Well-Being of Pre-Service Teachers: Investigating Its Multidimensionality and Exploring Profiles

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Abstract

While teacher well-being is crucial for teachers to thrive and for student success, the well-being of pre-service teachers remains understudied. Pre-service teacher well-being might support their learning during initial teacher education (ITE) and might be linked with their well-being after career entry. This dissertation advances knowledge of pre-service teacher well-being through three studies employing multidimensional, context-specific, and person-centered approaches. Study 1 extends the multidimensional model of scholastic well-being (Hascher, 2004, 2023) to ITE and adapts the teacher well-being questionnaire (Hascher, 2020) to pre-service teachers. Analysis of data from 1,749 pre-service teachers across Switzerland, Germany, and Austria revealed strong psychometric properties for five out of six well-being dimensions (positive attitudes towards ITE, enjoyment of ITE, positive academic self-concept regarding ITE, worries about ITE, and physical complaints related to ITE). The dimension of social problems in ITE was removed from all analyses due to insufficient reliability. In two subsequent studies, well-being profiles were explored by applying latent profile analysis to a sample of 989 Swiss pre-service teachers (Study 2) and a sample of 2,867 Austrian pre-service teachers (Study 3). Five well-being profiles were identified in Study 2 and six in Study 3 (adaptive, maladaptive, and mixed profiles). The profiles across both samples broadly corresponded, strengthening their construct validity. Several pre-service teacher characteristics were related with well-being profiles. Moreover, in Study 3, pre-service teachers reporting higher levels of ITE resources (practicum quality and practicum-university coherence) and personal resources (teacher self-efficacy) were more likely to belong to adaptive well-being profiles than maladaptive ones. In turn, the well-being profiles differed in terms of retention-related outcomes (ITE quitting intentions and profession quitting intentions), demonstrating the importance of promoting pre-service teacher well-being for teacher retention. The findings call for the development of multidimensional intervention studies to boost positive well-being dimensions and reduce negative ones, tailored to the specific needs of the distinct well-being profiles. Directions for future research in this little-explored yet promising research field are discussed.

Keywords: teacher well-being, initial teacher education, resources, teacher retention, validation, latent profile analysis, quantitative methods

List of Studies[1]

Study 1	Haldimann, M., Hascher, T., & Flick-Holtsch, D. (2024). Well-being of pre-service teachers: A construct validation study across three countries. *International Journal of Educational Research Open*, *7*, Article 100346. https://doi.org/10.1016/j.ijedro.2024.100346
Study 2	Haldimann, M., Hascher, T., & Flick-Holtsch, D. (2024). Wohlbefindensprofile angehender Lehrpersonen aus der deutschsprachigen Schweiz. *Beiträge zur Lehrerinnen- und Lehrerbildung*, *42*(1), 47–69. https://doi.org/10.36950/bzl.42.1.2024.10364
Study 3	Haldimann, M., Collie, R. J., Hascher, T., & Flick-Holtsch, D. (under review). Well-being profiles of pre-service teachers: Links with resources and retention-related outcomes.

[1] For Study 1 and Study 2, the accepted manuscript versions and for Study 3, the submitted manuscript version are included. Citations and bibliographies are formatted according to the respective journal guidelines. For better readability, the chapter numbering and formatting of the manuscripts have been adjusted. The Supplementary Materials for Study 1 and Study 3 are provided in Appendix C and Appendix D, respectively.

Dissertation at a Glance

Study 1	Well-Being of Pre-Service Teachers: A Construct Validation Study across Three Countries
Aim	To extend the multidimensional model of scholastic well-being (Hascher, 2004, 2023) to initial teacher education; to adapt the teacher well-being questionnaire (Hascher, 2020) for pre-service teachers and provide evidence for its validity and reliability.
Method	Participants: 1,749 pre-service teachers from Switzerland, Germany, and Austria. Data collection: Online survey from April to June 2022 (cross-sectional). Analysis: Factor and reliability analyses, measurement invariance testing, and correlations.
Results	Strong psychometric properties for all factors except for "Social problems in initial teacher education" (excluded for further analysis); first-order, five-factor structure; (partial) measurement invariance across Swiss, German, and Austrian pre-service teachers; evidence for external validity with established well-being constructs (e.g., engagement and emotional exhaustion in initial teacher education).
Conclusion	Empirical support for the questionnaire as a multidimensional and context-specific measure of pre-service teacher well-being. The dimension "Social problems in initial teacher education" needs revision.
Study 2	Well-Being Profiles of Pre-Service Teachers from the German-Speaking Part of Switzerland
Aim	To investigate potential well-being profiles and to what extent pre-service teacher characteristics are associated with these profiles.
Method	Participants: 989 pre-service teachers from the German-speaking part of Switzerland. Data collection: Online survey from April to June 2022 (cross-sectional). Analysis: Latent profile analysis using unstandardized factor scores.
Results	Identification of five well-being profiles; varying relationships of pre-service teacher characteristics with these well-being profiles.
Conclusion	Need for multidimensional well-being interventions (boosting positive dimensions and reducing negative ones) that are tailored to the unique nature of the different profiles.
Study 3	Well-Being Profiles of Pre-Service Teachers: Links with Resources and Retention-Related Outcomes
Aim	To replicate identified well-being profiles from Study 2. To investigate to what extent pre-service teacher characteristics, contextual resources, and personal resources are associated with these well-being profiles, and in turn, how these well-being profiles differ regarding retention-related outcomes.
Method	Participants: 2,867 pre-service teachers from Austria. Data collection: Online survey from May to July 2021 (cross-sectional). Analysis: Latent profile analysis using standardized factor scores.
Results	Identification of six well-being profiles; varying relationships of pre-service teacher characteristics with well-being profiles; positive relationships of higher contextual and personal resources with more adaptive well-being profiles; differences in terms of retention-related outcomes with more favorable values for more adaptive well-being profiles.
Conclusion	Need for multidimensional well-being interventions that are tailored to the unique nature of the different profiles. Both contextual and personal resources are essential for profile membership in more adaptive well-being profiles. Importance of pre-service teacher well-being for teacher retention.

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"Which is more important," asked Big Panda, "the journey or the destination?"
"The company." said Tiny Dragon.
— James Norbury

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Wonderful human beings sparkling with light

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Encouraging cheerleader and partner in crime

Clément Durance
Compagnon de vie

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1 Introduction

Education is a human right and plays a fundamental role in shaping individuals' life trajectories, promoting peace, and fostering sustainable development (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2024). Teachers are key agents in education, as they stimulate learning processes, support students' social-emotional development, and prepare students for future challenges (Hattie, 2009). Given teachers' pivotal role, it is alarming that many education systems around the globe are facing teacher shortages, with heavy educational, emotional, and financial costs to society (Organization for Economic Cooperation and Development [OECD], 2024). One way of tackling this challenge is to address the well-being of teachers. Teacher well-being is crucial not only for teachers' career development and retention (Skaalvik & Skaalvik, 2018; Zhou et al., 2024) but also for their and students' thriving and success (Klusmann et al., 2022; Turner & Thielking, 2019).

While there is extensive research on teacher well-being (e.g., Hascher & Waber, 2021; Zhang et al., 2023), the understanding of well-being during initial teacher education (ITE) remains limited and needs to be investigated for two main reasons. First, ensuring individuals' well-being in educational contexts is a worthy goal in and of itself (Hascher et al., 2018; OECD, 2017). Well-being is related to learning and academic achievement (Hascher, 2023; Kaya & Erdem, 2021). Therefore, creating well-being-promoting ITE seems important for supporting pre-service teachers' learning and development before they enter a demanding profession. Second, ITE might represent an opportunity for pre-service teachers to proactively gain awareness of their professional well-being and learn sustainable well-being strategies that will benefit both their educational journey during ITE and also their future teaching experiences, ultimately boosting retention in the profession (Dreer, 2021a; Mairitsch et al., 2021; Price & McCallum, 2015). Empowering pre-service teachers to promote their own well-being and later also that of their students and the wider school community (Benincasa & Springob, 2024; White, 2021) seems particularly significant given recent calls to transform education systems from a focus on human capital towards promoting lifelong human flourishing (Curren et al., 2024).

Due to the limited research on pre-service teacher well-being, there are significant gaps in our understanding, including (a) how pre-service teacher well-being can be conceptualized and measured, (b) what potential well-being profiles are prevalent among pre-service teachers, and (c) the relationship between pre-service teacher characteristics and resources and profiles and, in turn, how these profiles differ in terms of retention-related outcomes. The purpose of

this dissertation is to address each of these gaps through three related studies, taking a multidimensional, context-specific, and person-centered approach. In the first step, the psychometric properties of a self-report questionnaire that conceptualizes and measures pre-service teacher well-being multidimensionally were tested (Study 1). In the second step, latent profile analysis was applied to identify potential well-being profiles and enhance the understanding of how well-being dimensions may co-occur among pre-service teachers. The relationship between pre-service teacher characteristics, contextual resources, and personal resources and these potential profiles was also examined, as well as how they differ in terms of retention-related outcomes (Study 2, Study 3). The dissertation aims to provide indications for interventions supporting thriving and retention in the teaching profession and to identify directions for future research in this little-explored yet promising research field.

This dissertation comprises nine chapters. Chapter 2 presents a literature review, establishing the theoretical and empirical foundations of the dissertation. It begins with an overview of well-being research before focusing specifically on ITE and the construct of pre-service teacher well-being. Chapter 3 then outlines the central research questions that guide this investigation and provides an overview of the three constituent studies, detailing their objectives, methodological approaches, key findings, and unique contributions to the dissertation. Chapters 4, 5, and 6 form the core of this publication-based dissertation, presenting the three empirical studies in detail. Chapter 7 synthesizes the research findings, examines their practical implications, acknowledges limitations, and proposes future research directions. Finally, Chapter 8 ends the dissertation with conclusions.

2 Literature Review

This chapter establishes the theoretical and empirical foundations of the dissertation. Beginning with a brief outline of well-being research (Section 2.1), it then narrows its focus to pre-service teacher well-being. First, the context of ITE is introduced (Section 2.2), and building on that, a rationale is presented for the importance of pre-service teacher well-being (Section 2.3). In Section 2.4, the construct of pre-service teacher well-being is described by reviewing existing conceptualizations in empirical studies and introducing the well-being model adopted in this investigation. Factors related to pre-service teacher well-being, specifically key pre-service teacher characteristics, resources, and retention-related outcomes, are explored in Section 2.5. The chapter concludes by discussing the potential of person-centered approaches in investigating pre-service teacher well-being (Section 2.6).

2.1 A Brief Outline of Well-Being Research

The concept of well-being has deep historical roots, with Greek philosophers debating its definition over 2,000 years ago. Two main perspectives emerged and continue to shape today's diverse research field. From a hedonistic point of view, well-being is equated with maximizing pleasure and minimizing pain, thus focusing on the pursuit of happiness and avoidance of suffering (Deci & Ryan, 2008; Haybron, 2008). In contrast, the eudaimonic perspective, rooted in Aristotelian philosophy, defines well-being as realizing one's full potential. Aristotle conceived eudaimonia as the highest human good, achieved through living virtuously, emphasizing optimal functioning rather than mere pleasure seeking (Ryan & Martela, 2016; Ryff, 2014).

After the Second World War, researchers started to investigate well-being, laying the foundation for today's multidimensional conceptualization of the construct. In psychology, Bradburn (1969) discovered that positive and negative affect were independent of each other, suggesting that beyond their simultaneous occurrence, the positive affect an individual experiences does not predict their level of negative affect and vice versa. This led to the idea that an individual experiences well-being when their positive affect outweighs their negative affect. In the 1980s, Diener (1984) advanced this understanding by introducing the concept of subjective well-being, combining three key elements: high levels of positive affect, low levels of negative affect, and high levels of life satisfaction. While this conceptualization recognized the independence of positive and negative affect and incorporated affective and cognitive dimensions, it was criticized for neglecting eudaimonic aspects and focusing too heavily on

well-being as an end state rather than a process (Deci & Ryan, 2008; Martela & Sheldon, 2019). In response, Ryff (1989) introduced the model of psychological well-being, emphasizing the eudaimonic perspective on well-being. The model consists of six dimensions: environmental mastery, purpose in life, self-acceptance, autonomy, personal growth, and positive relations with others.

