might not work the next day when the circumstances are in constant flux.

In terms of a certainty about how people would look for an environment that is either changeable or not changeable and if society supports this, more content in the future can be presented on this point and problematised. In current times, overheard conversations with people from older generations inevitably reveal the theme that the systems are changing dramatically fast and that many habits are being lost. For example, common complaints relate to modifications in procedures that were 'easier' or more customer-friendly in the past: 'Why should I need to know and verify all the steps for sending a package with determined characteristics to a specific destination? – Couldn't a company simply offer customer service through employees who are going to be occupied on a daily basis with repetitive tasks anyway, tasks that I am not usually aware of?' – 'Yeah! Instead of having a website that I can hardly understand and that changes every time I access it!' (in relation to a typical conversation about the replacement of people by machines). Notwithstanding, the older generations have been constantly cast as critics towards what the younger generation does. Hence, are changes part of the order of a society, or are the societies part of the reactions against these adjustments?[509] As I have discussed in the development of this work, none of these is a single question with one solitary answer. Besides, the older generations were new generations once upon a time in the past, when a former modification was not understood by the parents of those youngsters at that time.

Furthermore, I have tried to support that sociological studies should be translated into the pedagogical language in order to make them feasible or viable for problematising the educational object. In this same manner, languages at one time and as time passes[510] have evolved for establishing plausible new conditions. Sociological methodologies can be put together at a greater distance in the scope of such an own discipline, and unfortunately, a work like this one cannot provide a deeper systematisation for external opinions related to what pedagogy should do, according to and from the perspective of those outside beliefs of specific scientific groups. Pedagogy, however, will meet the

[509] From a position taken by this work, an answer towards this questioning would yield the explanation based on a complex system that requires collaboration of different positions in order to adjust a targeted request to a specific action.

[510] 'languages at one time and as time passes' would refer to a phenomenological condition upon an ontological existence of what is and continues.

encounter of several points of connection for analysis because of how the topics are related among and between themselves. Also, pedagogy can try to handle from specific perspectives and particular concepts the boundaries of some that appear now and then in the activity of analysing a situation, recognising the condition of another person, working together and acknowledging a difference between what is known when two viewpoints are compiled. Pedagogy has not yet addressed all questions of society due to the heritage of the place that society has delivered to it, and for this, the historical contextualisation procures an overall comprehension of what has been done over the course of explicit situations and how this journey is confirmed with announcements as a fait accompli. In this way, pedagogy is localised in the area of conflict or field of study, between results, transmission and new developments. Such a sphere is where the human being has created herself and where science can set up a target for making progress.

When I started from the affirmation that knowledge can be transmitted, it included those formulations in the transmission of knowledge coming from the medical area, as well as from the interrelation of disciplines. I proposed to have a 'connecting point' based on the difficulties in handling the information produced in such a collaboration that is also inserted into the pedagogical discussion. Academic discussions must show that theoretical internal disparities from other disciplines and manifestation of perspectives are contemplated in pedagogy. Therefore, the quarrel about empirical pedagogy and applied psychology, such as regarding philosophical pedagogy and experimental psychology, forms a basis that holds the register of experiences and considers how to ground a proposal of alternatives on the composition of concepts. This means then to set a way to identify re-entry points on boundaries of concepts and continue to work with them according to proposed approaches under consideration.

5.3 Translation of languages is not pedagogical translation

This work has been written in English by Gerónimo-Cid, Eric Dan, MSc Psy as the intellectual content author and with the editing composition of the native US English speaker, proofreader, home educator, instructor and facilitator Jean Hall. By only means of two different languages, an encounter of a description of a reality clashes for making productive one version of these realities. This thesis is being written in the year 2018 at a time permeated by business language. Accordingly, the statements coming from an organisational psychologist in a philosophical educational realm lean towards the delivery of an outcome, prospectively towards the transfer into a practical output. The mere combination of two different languages does not compose an inquiry, nor does the complication of translation or of shoehorning concepts into another area complicate the process of arriving at a unified version of realities. The reality that this work has addressed should aim to be in the realm of pedagogy, or according to the vocabulary of this thesis: a reality composed by 'spheres of actions' coming from a pedagogical point of view. Thus far, the language employed for this thesis that comes from different viewpoints will remain situated in a general perspective of science, educational science, history and sociology of science. While my task is to write a work from the pedagogical side, it is immersed within the wide spectrum of all the fields of action. Hence, this work is not ready to be integrated into the pedagogical classification, nor into the classification of the other mentioned disciplines. However, it can serve as an outline of the new challenges that beckon new academic generations.

Considering that two realities can find a meeting point in one moment, an achievement of one of the parts that can translate and interpret writings from the German language into a foreign one rests on the movement of concepts in accordance with alternative contexts. This happens with the basis of the pedagogical translation that has been set forth throughout the work. The success of this fact can be in consequence a confirmation that the contribution of this work might develop further approaches of research. This must not mean that a translation from one or more languages into another conforms to a new reality as found in *automatic assumptions*.[511] Neither a translator, nor an algorithm that connects preferences or repetitive meanings, is comparable with the human action of translation during pedagogical orientation. This last one mentioned can be identified in the interaction of two persons, relating to the classic presentation of 'linear communication' as a pedagogical interest.[512] In this sense, a place that is occupied by every particular person can portray a process of Bildung or a process of transformation (see Rucker 2014), which can be confirmed by and connected to the existence of another individual. This case has also been situated several times when the subjects and their processes of transformation appeared within the process of reading, rejecting, analysing, composing and interacting with a reality while recognising the condition of another person inside. The subject as a commander of the process of transformation has showed that this is not isolated and is immersed within a complex situation of unforeseeable events. A subject in composition with an external reality would require a research approach that can be benefited by the formulation of inquiries in experimental areas. I set the experimentation as a possibility because the application would vary according to areas of research. Furthermore, experimentation needs to be considered as part of a whole process of making science.

Throughout the history of experimentation, any result has proven to be eternal. Beyond the foundations of research, this issue has been detected for its problematisation. It has been localised for its point of origin to be connected with a following approach of research. One enhancement that cannot be denied is the continuous growth of human sprawl. This will ensure an extension of our heritage into the future thanks to the mechanism of viability and beyond selection in a sense of natural evolution (von Glasersfeld 1980). It is true that we cannot know until the moment comes when the human being would arrive, but we have done enough to create consequences for our actions. This is a vital conclusion in any pedagogical writing since in pedagogy, the definition of the object of study is discussed, and therefore, it will bring benefits in the form of certainty that what we did yesterday is something to be read today. Nevertheless, much would be created that will make an impression, which would perhaps lead to a next motive and purpose or maybe to any sense at all. Here again, a subject appears whenever an individual should be present that would try to imply something. Perchance, that person would be successful in the dispatch of a message whenever several elements are taken into consideration. Offering recommendations about how to aim the delivery of information was not the goal of this work, but rather, to strive to describe the

[511] 'automatic assumptions' in a context of translation would challenge a position in terms of common sense, which cannot be taken as either *being* understandable in a moment when valid and contra valid statements from synthetic constructs are immersed or closely related to the starting of an idea next to a parallel action.

[512] 'Linear communication' can be indicative of another example of how pedagogy and other disciplines are being sought by a society that pursues concreteness.

individual involved in the translation – pedagogical translation – of scientific languages. Likewise, I did not aim to collect an analysis on the development of educational frameworks of German traditions but to make use of their reflections in order to contribute to the self-determination systematisation within an environment that I display in a concerted system. Theory of the knowledge of German traditions leaves us enough products for exploring new outcomes, but one of the results taken for this work relies on the own producer of the statements: the person.

As a fact, pedagogy has a relevant role in retaining the meaning of science, since its structure follows the systematisation of the academy but remains open to a public defined by alternative opinions. However, following the direction of the argumentation, pedagogy is not intending to establish a place for maintaining the idea of scholarly traditions, but the individual who invests a mindset of specific disciplines. This means, in other words, that the pedagogue is not someone devoted to preserving hidebound and restrained beliefs, but an individual who invests in a mindset of specific disciplines. Thence, positions of the sort open possibilities for being discussed in different manners and not granting only a unique one. In this way, when writing on the basis of research in educational science, as Anhalt (2009, p. 28) pointed out, innuendo attention to problems that were not previously recognised, the focus on solutions does not come before reflection[513]. Therefore, I take that the language of modern times as presently used in business must be approached with caution when handling scientific topics. Just the same, the 'capacity of carrying' concepts from one person into another field of action should be also taken with reserve. Despite the long time required for taking some concepts from one discipline into another, the translation of concepts should go through the allocated period, even when it could demand a lifetime engagement. Only in this way would the combination of situations with the portrayal of affected elements give sense to possible results in the own language of scientific cultures. Hence, the dynamic of subject-matters and actions within science reflect processes that demand patience, time and readiness to continue to speak about all these related items.

Educational science has been working hard to develop own terms from the inner circles (Tenorth 2000). This work has presented not only the dynamics, but some of the facts and their handling in different contexts that have created an influence on how to operate using educational terms, concepts and categories from the same pedagogical circle. In definite moments, educational science has changed and presented itself in moving onward to its own destiny. Hence, a meta-theoretical discussion emerges about how to work together with other traditions from one and many perspectives and identify a problem that can generate alternative solutions for collaborations. In consequence, theoretical knowledge can help itself to be sustainable, in the sense of portable and bearable to heads of other disciplines. Had a question not appeared regarding diagnosis from scientists who are also in touch with human beings, it would be more difficult to

[513] The suggestion established by Anhalt (2009) emphasised that the allusion to problems not previously recognised does not come before reflecting on the focus on solutions. I set a footnote to this point because despite the fact that the statement can be read with logical assumptions, it displays a basis on the premises of theory of knowledge that can be overseen after getting too involved in the practice or in the generality of a topic. This would lead the reader back to the difference between specialisation and integration of statements, which in a scientific systematisation is difficult to convey when the learner's opinion should be included.

give a place to a free decision supporting health,[514] for example, from the pedagogical side leaning towards and from inside biological topics. Constant problems coming from clinical encounters are required to be translatable every time a non-expert asks for a sign of hope that everything will get better. To this extent, I know that as scientists, we cannot suddenly change our speech to layman-prate and political messages; therefore, I mentioned previously the concept of prudence in this work.[515] In this sense, however, the idea of 'hope' is not only a political standard but a moment of awareness for what would come next. The moment of 'what comes next' has been managed as a connecting and conversational point for further analysis that can be linked within the theory construction. Effectively, as Anhalt (2009, p. 31) wrote: the employment of a concept without awareness of the development of a problem is a characteristic to regret from the scientific perspective. Hence, the description made by this work on the concept of diagnosis, in conjunction with the theoretical problems that it should defeat, helps to set elements of a context that should be remembered for finalising the integration of a concept in the exercise between theory and praxis. In this sense, not only concepts, previous and current existence, but their context and contexts are part of a complex situation.

For example, and in this manner, 'spheres of action' is not according to my knowledge a previously established word in pedagogy. However, and since spheres of action are to be located from the beginning in a second-order observation, they have been used to refer to the pedagogical thinking in the line of educational science. The discussion on the difference between pedagogy and educational science was not extended deeper within this work. This decision was taken based on the fact that it is part of the contextualisation that affects the theorisation and systematisation of the concepts, but at the same time, in order not to lose structure and focus in the development of diagnosis as a possible pedagogical concept. Nevertheless, references were given to account for the theoretical difference between pedagogy and educational science. Conclusively, the reader – the person's self – is the only one responsible to follow interests and initiated paths. An effort in favour of a systematisation was provided, which would stand once the curious learner is awoken.

5.4 Ancillary analyses

This work hails from the educational-historic-philosophic qualitative research procedures. With an extensive tradition in all the works that are products of these interrelations of perspectives, there is no easy standard to follow for making an analysis or report on analyses performed. Previous inquiries can yield experience in procedures under constant discussion to explicate the research documentation as well as the steps executed to earn an intellectual position. In terms of *multiplicity by reporting any other analyses performed* (Moher et al. 2001, p. 1192), from randomised controlled trials (RCTs) that portray a research process supported by health-care journals (ibid), I

[514] The extreme example for this matter speaks about the free will for ending the own existence (i.e. euthanasia). This work would not be able to address such a large and controversial topic as such. However, it needs to highlight that free will also exists under extreme circumstances, when it will be required. As such, this would represent an approach of research yet to be problematised in pedagogical terms.

[515] The concept of prudence was not problematised extensively within this work, and therefore, it appears as a point of connection for further analysis in later research.

identified that a purpose to enable the reader's understanding of complex research employs a compilation of other methods. Like this, a note on the order and accommodation of analyses ought to mention that in empirical researchers' reports (ibid) as well, a combination of methods is employed according to the requirements in stages. The openness to recognise that reporting results from complex designs needs improvement relies on the pursuit of transparency (ibid), which is an element additionally required in the effort to deal with certainty and uncertainty in study outcomes.

As a matter of fact, this thesis did not apply a methodology of controlled trials. Nevertheless, a work from educational science needs to highlight recommendations registered about the reflections advanced after the modifications made on ways to perform science. For example, the portrayal of the diagnostic procedure manifested a movement that during the 70s was limited to the assessment of students[516] and that more than thirty years later, during the first decade of the 2000s, has collected more arguments for figuring out that this procedure goes beyond a specific estimation and rather addresses a complex integration of interpretations. Specifically, when including the viewpoint of processes, for example, from a capacity of judgement according to a problematisation of cognitive processes and their acquisition of information (see Van Ophuysen & Lintorf 2009), ancillary analysis and more than one methodology of performed analysis appear to be *de rigueur*.

Due to the combination of methods, stages are arranged according to the determined purposes of how to achieve an adequate scientific project. The purpose of this research was not to make and to present a general analysis about what was modified in particular within the theoretical construction of pedagogy and educational science. Notwithstanding this alternative, educational science accounts for the evolution of theory development; hence, it is affected by the passage of time and questioning in other theories. In order to see the modifications made by the set of theories, the diagnosis concept borrows its theoretical background for problematising from an external perspective of all the methods and analyses that can be at a present moment interrelated. In the same way that several thinkers reach agreement and disagreement on the explanations for how to understand the world, the pedagogues assumed a responsibility for alertness regarding the modifications in the context.

For example, by handling the concept of diagnosis within the pedagogical framework, in one stage, the 'analysis concept' of diagnosis was localised, while in another stage, the 'analysis of meaning' upon the diagnosis concept and yet another comprised the literature analysis as I presented in the introduction of the work. During the workflow of the project, these kinds of analyses were performed simultaneously. Sometimes the emphasis was given to the development of the structure of the work, and at other times, the priority taken depended on the load-bearing capacity of the concepts. Hence, during the introduction, I mentioned the difference between the methods of collection and the methods of analysis employed. Nevertheless, within the conceptual framework of this research, the methods of analysis were problematised and explained. With such effort in

[516] Such a limitation can be explained in several scenarios. From the reflections of educational science, for example, this limitation has been part of the own analysis of how to diagnose the work of pedagogy throughout the passage of time (Tenorth 2000, pp. 265–266).

a procedural explanation, I directed attention to the self-organisation process from a theoretical construction that can be discussed upon the diagnosis concept. Astride the partition of methods, the evolution in theory development should not be taken for granted as one given reality that does not count the leaps from intellectual positions. In the case when the methods are not being differentiated in terms of their background from the juncture-points in disciplines whence they come, the appearance of research-artefacts would continue. This lack of differentiation creates a cause for impervious procedures that ironically awaken a strong belief for those who practice them – those who hope that what the computer shows them is a reliable result.

With that admission, I also mentioned that reduction finds itself face to face with the register of events in history once procedures that cannot be understood are identified. For example, the concept of diagnosis is strongly associated with medical practice without reference to the fact that many of the analytical concepts come from epistemological traditions. For the purpose of validating ‘diagnosis’ in the pedagogical realm, the independence of disciplinary traditions should be constantly taken into consideration. This would yield the positive consequence of not trying to reduce the correlations of procedures but to take knowledge and learn from each other using a common strategy.

6. Discussion on spheres of action and pedagogical diagnosis

Opening statements: The accountability of the reader to think about the spheres of action of medicine and psychology regarding the pedagogical diagnosis should be included as a part of the shaping of a situation with an individual. Pedagogical diagnosis itself as a construct can be included next to the individual. Pedagogical diagnosis cannot be a single concept in science since the language of a discipline encourages discussion on many missing points, supplemented by several perspectives. Moreover, the diagnosis concept itself relates to a proposal for collaborative opinions. To this extent, the pedagogical diagnosis cannot ignore the conceptualisation of the individual, and therefore, an option aims to build on scientific approaches associated with the individual's freedom.

Getting down to business, this is the moment not only to mention the achievements of this work, but also to start discussing the next step for the concepts outlined by this work and resulting from it. This must be done in terms of a discussion since the concepts of pedagogical diagnosis and sphere of action do not refer to absolute statements. Spheres of action as a space or universe of discourse set the precedent for speaking about the individual in connection with another person and the surroundings [spheres of action emerge while the pedagogical diagnosis as a system for explaining the reality of education takes place alongside the definition of the educational object]. For this, it was necessary to allow the entrance of the connection between theory and praxis and from the general to the particular outside the pedagogical context but with pedagogical intentions.[517] With this short summary of some related concepts found in this work, the reader is encouraged to assess whether the conclusion supports additional discussion, as O'Brien (2014) proposed to report on qualitative research (see Appendix 2, Item 18 in ibid). Accountability is given now to the reader for discussing the sphere of action of medicine and psychology in pedagogical diagnosis – perhaps the reader is a patient, an expert or a student, but without a doubt, a person who is willing to think about what is affected in return.

The description of the pedagogical action in pedagogical contexts has covered the requirements of previous researches and included reference to literature that has successfully shown the components of a pedagogical tact as an intention of developing another human being. Concerning the topic of questioning the educational object, the version of *truth* displayed by this work showed that facts are under construction and that to fix a pedagogical intention implies acting also according to a *sense-datum* (Moore 1977, pp. 57–59) of specific theoretical traditions. For example, an indispensable certainty to act upon another person deserves a structure of the condition of experts in order to provide attention to the maladies being oriented to the goal of *health services research.*[518] As far as an argument beyond the temporal reference is concerned, not a

[517] This connection depicted *in* and *out*side the pedagogical realm was achieved in the portrayal of the practical deed.

[518] 'Health services research' or *Versorgungsforschung* (as it is denoted in German language) speaks about an area of research where health and health care are placed within the health system. Due to the diversity of aims and research questions during the definition of goals for the application of tasks in

single case prohibits demeaning oneself based on a medical condition because the *tools of understanding* are the basis of the development of criteria, which in consequence can produce protocols – opening in parallel different options available for various treatments. This means that there is no way to prevent someone from conducting a search to alleviate or lighten personal pain; neither is it possible to stop someone from looking to get acquainted with new questions about the purpose of being alive. This also means that a current time has a prepared layout so that people can react and thus look beyond the collaborations. Consequently, the systematisation must be continued with the next idea.

In this order, I will try to concentrate mainly on the concept of perspectives with its further categorisations that come from the theory of complexity of education (Anhalt 2012) inside the pedagogical tradition. This is a first step that I am proposing for bringing categories created on the basis of a disciplinary work with pedagogy, sociology, philosophy and biology into the realm of educational science (see as a reference the work done by Anhalt, ibid). The complexity of the subject-matter endorsed by a medical doctor and pedagogue would be missing in the attempt to validate the diagnosis as a pedagogical concept. Until now, the concept of diagnosis has not been incorporated inside the pedagogical construction, and as a result, the pedagogical action thus far represents an opportunity for possible worlds of education when giving reasons why pedagogical action links two persons with a moral intention and self-reflective purpose[519] under a context of mutual understanding and recognition. This happens when pedagogical action is aligned with the problematisation of other components in pedagogy, as in the case of the proposed diagnosis concept by dint of the 'practical deed' and 'pedagogical translation' [in tandem with the establishment of spheres of action, pedagogical action also takes place]. In this vein, the discussion concerning the complex situation of the disciplinary collaboration among medicine, neurobiology, psychology and educational science must also first be validated in terms of the science of education by academic circles.[520] Due to the evolution of the subject-matters contemplated within the leeway created in this alliance, this dissertation can only manage to fasten attention on this collaboration and the elements that must be taken into consideration when writing a work from the psychological, neurobiological or medical viewpoint.

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caring for patients (Müller et al. 2010, p. 825), methodological guidelines are discussed to allow the assessment of proposals of protocols according to scientific standards (ibid, p. 835).

[519] As a reiterative statement, I need to connect that when taking two views on theory construction (e.g. internal and external), the external has its own rules and a historical tradition about how time passes with concrete – but complex – signs in the modifications of contexts. The external viewpoint provides ways to problematise interpretations about why a number has a constant value around the world, for example. Alternatively, an internal viewpoint can provide functions of the value that initiate a task of thinking and making calculations to bring balance to one equation. Since this work comes from the educational viewpoint regarding the transmission of knowledge, it signals that there are functions in the value of diagnosis that a collaborative work with experts on the medical action can take for their own responsibility. Educational science can provide tools for systematising the actions of scientists that can be aligned in knowledge delivery.

[520] Such a discussion that can be validated upon a disciplinary collaboration would take place outside and in parallel to a concerted system since it would come from an external place in the idea of a circuit of paths of notions that feed the information incorporated constantly within this loop. Accordingly, other studies upon hypothetical tracks of thinking should be extended.

While pursuing a description with origins in other perspectives, the concepts suggested in this work, like the spheres of action, pedagogical translation and the method of the circle of problem development (this last one as a method taken from the writings of Elmar Anhalt in 2012) should be and would necessarily be translated into the new possible order of disciplinary collaboration.[521] With the intent to avoid turning the circle of problem development (ibid) into a vicious circle of never-ending stories, this work started by marking specific historical signs that help to show indications of growth in the theoretical position of pedagogy. Pedagogy does not occupy the same place it occupied more than 200 years ago. Thus, problematisations on complex situations that allow discussion about the interchange between complex subject-matters with their contexts serve as an advantage in the endeavours to reaffirm the evolution of pedagogical thinking in parallel with the movement of scientific approaches of research. Explicitly spoken, the broadness handled by the findings of pedagogy burgeons in parallel to the discoveries of other disciplines in science.

To this last point, it is possible to wonder how to keep a 'disciplinary personality' or an 'own disciplinary identity'. This refers to the boundaries to other disciplines when looking for a common contribution but simultaneously expecting to have independence to continue speculating on further steps of progress that are required by society in general and not only by academic circles. As a matter of fact, in the current moment, the development of disciplinary own languages requires a process of transformation, which according to theoretical traditions allows different scopes of range in the theoretical flexibility or lack thereof. This means, in other words, that own languages cannot come simply from inside the self, or in the global overview of scientific collaboration, they cannot come from inside of own disciplines because they are in correlation with the surroundings. Own languages are to be composed in parallel to the delimitation of study contents and the reinforcing of the strengths that one expert can provide. However, within this work, the constant meeting point of positions was mentioned to foster argument on the collaboration of science and how this merger is dynamic as displayed within a concerted system for explaining and speculating on a reality of education.