There have also been efforts to integrate hedonic and eudaimonic perspectives into a more comprehensive conceptualization of well-being. This is reflected in the well-being definition of Huppert and So (2013, p. 838) of well-being—also referred to as flourishing—as "a combination of feeling good and functioning effectively." This definition aligns with Seligman's (2012) positive emotion, engagement, relationships, meaning, and accomplishment (PERMA) model. This model was later expanded to include physical health (PERMAH, Kern, 2022). More recently, Ryan and Martela (2016) proposed viewing eudaimonia not as an alternative form of subjective well-being, but as its antecedent. Building on this idea, Martela and Sheldon (2019) suggest a causal framework that divides well-being into three interconnected subcategories: Eudaimonic motives and activities (values, motivations, goals, and practices conducive to well-being), psychological need satisfaction (e.g., need for autonomy, competence, and relatedness), and subjective well-being (positive affect, negative affect, and life satisfaction). In this model, eudaimonic motives and activities predict psychological need satisfaction, which in turn predicts subjective well-being.

The contemporary landscape of well-being research spans multiple disciplines and there is no consensus about the conceptualization. While researchers generally agree on the importance of taking a multidimensional approach, they differ considerably regarding which specific dimensions to include. As Sheldon (2016) metaphorically stated, the field contains a "jarring discordance of different melodies and themes, with the different musicians sometimes pounding (or blaring) away without really listening to each other" (p. 531). This complexity is further compounded by studies that are incongruent in the way they conceptualize and measure well-being, making it difficult to compare results and build cumulative knowledge (Hascher & Waber, 2021; Martela & Sheldon, 2019). Because of this complexity, researchers need a strong theoretical underpinning for the selection of well-being dimensions (Collie & Hascher, 2024; Hascher & Waber, 2021).

The research thus far described addresses general human well-being, operating at a high level of abstraction (Alexandrova & Fabian, 2022). However, individuals exist within diverse contexts, necessitating well-being theories tailored to the specific responsibilities, activities, and environmental conditions they encounter (Hascher, 2007; Hascher & Waber, 2021). More

recent research has started considering the context specificity of well-being, including the educational context.

Well-being in the educational context has gained increased attention over the last years (e.g., Khatri & Duggal, 2022; Zhang et al., 2023). Various literature reviews and meta-analyses have captured a growing body of empirical evidence regarding student well-being across different education levels, up to and including university (e.g., Dodd et al., 2021; du Toit et al., 2022; Hossain et al., 2023; Kaya & Erdem, 2021; Khatri & Duggal, 2022); teacher well-being (e.g., Dreer, 2023a; Fox et al., 2023; Hascher & Waber, 2021; McCallum et al., 2017; Zhang et al., 2023; Zhou et al., 2024); and the well-being of other educational stakeholders such as principals (Chen et al., 2023; Doyle Fosco, 2022). Moreover, large-scale international assessments like the Programme for International Student Assessment (PISA) have started integrating student and teacher well-being (e.g., OECD, 2017; Viac & Fraser, 2020). Research has highlighted the interconnectedness of student and teacher well-being (e.g., Harding et al., 2019; Maricuțoiu et al., 2023; McCallum & Price, 2010), and whole-school well-being approaches targeting the well-being of several stakeholders within a school have also been explored (e.g., Kern et al., 2015). Recently, the well-being of pre-service teachers has also started to attract attention. Before the importance of pre-service teacher well-being and its conceptualization is discussed, the context of ITE is introduced, with a focus on ITE in Switzerland, Germany, and Austria.

2.2 Setting the Stage: Initial Teacher Education

In many countries, students undergo several years of ITE in higher education institutions to become qualified teachers (European Commission/Education Audiovisual and Culture Executive Agency/Eurydice, 2021; OECD, 2024). ITE marks the starting point of a continuous process of professionalization for future teachers, and it is the pivot for the quality and quantity of teachers available in an education system (Musset, 2010). Qualified teachers bear full pedagogical and legal responsibility immediately upon entering the profession (Tynjälä & Heikkinen, 2011), highlighting the importance of ITE. Unlike other careers that allow for gradual skill development through increasingly complex duties, teachers are expected to manage teaching and related responsibilities such as collaborations with colleagues and caregivers from day one. Fuller and Bown (1975) refer to the first years of teaching as the "survival stage," and Huberman (1989) characterizes them as periods of "survival" and "discovery." The term "reality shock" is also used when describing this challenging career entry phase, referring to the disconnect between potential idealistic conceptions developed during

ITE and the workplace reality encountered in schools (e.g., Friedman, 2000; Veenman, 1984). Therefore, it is not surprising that empirical studies examining this period indicate heightened emotional exhaustion, and symptoms of anxiety and depression (e.g., Dicke et al., 2015; McLean et al., 2017; Voss & Kunter, 2020) with significant attrition occurring during this critical phase (Borman & Dowling, 2008). To facilitate the transition from ITE to the profession, early-career teachers in some education systems undergo an induction phase during their first year(s) of teaching (Ingersoll & Strong, 2011; Keller-Schneider & Hericks, 2021; Prenzel et al., 2021). Besides qualifying future teachers, ITE impacts education systems and student learning in a broader way, through advocacy and partnerships with schools (Ell et al., 2019).

ITE varies significantly between and within countries. Since the current dissertation focuses on Switzerland, Germany, and Austria, these countries are discussed in some detail (for further information on ITE in Switzerland, see Criblez et al., 2016; for Germany, Blömeke, 2019; and for Austria, Schnider et al., 2023). In Switzerland and Austria, ITE consists of one phase covering courses at ITE institutions and teaching practicums in schools (Gröschner & de Zordo, 2021). In the German-speaking part of Switzerland, a bachelor's degree is required to teach at pre-primary and primary school levels, and a master's degree is required to teach at the lower secondary school level (Criblez, 2016). To teach at the higher secondary school level, different study programs are offered (Criblez, 2016). A master's degree is required to teach in special needs education (Criblez, 2016).

In Austria, all pre-service teachers—regardless of whether they will later teach at a primary school, secondary school, or special needs education—need a bachelor's and master's degree for permanent employment (Messner et al., 2018). The master's studies can be completed immediately after the bachelor's studies or pursued while working. There are three main types of ITE studies, for teaching at primary schools, general education secondary schools, and vocational education secondary schools. For teaching in special needs education, there is no separate study program; instead, pre-service teachers choose the specialization of inclusive pedagogy (Messner et al., 2018).

In contrast to the ITE systems in Switzerland and Austria, the German ITE system consists of two phases (Keller-Schneider & Hericks, 2021; Terhart, 2019): The first phase involves bachelor's and master's studies, including courses at ITE institutions and teaching practicums in schools. There are studies for five different school types: primary school, lower secondary school, upper secondary school, upper secondary vocational schools, and schools for students with special educational needs. The second phase of ITE (called the *Referendariat*) is

practice oriented and lasts between 1.5 and two years. Pre-service teachers teach at least eight lessons a week in schools and are supervised by teacher trainers and mentors. In all three countries, alternative pathways are also offered, such as short professional-oriented programs or employment-based training to respond to teacher shortages (European Commission/Education Audiovisual and Culture Executive Agency/Eurydice, 2021).

On their path to becoming a teacher, pre-service teachers in all three countries must navigate through two distinct learning environments in ITE, each of them with its own resources and demands (Núñez-Regueiro et al., 2024). On the one hand, pre-service teachers are students attending academic lectures and seminars at ITE institutions. On the other hand, pre-service teachers conduct teaching practicums in schools to acquire their first teaching experience and familiarize themselves with the responsibilities they will face as future teachers (Cohen et al., 2013; Lawson et al., 2015; Zeichner, 2012). The integration of these two learning environments into a coherent ITE program represents a challenge for ITE institutions (Darling-Hammond, 2014; Gröschner & de Zordo, 2021). Moreover, in spring 2020, the COVID-19 pandemic drastically changed these learning environments (Carrillo & Flores, 2020; Kan et al., 2022). Educational institutions had to adapt learning settings several times depending on the epidemiological situation, with national and regional variations. Educational institutions were required to reconcile teaching with necessary protective measures, which led to temporary distance learning (Carrillo & Flores, 2020). From spring 2020 until the beginning of 2022, higher education institutions in Switzerland, Germany, and Austria mainly used distance learning (for a detailed chronology for these three countries, see Dittler & Kreidl, 2023). Teaching practicums were also affected by restrictions and often also moved online (Kadir & Aziz, 2021; Kan et al., 2022). The COVID-19 pandemic not only required pre-service teachers to learn specific digital skills but also drastically changed the opportunities for communication and social interactions with lecturers and fellow students (Elmer et al., 2020; Pausits et al., 2021). Beyond ITE, pre-service teachers also faced challenges such as social distancing, worries about their health, and financial difficulties (Elmer et al., 2020; Evans et al., 2021; Pausits et al., 2021). Longitudinal studies reported increased depressive symptoms and anxiety among higher education students (Evans et al., 2021; Huckins et al., 2020; McLafferty et al., 2021). Taken together, pre-service teachers occupy—both during exceptional circumstances like a pandemic and in normal conditions—a vulnerable position, as their dual status as students and future teachers may exacerbate any well-being challenges they face (Malone et al., 2024). A rationale for the importance of enhancing our limited understanding of pre-service teacher well-being is presented next.

2.3 Well-Being of Pre-Service Teachers: Why Does It Matter?

Considering the complex learning environments pre-service teachers encounter during ITE paired with the perspective of entering a demanding profession with full responsibility for their students and their learning after graduation, enhancing the understanding of pre-service teacher well-being is important for two main reasons: First, pre-service teachers are higher education students and learners themselves. Prioritizing well-being within educational settings is an inherently valuable objective (OECD, 2017). Empirical evidence suggests that well-being supports learning and is related to academic achievement (e.g., El Ansari & Stock, 2010; Hascher, 2023; Kaya & Erdem, 2021). Consequently, designing ITE programs that foster well-being is crucial for optimally supporting pre-service teachers' growth and development as they prepare to enter this challenging profession.

Second, scholars argue that ITE serves as a learning opportunity for pre-service teachers to (proactively) gain awareness of their professional well-being and acquire sustainable well-being strategies—benefitting their learning journey in ITE but likely also their well-being when working as a teacher in schools (e.g., Dreer, 2021a; Mairitsch et al., 2021; Price & McCallum, 2015). For example, evidence suggests that social-emotional competencies are not only important for pre-service teacher well-being (Braun & Hooper, 2024) but also for teacher well-being (Jennings & Greenberg, 2009). Similarly, research has revealed links between mindfulness and both pre-service teacher well-being (Hue & Lau, 2015) and teacher well-being (Hwang et al., 2017). In turn, teacher well-being is important for a variety of reasons (for literature reviews, see Hascher & Waber, 2021; Zhang et al., 2023). For instance, research highlights the significance of teacher well-being for teaching quality (e.g., McCallum et al., 2017), better student performance (e.g., Klusmann et al., 2016), and reduced intentions to leave the profession (e.g., Collie, 2023). Given the number of pre-service teachers already teaching in schools while undertaking ITE due to teacher shortages (Helm et al., 2024; Schweizerische Koordinationsstelle für Bildungsforschung, 2023), addressing pre-service teacher well-being as an integral part of the professional development during ITE seems even more critical (Benincasa & Springob, 2024). Finally, empowering pre-service teachers to promote not only their own well-being, but also that of their students and the broader school community (Benincasa & Springob, 2024; White, 2021) aligns with contemporary calls to transform education systems toward fostering lifelong human flourishing (Curren et al., 2024).

To sum up, the importance of pre-service teacher well-being lies not only in supporting pre-service teachers' learning processes in complex learning environments, but ITE also provides a learning opportunity for pre-service teachers to potentially develop sustainable well-

being strategies, which seems particularly important given the challenging career entry with heavy responsibilities right from the start. However, the relevance of pre-service teacher well-being stands in contrast with how little consideration it has received within ITE. Therefore, scholars around the globe have called for an exploration of pre-service teacher well-being, and this has become even more important due to the recent challenges ITE faced in the COVID-19 pandemic and its aftermath (Benincasa & Springob, 2024; Corcoran & O'Flaherty, 2022; Thompson et al., 2020). It is encouraging that an increasing number of studies on pre-service teacher well-being have been published; however, these studies display considerable heterogeneity in how well-being is conceptualized. The following section explores these diverse conceptualizations and introduces the multidimensional and context-specific model of pre-service teacher well-being employed in this dissertation.

2.4 The Construct of Pre-Service Teacher Well-Being

Recently, Collie and Hascher (2024) have suggested two classifications of how researchers conceptualize student well-being, which also apply to pre-service teacher well-being. The *model-determined approach* uses a well-being model with a predetermined set of well-being dimensions, which has a strong theoretical foundation and is supported by prior empirical evidence. This includes models such as Ryff's (1989) six-dimensional model of psychological well-being, Diener's (1984) three-dimensional model of subjective well-being, and Hascher's (2004, 2023) six-dimensional model of scholastic well-being. In contrast, when researchers take the *model-informed* approach, they examine well-being by selecting well-being indicators within the broad umbrella term of well-being such as positive academic emotions or intrinsic motivation. This choice is conceptually informed, but researchers might also proceed bottom-up inspired by practice. Both approaches come with strengths and weaknesses (Collie & Hascher, 2024): While the model-determined approach promotes the comparability of results across studies, it also limits the researcher due to the pre-defined set of well-being dimensions. The model-informed approach allows the researcher to select a wider array of well-being indicators; however, it reduces the comparability across studies as variable selection varies from study to study, thus contributing to the "jingle-jangle fallacy" (p. 2) in well-being research. In the following, this classification is used to describe how pre-service teacher well-being has been conceptualized in prior empirical studies (Section 2.4.1). Then, taking a model-determined approach, the multidimensional and context-specific conceptualization of pre-service teacher well-being employed in the dissertation is introduced (Section 2.4.2).

2.4.1 Conceptualizations of Pre-Service Teacher Well-Being in Prior Empirical Studies

This section provides an overview of how pre-service teacher well-being has been conceptualized in prior empirical studies in terms of its multidimensionality and context specificity. First, the well-being indicators or dimensions researchers have selected to examine a construct they labeled "well-being" among pre-service teachers are described, followed by an examination if the context of ITE has been considered in these well-being conceptualizations. A literature search was conducted in September 2024 using three electronic databases: the Education Resources Information Centre (ERIC), Scopus, and FIS Bildung Literaturdatenbank (FIS). For ERIC and Scopus, the search string consisted of two different spelling variations of well-being (i.e., "well-being" OR "wellbeing") in combination with a set of terms associated with pre-service teachers (i.e., "pre-service teacher*" OR "preservice teacher*" OR "student teacher*" OR "trainee teacher*" OR "teacher candidate*" OR "prospective teacher*")[2]. The Boolean operator "OR" was used to separate synonyms and different spelling variations, and the asterisk was used to find both singular and plural word forms. For FIS, the search string consisted of the German term for well-being ("*Wohlbefinden*") in combination with two terms referring to pre-service teachers ("*Lehramtsstud**" OR "*angehende Lehrperson**")[3]. Terms related to well-being (e.g., "wellness" or "flourish*") were not integrated into the search string. The search was limited to peer-reviewed journal articles. No restraints regarding the year of publication were defined. Titles, abstracts, and keywords were searched, leading to 1,302 hits in ERIC, 571 hits in Scopus, and 19 hits in FIS. Four exclusion criteria were defined (see Table 1): (1) not reporting an empirical study; (2) not empirically examining a construct labeled as "well-being" or declared as an indicator of well-being; (3) using a mixed sample of pre-service teachers and in-service teachers and not reporting findings for these groups separately; and (4) examining German pre-service teachers enrolled in the second phase of ITE (*Referendariat*), since this phase bears a strong resemblance with induction phases in other countries (see Section 2.2). When articles were excluded based on these criteria, a total of 57 articles remained (for an overview of these articles, see Table A1 in Appendix A). All 57 articles were published in peer-reviewed journals between April 2011 and July 2024, with more publications in the last few years (see Figure 1). The studies were conducted with pre-service teachers from Europe (n = 30 studies; Austria, Denmark, England, Finland, Germany, Ireland, Italy, the Netherlands, Spain,

[2] The complete search string for ERIC and Scopus was: (("well-being" OR "wellbeing") AND ("pre-service teacher*" OR "preservice teacher*" OR "student teacher*" OR "trainee teacher*" OR "teacher candidate*" OR "prospective teacher*")).

[3] The complete search string for FIS was: (Freitext: "WOHLBEFINDEN'' und Freitext: "LEHRAMTSSTUD*'' oder "ANGEHENDE LEHRPERSON*")

Turkey, and the United Kingdom), Asia (*n* = 13 studies; China, Indonesia, Malaysia, and the Philippines), North America (*n* = 8 studies; Canada and the United States), and Oceania (*n* = 6 studies; Australia).

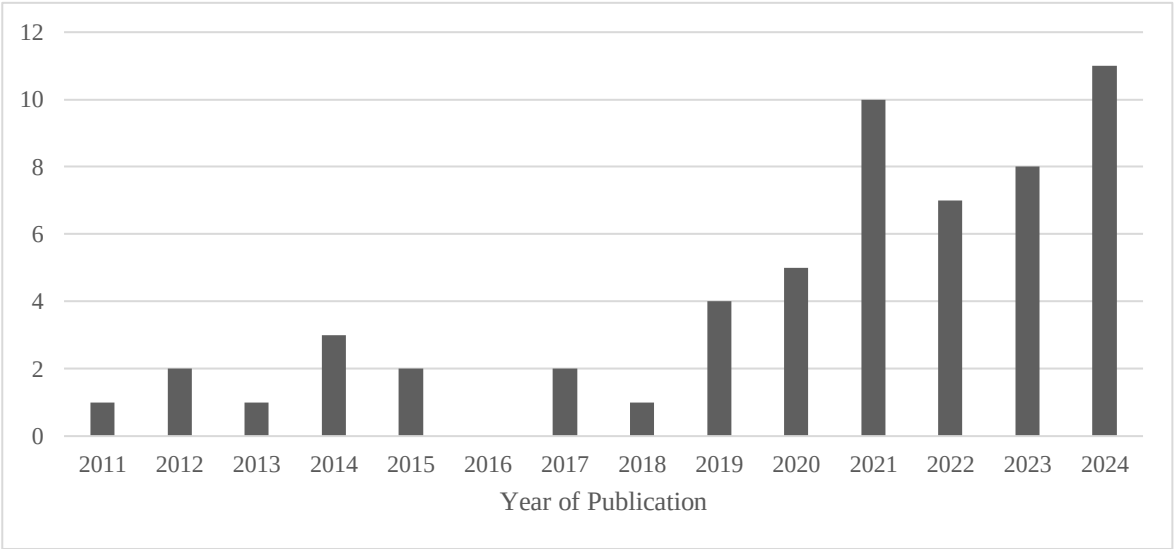
Table 1

Exclusion criteria

	Exclusion Criterion	Description	Example
1	Not empirical	The article does not report an empirical study.	White (2021)
2	Not about well-being	The article did not empirically examine a construct labelled as "well-being" or declared as an indicator of well-being among pre-service teachers.	Lemoine et al. (2024)
3	Using a mixed sample of pre-service and in-service teachers	In the article, findings are presented based on a mixed sample consisting of both pre-service and in-service teachers and the findings are not reported separately for each group.	Chan (2009)
4	Focus on German pre-service teachers during the second phase of ITE (*Referendariat*)	Well-being was examined among German pre-service teachers who were enrolled in their second phase of ITE. Exclusion due to strong resemblance to the induction phase in other countries.	Schmidt et al. (2016)

Figure 1

Included studies (n = 57) sorted by year of publication



First, the studies were classified based on whether they used a model-determined or model-informed approach (see Table 2). Among the identified studies, only a minority of the studies applied the model-determined approach (n = 7 studies). Three multidimensional well-being models were used to conceptualize pre-service teacher well-being: The psychological well-being model (Ryff, 1989) with the six dimensions of environmental mastery, purpose in life, self-acceptance, autonomy, personal growth, and positive relations with others; the PERMA model (Seligman, 2012) with the five dimensions of positive emotion, engagement, relationships, meaning, and accomplishment; and the PROSPER model (Noble & McGrath, 2015), which besides the dimensions of positivity, engagement, purpose, relationships, and outcomes—which are comparable to the dimensions in the PERMA model—also includes the two dimensions of strengths and resilience and was particularly developed for the educational context.

In contrast, most of the studies used the model-informed approach (n = 50 studies) to conceptualize well-being among pre-service teachers. Within the model-informed approach, four different categories emerged: (1) studies that used one or multiple positive well-being dimensions, such as life satisfaction (Bjorklund et al., 2021; Daniels et al., 2017) or flourishing (Asici, 2021; Zhao et al., 2022); (2) studies that used one or multiple negative well-being dimensions, such as emotional exhaustion (Hartl et al., 2022; Varol et al., 2023) or depression, anxiety, and stress (Atabek et al., 2019); (3) studies that used a combination of positive and negative well-being dimensions, such as the combination of study satisfaction and emotional exhaustion (Schriek et al., 2024) or self-esteem and depression (Hagger & Malmberg, 2011); and (4) qualitative studies that took a holistic approach beyond distinct well-being dimensions, such as conceptualizing well-being as a complex dynamic system (Sulis et al., 2021) or as a dynamic balance (O' Brien et al., 2022; Pihlainen et al., 2024).

Even though within the model-informed approach, researchers are flexible to combine well-being dimensions to suit their study purpose and context, these studies still require a strong theoretical foundation (Collie & Hascher, 2024). This is particularly important when researchers combine well-being dimensions from different research fields (e.g., positive psychology and psychology of work and organization, see Hascher & Waber, 2021). To systematically analyze to what extent researchers elaborated on the theoretical background of their conceptualizations is beyond the scope of this literature review, but it is clear that it varied between studies. Daniels et al. (2017), for example, integrated well-being as a variable of interest with little theoretical elaboration on the construct. Sulis et al. (2021), on the other hand, provided profound theoretical underpinnings of its conceptualization. Similarly, the studies

differed in terms of the theories they used, ranging from Diener's concept of subjective well-being (e.g., referred to in Bjorklund et al., 2021), Ryff's concept of psychological well-being (e.g., referred to in Kasapoglu & Didin, 2019), the study demands-resources (SD-R) model (e.g., referred to in Hartl et al., 2022), to the well-being definition of Dodge et al. (2012) of well-being as maintaining a balance between resources and challenges (e.g., referred to in Pihlainen et al., 2024).

Second, the studies were analyzed in terms of how the context of ITE is reflected in the well-being conceptualizations (see Table A1 in Appendix A). In total, 28 studies took solely a context-unspecific approach when conceptualizing pre-service teacher well-being. With a quantitative approach, general well-being dimensions were measured such as life satisfaction (Bjorklund et al., 2021; Daniels et al., 2017), flourishing (Asici, 2021; Zhao et al., 2022), or stress (Atabek et al., 2019; Cavioni et al., 2023). In contrast, 22 studies focused on well-being dimensions in the ITE context, with some of them specifically teaching practicums (e.g., Dreer, 2021b; Varol et al., 2023) Context-specific dimensions were investigated, such as study satisfaction (Schriek et al., 2024), job satisfaction (Dreer, 2021a), or emotional exhaustion (Hartl et al., 2022). More than half of these studies were qualitative studies (e.g., Nimasari et al., 2024; Price & McCallum, 2015). Besides, there were seven studies that examined both general well-being and context-specific well-being (e.g., Datu et al., 2023; Lee, Fung, Datu, et al., 2024). For instance, Datu et al. (2023) used different subscales to operationalize the seven dimensions of the PROSPER model (Noble & McGrath, 2015), with some of these subscales tapping into general well-being (e.g., purpose in life) and others into context-specific well-being (e.g., work engagement).