6.1 Some statements regarding to limitations, implications and discussion

Nobody can say that within a disciplinary collaboration, one discipline has a greater value than another. Overtime, gaining a position of autonomy has to do in with unfolding theoretical approaches that belong to distinct thinking traditions, but which are still not fully recognised today. With an eye to validating different ways of understanding, alternative positions must confirm that they are possible. This means that the notion of a given reality must conform to the possibility of being set under inquiry within the terms of up-to date advances. Thus, one own language must remain open to languages of statements of different disciplines. This is not new in the pedagogical realm, but it is necessary to continue providing argumentation about how to do this and what is

[521] As I said above within the text, this would involve a work of knowledge distribution that requires endorsement, respectively participation, from experts of other disciplines. This backing points to the recognition of specialised science when open to a collaborative approach, which having said that it is no longer unitary should solve the conjunction between assumptions regarding integration and those regarding specialisation. Such recognition extends the idea that a position of specialisation is to be taken from its mechanism of selection related to others of viability and reduction.

necessary to keep in mind when integrating the viewpoints of positions (as in this work upon a concerted system from assumptions of spoken viewpoints).

Regarding this section of limitations, implications and discussion found in disciplines involved in recognising the condition of another person, the word *facts* must appear. Facts are supported and attached to logic, true definitions, common sense and time – as I discussed with the presentation of actions within the efforts of the *healing art* and offering solutions. By way of illustration, the inclusion of the concept of Bildung anticipated preventing a solipsism that could not escape a vicious circle. For this reason, I relied on a systematisation in the pedagogical realm that can yet be problematised and admits the relation of oneself with the surroundings. Thereby, I begin a journey with the collaboration of other experts who can read this work from their own domains and who can contribute with other internal discussions undertaken in the bio-psycho-social encounter. This whole chapter handles a discussion of a pedagogical proposal relating to the medical and psychological area. The limitations and implications are spoken according to possibilities and the development of other definitions.

Such an enrichment is suggested to take place within the development of young researchers that when in a formative stage can gain access to a likelihood of occurrences or prospects of irrationality when not considering other options within an academic framework. To this point, the position of paradoxical thinking must be accepted because vanquishing diseases through successful diagnoses and treatments represents an ocean of contradictions that neither the experts nor the affected people can completely control. To this posture of supremacy, history has shown that connoisseurs should go in search of alternatives. On a related note, the combination of perspectives reveals that uncertainties exist. Since, at the current time, we are immersed in an existence of immediate reaction and overwhelming information, we tend to look for control. As a consequence, one idea about what to do with this uncertainty is not to control it but to set it under methodological supervision.

6.1.1. Possibilities and development of other definitions

Thence, thanks to the discussions held throughout this work, the evolution of pedagogical thinking can be pondered. Nowadays, with the idea of parallel improvement of disciplines, considering that the questions do not point to never-ending stories or unsolvable conversations, it is possible to begin to ask questions about how the problematisation of research approaches has been conducted within neighbouring disciplines and alternative propositions from different traditions. This means to put on the brakes regarding posing a problem, in general but within an own discipline as well, or then to look for a formulation of an inquiry about the methodological tools with which disciplines started making progress with specific subject-matters. At least, educational science must pursue this kind of inquiry since, in the pedagogical realm, the potential of the person gives structure to necessary requirements for expanding this talent (Anhalt 1999, p. 245).

Thanks to the historical contextualisation of the sphere of action of educational science presented in this work, the facts connected to different moments in human history appeared in the identification of a subject-matter: the concept (as done, for example, based on the diagnosis and recognition concept). By speculating upon a process of a concept, some constructs yield assumptions regarding attitudes from an observation in

the second order. The process of diagnosis, for example, has different stages that can be gathered in a moment and can display how priorities should be taken. Furthermore, this process has an impact on a social expectation of what should be done and for what purpose it should be performed. This means that specialists do not diagnose with the aim of finding a universal cure but according to requirements presented in a context of maladies. In this way, a complex situation comes into sight for the greater good of staying healthy, in other words functional, [522] as a consequence of circumstances. [523] Within this delineation, the theoretical discussion on the individual claims a place where the extent of self-reflection can be included. The moment of self-reflection happens both from the side of the suffering person and from the expert who intends to give comfort – meaning that when self-reflection is within a systematisation, it portrays an order that should not be taken as the outcome of a theoretical discussion – but as an entrance to observe an exchange of the relations. Better said, it can complement one argumentation. In this way, diagnosis covers a moral need based on a reflective position that will connect to further environmental influences.[524]

The difference between the commonplace and the scientific construct deserves a higher expansion when retrieving a procedure for accomplishing ideas. The position of this work belongs where either common or integrative as well as specialised knowledge can be employed by the same figure: an individual. I want to leave the clear impression that from such a starting point, a range of systematisations will follow. Alongside this topic, another definition that will rely on connection is about the extent of clarifying a purpose [which can be gleaned from identifying specific tasks]. The word 'purpose' has marked a problem or connecting point of analysis. The execution of a pedagogical action portrays a pedagogical intention that can be problematised depending on the direction of an approach. Not all the directions proposed a purpose in themselves, at least not from the pedagogical side or from another side that can be expected once a perspective is assumed because the horizon of the individual must remain opened (this means, in other words, that from specialised positions, for example, the outcomes of an exercise of specialisation would target a specific point that can be counterintuitive or contra valid to a pedagogical intention. Despite an epistemological conflict, however, directions mark signs of distinctions that can provide an entry into approaches). For many of these courses, on different occasions and due to changeable internal dynamics of subject-matters as to the perspectives for handling them, a lack of purpose might be perceived. An absence of purpose only confirms that a reality is not predetermined or, in other words, that purposes are set (Anhalt 1999, p. 313). However, even when the situation involves a dearth of time or of sufficient information, decisions and actions must still be taken. This could be another point to consider in the contemporaneous scientific exercise and to be interpreted by the pedagogical action. Different to the position of the nominalists – about starting from zero with less consideration regarding what was done before, educational science can also be focused on the unavoidable consequences that

[522] As I mentioned within some chapters, specifically in the third chapter, 'functional' in terms of a reflective attitude.

[523] Healthy according to circumstances because what it means to be healthy in Europe must not be to be healthy in other countries since cultural beliefs are interrelated with previous traditions.

[524] The distance between the diagnosis concept and the proposal of a pedagogical diagnosis must continue to be problematised since the pedagogical intention on reading the related actions with this concept will support the interaction from the concept with the surroundings.

this way of acting would inflict on later generations. In this sense, purpose becomes only another tip of the iceberg requiring attention. 'Purpose' establishes a place for the definition of possibilities and development of further definitions.

In many forms, purpose can be located in different moments of the research's execution. Research portrays a process in which actions can be taken before, during and after its performance. To this aim, the concept of diagnosis points to actions, measurements and decisions taken after its realisation to heal a malady or diminish pain. This explicitly opens a door to understand and to pay attention to how to classify the actions that follow. Thus, the exercise of science does not stop with the development of procedures or application of methodologies; rather, this exercise is followed by the orientation towards the sense of a context created only after the delivery of outcomes. For good measure, science has formulated an own system of control. On the top of everything, the structure of science lends itself to accommodate reflections for a continuous definition of the contents of science and further actions upon them.

In the discussion of *prudence*, between *wisdom* and *conditions and means* (Dewey 1925, p. 52), *self-deception* (ibid) can problematise in consequence a way out towards the risk of solipsism that this work has sought to avoid as well. In a combination of prudence and purpose, the border of the never-ending story of illusory scientific paradigms is delimited and taken in consideration for points for the further connection of analysis. With the process of diagnosis, a moral purpose is integrated with a logical reconciliation[525] for obtaining a moment of certainty under uncertain conditions, which dictates that even more is possible. In it, suddenly the idea is no longer about one strong monistic reality that psychologists or any other discipline can control with statistics. Hence, alternatives for approaches must be sought after. As John Dewey (ibid, p. 49) detected from Aristotle, a pluralistic option would refer to a myriad of viewpoints. Such standpoints, when taken from their problematisation as perspectives in the theory of complexity of education (Anhalt 2012), ensure a theoretical access point to different ways of watching the world. In the way of watching the world, a pause is necessary, and hence, a pause would be another connecting point for further analysis by taking a pause outside of the moment of pedagogical translation.

Making a pause to analyse the condition of another person is an action that exerts the intention of recognising such a condition. Accordingly, a theoretical pause is not easy to reach. For this, previous foundations of premises that will always be respected must be set – to wit, having established theoretical rules and norms that must not be violated. These last mentioned are taken as guidelines of a way of proceeding; however, they must be constantly open to the evolution in time that modifies those premises that cease speaking from the context. One only definite core principle should not be violated: human freedom. Pedagogy across time has managed to sustain this basis. As this work has shown throughout, several theoretical streams of thinking can work on the reflection of the object of pedagogy at the same time rather than attempting to steer the problems of theoretical contrapositions and advances in science. In this same vein, at the end of writing this thesis, the concept of 'pause' was supposed for bringing light upon a further revision of theorists and in a later analysis about how they justify this space of rest.

[525] 'logical reconciliation' as an execution of an action ties together here the problematisation between means, conditions and wisdom by running a synthetic construct of opened possibilities.

Perhaps such a space is not justifiable in academic terms if it is regarded as a pause in a general action without reference, since it can be confused with the idea of ambiguity[526] or abstract content of not doing anything. Effectively, I am not calling upon a revival of philosophies with a purposeless view. I am rather directing attention to the maintenance of individual guarantees as the way to start an action. The pause has to be justified in its epistemological construction (see *Haltepunkte* in Anhalt 2012). Like this, not all times are accommodated in extending a long reflection about a set of foundations for making a pause. Sometimes, based on the liberty of starting at the most suitable point, the thinker must simply sit down and start writing. In this sense, a pause has the relevance of a moment of action with an intention [in this idea the intention marks a clear difference to a purpose]. By thinking on a pedagogical intention of understanding the reality of education, at this current point in time, pause portrays the discussions of science during the consideration of elements from different disciplines.

By taking into consideration that pause is only a moment, the theorisation of further actions is pending development in terms of 'pedagogical time'. As such, for example, to write 'brief discussions' for the achievement of an idea would be a next step to consider in the methodological approach to delimited 'spheres of action' where methods can be ample and not abbreviated. As I mentioned earlier, once the concept of 'spheres of action' can be extended by the discussion coming from other disciplines, then these 'brief discussion' can turn to explain the employment of tables and figures that have access to a wider problematisation in applied and specific topics. Most of the time, these spoken tables and figures make sense only to a community of scientists within a specific culture that without any other reference can comprehend what the next steps to follow may be.

6.1.2. Bottom line for further statements regarding the diagnosis concept

The diagnosis concept comprises several orders of different disciplines. I explicitly repeat that, from the pedagogical side, a possible systematisation that is employed can be divided according to the complexity of the situation and the complexity of the subject-matter (in line with the theory of complexity of education of Elmar Anhalt 2012). However, this systematisation cannot be immediately translated into the terms of the diagnosis concept or from the internal dynamic of diagnosis to accommodate its elements, components and implications according to the systematisation of the complexity of education. The disciplinary collaboration should be taken as an object of the educational side, as a concerted system, for example, in order to extend its effects upon the relation of two persons. 'Concerted system' as an object in theory of systems in theory of complexity of education, as for instance to further problematised its construction. Nevertheless, a disciplinary collaboration is not the only access for speaking about the influence among people when pursuing the development of a next

[526] From the philosophical tradition, *unambiguous* (Carnap 1996, p. 73) content is used when it has lack of systematisation (in specific terms of Carnap, when it is not synthetic or when it has gone through a process of transformation via the employment of 'logical syntax'). To this respect, 'pause' is not culminated yet, and hence, I place this notion in the section for the possibility of development of other definitions. As a matter of fact, 'pause' would be integrated within a whole systematisation during the recognition of another person. Thus, this notion can bring a connection with specific elements of other theories within educational science.

moment among generations. By accepting several access points, other systems can be generated outside the concerted system using the speculative method.