Taken together, the literature review reveals a growing interest in pre-service teacher well-being. The research landscape is diverse, encompassing studies from various countries and employing both model-determined and model-informed approaches to conceptualize well-being. Most studies applied the model-informed approach, using one or several well-being dimensions. The majority of studies in this literature review examined at least one positive well-being dimension (Collie & Hascher, 2024), but some combined positive and negative dimensions. Only a minority of studies relied on established multidimensional well-being models, and even fewer adapted these to the context of ITE. No studies considered both positive and negative well-being dimensions in the context of ITE. Overall, only a minority of the quantitative studies tailored their measures to the context of ITE, with no study providing evidence for both internal and external validity. This finding aligns with Khatri and Duggal's (2022) observation of a critical gap in higher education research: the scarcity of validated

Table 2

Conceptualizations of pre-service teacher well-being in prior studies

Conceptualization	Examples of Publications
Model-determined approach (n = 7 studies)	
Psychological well-being model (Ryff, 1989)	· Corcoran and O'Flaherty (2022)
PERMA model (Seligman, 2012)	· Dreer (2021b, 2023b); Lee, Fung and Chung (2024); Nimasari et al. (2024)
PROSPER model (Noble & McGrath, 2015)	· Datu et al. (2023); Lee et al. (2023)
Model-informed approach (n = 50 studies)	
Only positive dimension(s)	· Life satisfaction (Bjorklund et al., 2021; Daniels et al., 2017) · Flourishing (Asici, 2021; Zhao et al., 2022) · Life satisfaction, flourishing (Lin & Datu, 2023)
Only negative dimension(s)	· Emotional exhaustion (Hartl et al., 2022; Varol et al., 2023) · Depression, anxiety, stress (Atabek et al., 2019) · Somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, psychological distress (Gustems & Calderón, 2014)
Combination of positive and negative dimensions	· Study satisfaction, emotional exhaustion (Schriek et al., 2024) · Self-esteem, depression (Hagger & Malmberg, 2011) · Mental health, resilience, stress (Cavioni et al., 2023)
Holistic approach (qualitative research)	· Complex dynamic system (Sulis et al., 2021) · Dynamic balance (O' Brien et al., 2022; Pihlainen et al., 2024) · Social, physical, and psychological dynamic state (Mairitsch et al., 2021)

Note. Studies were classified as taking the model-determined approach when all of the proposed model dimensions were examined individually (e.g., only measuring life satisfaction as part of the concept of subjective well-being or measuring the six-dimensional construct of psychological well-being using a one-dimensional scale was classified as model-informed approach).

instruments for measuring student well-being using context-specific approaches. Given this scarcity in research, there is a need for a multidimensional and context-specific model and measure of pre-service teacher well-being that includes both positive and negative well-being dimensions and is theoretically grounded. This is discussed in the following section.

2.4.2 Multidimensional and Context Specific: Extending the Model of Scholastic Well-Being to Pre-Service Teachers

In this dissertation, pre-service teacher well-being is conceptualized by extending the six-dimensional model of scholastic well-being (for an extensive theoretical background of the model, see Hascher, 2004) to pre-service teachers. Theoretically rooted in general well-being research (e.g., Ryff, 1989), the model was initially developed to capture student well-being (Hascher, 2007, 2008), but it has recently been expanded to teacher well-being (Hascher, 2020). Scholastic well-being is defined as the quality of experience, covering emotional, cognitive, and psychosomatic aspects, and it is assumed that these aspects are closely interlinked (Hascher, 2004, 2007). Specifically, the model consists of three positive and three negative well-being dimensions, with teacher well-being conceptualized as the dominance of positive dimensions over negative ones (Hascher, 2020, 2023). The three positive dimensions are (1) *positive attitudes towards school*, encompassing teachers' cognitive evaluations of the workplace (the school); (2) *enjoyment in school*, related to professional activities such as collaborating with colleagues; and (3) *positive academic self-concept* in terms of the teaching profession. The three negative dimensions are (4) *worries in school*, related to the work at school; (5) *physical complaints in school*, encompassing negative psychosomatic experiences such as headaches due to teaching; and (6) *social problems in school*, addressing negative social interactions in school, such as with students and colleagues (Hascher, 2020). The strength of Hascher's model (2004, 2023) lies in its multidimensionality and combining both hedonic aspects, such as enjoyment in school, and eudaimonic aspects, such as academic functioning in school. Moreover, it emphasizes well-being experiences in educational settings, harnessing the context specificity of well-being.

Therefore, to conceptualize pre-service teacher well-being, the current dissertation takes a model-determined approach by adapting the model of scholastic well-being to ITE. This allows for examining pre-service teacher well-being in a manner that is theoretically aligned with the well-being of both teachers and students. Specifically, pre-service teacher well-being is conceptualized with three positive dimensions, positive attitudes towards ITE, enjoyment of ITE, positive academic self-concept regarding ITE, and three negative dimensions, worries

about ITE, physical complaints related to ITE, and social problems in ITE. Each of these well-being dimensions is described further below.

Positive attitudes towards ITE refers to pre-service teachers' favorable overall evaluations of ITE, including its purpose and value. Eagly and Chaiken (1993, p. 1) refer to attitudes as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor." Attitudes are described as a multi-faceted construct comprising cognitive, emotional, and behavioral components (Pickens, 2005; Shuman & Scherer, 2014). Unlike emotions, attitudes are characterized as more enduring and having a less direct relationship with behavior (Shuman & Scherer, 2014). Nevertheless, extensive research on the attitude-behavior relationship suggests that attitudes can be modified, potentially leading to behavioral changes (Verplanken & Orbell, 2022).

Enjoyment of ITE captures positive emotional experiences, taking the situational context into account (Hascher, 2007, 2008). It assesses, for example, enjoyment related to learning processes. Referring to the control-value theory of achievement emotions (Pekrun, 2006), enjoyment of ITE occurs when aspects of ITE are positively valued and experienced as controllable. There is evidence of enjoyment supporting the application of flexible, creative learning strategies, motivation, and academic achievement (Camacho-Morles et al., 2021; Pekrun, 2006).

Positive academic self-concept regarding ITE includes pre-service teachers' cognitive evaluation of their academic abilities and forms one part of the general self-concept of an individual (Marsh & Seaton, 2013). Academic self-concept is differentiated from academic self-efficacy: While the academic self-concept represents an aggregated past-oriented judgment, academic self-efficacy refers to future-oriented task-specific judgments (Bong & Skaalvik, 2003). Individuals use different reference points for evaluating their abilities to form their academic self-concept, such as comparing oneself to others (Bong & Skaalvik, 2003). For instance, the big-fish-little-pond effect suggests that learners tend to have lower academic self-concepts when placed in high-achieving environments compared to low-achievement environments (Marsh, 1987). Evidence suggests favorable outcomes of a positive academic self-concept, such as motivation and academic achievement (Bong & Skaalvik, 2003; Marsh & Seaton, 2013).

Worries about ITE capture future-oriented cognitions about the threat to pre-service teachers' current goals, for example related to exams and certificates of achievement. Worry is defined as a domain-specific construct representing the cognitive component of anxiety disorders, such as test anxiety (Fam et al., 2020; von der Embse et al., 2018). Attentional control

theory (Eysenck et al., 2007) suggests that worry uses an individual's limited attentional resources, which are then less available for concurrent processing. However, worry may also lead to the application of compensatory strategies, such as enhanced effort to minimize this aversive state. Worries are related to an array of unfavorable outcomes, such as impairment of problem solving (Llera & Newman, 2020), lower academic performance (von der Embse et al., 2018), and shorter sleep length (Kelly, 2002).

Physical complaints related to ITE cover negative psychosomatic experiences such as headaches, loss of appetite, or sleeping problems due to ITE and relate to physical well-being as subjective in nature (Frank, 2011). In 1946, the World Health Organization (WHO) referred besides mental and social well-being also to physical well-being (WHO, 1946, 1984). However, the physical dimension of well-being is incorporated in well-being models less frequently than emotional, cognitive, or social dimensions. For example, Becker (1994) distinguished between psychological and physical well-being. In their five-dimensional model of occupational well-being, Van Horn et al. (2004) incorporated a psychosomatic dimension covering psychosomatic health complaints such as headaches or stomachaches. Physical health is also often added to the PERMA model of Seligman (2012).

Finally, *social problems in ITE* capture pre-service teachers' social functioning in ITE by focusing on negative social interactions. During ITE, pre-service teachers interact with various stakeholders in ITE institutions (e.g., peers, lecturers) but also in schools during teaching practicums (e.g., mentors, students). To belong and to connect with other individuals is postulated as a basic human need (Baumeister & Leary, 1995; Ryan & Deci, 2000). Therefore, social dimensions are also present in established well-being models with a eudaimonic approach. For instance, Ryff's (1989) model of psychological well-being contains the dimension "positive relations with others,", and Seligman's (2012) PERMA model includes "relationships." A particular emphasis on the social nature of well-being was put forward by Keyes (1998), who introduced the concept of "social well-being," as indicated by social coherence, social actualization, social integration, social acceptance, and social contribution.

Taken together, the six dimensions represent important indicators of pre-service teacher well-being and are relevant for their flourishing and thriving during ITE. By focusing on both the learning environment at ITE institutions and schools during teaching practicums, they provide a global evaluation of pre-service teachers' well-being experiences in ITE. It could be argued that this integrative approach reduces context specificity compared to an approach tailored to one of the two learning environments, however, it increases flexibility and allows for comparison of pre-service teacher well-being across different ITE systems, learning

environments, and phases during the academic year. To empirically investigate this model of pre-service teacher well-being and test if its postulated first-order six-factor model is supported by empirical evidence, an adequate instrument is needed. Therefore, Study 1 (Chapter 4) introduces the pre-service teacher well-being questionnaire, a self-report instrument aimed at capturing the subjective nature of well-being (e.g., Diener, Lucas, et al., 2018; Diener, Oishi, et al., 2018; Diener et al., 2010). Concretely, the teacher well-being questionnaire developed by Hascher (2020) was adapted to the context of ITE, measuring each of the six pre-service teacher well-being dimensions with one subscale each. The study aimed to provide evidence for the validity and reliability of the questionnaire.

2.5 Pre-Service Teacher Characteristics, Resources, and Retention-Related Outcomes

While the focus of the dissertation lies on the construct of pre-service teacher well-being itself, it is also important to enhance our understanding of related factors. In the dissertation, three types of related factors are considered: Pre-service teacher characteristics (Study 2, Study 3), resources (Study 3), and retention-related outcomes (Study 3). In the following, important pre-service teacher characteristics considered in the investigation—such as the study program or the enrolled study semester/year—are briefly introduced (Section 2.5.1). Then, framed by the job demands-resources (JD-R) theory (Bakker & Demerouti, 2017) and the recently proposed SD-R theory (Bakker & Mostert, 2024) an overview of prior empirical findings regarding resources and retention-related outcomes is provided, and the selected resources and retention-related outcomes investigated in the dissertation are introduced (Section 2.5.2).

2.5.1 Important Pre-Service Teacher Characteristics

To deepen our understanding of pre-service teacher well-being, a starting point is to pay attention to the role played by pre-service teacher characteristics. Therefore, eight pre-service teacher characteristics were included in the investigation, three general ones (gender, age, and caring responsibilities) and five ITE-related ones (study program, enrolled semester/year, experience of exam phase, experience of teaching practicum phase, and part-time job as a teacher besides ITE). The relationship between these pre-service teacher characteristics and pre-service teacher well-being was explored, as prior findings are scarce.

In terms of gender, prior findings are contradictory. A Canadian study reported no relation between gender and pre-service teachers' well-being (Squires et al., 2022), while in other studies with German and Turkish pre-service teachers, either male pre-service teachers (Bredehöft, 2023; Kasapoglu & Didin, 2019) or female pre-service teachers displayed higher well-being (Bingöl & Batık, 2019). Regarding age, it might be assumed that pre-service

teachers who enter ITE at a later stage in their life can build on previous learning and professional experiences and therefore might experience higher well-being. For example, older pre-service teachers may demonstrate a particularly clear understanding of the personal significance and relevance of their studies and may already demonstrate a wide range of knowledge and skills to approach challenges during ITE (McCune et al., 2010). However, again, prior findings are mixed: While Kasapoglu and Didin (2019) found a positive relationship between increasing age and Turkish pre-service teachers' well-being, Squires et al. (2022) did not among Canadian pre-service teachers. Having caring responsibilities was likewise included as a pre-service teacher characteristic to account for the COVID-19 pandemic potentially challenging pre-service teachers with school-aged children to combine family commitments and their studies. Due to the COVID-19 pandemic Austrian schools, for instance, were (partly) closed for 30 weeks between March 2020 and June 2021 (Bock-Schappelwein & Famira-Mühlberger, 2021). However, prior studies reported that having children was not associated with perceived stress and engagement of German and Swiss pre-service teachers during the COVID-19 pandemic (Hahn et al., 2021; Zellweger et al., 2024).