As I have traced the development of why the diagnosis concept appears to be required within a situation, disciplinary collaboration is only one feature associated with the internal dynamics that a subject-matter presents. The diagnosis concept in itself is an access point for revealing different processes and clashes of positions. The identification of the process of diagnosis then serves as a starting point for taking the related elements that have to be considered with an object of educational science. Thus, the process of diagnosis is also to be taught. Consequently, in a discrete process of teaching and learning how to diagnose, the experts in the fields that are related to the certainties of propositions to be done are in a position to lead an achievement outside rigid knowledge. In this content, as has been manifested by this work, concepts like that of diagnosis of the interrelation of a common good are to be problematised with the specificity of the actions along with that the particularity of those who performed and received the consequences of these actions. For this, further problematisations must be innovative in thinking about the combination of methods or speculating on the outcome of what would happen when inserting a concept into an old discussion or updating constructs into new contexts. I refer to the use of the word 'innovative' as it trends to profound and serious. Hence, deep and serious thinking will be required in the portrayal of conceptual contents, for example, as in the link between the physical world and the potential of the individual (i.e. in the physicality of Bildsamkeit).

'Physicality of Bildsamkeit' refers to one discussion that this work has constantly handled in terms regarding how to explain the hyper-specialisations of some contents or parts of content of disciplines in light of disciplinary collaboration from assumptions regarding unity. My position is that in the external perspective of the observation of a problem, scientists can turn to look at themselves. Therefrom, individuals are included within the system. With this action, they will discover – including myself in this action – and ergo, we will make it clear to ourselves that there are a myriad of effects and characteristics that were invisible to us. I have stated constantly that I am at the entrance of a theoretical building that I cannot reproduce on my own. Certainly, there will be at other times another group of scientists who will be capable of accessing a bigger infrastructure of science in aiming to exert a change on other spheres of actions that might even come from other disciplines and not only pedagogy. The irony in this last statement relies on the intention of developing an own language, which takes the form of looking for the construction in other disciplines because, by dint of pedagogical premises, the own language is exerted in the combination of opinions. I will continue my academic life, and perhaps I might be lucky enough to belong to this hypothetical group of emergent scientists. At this point in time, I confirm that there is a partition in approaches of research that should be targeted to be problematised by the same representatives from fields. On a daily basis, many of these members of the academy are dealing with ways of proposing solutions to the shelf of information that thrusts us into questions of inquiry – when suddenly, the occurrence of forgetting what we were looking for appears: *Oh, I was looking for Kant, but Anhalt comes first on my directory…*

References

- *AAE, Abteilungskolloquium der Allgemeine und Historische Erziehungswissenschaft* (2016, 2017, 2018). Universität Bern. Persönliches Notizenbuch. Institut für Erziehungswissenschaft.
- accelopment. (2017). Early Stage Researcher (ERS) explained. Retrieved from http://www.accelopment.com/blog/early-stage-researcher-esr-explained-0 [17.10.2017]
- Anhalt, E. (2017a). Vorlesung 9. II.2 Starke Persönlichkeiten in komplexen Gesellschaften II. In *Vorlesung „Bildung und Nachhaltigkeit: Starke Persönlichkeiten in komplexen Gesellschaften" am 5. Mai 2017*. Bern: Institut für Erziehungswissenschaft.
- Anhalt, E. (2017b). *Bildung und Nachhaltigkeit. Starke Persönlichkeiten in komplexen Gesellschaften* (Unveröffentlichtes Manuskript). Bern: Institut für Erziehungswissenschaft, Abteilung Allgemeine und Historische Erziehungswissenschaft, Universität Bern.
- Anhalt, E. (2017c). Vorlesung 11. II.4 Vortrag: Prof. Dr. Volker Kraft (Christian-Albert-Universität zu Kiel): ›Zeitgeist und Erziehung‹. In *Vorlesung „Bildung und Nachhaltigkeit: Starke Persönlichkeiten in komplexen Gesellschaften" am 19. Mai 2017*. Bern: Institut für Erziehungswissenschaft.
- Anhalt, E. (2012). *Komplexität der Erziehung. Geisteswissenschaft – Modelltheorie – Differenztheorie.* Bad Heilbrunn: Julius Klinkhardt.
- Anhalt, E. (2011). Bildsamkeit / Erziehungsbedürftigkeit. In: Sandfuchs, U. et al. (Hrsg.), *Handbuch Erziehung* (pp. 124–131). Bad Heilbrunn.
- Anhalt, E. (2010). »Haltepunkte«. Zur Funktion der Problemgenerierung bei Whitehead, Cassirer, Piaget und Herbart. In Fetz, R. L.; Seidenfuß, B.; Ullrich, S. (Hg.), *Whitehead, Cassirer, Piaget. Unterwegs zu einem neuen Denken* (pp. 87–131) München: Freiburg i.Br.
- Anhalt, E. (2009). Gibt es einen Lernenbegriff der Pädagogik? In Strobel-Eisele, G. und Wacker, A. (hrsg.), *Konzepte des Lernens in der Erziehungswissenschaft* (pp. 18–44). Bad Heilbrunn: Julius Klinkhardt.
- Anhalt, E. (2007). Erziehungswissenschaft als Reflexion auf die Komplexität der Erziehung. In Kraft, V. (Hrsg.): *Zwischen Reflexion, Funktion und Leistung: Facetten der Erziehungswissenschaft. Beiträge zur Theorie und Geschichte der Erziehungswissenschaft (Bd. 27)* (pp. 101–124). Bad Heilbrunn.
- Anhalt, E. (2003). Grundlagen des Konstruktivismus. In *1. Vortrag, gehalten auf der Fachleitertagung „Bedeutung des Konstruktivismus für den Pädagogikunterricht" am 25. März 2003*. Krefeld, Leitung: E. Knöpfel u. B. Geyer.
- Anhalt, E. (1999). *Bildsamkeit und Selbstorganisation. Johann Friedrich Herbarts Konzept der Bildsamkeit als Grundlage für eine pädagogische Theorie der Selbstorganisation organismischer Aktivität.* Weinheim: Deutscher Studien Verlag.
- Ansari, D.; Coch, D. (2006). Bridges over troubled waters: education and cognitive neuroscience. *TRENDS in Cognitive Sciences*, 10(4), 146–151.
- Apostel, L.; et al. (1970). *Interdisciplinarity. Problems of teaching and research in universities*.
- Arbabi, M.; et al. (2013). High frequency TMS for the management of Borderline Personality Disorder: A case report. *Asian Journal of Psychiatry 6*, 614–617.
- Auenbrugger, L (1912). Neue Erfindung, mittelst des Anschlagens an den Brustkorb, als eines Zeichens, verborgene Brustkrankheiten zu entdecken (1761). In Sudhoff, K. (Hrsg.), *Klassiker der Medizin. Bd. 15* (p. 3-44). Leipzig: Johann Ambrosius Barth.

- Aurenque, D.; Friedrich, O. (Hrsg.) (2014). *Medizin und Philosophie. Bd. 11: Medizinphilosophie oder philosophische Medizin? Philosophisch-ethische Beiträge zu Herausforderungen technisierter Medizin*. Lepizig: frommann-holzboog.
- Bachelard, G. (1978). *Die Philosophie des Nein. Versuch einer Philosophie des neuen wissenschaftlichen Geistes*. Wiesbaden: B. Heymann.
- Bachelard, G. (1971). *A Epistemologia*. Lisboa: Edições 70.
- Bachelard, G. (1966). Le rationalisme appliqué (3e ed.). Paris: PUF (Presses Universitaires de France).
- Balsiger, P. W. (2005). *Transdisziplinarität*. München: Wilhelm Fink Verlag.
- Barker, A.; Freeston, I.; Jalinous, R.; Jarrat J. (1985). Non-invasive magnetic stimulation of the human motor cortex. *Lancet, 2*, 1106–1107.
- Bates, J.; Best, P.; McQuilkin, J.; & Taylor, B. (2016). Will Web Search Engines Replace Bibliographic Databases in the Systematic Identification of Research? *Journal of Academic Librarianship*. doi: 10.1016/j.acalib.2016.11.003
- Battro, A. M.; Fischer, K. W.; Léna, P. J. (2008). *The educated brain. Essays in Neuroeducation.* New York : Cambridge University Press.
- Becker, N. (2006). *Die neurowissenschaftliche Herausforderung der Pädagogik.* Kempten: Julius Klinkhardt.
- Beckmann, M. (2009). Diagnosen der Moderne: North, Luhmann und mögliche Folgerungen für das Rational-Choice-Forschungsprogramm. In Pies, I.; Leschke, M. (Hrsg.), *Douglass Norths ökonomische Theorie der Geschichte*, (48–56). Tübingen: Mohr Siebeck.
- Benner, D. (2001). *Allgemeine Pädagogik. Eine systematisch-problem-geschichtliche Einführung in die Grundstruktur pädagogischen Denkens und Handelns.* Germany: Juventa Verlag.
- Benner, D.; Brüggen, F. (2000). Theorien der Erziehungswissenschaft im 20. Jahrhundert. Entwicklungsprobleme - Paradigmen – Aussichten. In Benner, D.; Tenorth, H-E. (Hrsg.), *Bildungsprozesse und Erziehungsverhältnisse im 20.Jahrhundert. Weinheim,* (240–263). Beltz.
- Benner, D. (1991). *Hauptströmungen der Erziehungswissenschaft. Eine Systematik traditioneller und moderner Theorien* (3., verbesserte Auflage). Weinheim: Deutscher Studien Verlag.
- Berger, H. (1929). Über das Elektrenkephalogramm des Menschen [I. Mitteilung]. *Archiv für Psychiatrie 87*, 527–570.
- Best, P.; Taylor, B.; Manktelow, R.; McQuilkin, J. (2014). Systematically retrieving research in the digital age: Case study on the topic of social networking sites and young people's mental health. *Journal of Information Science, 40(3)*: 346–356. doi: 10.1177/0165551514521936
- Blankertz, H. (1982). *Die Geschichte der Pädagogik. Von der Aufklärung bis zur Gegenwart.* Wetzlar: Verlag Büchse.
- Block, N. (2007). *Consciousness, Function, and Representation.* Cambridge: MIT Press.
- Brezinka, W. (1992). *Philosophy of Educational Knowledge. An Introduction to Foundations of Science of Education, Philosophy of Education and Practical Pedagogics*. Munich, Basel: Ernst Reinhardt Verlag.
- Brezinka, W. (1978). *Metatheorie der Erziehung. Eine Einführung in die Grundlagen der Erziehungswissenschaft, der Philosophie der Erziehung und der Praktischen Pädagogik*. München: Ernst Reinhardt Verlag.
- Brüggen, F. (2009). Bildsamkeit und Mündigkeit als pädagogische Grundbegriffe. *Pädagogik Unterricht 2/3*, 4-11.
- Borck, C. (2016). *Medizinphilosophie zur Einführung*. Hamburg: Junius Verlag GmbH.