Moving on to the ITE-related pre-service teacher characteristics, no prior empirical evidence was identified on the relationship between the ITE program and pre-service teacher well-being. Regarding the semester or year in which pre-service teachers are enrolled, Squires et al. (2022) did not find a significant relationship among Canadian pre-service teachers. Next, an exam phase and/or a teaching practicum phase might be negatively related to pre-service teacher well-being due to increased workload (Malone et al., 2024; O' Brien et al., 2022) and time pressure (Mairitsch et al., 2021; Sulis et al., 2023). However, prior research highlights that pre-service teachers in teaching practicums also report positive emotions besides experiencing worries, nervousness, and anxiety (Hascher & Hagenauer, 2016). Finally, findings have been mixed with regards to the impact of having a part-time teaching job on pre-service teacher well-being. For example, working part time as a teacher was not related with pre-service teachers' stress experience (Hahn et al., 2021). In contrast, Austrian pre-service teachers starting their teaching career parallel to their master's studies showed increased strain indices compared to pre-service teachers without parallel career entry (Beer et al., 2020).

Taken together, there is mainly variable-centered evidence suggesting a relationship between pre-service teacher characteristics and their well-being at a sample-wide level. This dissertation enhances our understanding in this area by taking a person-centered approach (see Section 2.6). Five pre-service teacher characteristics were included in Study 2 (gender, study program, enrolled study semester, experience of exam phase, and experience of teaching

practicum phase), and six pre-service teacher characteristics in Study 3 (gender, age, caring responsibilities, study program, enrolled study year, and part-time job as a teacher).

2.5.2 Resources and Retention-Related Outcomes

One popular framework to investigate both predictors and outcomes of well-being is JD-R theory (Bakker & Demerouti, 2017; Demerouti et al., 2001). Focusing on occupational well-being, over 20 years ago, Bakker and Demerouti proposed three critical elements that influence employee well-being and, consequently, job-related outcomes, such as the intention to leave the profession (Bakker et al., 2023; Demerouti et al., 2001). Within the framework, *job resources*, like support from coworkers, assist employees in achieving their professional goals. *Job demands* are facets of work requiring sustained effort, which come with physiological and/or psychological costs for the employee. An example is a heavy workload. In addition to these two contextual factors, the theory also recognizes the importance of *personal resources*, such as an employee's self-efficacy, capturing how individuals assess their own abilities to effectively shape the world around them (Xanthopoulou et al., 2007).

The JD-R framework has been extensively applied to capture the working experience among teachers (e.g., Collie, 2023; Collie et al., 2020; Dicke et al., 2018; Granziera et al., 2021; Hakanen et al., 2006; Skaalvik & Skaalvik, 2018). While initially developed for occupational settings, scholars have adapted the framework and its principles to educational contexts. These include the academic demands-resources model (Martin & Collie, 2022), and the study demands-resources model (Lesener et al., 2020; Salmela-Aro et al., 2022). Based on these demands-resources models, Bakker and Mostert (2024) have developed the SD-R theory, focusing particularly on student well-being in higher education. This multidimensional and context-specific approach conceptualizes student well-being as student engagement and student burnout. In accordance with JD-R theory in the occupational context, Bakker and Mostert (2024) propose a predictive value of study resources (e.g., having access to learning materials and supportive mentors), study demands (e.g., high study workload, learning obstacles), and personal resources (e.g., resilience, optimism, and hope) for student well-being. They suggest that student well-being is related to retention-related outcomes such as intention to quit their studies. With ITE encompassing both courses at ITE institutions and teaching practicums in schools, both JD-R theory and SD-R theory may apply to pre-service teachers. In the current dissertation, the focus lies on resources and retention-related outcomes, but demands were not investigated. Since contextual resources in ITE extend beyond traditional job or study resources (Núñez-Regueiro et al., 2024), these resources will be subsequently referred to as ITE resources.

Prior empirical studies investigating pre-service teacher well-being from the JD-R or SD-R perspectives are scarce. Of the 57 publications identified in the literature research on pre-service teacher well-being (Section 2.4.1), only two used models grounded in JD-R theory to frame their study. In the first publication, Hartl et al. (2022) used the SD-R model as a framework. Specifically, they conducted a study with 903 German pre-service teachers and applied latent change score models to investigate the longitudinal relationship between emotional support of peers (ITE resource) and emotional exhaustion (pre-service teacher well-being). Moreover, an open question was used to collect qualitative data on ITE quitting intentions and motives. Quantitative findings revealed that emotional support of peers was not a predictor of later emotional exhaustion, contradicting prior findings. Qualitative findings indicated that pre-service teachers' ITE quitting intentions were primarily driven by three factors: performance issues, lack of study motivation, and unfavorable study conditions at university, such as insufficient support from lecturers or feeling anonymous. In the second publication, Varol et al. (2023) referred to the job-demands-resources-recovery model (Kinnunen et al., 2011) to investigate pre-service teacher well-being during teaching practicums. Based on cross-sectional data of 276 German pre-service teachers, structural equation modeling demonstrated the mediating role of psychological detachment (in terms of recovery) in the positive relationship between workload (demand) and emotional exhaustion (pre-service teacher well-being). Moreover, post-lesson supervisor feedback and reflection hindered pre-service teachers' psychological detachment and was related to higher emotional exhaustion.

Besides these two publications, several other qualitative and quantitative studies, although they did not use JD-R or SD-R theory, provide further evidence on the importance of ITE and personal resources for pre-service teacher well-being. However, no study identified in the literature review investigated pre-service teacher well-being in relation to retention-related outcomes. Starting with personal resources, there is some evidence for a relationship between teacher self-efficacy and pre-service teacher well-being (Bjorklund et al., 2021; Cavioni et al., 2023; Lee, Fung, & Chung, 2024; Lee, Fung, Datu, et al., 2024). Moreover, mindfulness (Hepburn et al., 2021b; Hue & Lau, 2015), character strengths such as curiosity and fairness (Gustems & Calderón, 2014), emotional intelligence (Vesely et al., 2014), life skills such as creative and critical thinking (Kasapoglu & Didin, 2019), personal and professional organization skills (O' Brien et al., 2022), psychological detachment (Varol et al., 2023), social-emotional competencies (Braun & Hooper, 2024), and social entrepreneurship (Asici, 2021) emerged as personal resources for pre-service teacher well-being. Moving on to ITE resources,

studies particularly provide evidence for ITE resources related to the social aspects of ITE: positive social relationships such as with peers or mentors (Dreer, 2021b; Mairitsch et al., 2021; Price & McCallum, 2015; Squires et al., 2022), social support (Hartl et al., 2022; Sulis et al., 2021; Väisänen et al., 2017; Ye & Wang, 2024), university kindness (Datu & Lin, 2022; Lin & Datu, 2023), appreciation by lecturers (Carstensen et al., 2021), and being part of learning communities (Thompson et al., 2020).

Taken together, the JD-R and SD-R frameworks underpin the important role of personal and ITE resources for pre-service teacher well-being and, in turn, for retention-related outcomes (Bakker & Demerouti, 2017; Bakker & Mostert, 2024). However, the extant research has several critical limitations. First, few quantitative studies examining these relationships took a context-specific approach to investigate pre-service teacher well-being, and only one study combined a context-specific and person-centered approach (Lee, Fung, Datu, et al., 2024). Second, as teaching practicums form an integral part of ITE systems (Darling-Hammond, 2014; Zeichner, 2012), ITE resources related to teaching practicums and their alignment with ITE learning environments require further investigation (Benincasa & Springob, 2024). Third, evidence on how pre-service teacher well-being relates to retention-related outcomes such as quitting intentions is scarce. Drawing on the theory of planned behavior, which posits that behavioral intentions predict future actions (Ajzen et al., 2009), quitting intentions would serve as a meaningful measure for understanding retention in the teaching profession.

To address these limitations, two ITE resources, one personal resource, and two retention-related outcomes were investigated in Study 3 of this dissertation (Chapter 6), harnessing a multidimensional, context-specific, and person-centered approach to well-being. For ITE resources, the practicum quality and the practicum-university coherence were investigated, since these support successful professionalization (Darling-Hammond, 2014). For personal resources, teacher self-efficacy was examined, which was identified in prior research as an important personal resource for (pre-service) teachers (Bjorklund et al., 2021; Granziera, 2022; Lee, Fung, & Chung, 2024; Zee & Koomen, 2016). It captures (pre-service) teachers' belief in their abilities to produce desired outcomes through their actions when teaching, in terms of student engagement, classroom management, and instructional strategies (Bandura, 1999; Tschannen-Moran & Woolfolk Hoy, 2001). Besides these resources, two retention-related outcomes were examined: ITE quitting intentions and profession quitting intentions. While ITE quitting intentions refer to the intent to no longer pursue ITE, profession quitting intentions refer to the intention to complete ITE and then leave the teaching profession (e.g., Struyven & Vanthournout, 2014; Trent, 2019). The potential of person-centered approaches for studying

pre-service teacher well-being and related factors—such as these resources and retention-related outcomes—is discussed next.

2.6 The Potential of Person-Centered Approaches

Most of the studies investigating pre-service teacher well-being and related factors have employed variable-centered approaches (e.g., Corcoran & O'Flaherty, 2022; Dreer, 2021b; Hartl et al., 2022; Schriek et al., 2024), which examine relationships between variables at a sample-wide level (Hofmans et al., 2020). While studies employing these methods (e.g., structural equation modeling) have provided valuable insights, they operate under the assumption of population homogeneity, which may oversimplify the complex reality of well-being (Morin et al., 2017). Person-centered approaches (e.g., latent profile analysis, cluster analysis) have the potential to complement these findings by emphasizing the multidimensional nature of pre-service teacher well-being. By examining how variables combine within individuals, these methods allow the researcher to uncover subpopulations that might be masked by sample-wide correlational patterns (Morin et al., 2018; Nylund-Gibson et al., 2019). For instance, while variable-centered analyses might reveal negative correlations between positive and negative well-being dimensions across a sample, person-centered approaches might identify subpopulations that experience high levels of both positive and negative well-being simultaneously.

The value of person-centered perspectives in investigating pre-service teacher well-being has only recently been recognized. Cavioni et al. (2023) utilized cluster analysis with 133 special education pre-service teachers from Italy, identifying three distinct profiles based on mental health, perceived stress, and resilience: high well-being (38.3%), moderate well-being (54.1%), and low well-being (7.5%). They find that pre-service teachers in higher profiles tended to report higher teacher self-efficacy and work engagement. Similarly, Lee, Fung, Datu, et al. (2024) conducted latent profile analysis among 291 pre-service teachers from Hong Kong based on subjective well-being (positive affect and negative affect) and psychological well-being (personal accomplishment, presence, dedication, and relationship with peers) indicators. Like Cavioni et al. (2023), Lee, Fung, Datu, et al. (2024) also identified three profiles with comparable distributions: High well-being (26.6%), moderate well-being (65%), and low well-being (8.4%). Their study similarly found that pre-service teachers in the high well-being profile reported higher teacher self-efficacy than those in other profiles.

While these two studies provide valuable initial insights, they have several limitations. Both studies relied on relatively small samples, which makes it difficult to generalize their

findings. Moreover, only Lee, Fung, Datu, et al. (2024) adapted some measures specifically to the ITE context. To advance the field, studies using bigger sample sizes and specifically considering the context of ITE are necessary. These studies should ideally apply indicator variables based on solid theoretical well-being conceptualizations and measured with instruments supported by empirical evidence for reliability and validity. Moreover, given the exploratory nature of person-centered analyses, validation of profile solutions is essential, including demonstrating the theoretical value of potential well-being profiles, illustrating meaningful relations with key covariates, and replicating identified solutions with new samples (Hofmans et al., 2020; Morin et al., 2017). Given these methodological considerations, this dissertation combines both variable- and person-centered approaches to provide a comprehensive understanding of pre-service teacher well-being and its multidimensionality (Morin et al., 2017; Sonnentag, 2015). A variable-centered approach is applied (e.g., using factor analysis to identify underlying well-being dimensions and analyze competing model structures) to test the psychometric properties of the pre-service teacher well-being questionnaire (Study 1). Then, a person-centered approach is applied to investigate pre-service teacher well-being profiles in two different samples (Study 2 and Study 3). The overarching research questions addressed in this dissertation are detailed in the next chapter.