- Borck, C. (2008). Recording the Brain at Work: The Visible, the Readable, and the Invisible in Electroencephalography. *Journal of the history of the neurosciences, 17*, 367–379. doi: 10.1080/09647040701348332
- Borck, C. (2005). *Hirnströme. Eine Kulturgeschichte der Elektroenzephalographie*. Göttingen: Wallstein Verlag.
- Borck, C. (2005b). Writing Brains: Tracing the Psyche With the Graphical Method. *History of Psychology, 8, 1*, 79 –94
- Böhm, W. (2011). *Theorie und Praxis. Eine Einführung in das pädagogische Grundproblem*. Würzburg: Königshausen & Neumann.
- Böhm, W. (2004). *Geschichte der Pädagogik. Von Platon bis zur Gegenwart*. München: C.H. Beck.
- Bruford, W. (1975). *The German Tradition of Self-Cultivation. 'Bildung' from Humboldt to Thomas Mann*. Cambridge University Press: Great Britain.
- Bueb, B. (2008). *Von der Pflicht zu führen: neun Gebote der Bildung* (pp. 34-87). Berlin: Ulstein.
- Calfee, R. C.; Greitz Miller, R.; Norman, K.; Wilson, K., Trainin, G. (2006). Learning to Do Educational Research. In Constas, M. A., Sternberg, R. J. (ed.), *Translating Theory and Research Into Educational Practice. Developments in Content Domains, Large-Scale Reform, and Intellectual Capacity* (77–104). Mahwah, New Jersey and London: Lawrence Erlbaum Associates, Publishers.
- Calvo Muñoz, C. (2012). *Del mapa escolar al territorio educativo. Disoñando la escuela desde la educación.* Chile: Editorial Universidad de la Serena.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin Company.
- Carnap, R. (1996). *Philosophy and Logical Syntax* (1935). Thoemmes Press: England.
- Carrier, M. (2007). Wege der Wissenschaftsphilosophie im 20. Jahrhundert. In Bartels, A., Stöckler, M. (Hrsg.), *Wissenschaftstheorie* (15–44). Paderborn: mentis Verlag GmbH.
- Castañeda, C. (1995). *Las enseñanzas de Don Juan (23a reimpr.)*. Fondo de Cultura Económica.
- Castellón Gort, C. M. (2017). *Jamaican Talk: English / Creole Codeswitching in Reggae Songs.* Universidad de Valladolid: Facultad de filosofía y letras. Departamento de filología inglesa.
- Chimisso, C. (2001). *Gaston Bachelard. Critic of Science and the Imagination.* London: Routledge.
- Clarke, J. A. (2009). Fichte and Hegel on Recognition. *British Journal for the History of Philosophy, 17, 2*, 365–385. doi: 10.1080/09608780902761745
- Clausen, J., Fetz, E., Donoghue, J., Ushiba, J., Spörhase, U., Chandler, J., Soekadar S. R. (2017). Help, hope, and hype: Ethical dimensions of neuroprosthetics. *Science, 356*(6345), 1338–1339.
- *CONACyT, Fondo I015B. Consejo Nacional de Ciencia y Tecnología, Solicitud de fondos* (2014). Sistema de Fondos. Programa Institucional: Maestría en Investigación Médica Línea terminal Biomedicina y nueva Maestría en Neurometabolismo y Cognición. Propuesta Convocatoria: INFR-2014-02. Modalidad INFC1.
- Coopersmith, S. (1969). Paper *Educational Strategies, Learning Characteristics, Motivation, Peer Acceptance, Psychological Characteristics, Psychological Needs, Psychological Studies, Reinforcement, Self Concept, Self Esteem, Self Reward, Stress Variables on February 6.* Los Angeles, California: AERA.
- Cooter, R., & Stein, C. (2016). *The history of medicine*. London and New York: Routledge.

- Cubelli, R. (2009). Theories on mind, not on brain, are relevant for education. *Elsevier Cortex*, 45, 562-564.
- Dahl, L.; Raz, A. (2019). "Backed by neuroscience": How brain imaging sells. In Raz, A.; Thibault, T. (Ed.). *Casting Light on the Dark Side of Brain Imaging* (pp. 177–131). UK and USA: Academic Press.
- Dahlstrom, M. F. (2014). Using narrative and storytelling to communicate science with nonexpert audiences. PNAS, 111 (4): 13614–13620.
- Deeley, J. N. (2001). *Toronto studies in semiotics: Four ages of understanding. The first postmodern survey of philosophy from ancient times to the turn of the twenty-first century*. Toronto: University of Toronto Press.
- Dewey, J. (1925). *Experience and nature*. London: Open Court.
- Dietrich, C., Krinninger, D., Schubert, V. (2013). *Einführung in die ästetische Bildung*. Weinheim und Basel: Belz Juventa
- Dilthey, W. (2002). Grundlinien eines Systems der Pädagogik und Über die Möglichkeit einer allgemeingültigen pädagogischen Wissenschaft. In D.-J. Löwisch, Wilhelm Dilthey. *Werkinterpretationen pädagogischer Klassiker.* Darmstadt: Wissenschaftliche Buchgesellschaft.
- Ditton, H.; Eckert, Th.; Tarnai, Ch.; von Saldern, M.; Wellenreuther, M. (2010). Empirische Methoden. In Jäger, R. S.; et al. (Hrsg.), *Empirische Pädagogik 1990–2010. Eine Bestandsaufnahme der Forschung in der Bundesrepublik Deutschland. Band 1: Grundlegende empirische pädagogische Forschung* (pp. 7–47). Landau: Verlag Empirische Pädagogik.
- Djulbegovic, B., Hozo, I., and Greenland, S. (2011). Uncertainty in clinical practice. In Gifford, F. (ed.), *Handbook of the Philosophy of Science. Volume 16. Philosophy of Medicine*. Oxford: Elsevier B.V.
- Djulbegovic, B. (2011b). Uncertainty and Equipoise: At Interplay Between Epistemology, Decision-Making and Ethics. *Author Manuscript; available in PMC 2012*, 1–14.
- Döscher, D.; Kuhr, H-J., Ziegenspeck, J. (1977) *Pädagogische Diagnostik*. Duisburg: Verlag für pädagogische Dokumentation.
- Eibl, K. (1991). Zurück zu Darwin. Bausteine zur historischen Funktionsbestimmung von Dichtung. In Titzmann (Ed.), *Modelle des literarischen Strukturwandels* (pp. 347–366). Tübingen: Max Niemeyer.
- Espino Torres, D. M. (2015). *Del istmo de Tehuantepec a Baja California: experiencia migratoria y la reconstrucción de pertenencia en familias zapotecas en Ensenada*. Centro de investigaciones y estudios superiores en antropología social. Unidad Golfo.
- Faro, S. H., Mohamed, F. B. (2010). *BOLD fMRI. A guide to Functional Imaging for Neuroscientists*. Dordrecht Heidelberg London New York: Springer.
- Fetz, E. E. (1969). Operant conditioning of cortical unit activity. *Science*, 163 (3870), 955–958.
- Feyerabend, P. (1993). *Against the Method* (3rd ed.). London: Verso.
- Fisher, R.; et al. (2017). Instruction manual for the ILAE 2017 operational classification of seizure types. *Epilepsia*, 58 (4), 531–542; doi: 10.1111/epi.13671
- Fillipi, M. (ed.) (2009). *fMRI Techniques and Protocols*. Dordrecht Heidelberg London New York: Humana Press.
- Flitner, W. (1950). *Allgemeine Pädagogik* (pp. 13-23). Stuttgart: Ernst Klett.
- Forster, O. (2016). *Analysis 1. Differential- und Integralrechnung einer Veränderlichen*. 12 Auflage. Deutschland: Springer Spektrum.
- Freidson, E.; Rohde, J. J.; Schoene, W. (1979). *Der Aerztestand.* Stuttgart: Ferdinand Enke Verlag.

- Fuchs, Th. (2012). Are Mental Illnesses Diseases of the Brain? In S. Choudhury, J. Slaby (eds.) *Critical Neuroscience: A Handbook of the Social and Cultural Contexts of Neuroscience* (331-344). Wiley-Blackwell.
- Fuchs, Th. (2008). *Das Gehirn – ein Beziehungsorgan. Eine phänomenologisch-ökologische Konzeption*. Stuttgart: W. Kohlhammer Verlag.
- Gerónimo-Cid, E.D. (2017b). *Problem of Translation between Science and Social Studies in Theory and Practice Using the Example of the Concept of Consciousness*. Manuscript submitted for publication.
- Gerónimo-Cid, E.D. (2017c). *Unterkomplexität von (Heil-)Pädagogik – Kann der Anschluss an die Neurowissenschaft gewährleistet werden?* Manuscript submitted for publication.
- Gerónimo-Cid, E. D. (2016). *Summary of the report of the work of interviews and data collection of the Clinic of the Nervous System (CSN –from its abbreviation in Spanish) V.1.1.* Querétaro: Universidad Autónoma de Querétaro, Department of Medicine.
- Gifford, F. (2011). *Handbook of the Philosophy of Science. Volume 16. Philosophy of Medicine*. Oxford: Elsevier B.V.
- González Chávez, A.; Lavalle, González, F.; Ríos González, J. J. (2004). *Síndrome Metabólico y Enfermedad Cardiovascular. Intolerancia a la glucosa, diabetes tipo 2, hipertensión arterial, obesidad, dislipidemia y resistencia a la insulina. Criterios clínicos aplicables a la práctica médica*. México: Intersistemas.
- Görnitz, T. (2017). Quantum Theory and the Nature of Consciousness. *Springer*. doi: 10.1007/s10699-017-9536-9
- Görnitz, T. & Görnitz, B. (2016). *Von der Quantenphysik zum Bewusstsein*. Berlin Heidelberg: Springer.
- Grzesik, J. (2010). Welchen Erkenntnisgewinn kann die Neuropsychologie für den Prozess der erzieherischen Beeinflussung erzielen? In Schlüter, S.; Langewand, A. (Hrsg.). *Neurobiologie und Erziehungswissenschaft. Die neueren Konjunkturen pädagogischer Wissenschaftsforschung aus historischer und systematischer Perspektive* (pp. 151–185). Bad Heilbrunn: Klinkhardt.
- Grzesik, J. (2002). *Operative Lerntheorie. Neurobiologie und Psychologie der Entwicklung des Menschen durch Selbstveränderung*. Bad Heilbrunn: Julius Klinkhardt.
- Gross, R. (1969). *Medizinische Diagnostik – Grundlagen und Praxis*. Berlin/Heidelberg: Springer-Verlag.
- Gudjons, H. (2010). *Pädagogisches Grundwissen. Überblick – Kompendium – Studienbuch* (pp. 19-54). Bad Heilbrunn: Klinkhardt.
- Günther, G. (2005). *Das Janusgesicht der Dialektik*. Retrieved from http://www.vordenker.de/ggphilosophy/gg_janusgesicht.pdf [15.11.2017]
- Hagner, M. (2008). *Homo cerebralis. Der Wandel vom Seelenorgan zum Gehirn*. Frankfurt am Main: Suhrkamp Verlag.
- Hegel, G. W. F.; Miller, A.V.; Findlay, J. N. (1977). *Phenomenology of spirit*. Oxford: University Press.
- Hegel, G. W. F. & Lasson, G. (1968 [1923]). *Vorlesungen über die Philosophie der Weltgeschichte.* Hamburg: Felix Meiner.
- Hegel, G. W. F. & Lasson, G. (1962a [1928]). *Differenz des Fichte'schen und Schelling'schen Systems der Philosophie*. Hamburg: Felix Meiner.
- Hegel, G. W. F. & Lasson, G. (1962b [1928]). *Glauben und Wissen oder die Reflexionsphilosophie der Subjektivität in der Vollständigkeit ihrer Formen als Kantische, Jacobische und Fichtesche Philosophie*. Hamburg: Felix Meiner.
- Hegel, G. W. F. & Lasson, G. (1907). *Georg Wilhelm Friedrich Hegels Phänomenologie des Geistes* (Jubiläumsausg. / in revidiertem Text hrsg. und mit einer Einl. vers. von Georg Lasson.). Leipzig: Verlag von Felix Meiner.