3 The Present Research

Pre-service teacher well-being seems critical for multiple reasons. Well-being research suggests that the well-being of pre-service teachers might support their learning in complex institutional and school environments (El Ansari & Stock, 2010; Hascher, 2023; Kaya & Erdem, 2021). ITE might also provide an opportunity for pre-service teachers to learn how to sustain their well-being—a crucial skill given a challenging career entry with immediate high-stakes responsibilities (Dreer, 2021a; Mairitsch et al., 2021; Price & McCallum, 2015; Tynjälä & Heikkinen, 2011). Moreover, empowering pre-service teachers to promote their own well-being and that of their future students aligns with contemporary educational goals of fostering lifelong human flourishing (Curren et al., 2024).

Despite its relevance, the understanding of pre-service teacher well-being remains limited, with notable gaps in both conceptualization and measurement. Consequently, scholars globally have increasingly called for more research in this area, and this demand has been amplified by the disruptions of the COVID-19 pandemic (Benincasa & Springob, 2024; Corcoran & O'Flaherty, 2022; Thompson et al., 2020). This dissertation addresses these gaps by taking a multidimensional, context-specific, and person-centered approach to enhance the understanding of pre-service teacher well-being.

A literature review on pre-service teacher well-being revealed that a variety of different conceptualizations are employed with only a few relying on established theoretical models (see Section 2.4.1). Even though the research field is still very small, a great deal of heterogeneity is already apparent at this stage, which makes cumulative research difficult (Hascher & Waber, 2021; Martela & Sheldon, 2019). With most studies targeting the general well-being of pre-service teachers, there is a paucity of conceptualizations and validated measures specifically targeting well-being in the context of ITE. Therefore, this dissertation takes a model-determined approach (Collie & Hascher, 2024) by extending the six-dimensional model of scholastic well-being (Hascher, 2004, 2023) to ITE. The model of scholastic well-being reflects the multidimensional nature of well-being: Scholastic well-being is conceptualized as a dominance of positive dimensions over negative ones, covering emotional, cognitive, and psychosomatic aspects and integrating hedonic and eudaimonic elements (Hascher, 2004, 2007, 2023). Specifically, the teacher well-being questionnaire (Hascher, 2020) was adapted for pre-service teachers for this dissertation, measuring each of the six well-being dimensions with one subscale (see Chapter 4). To support this adaption, evidence for the validity and reliability of this measure—the pre-service teacher well-being questionnaire—is needed.

There is also a need to enhance our understanding of how positive and negative well-being dimensions may co-occur within individuals. Person-centered approaches have the potential to identify potential subpopulations that might be obscured by sample-wide correlational patterns (Morin et al., 2018; Nylund-Gibson et al., 2019). There is emerging research suggesting sample heterogeneity in pre-service teacher well-being, however, there is as yet limited or no context specificity when conceptualizing the construct (Cavioni et al., 2023; Lee, Fung, Datu, et al., 2024). To strengthen the construct validity of well-being profiles, Morin et al. (2017) recommend to not only demonstrate their theoretical value, but also to identify profiles across two independent samples and provide evidence for their relatedness with key variables.

In terms of the relatedness of well-being profiles with such key variables, JD-R theory (Bakker & Demerouti, 2017; Demerouti et al., 2001) and its application to the educational context (SD-R theory; Bakker & Mostert, 2024) theoretically suggest that contextual and personal resources positively predict well-being and that well-being, in turn, is linked with retention-related outcomes. For pre-service teachers, prior research in this regard is limited and based on mostly variable-centered approaches (see Section 2.5). An enhanced understanding of how important pre-service teacher characteristics and resources are associated with well-being profiles would provide specific information for creating ITE learning environments that promote pre-service teacher well-being. Moreover, while there is evidence for the importance of teacher well-being for their retention (Skaalvik & Skaalvik, 2018; Zhou et al., 2024), this evidence is still missing for pre-service teachers.

The dissertation aims to not only advance our theoretical understanding of this multidimensional construct but also to provide, with the pre-service teacher well-being questionnaire, a measure for future investigations in this underdeveloped research field. Moreover, the findings may inform possible interventions to promote pre-service teacher well-being—targeting them both as learners and as future teachers entering a demanding profession with high societal responsibilities. In this publication based dissertation, four research questions are addressed in three studies:

1. What is the evidence to support the validity and reliability of the pre-service teacher well-being questionnaire? (Study 1)
2. What well-being profiles are evident among pre-service teachers? (Study 2 and Study 3)
3. To what extent are pre-service teacher characteristics and resources associated with well-being profiles? (Study 2 and Study 3)

4. To what extent do potential well-being profiles differ in terms of retention-related outcomes? (Study 3)

All three studies were conducted collaboratively. Study 1 was designed to address the first research question of the dissertation, aiming to examine the validity and reliability of the pre-service teacher well-being questionnaire. Study 2 and Study 3 address the second and third research questions. They investigate well-being profiles among pre-service teachers and examine to what extent pre-service teacher characteristics (Study 2 and Study 3) and resources (Study 3) are associated with these profiles. Study 3 addresses the fourth research question regarding how these well-being profiles may differ in terms of retention-related outcomes. Study 1 and Study 2 are published, and therefore, the final accepted manuscript versions have been included in the dissertation. Study 3 is under review, and thus, the submitted manuscript version has been included. Below, the three studies are presented, providing information on the authorship, journal, aim, method, results, and contribution to the dissertation.

3.1 Study 1

Authorship. Haldimann, Hascher, and Flick-Holtsch

Journal. International Journal of Educational Research Open (published)

Aim. The first study extends the multidimensional model of scholastic well-being (Hascher, 2004, 2023) to ITE. Specifically, the teacher well-being questionnaire (Hascher, 2020) was adapted to the context of ITE, which resulted in the pre-service teacher well-being questionnaire. To test the psychometric properties of the questionnaire, the standards for educational and psychological testing (American Educational Research Association [AERA] et al., 2014) were followed to explore the internal structure of the questionnaire and its relation with other established constructs in the field of well-being research.

Method. The first study was part of the cooperation project "Becoming a teacher: Well-being during ITE," which was carried out by the University of Bern, the University of Zurich, and the University of Teacher Education St. Gallen. In total, 1,749 pre-service teachers for primary and secondary schools from Switzerland (n = 989), Germany (n = 563), and Austria (n = 197) completed an online survey between April and June 2022 (see Appendix B for the information letters used to contact pre-service teachers through ITE lecturers). The main component of the online survey was the pre-service teacher well-being questionnaire measuring each well-being dimension with one subscale. The main analyses were conducted in R (version 4.0.3; R Core Team, 2023) and involved exploratory and confirmatory factor analyses, reliability analysis, measurement invariance testing, and Spearman correlations.

Results. The questionnaire demonstrated strong psychometric properties for five out of six pre-service teacher well-being dimensions. The dimension "Social problems in ITE" was excluded due to poor internal consistency. The first-order, five-factor structure demonstrated adequate model fit and fitted the data better than two competing models. (Partial) measurement invariance was established across Switzerland, Germany, and Austria. Moreover, the five well-being dimensions were related to established external positive well-being constructs (general hedonic well-being, general eudaemonic well-being, and engagement in ITE) and negative well-being constructs (emotional exhaustion in ITE, stress in ITE, ITE quitting intentions), providing evidence for external validity.

Contribution to the dissertation. The first study supports the use of the pre-service teacher well-being questionnaire as a multidimensional and context-specific assessment of pre-service teacher well-being, although the dimension "Social problems in ITE" needs revision and was therefore excluded. (Partial) measurement invariance supports cross-country comparisons between Switzerland, Germany, and Austria. Moderate correlations between two measures of general well-being and the five well-being dimensions highlight the importance of a context-specific approach.

3.2 Study 2

Authorship. Haldimann, Hascher, and Flick-Holtsch

Journal. Beiträge zur Lehrerinnen- und Lehrerbildung (published)

Aim. The second study identifies potential well-being profiles and investigates the relationship between several pre-service teacher characteristics and these profiles.

Method. The second study used a subsample from the cooperation project "Becoming a teacher: Well-being during the initial teacher education." The sample consisted of 989 Swiss pre-service teachers for primary and secondary schools who completed an online survey between April and June 2022. The main analyses involved confirmatory factor analysis conducted in R (version 4.0.3; R Core Team, 2023) and latent profile analysis conducted in M*plus* (version 8.7; Muthén & Muthén, 1998-2017). For the latent profile analysis, unstandardized factor scores of the five well-being dimensions were used as profile indicators. We applied the R3STEP approach (Vermunt, 2010) to examine the relationship between pre-service teacher characteristics and well-being profiles.

Results. Five well-being profiles were identified: Flourisher (14.1%), vulnerable flourisher (27.9%), empowered worrier (27.6%), confident distant (16.1%), and at risk (14.4%). The enrolled semester, whether the participant was undergoing an exam phase and/or practicum phase, and gender were associated with the profiles; the study program was not.

Contribution to the dissertation. The second study illustrates the heterogeneity among Swiss pre-service teachers based on distinct combinations of positive and negative well-being dimensions beyond sample-wide means. Pre-service teacher characteristics revealed varying associations with profiles. The findings call for well-being interventions that are specific to the unique nature of the different profiles.

3.3 Study 3

Authorship. Haldimann, Collie, Hascher, and Flick-Holtsch

Journal. Under review

Aim. The third study replicates the well-being profiles of pre-service teachers identified in the second study. Moreover, it investigates the relationship between several pre-service teacher characteristics, two ITE resources (practicum quality and practicum-university coherence), and one personal resource (teacher self-efficacy) and these profiles and, in turn, how profiles differ in terms of two retention-related outcomes (ITE quitting intentions and profession quitting intentions).

Method. The third study used data from the evaluation project "Evaluation and further development of teacher education NEW in Austria" (Flick-Holtsch et al., 2023). The study included data from 2,867 pre-service teachers for primary and secondary schools who participated in an online survey and had conducted at least one teaching practicum. Main analyses involved confirmatory factor analysis and latent profile analysis conducted in M*plus* (version 8.11; Muthén & Muthén, 1998-2017). For the latent profile analysis, standardized factor scores of the five well-being dimensions were used as profile indicators—in contrast to unstandardized ones in Study 2. We applied the manual BCH three-step approach (Vermunt, 2010) to examine the relationship between pre-service teacher characteristics and resources and profiles and how profiles differ in terms of retention-related outcomes.

Results. Six well-being profiles were identified: Success approach (5.9%), cautious striver (9.5%), mixed indifferent (14.5%), mixed cautious (31.7%), aspiring fearer (24.4%), and failure fearer (14.0%). All examined pre-service teacher characteristics were associated with the profiles (gender, age, caring responsibilities, study program, enrolled study year, and part-time job as a teacher), however, to varying degrees. Pre-service teachers reporting higher levels of both ITE and personal resources tended to be more likely to belong to adaptive well-being profiles than to maladaptive ones. Adaptive well-being profiles also displayed lower ITE quitting intentions and profession quitting intentions than maladaptive ones.

Contribution to the dissertation. The third study confirms the sample heterogeneity in pre-service teacher well-being identified in the second study. Moreover, it advances findings from the second study in three ways: First, by combining Hascher's scholastic well-being framework (2004, 2023) with additional theoretical arguments for why certain combinations of well-being dimensions might co-occur based on the motives of success orientation and failure avoidance (Covington & Müeller, 2001, see Chapter 6). Second, methodologically, it takes a slightly different angle by considering the standardized profile solution instead of the unstandardized one. Third, it emphasizes both contextual and personal resources to promote pre-service teacher well-being and illustrates the importance of pre-service teacher well-being for teacher retention.