- Heid, H. (2015). Gerechte Bildung in einer heterogenen Gesellschaft? *Inklusion/Integration. Ringvorlesung*. Institut für Erziehungswissenschaft, Universität Bern. 18.10.2015. Vortrag.
- Helm, L., Tenorth, H-E., Horn, K-P., Keiner, E. (1993). Autonomie und Heteronomie – Erziehungswissenschaft in Frankreich und Deutschland. In Schriewer, J., Keiner, E., Charle, Ch. (Hrsg.), *Sozialer Raum und akademische Kulturen. Studien zur europäischen Hochsul- und Wissenschaftsgeschichte im 19. und 20. Jahrhundert. A la recherche de l'espace universitaire européen. Etudes sur l'enseignement supérieur aux XIXe et XXe siècles* (pp. 251–275). Frankfurt am Main: Peter Lang GmbH.
- Herbart, J. F. (1835). Umriss Paedagogischer Vorlesungen. 1835 u. 1841. *Sämtliche Werke. In Chronologischer Reihenfolge Herausgegeben von Karl Kehrbach und Otto Flügel*. *Band VI*. Darmstadt: Ed. Scientia Verlag AALEN, 1989 (1902).
- Herbart, J. F. (1824). Psychologie als Wissenschaft, neu gegründet auf Erfahrung, Metaphysik und Mathematik. Erster syntethischer Theil. In *Sämtliche Werke. (Bd V., S. 189–514), herausgegeben von Kehrbach, K. und Hartenstein, G*. Königsberg: A. W. Unzer.
- Herzog, M., Kammer, T., Scharnowski, F. (2016). Time Slices: What Is the Duration of a Percept? *PLoS Biol 14(4)*: e1002433. doi:10.1371/ journal.pbio.1002433
- Herzog, M.; et al. (2007). Consciousness & the small network argument. *Neural Networks 20*, 1054–1056.
- Hillmann, K., & Hartfiel, G. (1994). *Wörterbuch der Soziologie* (4., überarb. und erg. Aufl.). Stuttgart: Kröner.
- Hochberg L. R.; et al. (2006). Neural ensemble control of prosthetic devices by a human with tetraplegia. *Nature,* 442, 164–171.
- Hoyningen-Huene, P. (2007). Reduktion und Emergenz. In Bartels, A., Stöckler, M. (Hrsg.), *Wissenschaftstheorie* (177–197). Paderborn: mentis Verlag GmbH.
- Hoyningen-Huene, P. (1993). *Reconstructing Scientific Revolutions. Thomas S. Kuhn's Philosophy of Science*. Chicago & London: The Universtiy of Chicago Press.
- Hopf, D. (1980). Pädagogische Diagnostik. *Postprints der Universität Potsdam,102,* 896-919.
- Hörster, R. (2002). Pädagogisches Handeln. In Krüger, H-H.; Helsper, W. (Hrsg.). *Einführung in Grundbegriffe und Grundfragen der Erziehungswissenschaft. 7., durchgesehene und aktualisierte Auflage* (pp. 35-42). Opladen: Verlag Barbara Budrich/ Opladen & Farmington Hills.
- Hufeland, C. W. (1839). *Enchiridion medicum oder Anleitung zur medic. Praxis*. St. Gallen: 2. Aufl. Litteratur Comptoir.
- Ingenkamp, K. (1997). *Lehrbuch der Pädagogischen Diagnostik. Studienausgabe*. Weinheim und Basel: Beltz Verlag.
- Ingenkamp, K., Jäger, R. S., Petillon, H., Wolf, B. (Hrsg.) (1992). *Empirische Pädagogik 1970-1990. Eine Bestandsaufnahme der Forschung in der Bundesrepublik Deutschland. Band I*. Weinheim: Deutscher Studien Verlag.
- Ingenkamp, K. (1976). *Die Fragwürdigkeit der Zensurengebung*. Weinheim und Basel: Beltz.
- Irblich, D.; Renner, G. (Hrsg.) (2009). *Diagnostik in der Klinischen Kinderpsychologie. Die ersten sieben Lebensjahre*. Göttingen: Hogrefe.
- Iwers-Stelljes, T. (2008). *Gelassen und handlungsfähig. Das Qualifizierungsmodul Integrative Introvisionsberatung (QUIB) zum Erwerb von Selbst- und Sozialkompetenz im Pädagogikstudium*. Bad Heilbrunn: Julius Klinkhardt.
- Jäger, R. S.; et al. (2010). Pädagogische Diagnostik. In Jäger, R. S.; et al. (Hrsg.), *Empirische Pädagogik 1990–2010. Eine Bestandsaufnahme der Forschung in der*

Bundesrepublik Deutschland. Band 1: Grundlegende empirische pädagogische Forschung (pp. 49–88). Landau: Verlag Empirische Pädagogik.
- Jäger, R. S., Frey, A.; Wosnitza, M.; Flor, D. (2001). Pädagogische Diagnostik. In Roth, L. (Hrsg.). *Pädagogik. Handbuch für Studium und Praxis* (pp. 848–872). München: Oldenbourg.
- Jungert, M. (2010). *Interdisziplinarität. Theorie, Praxis, Probleme.* Darmstadt: WBG.
- Katz, Y. (2013). Against storytelling of scientific results. *Nature Methods*, 10 (11): 1045–1046.
- Keiner, E. (1999). *Erziehungswissenschaft 1947–1990. Eine empirische und vergleichende Untersuchung zur kommunikativen Praxis einer Disziplin*. Weinheim: Deutscher Studien Verlag.
- Klattenhoff, K. (Hrsg.) (2004). *Zum aktuellen Erbe Herbarts. Ein Klassiker der Pädagogik nach der Jahrtausendwende*. Oldenburg: BIS.
- Klauer, K. J. (Hrsg.) (1978). *Handbuch der Pädagogischen Diagnostik. Band 1*. Düsseldorf: Pädagogischer Verlag Schwann.
- Kleber, E. W. (1992). *Diagnostik in pädagogischen Handlungsfeldern. Einführung in Bewertung, Beurteilung, Diagnose und Evaluation*. Weinheim und München: Juventa.
- Knauer, K. (1994). *Diagnostik im pädagogischen Prozess. Eine didaktisch-diagnostische Handreichung für den Fachlehrer.* Frankfurt am Main: Peter Lang GmBH.
- Kneisler, T. (2015). *Piaget in der Erziehungswissenschaft. Eine wissenschaftshistorische und wissenschaftstheoretische Bilanzierung*. München: Julius Klinkhardt.
- Knorr-Cetina, K. (2003). *Epistemic Cultures. How the Sciences Make Knowledge.* Cambridge, Massachusetts: Harvard University Press.
- Koch, R. (1920). *Die ärztliche Diagnose. Beitrag zur Kenntnis des ärztlichen Denkens* (2. neu. bearb. Aufl.). Wiesbaden: Bergmann.
- Koller, H-C. (2011). The Research of Transformational Education Processes: exemplary considerations on the relation of the philosophy of education and educational research. *European Educational Research Journal, 10, 3*, 375–382.
- Koller, H-C. (2009). Der klassische Bildungsbegriff und seine Bedeutung für die Bildungsforschung. In Wigger, L. (Hrsg.). *Wie ist Bildung möglich?* (pp. 34–51). Bad Heilbrunn: Julius Klinkhardt.
- Kopp, D.; Minder, B.; Horn, M. (2017). *Systematisch recherchieren. Workshop Wissenschaftliche Literatur*. Presentation taken during the course of lectures "Wissenschaftliche Literatur – von der Recherche zur Publikation". Workshop der Strategie 2021 zur Nachwuchsförderung des Kursprogramms Überfachliche Kompetenzen given by Gerdes, G. and Dr. Maier, D. on 28.3.2017, Bern, Switzerland.
- Kopp-Heim, D.; Minder Wyssmann, B. (2016). Job-shadowing Swiss health librarians observing experienced search specialists and information skills trainers in London. *Journal of EAHIL*, 12 (1): 10–13
- Kraus de Camargo, O.; Simon, L. (2013). *Die ICF-CY in der Praxis*. Bern: Verlag Hans Huber.
- Krüger, H-H.; Helsper, W. (Hrsg.) (2002). *Einführung in Grundbegriffe und Grundfragen der Erziehungswissenschaft. 7., durchgesehene und aktualisierte Auflage*. Opladen: Verlag Barbara Budrich/ Opladen & Farmington Hills.
- Krüger, H-H., Rauschenbach (Hrsg.) (1994). *Erziehungswissenschaft. Die Disziplin am Beginn einer neuen Epoche*. Weinheim und München: Juventa Verlag.
- Krzywinski, M., Kairo, A. (2013). Storytelling. *Nature Methods*, 10 (8): 687.
- Kuhn, T. (2012). *The Structure of Scientific Revolutions* (4th ed.). Chicago and London: The University of Chicago Press.

- Kuhn, T. (1961). The Function of Measurement in Modern Physical Science. *Isis, 52, 2*, 161–193.
- Kunz, R.; Marti, A.; Plüss, D. (Hg.) (2011). *Reformierte Liturgik - kontrovers*. Zürich: Theologischer Verlag.
- Kutscher, J. (1979). *Pädagogische Diagnostik. Zum Problem der Schülerbeurteilung*. Regensburg: Verlag Anton Hain Meisenheim GmbH.
- Lachmund, J. (2009). Das Geräusch in der Medizin. Zu den historischen Grundlagen der modernen Diagnostik. *Wiener klinische Wochenschrift, 121,* 491–500.
- Lachmund, J. (1997). *Der abgehorchte Körper. Zur historischen Soziologie der medizinischen Untersuchung.* Opladen: Westdeutscher Verlag.
- Lagemann, E. C. (2000). *An elusive science.* Chicago and London: University of Chicago Press.
- Lan, F.; Wallner, F.; Schulz, A. (2013) (eds.). *Concepts of a Culturally Guided Philosophy of Science. Contributions from Philosophy, Medicine and Science of Psychotherapy*. Frankfurt am Main: Peter Lang GmbH.
- Laín Entralgo, P. (1982). *El diagnóstico medico. Historia y Teoría.* Barcelona: Salvat Editores.
- Larrison, A. (2013). *Mind, Brain and Education as a Framework for Curricular Reform*. San Diego: UC San Diego Electronic Theses and Dissertations.
- Latour, B. (2016). Medicine at last. In Cooter, R., & Stein, C. (Ed.). *The history of medicine*, (pp. 256–286). London and New York: Routledge.
- Leibbrand, W. (1956). *Die spekulative Medizin der Romantik*. Hamburg: Claassen.
- Liew, S. L.; Santarnecchi, E.; Buch, E. R.; Cohen, L. G. (2014). Non-invasive brain stimulation in neurorehabilitation: local and distant effects for motor recovery. *Front. Hum. Neurosci.* 8, 378. http://dx.doi.org/10.3389/fnhum.2014.00378 (Jun 27, eCollection 2014. Review).
- Lischewski, A. (2014). *Meilensteine der Pädagogik. Geschichte der Pädagogik nach Personen, Werk und Wirkung*. Stuttgart: Kröner.
- Liu, K. (2000). *Semiotics in information systems engineering*. UK: Cambridge University Press.
- Luhmann, N. (2001). *Aufsätze und Reden*. Stuttgart: Philipp Reclam jun.
- Mainzer, K. (2008). *Komplexität*. Wilhelm Fink.
- Matthiessen, P. F. (2004). Der diagnostisch-therapeutische Prozess als Problem der Einzelfallforschung. *Originalia 57, 1,* 2–14.
- Mayring, Ph. (2000). Qualitative Inhaltsanalyse. *Author Manuscript*, 187–211.
- McDowell, I. (2006). *Measuring health: a guide to rating scales and questionnaires*. Oxford: University Press.
- Meumann, E. (1920). *Abriss der experimentellen Pädagogik.* Leipzig: Wilhelm Engelmann.
- Meywerk, W. (1930). Zur Kritik der Bissky schen elektro-diagnoscopischen Methode. *Z. f. d. g. Neur. u. Psych. 126, 1*, 289–29. https://doi.org/10.1007/BF02864107
- Michel, C. M.; et al. (2009). *Electrical Neuroimaging*. United Kingdom: Cambridge University Press.
- Mikhail, T. (2016). *Pädagogisches handeln. Theorie für die Praxis*. Paderborn: Ferdinard Schöningh.
- Mittelstraß, J. (2011). On Transdisciplinarity. *TRAMES*, 15(65/60), 4, 329–338.
- Mittelstraß, J. (2005). Methodische Transdisziplinarität. *Technikfolgenabschätzung – Theorie und Praxis*, 14(2), 18–23.
- *MNM, Proyecto de Nueva Creación de la Maestría en Ciencias Neurometabolismo* (2014). Universidad Autónoma de Querétaro, Dirección de Investigación y Posgrado. Facultad de Medicina.