4 Well-Being of Pre-Service Teachers: A Construct Validation Study across Three Countries (Study 1)

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Abstract

Teacher well-being is becoming increasingly important in research and in education policy. However, studies that investigate the well-being of pre-service teachers empirically are still scarce and tend to use instruments that assess general well-being or focus only on negative aspects such as stress and strain. Therefore, this study tests the psychometric properties of the pre-service teacher well-being questionnaire. The questionnaire draws on research in well-being psychology and aims to capture pre-service teacher well-being as a multidimensional and context-specific construct. The underlying model consists of three positive dimensions, (1) positive attitudes towards initial teacher education, (2) enjoyment of initial teacher education, and (3) positive academic self-concept regarding initial teacher education, and three negative dimensions, (4) worries about initial teacher education, (5) physical complaints related to initial teacher education, and (6) social problems in initial teacher education. Evidence presented in this study is based on an online survey that pre-service teachers for primary and secondary school from Switzerland (n = 989; primary education: 76.8%), Germany (n = 563; primary education: 16.3%), and Austria (n = 197; primary education: 76.6%) completed in spring 2022. Results confirmed the factor structure and the reliability of the instrument for all but one factor, and there is evidence for correspondence with other well-being constructs. Furthermore, partial measurement invariance was established between the three countries' subsamples. These findings support the use of the instrument for assessing pre-service teacher well-being. Directions for future research and implications for initial teacher education institutions are discussed.

Keywords: well-being, pre-service teachers, higher education, validity, measurement invariance

4.1 Introduction

Education systems worldwide face rising teacher demand (UNESCO Institute for Statistics, 2016). One approach to reducing teacher shortages is to retain qualified teachers in the teaching profession. Research findings indicate that well-being is a critical factor in teachers' career development and retention. For example, teachers reporting higher well-being showed a lower risk of burnout (Renshaw et al., 2015) and were less likely to express the intention of leaving the profession (Skaalvik & Skaalvik, 2018). Equally important are findings that point to the connection between teacher well-being and students' educational success (Collie et al., 2021; Klusmann et al., 2022).

Whereas a growing body of research is available on teacher well-being (for a literature review, see Hascher & Waber, 2021), studies that investigate the well-being of pre-service teachers are still scarce (Bjorklund et al., 2021; Corcoran & O'Flaherty, 2022; Thompson et al., 2020). We find this surprising, for two reasons: First, studies on teacher well-being could provide evidence for designing higher education learning settings and fostering professional development. Empirical correlations between university students' well-being and their academic performance support this assumption (El Ansari & Stock, 2010). Second, the foundations for continuous professional development are laid during initial teacher education (ITE), and maintaining well-being can be considered central to professional competence (Herzog et al., 2021). ITE provides pre-service teachers with valuable learning opportunities for professional strategies supporting their well-being prior to entering the teaching profession and the "survival stage" (Fuller & Bown, 1975). Therefore, more in-depth studies are needed to understand pre-service teacher well-being, support their development, and derive interventions for ITE and later professional activities. Thus, an instrument is required that can measure pre-service teacher well-being.

This paper aims to discuss a self-report questionnaire to measure pre-service teacher well-being. The questionnaire is embedded in well-being psychology and extends the concept of scholastic well-being (Hascher, 2020) to the context of ITE. In addition to the theoretical underpinnings of the questionnaire, we also provide its psychometric properties based on data from pre-service teachers from three different German-speaking countries.

4.1.1 Conceptualizing and Measuring Well-Being

The roots of well-being research go back to Greek philosophers in antiquity 2000 years ago. Two traditions still shape the debate today: hedonic and eudaimonic (Deci & Ryan, 2008). Within the hedonistic perspective, well-being is associated with maximizing feelings of happiness and avoiding suffering (Deci & Ryan, 2008; Haybron, 2008). The eudaimonic

perspective stems from Aristotle, who described eudaimonia as the highest human good, which meant "striving to achieve the best that is within us" (Ryff, 2014, p. 11). For Aristotle, well-being was closely linked to a person's ability to function, in that they act by their virtues to the best of their ability.

In psychology, Diener (1984) was among the first authors who investigated well-being. According to his model of subjective well-being, a person experiences well-being when reporting high positive affect, low negative affect, and life satisfaction. Diener both emphasized the subjectivity of well-being and contributed to its multidimensional conceptualization, including positive, and negative as well as emotional and cognitive dimensions. Ryff (1989) challenged this primarily hedonic view by claiming that affective experience and life satisfaction are insufficient indicators of psychological well-being (Deci & Ryan, 2008). Preferring a eudaimonic approach, she introduced a model that characterizes well-being with six dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Whereas Ryff (1989) defined these six dimensions as inherent to well-being, Diener considered them as potential predictors and thus beyond subjective well-being (Diener, Lucas, et al., 2018). However, Diener and Ryff agree about the role of the individual perspective in understanding well-being, and both used self-report instruments to capture its subjective nature (Diener, Oishi, et al., 2018).

In recent decades, a plethora of conceptualizations of well-being have been developed following either the hedonic or eudaimonic approach or integrating both (Alexandrova & Fabian, 2022; Diener, Lucas, et al., 2018; Martela & Sheldon, 2019; Ryff, 2014). The noticeable variability of conceptualizations is reflected in their measurements (Cooke et al., 2016; Linton et al., 2016). For instance, Linton and colleagues' (2016) review identified 99 self-reported well-being instruments with a total of 196 dimensions. On average, instruments contained five dimensions, many of which overlapped with correlates of well-being, such as general health. They identify a need to examine the psychometric properties of instruments including content-based and construct-based evidence.

4.1.2 Conceptualizing and Measuring Teacher and Pre-Service Teacher Well-Being

In recent years, research interest in general well-being has expanded to various contexts, such as the teaching profession. This involves considering individuals' roles, tasks, and environmental conditions within specific contexts (Hascher & Waber, 2021). Teacher well-being research is a growing field characterized by heterogeneity in conceptualizations and measurement (Acton & Glasgow, 2015; Hascher & Waber, 2021; McCallum et al., 2017). The multidimensionality and blur between well-being dimensions and well-being correlates

compromise the comparability of study results (Hascher & Waber, 2021). One theoretical framework popularly used for investigating teacher well-being (e.g., Dicke et al., 2018; Granziera et al., 2022) is the Job Demands-Resources (JD-R) model (Demerouti et al., 2001). The model examines the interplay of demands and resources to predict teacher strain (e.g., emotional exhaustion), teacher motivation (e.g., work engagement), and related occupational outcomes (e.g., intention to quit the teaching profession).

Studies that conceptualize and measure well-being at the beginning of teaching careers during ITE are scarce. To our knowledge, no systematic review of research into pre-service teacher well-being has yet been published. Some studies have assessed the general well-being (e.g., life satisfaction) of pre-service teachers (e.g., Bjorklund et al., 2021; Corcoran & O'Flaherty, 2022; Hagger & Malmberg, 2011; Hue & Lau, 2015; Vesely et al., 2014). Among the few studies considering pre-service teacher well-being within the context of ITE, we found three strands of research. First, some studies focused exclusively on emotional exhaustion as a unique indicator of the absence of pre-service teacher well-being (e.g., Hartl et al., 2022). Second, some studies conceptualized pre-service teacher well-being as the absence of negative dimensions combined with the presence of positive dimensions (Carstensen et al., 2021; Dreer, 2023). Third, some qualitative studies take a holistic approach that captures a variety of pre-service teacher well-being dimensions (e.g., Sulis et al., 2021; Väisänen et al., 2017). In contrast to the few studies focusing explicitly on pre-service teacher well-being within the context of ITE, we identified many studies focusing on perceived study-related strain, stress, and burnout (e.g., Fives et al., 2007; García-Martínez et al., 2021; Klassen & Chiu, 2011; Väisänen et al., 2018).

In many countries, ITE is embedded in higher education, and therefore, research on university student well-being may provide further evidence of its conceptualization and measurement. Dodd and colleagues (2021) conducted a scoping review of university student well-being in the UK. Whereas some studies referred to established theoretical frameworks, most did not define or conceptualize university student well-being. They used general population measures and neglected the higher education context. Similarly, Khatri and Duggal (2022) conducted a systematic literature review on the well-being of higher education students and identified 112 studies from the last two decades. They found that 76% of those studies did not refer to any theoretical background to conceptualizing their research (Khatri & Duggal, 2022, p. 1576). The authors identified a lack of theories and validated instruments with holistic and contextual approaches to higher education.

In conclusion, our knowledge about pre-service teacher well-being is relatively limited. One likely reason is a lack of valid instruments for higher education students such as pre-service teachers (Khatri & Duggal, 2022). Few studies have used contextual and multidimensional approaches that consider the nature of well-being and the characteristics of pre-service teachers' contexts. For example, assessing positive and negative dimensions of well-being seems important, because research on general well-being suggests that they are independent (Bradburn, 1969; Diener, 1984). Furthermore, a solid theoretical background is required to adequately address the complex field of well-being research (Acton & Glasgow, 2015; Dodd et al., 2021; Hascher & Waber, 2021; Khatri & Duggal, 2022). To approach this research gap, we adapted the concept of scholastic well-being (Hascher, 2004, 2023) to the context of ITE and examined the psychometric properties of a new instrument, the pre-service teacher well-being questionnaire.

4.1.3 Framework of the Pre-Service Teacher Well-Being Questionnaire

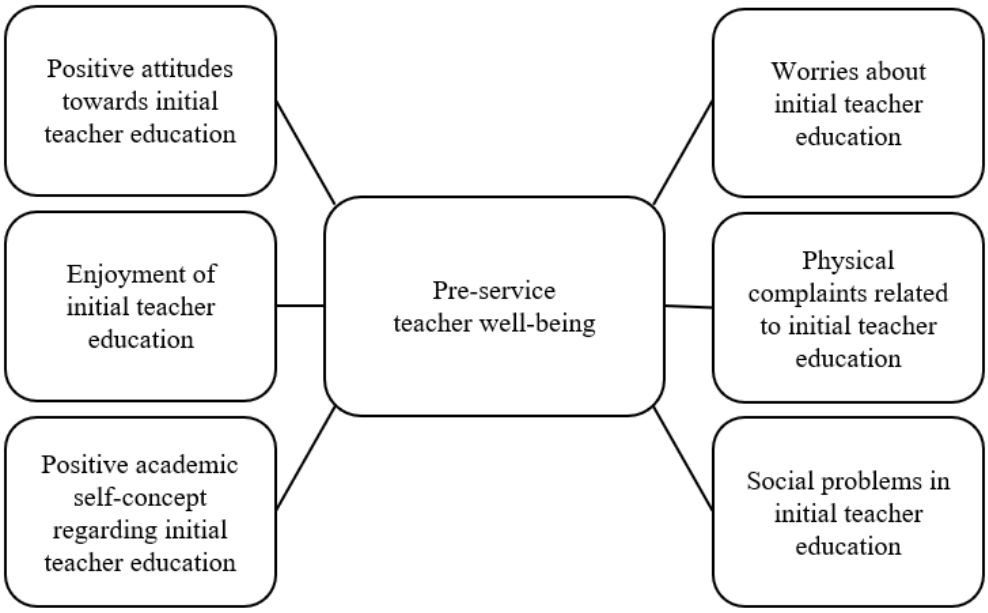
The theoretical foundation of the pre-service teacher well-being questionnaire is Hascher's (2004, 2023) theory of scholastic well-being. The theory is drawing on research in well-being psychology (e.g., Diener, 1984; Ryff, 1989), is specifically developed for the school context, and is characterized by three key elements. *First,* the theory is based on the premise, that scholastic well-being is more than just "feeling well in school". Scholastic well-being comprises hedonic aspects, such as enjoyment in school, and eudaimonic aspects, such as the academic functioning in school. Furthermore, it covers emotional aspects, cognitive aspects, and psychosomatic aspects. *Second*, scholastic well-being is defined as the presence of positive emotions, cognitions, and physical sensations, and the absence of negative emotions, cognitions, and physical sensations related to school. The greater the contrast between the positive and the negative ("positive imbalance"), the greater the level of scholastic well-being. *Third*, Hascher (2004, 2023) argues to capture scholastic well-being using specific indicators, also referred to as well-being dimensions, which reflect the diversity of the construct described above. Accordingly, Hascher developed a six-dimensional model and designed a questionnaire to measure student well-being (Hascher, 2004) and another to measure teacher well-being (Hascher, 2020), which were used in various studies (e.g., Hascher & Hagenauer, 2020; Morinaj & Held, 2023; Obermeier et al., 2021; Saxer et al., 2024). The model has yet to be adapted to the context of ITE. Applying the model of scholastic well-being to ITE has the advantage of examining pre-service teacher well-being in a manner theoretically congruent with teacher and student well-being. This seems promising for understanding the well-being of pre-service teachers in transition to the teaching profession and examining connections with student well-

being. Accordingly adapted for ITE, we propose that pre-service teacher well-being consists of three positive and three negative dimensions (see Figure 1):

1. (+) Positive attitudes towards ITE
2. (+) Enjoyment of ITE
3. (+) Positive academic self-concept regarding ITE
4. (-) Worries about ITE
5. (-) Physical complaints related to ITE
6. (-) Social problems in ITE

Figure 1

Dimensions of pre-service teacher well-being, adapted from Hascher (2023)



Congruent with the teacher questionnaire to measure scholastic well-being (Hascher, 2020), the pre-service teacher questionnaire captures the six dimensions with one subscale, each consisting of three to four items (see Section 4.2.2 and Supplementary Materials in Appendix C). Regarding the item wording only minor adaptations were necessary, such as from "I can easily solve challenges *in school*" (teacher well-being questionnaire) to "I can easily solve challenges *in my studies*" (pre-service teacher questionnaire). We aimed the items to be context-specific for ITE but general enough to be suitable for different teacher education systems, professional specifications, phases of the academic calendar, and course types.