- Moher, D.; Schulz, K.; Altman, D. G. (2001). The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomised trials. *The Lancet*, 357, 1191–1194.
- Mollenhauer, K., Rittelmeyer, Ch. (1977). *Methoden der Erziehungswissenschaft*. München: Juventa Verlag.
- Moore, G. E. (1977). A defense of common sense, pp. 32–59. *Philosophical papers* [Repr.] London, New York: Allen and Unwin, Humanities Press.
- Moreno Rodríguez, R. M. (1987-1988). El concepto galénico de causa en la doctrina médica. Su significado en el contexto científico-social. *Acta Hispánica ad Medicinae Scientiarumque Historiam Illustrandam*, 7-8, 25–57.
- Moulines, C. U. (2011). *El desarrollo moderno de la filosofía de la ciencia (1890–2000)*. México: Universidad Nacional Autónoma de México.
- Mulrow, C. D. (1994). Rationale for systematic reviews. *BMJ 309*, 597–599.
- Müller, D.; et al. (2010). Memorandum Register für die Versorgungsforschung. Memorandum Registry for Health Services Research. *Gesundheitswesen,* 72: 824–839.
- Nagel, Th. (1974). What is it like to be a bat? *Philos. Rev., 83,* 435–450.
- Navarro de Lara, L. I.; et al. (2017). High-sensitivity TMS/fMRI of the Human Motor Cortex Using a Dedicated Multichannel MR Coil. *NeuroImage 150,* 262-269.
- Nicolin, F. (Hrsg.) (1969). *Pädagogik als Wissenschaft*. Darmstadt: Wissenschaftliche Buchgesellschaft.
- Nicolin, F. (1955). *Grundlinien einer geisteswissenschaftlichen Pädagogik bei G.W.F. Hegel*. Bonn: Rheinischen Friedrich Wilhelms Universität Dissertation.
- Nohl, H. (1957). Die pädagogische Bewegung in Deutschland und ihre Theorie (pp. 119-131). Frankfurt am Main.
- O'Brien, B. C.; et al. (2014). Standards for Reporting Qualitative Research: A Synthesis of Recommendations. *Academic Medicine*, 89 (9): 1245–1251.
- Öğmen, H.; Patel, S. S.; Bedell, H. E.; Camuz, K. (2004). Differential latencies and the dynamics of the position computation process for moving targets, assessed with the flash-lag effect. *Vision Res.*, 44, 2109–2128. doi: 10.1016/j.visres.2004.04.003 PMID: 15183678
- Oppenheim, P.; Putnam, H. (1958). Unity of science as a working hypothesis. In *Concepts, theories, and the mind-body problem. Minnesota studies in the philosophy of science, Volume 2*. Minneapolis: University of Minnesota Press.
- Ostheimer, J. (2008). *Zeichen der Zeit lesen. Erkenntnistheoretische Bedingungen einer praktisch-theologischen Gegenwartsanalyse*. Stuttgart: Kohlhammer GmbH.
- Patry, J-L. (2012). Der Pädagogische Takt. In *Enzyklopädie Erziehungswissenschaft Online*. Weinheim und Basel: Beltz Juventa. doi: 10.3262/EEO 09120250
- Pauen, M.; Roth, G. (2001). *Neurowissenschaften und Philosophie. Eine Einführung*. München: Wilhelm Fink Verlag.
- Pawlik, K. (Hrsg.) (1976). *Diagnose der Diagnostik. Beiträge zur Diskussion der psychologischen Diagnostik in der Verhaltensmodifikation*. Stuttgart: Ernst Klett Verlag.
- Piaget, J. (1970). *Genetic Epistemology*. New York: Columbia University Press.
- Pickersgill, M.; Van Keulen, I. (2011). *Sociological Reflections on the Neuroscience Advances in Medical Sociology*. UK: Emerald Group Publishing Limited.
- Reulecke, W.; Rollett, B. (1976). Pädagogische Diagnostik und lernzielorientierte Tests. In Pawlik, K. (Hrsg.), *Diagnose der Diagnostik. Beiträge zur Diskussion der psychologischen Diagnostik in der Verhaltensmodifikation* (pp. 177–202). Stuttgart: Ernst Klett Verlag.

- Ricken, N. (2007). Das Ende der Bildung als Anfang – Anmerkungen zum Streit um Bildung. In Palentien, C.; Topor, M.; Rohlfs, C. (Hrsg.). *Perspektiven der Bildung: Kinder und Jugendliche in formellen, nonformellen und informellen Bildungsprozessen* (pp. 15–41). Wiesbaden.
- Rink, F. T. (1944). *Immanuel Kant über Pädagogik.* Leipzig: Verlag Felix Meiner.
- Ritter, J.; Gründer, K. (1971–2010). *Historisches Wörterbuch der Philosophie* (Völlig neu bearb. Ausgabe des Wörterbuchs der philosophischen Begriffe von Rudolf Eisler.). Schwabe. Bd. 2(1972): D-F.
- Rogers, T. B. (1992). Antecedents of Operationism: A Case History in Radical Positivism. In Tolman, Ch. W. (Ed.). *Positivism in Psychology. Historical and Contemporary Problems*. New York: Springer-Verlag.
- Rorty, R. (1991). *Contingencia, ironía y solidaridad*. Barcelona, Buenos Aires: Paidós Ibérica.
- Roth, L. (Hrsg.) (2001). *Pädagogik. Handbuch für Studium und Praxis.* München: Oldenbourg.
- Rothschuh, K. E. (1965). *Prinzipien der Medizin. Ein Wegweiser durch die Medizin.* München-Berlin: Urban & Schwarzenberg.
- Röck, T. (2019). Time for Ontology? The Role of Ontological Time in Anticipation. *Axiomathes*, 29, 33–47. UK: Springer. doi.org/10.1007/s10516-017-9362-2
- Rucker, Th. (2020). Teaching and the Claim of Bildung. The View from General Didactics. *Stud Philos Educ*, 39, 51–69. https://doi.org/10.1007/s11217-019-09673-0
- Rucker, Th. & Anhalt, E. (2017). *Perspektivität und Dynamik. Studien zur erziehungswissenschaftlichen Komplexitätsforschung*. Weilerswist: Velbrück.
- Rucker, Th. and Gerónimo, E. (2017). The Problem of Bildung and the Basic Structure of Bildungstheorie. *Stud Philos Educ*, 36(5), 569–584. https://doi.org/10.1007/s11217-017-9573-4
- Rucker, Th. (2014). *Komplexität der Bildung. Beobachtungen zur Grundstruktur bildungstheoretischen Denkens in der (Spät-) Moderne.* Bad Heilbrunn.
- Rucker, Th. (2014b). Erkenntnisfortschritt durch Problematisierung, oder: Über das Verhältnis von ›Bildung‹ und ›Subjektivation‹. *Zeitschrift für Pädagogik*, 60(6), 908–924.
- Ruhloff, J. (2001). The problematic employment of Reason in philosophy of Bildung and education. In: F. Heyting/ D. Lenzen/ J. White (Ed.). *Methods in Philosophy of Education* (p. 57-72). London & New York: Routledge.
- Sack, A. T. (2010). Does TMS need functional imaging? *Elsevier Cortex 46*: 131–133.
- Sadegh-Zadeh, K. (2012). *Handbook of analytic philosophy of medicine*. Münster: Springer.
- Sadegh-Zadeh, K. (2011). The logic of diagnosis. In Gifford, F. (ed.). *Handbook of the Philosophy of Science. Volume 16. Philosophy of Medicine* (pp. 357–424). Oxford: Elsevier B.V.
- Salmon, W. C. (1973). *Logic*. New Jersey: Prentice-Hall.
- Samuels, B. M. (2009). Can the Differences Between Education and Neuroscience be Overcome by Mind, Brain, and Education? *Journal Compilation, International Mind, Brain, and Education Society and Wiley Periodicals, Inc*., 3(1), 45–55.
- Sandkühler, H-J. (2012). Critique of Representation: Cultures of Knowledge – Humanly Speaking. In Abel, G., & Conant, J. (eds.), *Rethinking Epistemology*. Boston: Walter De Gruyter Incorporated.
- Sandkühler, H-J. (Hrsg.) (2010). *Enzyklopädie Philosophie*. Hamburg: Felix.
- Sandkühler, H-J. (2009). *Kritik der Repräsentation. Einführung in die Theorie der Überzeugungen, der Wissenskulturen und des Wissens*. Frankfurt: Suhrkamp.

- Shadish, W. R.; Cook, T. D.; & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
- Schäfer, A. (2012). *Zur Genealogie der Pädagogik*. Padeborn: Schöningh.
- Schäfer, M. (1999). Nomothetic and idiographic methodology in psychiatry – A historical-philosophical analysis. *Medicine, Health Care and Philosophy*, 2, 265–274.
- Schaller, F. (2012). *Eine relationale Perspektive auf Lernen. Ontologische Hintergrundsannahmen in lerntheoretischen Konzeptualisierung des Menschen und von Sozialität*. Berlin: Budrich UniPress.
- Semana. Ideas que liberan. (2015). El sueño de Simón Bolívar que no se cumplió. Retrieved from http://www.semana.com/nacion/articulo/crisis-binacional-una-traicion-boliva/441338-3 [17.10.2017]
- Schlüter, S. (2013). *Wechselwirkung und Erziehung von Johann Friedrich Herbart bis John Dewey*. Koblenz-Landau: Julius Klinkhardt.
- Schlüter, S.; Langewand, A. (Hrsg.) (2010). *Neurobiologie und Erziehungswissenschaft. Die neueren Konjunkturen pädagogischer Wissenschaftsforschung aus historischer und systematischer Perspektive*. Bad Heilbrunn: Klinkhardt.
- Schmidt-Atzert, L.; Amelang, M. (2012). *Psychologische Diagnostik*. Berlin Heildelberg: Springer-Verlag.
- Schriewer J., Keiner, E., Charle, Ch. (Hrsg.) (1993). *Sozialer Raum und akademische Kulturen. Studien zur europäischen Hochsul- und Wissenschaftsgeschichte im 19. und 20. Jahrhundert. A la recherche de l'espace universitaire européen. Etudes sur l'enseignement supérieur aux XIXe et XXe siècles*. Frankfurt am Main: Peter Lang.
- Schuntermann, M. F. (2009). *Einführung in die ICF: Grundkurs – Übungen – offene Fragen*. Heidelberg: ecomed Medizin.
- Schurr, J. (1975). *Schleiermachers Theorie der Erziehung. Interpretationen zur Pädagogikvorlesung von 1826*. Düsseldorf: Pädagogischer Verlag Schwann.
- Schütte, A. (2015). *Bildung und Vertikalspannung. Welt- und Selbstverhältnisse in anthropotechnischer Hinsicht* (Erste Auflage). Weilerswist: Velbrück Wissenschaft.
- Schwarz, M.K.L. (1994). *Strukturelle und dynamische Aspekte klinischer Indikation. Med. Diss.* Münster: Universität Münster.
- SNF. Swiss National Science Foundation. (2017). Action Plan 2013-2016. Retrieved from http://www.snf.ch/SiteCollectionDocuments/snf_aktionsplan_2013_2016_e.pdf [17.10.2017]
- Soekadar, S. R.; Haslacher, D. (2019). How brain imaging takes psychiatry for a ride. In Raz, A.; Thibault, T. (Ed.). *Casting Light on the Dark Side of Brain Imaging* (pp. 19–23). UK and USA: Academic Press.
- Soekadar, S. R.; et al. (2016). Transcranial electric stimulation (tES) and NeuroImaging: the state-of-the-art, new insights and prospects in basic and clinical neuroscience. *NeuroImage*, 140, 1–3. doi: 10.1016/j.neuroimage.2016.08.020
- Soekadar, S. R.; Witkowski, M.; Birbaumer, N.; Cohen, L. G. (2015). Enhancing hebbian learning to control oscillatory activity. *Cereb. Cortex.,* 25, 2409–2415. doi: 10.1093/cercor/bhu043
- Soekadar, S. R.; Birbaumer, N.; Slutzky, M.W.; Cohen, L.G. (2015b). Brain-Machine Interfaces In Neurorehabilitation of Stroke. *Neurobiol Dis.,* 83, 172–179; doi:10.1016/j.nbd.2014.11.025
- Soekadar, S. R.; Witkowski, M.; García Cossio; E.; Birbaumer, N.; Cohen, L. G. (2014). Learned EEG-based brain self-regulation of motor-related oscillations during application of transcranial electric brain stimulation: feasibility and limitations. *Front. Behav. Neurosci.,* 8, 93. doi: 10.3389/fnbeh.2014.00093

- Soekadar, S. R.; Witkowski, M.; Cossio, E. G.; Birbaumer, N.; Robinson, S. E.; and Cohen, L. G. (2013a). In vivo assessment of human brain oscillations during application of transcranial electric currents. *Nat. Commun.,* 4, 2032. doi:10.1038/ncomms3032
- Soekadar, S. R.; Witkowski, M.; Robinson, S. E.; and Birbaumer, N. (2013b). Combining electric brain stimulation and source-based brain-machine interface (BMI) training in neurorehabilitation of chronic stroke. *J. Neurol. Sci.,* 333, e542. doi: 10.1016/j.jns.2013.07.1906
- Soekadar, S. R.; Birbaumer, N.; Cohen, L. G. (2011). Brain-computer-interfaces in the rehabilitation of stroke and neurotrauma. In Kansaku K. & Cohen, L.G. (ed.) *Systems Neuroscience and Rehabilitation*, pp. 3–18. Tokyo: Springer.
- Solana, F., Cardiel Reyes, R., Bolaños Martínez, R. (1981). Historia de la educación pública en México. México: SEP Fondo de Cultura Económica.
- Spencer-Brown, G. (1972). *Laws of form*. The Julian Press, Inc.
- Stichweh, R. (1993). Wissenschaftliche Disziplinen: Bedingungen ihrer Stabilität im 19. und 20. Jahrhundert. In Schriewer J., Keiner, E., Charle, Ch. (Hrsg.), *Sozialer Raum und akademische Kulturen. Studien zur europäischen Hochsul- und Wissenschaftsgeschichte im 19. und 20. Jahrhundert. A la recherche de l'espace universitaire européen. Etudes sur l'enseignement supérieur aux XIXe et XXe siècles* (pp. 235–250). Frankfurt am Main: Peter Lang.
- Stichweh, R. (1991). *Der frühmoderne Staat und die europäische Universität. Zur Interaktion von Politik und Erziehungssystem im Prozeß ihrer Ausdifferenzierung (16.-18. Jahrhundert)*. Frankfurt am Main: Suhrkamp Verlag.
- Stichweh, R. (1990). Self-Organization and Autopoiesis in the Development of Modern Science. In Krohn, W., Küppers, G., Nowotny, H. (Ed.), *Selforganization. Portrait of a Scientific Revolution* (pp. 195–207). Netherlands: Kluwer Academic.
- Stojanov, K. (2006). *Bildung und Anerkennung. Soziale Voraussetzungen von Selbst-Entwicklung und Welt-Erschließung*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Strobel-Eisele, G., Wacker, A. (Hrsg.) (2017). *Konzepte des Lernens in der Erziehungswissenschaft. Phänomene, Reflexionen, Konstruktionen.* Bad Heilbrunn: Julius Klinkhardt.
- Strümpell, L. (1892). *Die pädagogische Pathologie oder die Lehre von den Fehlern der Kinder. Versuch einer Grundlegung für gebildete Ältern, Studierende der Pädagogik, Lehrer, Sowie für Schulbehörden und Kinderärzte*. Leipzig: Verlag von E. Ungleich.
- Sukopp, Th. (2010) Interdisziplinarität und Transdisziplinarität. Definitionen und Konzepte. In Jungert, M.; et al. (Hrsg.), *Interdisziplinarität. Theorie, Praxis, Probleme* (13–31). Darmstadt: WBG.
- Tenorth, H-E. (2000). Erziehungswissenschaftliche Forschung im 20. Jahrhundert und ihre Methoden. In Benner, D.; Tenorth, H-E. (Hrsg.). *Bildungsprozesse und Erziehungsverhältnisse im 20. Jahrhundert* (264–293). Weinheim: Beltz.
- Thut, G.; et al. (2017). Guiding transcranial brain stimulation by EEG/MEG to interact with ongoing brain activity and associated functions: A position paper. *International Federation of Clinical Neurophysiology 128*, 843-857.
- Tononi, G. (1998). Consciousness and Complexity. *Science, 282,* 1846-1851.
- Tolman, Ch. W. (Ed.) (1992) *Positivism in Psychology. Historical and Contemporary Problems*. New York: Springer-Verlag.
- Treagust, D. F. (1995). Diagnostic Assessment of Students' Science Knowledge. In Shawn M., G.; Reinders, D. (Eds.), *Learning Science in the Schools* (p. 327–346). New Jersey: L. Erlbaum Associates.
- Twenge, J. M. (2013). Teaching Generation Me. *Sage Journals, Teaching of Psychology*, 40(1), 66–69. doi: 10.1177/0098628312465870

- Twenge, J. M. (2010). Time-Lag Study. In Salkind, N. J. (ed.). *Encyclopedia of research design.* Thousand Oaks, CA: SAGE Publications.
- Twenge, J. M. (2009). Generational changes and their impact in the classroom: teaching Generation Me. *Blackwell Publishing Ltd, Medical education*, 43, 398–405.
- Ulich, D.; Mertens, W. (1973). *Urteile über Schüler. Zur Sozialpsychologie pädagogischer Diagnostik*. Weinheim und Basel: Beltz Verlag.
- Van Ophuysen, S.; Lintorf, K. (2009). Pädagogische Diagnostik im Schulalltag. In Beutel, S. I.; Bos, W.; Porsch, R. (Eds.). *Lernen in Vielfalt. Chance und Herausforderung für Schul- und Unterrichtsentwicklung* (pp. 55–76). Münster: Waxmann.
- Varela, F. J.; Lachaux, J. P.; Rodriguez, E.; Martinerie, J. (2001). The brainweb: phase synchronization and large-scale integration. *Nat Rev Neurosci.,* 2, 229–239.
- Varela, F. J. (1988). *Conocer. Las ciencias cognitivas: tendencias y perspectivas. Cartografía de las ideas actuales*. Barcelona: Gedisa.
- Veyne, P. (1990). *Geschichtsschreibung – und was sie nicht ist*. Frankfurt a.M.: Suhrkamp 2015.
- Von Glasersfeld, E. (1995). *Radical Constructivism. A Way of Learning*. London: The Falmer.
- Von Glasersfeld, E. (1980). Viability and the concept of selection. *American Psychologist*, 35, 970–974.
- Wagner, P. (2009). *Carnap's Logical Syntax of Language*. Great Britain: Palgrave Macmillan.
- Wallerstein, N.; Bernstein, E. (1988). Empowerment Education: Freire's Ideas Adapted to Health Education. *Health Education Quarterly*. 15 (4), 379–394.
- Wallner, F. G. (2002). *Culture and science. A New Constructivistic Approach to Philosophy of Science*. Wien: Wilhelm Braumüller.
- Walter, F. K. (1927). Über die Elektrodiagnose seelischer Eigenschaften («Diagnoscopie») nach Bißky. Eine kritische Besprechung. *Jahrbuch der Charakterologie 4*, 298-324.
- Westermann, H. (2005). Prinzip und Skepsis als Grundbegriffe der Pädagogik. Band 7. In Rekus, J. (Hrsg.), *Grundfragen der Pädagogik. Studien – Texte – Entwürfe*. Frankfurt am Main: Peter Lang GmbH.
- Westmeyer, H. (1972). *Logik der Diagnostik. Grundlagen einer normativen Diagnostik*. Stuttgart: W. Kolhammer.
- Wieland, W. (2004). *Diagnose. Überlegungen zur Medizintheorie.* Warendorf: Bibliothek des skeptischen Denkens. Verlag Johannes G. Hoff. (1975).
- Williams, R. R. (1992). *Recognition. Fichte and Hegel on the other*. State University of New York Press.
- Williams, R. (1991). *International Journal for Philosophy of Religion, 29*(2), 125-127. Retrieved from http://www.jstor.org/stable/40036657
- Wittgenstein, L. (1969). *On Certainty*. Oxford: Basil Blackwell.
- WHO (2001). *World Health Organization. International Classification of Functioning, Disability and Health*. [Publ] A54/18. Geneva: World Health Organization.
- Wood, R. E. (2014). *Hegel's introduction to the system. Encyclopaedia Phenomenology and Psychology*. Toronto, Buffalo, London: University of Toronto Press.
- Zappe, H. A., Mattern, Hj. (Hrsg.) (1989). *Das Philosophische und die praktische Medizin* (p. 3–6). Berlin Heildelberg: Springer-Verlag.
- Zeki, S. (2003). The disunity of consciousness. *TRENDS in Cognitive Science*. 7 (5), 214-218.
- Zigler, E., Finn-Stevenson, M. (2006). The School of the 21st Century. In Constas, M. A., Sternberg, R. J. (ed.), *Translating Theory and Research Into Educational Practice.*

Developments in Content Domains, Large-Scale Reform, and Intellectual Capacity (173–195). Mahwah, New Jersey and London: Lawrence Erlbaum Associates, Publishers.

- Zima, P. V. (2004). *Was ist Theorie?* Tübingen und Basel: A. Francke.
- ZPID. Zentrum für Psychologische Information und Dokumentation. (2001). Internationale Richtlinien für die Testanwendung (Version 2000. Deutsche Fassung). Retrieved from https://www.zpid.de/pub/tests/itc_richtlinien.pdfd [02.08.2017].