4.1.4 Aim and Hypotheses

We designed the current study to test the psychometric properties of the pre-service teacher well-being questionnaire. The pre-service teacher questionnaire aims to measure context-specific pre-service teacher well-being using a multidimensional approach. Following the standards for educational and psychological testing (American Educational Research Association [AERA] et al., 2014), we explored the internal structure of the questionnaire and its relation with other established constructs in the field of well-being research. We tested three hypotheses regarding the internal structure:

(H1) *The pre-service teacher well-being questionnaire measures six reliable factors.*
We hypothesize that six reliable factors from the theory of scholastic well-being (Hascher, 2004, 2023) can be identified.

(H2) *The model with six first-order factors fits the data adequately and better than a model with one first-order factor or a model with one second-order factor.*
We assumed that the six pre-service teacher well-being dimensions correlate with each other but are still distinct and do not represent an overarching second-level factor. This assumption is supported by empirical evidence on the scholastic well-being model in student populations (Hascher & Hagenauer, 2020; Obermeier, 2021).

(H3) *The questionnaire is equally suitable for pre-service teachers in Switzerland, Germany, and Austria*. Evidence of measurement invariance is recommended when conducting comparative research (Fischer & Karl, 2019; Greiff & Scherer, 2018) and thus for interpreting test scores between pre-service teachers of various countries' ITE systems.

In addition, we tested three hypotheses regarding the relation with other established constructs in the field of well-being research providing evidence for convergent, concurrent validity:

(H4) *General hedonic and eudaimonic well-being are related with pre-service teacher well-being.*
Research findings on the role of work in individuals' wellbeing suggest a connection between general and context-specific well-being (Blustein, 2008; Danna & Griffin, 1999). Therefore, we expected general hedonic and eudaimonic well-being to relate correspondingly with the positive and negative dimensions of pre-service teacher well-being. As previous research indicates an overlap between the

experience of hedonia and eudaimonia (Deci & Ryan, 2008), we assume that both constructs relate correspondingly with these dimensions.

(H5) *Engagement in ITE, emotional exhaustion in ITE, and the intention to quit ITE are related with pre-service teacher well-being.*
From studies using the JD-R framework (Gusy et al., 2016; Hakanen et al., 2006) and findings with higher education students and (pre-service) teachers, we expected corresponding correlations between engagement in ITE and the positive and negative dimensions (Hascher & Waber, 2021; Ouweneel et al., 2011). For emotional exhaustion in ITE (Capone & Petrillo, 2020; Zimmermann et al., 2018) and the intention to quit ITE (Hartl et al., 2022; Madigan & Kim, 2021), we expected inverted correlations: negative with the three positive dimensions and positive with the three negative dimensions.

(H6) *Stress in ITE is related to pre-service teacher well-being.*
From the transactional theory of stress (Lazarus, 1999), we expected stress in ITE to correlate negatively with the three positive dimensions and positively with the three negative dimensions of pre-service teacher well-being.

4.2 Material and Methods

4.2.1 Respondents and Procedure

In total, 1749 pre-service teachers from the German-speaking states in Switzerland, Germany, and Austria participated in an online survey in spring 2022. The sample consists of 989 pre-service teachers from Switzerland (78.8% female; 20.9% male; 0.3% gender-diverse; M_{age} = 24.65 years [*SD* = 6.02]), 563 from Germany (73.5% female; 25.2% male; 1.2% gender-diverse*;* M_{age} = 23.11 years [*SD* = 4.43]) and 197 from Austria (85.3% female; 14.7% male; 0% gender-diverse*;* M_{age} = 23.25 years [*SD* = 4.66]).

All three countries offer study programs to prepare for teaching at various school levels. In Switzerland, most pre-service teachers were training to be primary school teachers (76.8%) and fewer to be secondary school teachers (23.2%). In Germany, most of the pre-service teachers were training to be secondary school teachers (76.4%), fewer to be primary school teachers (16.3%), and a few to be teachers for students with special needs (8.0%). In Austria, most pre-service teachers were training to be primary school teachers (76.6%), fewer to be a secondary school teacher (25.9%), and a very few to be teachers for students with special needs (0.5%).

Universities offering ITE follow different academic calendars in Switzerland, Germany, and Austria. During the survey, 37.8% of Swiss respondents, 7.1% of German, and 16.8% of Austrian indicated being in an examination phase of their studies. In addition, 22.7% of Swiss respondents, 10.2% of German, and 54.2% of Austrian stated that they were undertaking a school internship placement in some form. Furthermore, the COVID-19 pandemic impacted the universities differently in how they organized their lectures. As no general lockdown was in place in spring 2022, students in all three countries stated that most of them joined courses in presence: 74.1% in Switzerland, 79.3% in Germany and 68.7% in Austria.

We contacted the participants through their university lecturers and asked them to conduct the online survey with their students. Eligible for participation were pre-service teachers of all study programs and subjects, apart from German pre-service teachers enrolled in the second phase of ITE ("Referendariat") as they mainly teach in schools. University lecturers were also encouraged to invite their teacher colleagues in ITE to the survey. Consequently, no response rate was calculated. Pre-service teachers and lecturers were provided with general information about the project and its goals beforehand. The online survey was accessed via university-specific links. For the pre-service teachers, participation was voluntary and anonymous; a consent form was obtained at the beginning of the survey.

4.2.2 Measures

Participants completed an online self-report questionnaire that included sociodemographic questions, the pre-service teacher well-being questionnaire, and six measures of external constructs.

Pre-service teacher well-being. Prior to application, a pilot study with a selected group of Swiss pre-service teachers ($N = 77$) was conducted to test the instrument and its psychometric properties. Due to poor internal consistency, the enjoyment of ITE scale (McDonald's omega $\omega = .37$) was revised. In the final version, we measured each of the six pre-service teacher well-being dimensions (see Figure 1) with a subscale containing three to four items. Six factors of pre-service teacher well-being were measured: (1) positive attitudes towards ITE (four items), (2) enjoyment of ITE (four items), (3) positive academic self-concept regarding ITE (four items), (4) worries about ITE (three items), (5) physical complaints related to ITE (four items), and (6) social problems in ITE (three items). Example items can be found in the complete instrument, provided in the supplementary materials (Appendix C) in German original and English translation. For each item, pre-service teachers responded on a 6-point Likert scale ranging from *not true at all* (1) to *totally true* (6). We sought a specific respondent opinion, and therefore, we chose a scale without a mid-point.

External constructs. We used German scales showing evidence of reliability and validity in prior studies to measure the external constructs. Unless stated differently, items were rated on a 6-point Likert scale ranging from *not true at all* (1) to *totally true* (6). We examined four study-related external constructs: Engagement in ITE (shortened German Version by Gusy et al., 2016 of the Utrecht Work Engagement Scale from Schaufeli & Bakker, 2003; 5 items), emotional exhaustion in ITE (adapted from Baumert et al., 2009; 4 items), and intention to quit ITE (adapted from Kunter et al., 2017; 3 items). Following Collie and colleagues (2015), a single item was used to measure stress in ITE: "How stressful do you find studying at the moment?". The item was rated on a scale from *not stressful at all* (1) to *extremely stressful* (6). In addition, we integrated two constructs from broader well-being research: We measured general hedonic well-being with the German version (Brähler et al., 2007) of the WHO-5 version II (Bech, 2004). Its five items use a scale ranging from *at no time* (0) to *all of the time* (5). We calculated the sum score with a range from 0 (lowest hedonic well-being) to 25 (highest hedonic well-being). A score below 13 indicates poor well-being and a risk of depression. To measure general eudaemonic well-being, we used the German version (Esch et al., 2013) of the Flourishing Scale (Diener et al., 2010). The eight items were measured with a scale ranging from *strongly disagree* (1) to *strongly agree* (7). Scores are summed across all items to obtain an overall score. A low value (minimum 8) indicates a low level of eudaemonic well-being, and a high value (maximum 56) indicates a high level.

Sociodemographic information. Pre-service teachers were asked to indicate their gender (female, male, gender-diverse), age in years, country of study (Switzerland, Germany, Austria), university, and study program. Additionally, pre-service teachers indicated whether they were in an examination phase and/or undertaking a field placement at the time of the survey. Furthermore, they indicated what percentages of all their courses in the spring semester of 2022 were delivered purely in presence.

4.2.3 Data Analysis

We used R (version 4.0.3; R Core Team, 2023) for all descriptive and multivariate analyses unless otherwise indicated. Except for the exploratory factor analysis (EFA), we ran all analyses separately for the three subsamples.

Internal structure. We conducted several analyses and then examined the extent to which these provide evidence supporting the internal structure of the pre-service teacher well-being questionnaire. First, we conducted EFA by applying principal axes factoring with oblique (oblimin) rotation (Luo et al., 2019). Subsequently, we examined the reliabilities by calculating McDonald's Omega coefficient (ω) using the *misty* R package (version 0.5.3; Yanagida, 2023).

Second, we conducted confirmatory factor analysis (CFA) to analyze the factorial structure of the pre-service teacher well-being questionnaire further. We used the *lavaan* R package (version 0.6-7; Rosseel, 2012), applying maximum likelihood with robustness to nonnormality. To assess model fit, we used the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), and the comparative fit index (CFI). The following criteria were applied to assess the adequacy of model fit: RMSEA and SRMR values of ≤ .05 and .08 and CFI values of ≥.95 and .90 were considered evidence of good and adequate fit respectively (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003). In addition, we performed χ^2 difference tests to compare competing factorial models using the approximation procedure as described by Satorra and Bentler (2010).

Measurement invariance between Swiss, German, and Austrian pre-service teachers. We conducted invariance testing with multigroup CFAs to understand whether the psychometric properties of the pre-service teacher well-being questionnaire differed across Swiss, German, and Austrian pre-service teachers. We ran four progressively more restrictive models using the *lavaan* R package (version 0.6-7): (a) a configural invariance model (no parameters were fixed; baseline model), (b) a metric invariance model (loadings fixed), (c) a scalar invariance model (loadings and intercepts fixed), and (d) a residual invariance model (loadings, intercepts, and residuals fixed). We looked for changes in RMSEA values of ≤ .015, changes in CFI values of ≤ .010, and changes in SRMR values of ≤ .030 for metric invariance and of ≤ .010 for scalar and residual invariance (Chen, 2007; Cheung & Rensvold, 2002). The traditional χ^2 difference test for nested models is also reported. In case of violated measurement invariance, we followed Fischer and Karl's (2019) procedure to establish partial measurement invariance.

External constructs. To provide evidence for empirical links between the six dimensions and theoretically relevant external constructs, we estimated Spearman correlations using the *stats* R package (version 4.0.3). The strength of associations was interpreted according to Cohen (1988).

Missing values. A total of 2222 participants opened the online questionnaire link. Participants who did not complete at least one of the pre-service teacher well-being items (n = 473) were thus excluded from the sample. This left a total sample of 1749 pre-service teachers with 0.5–2.9% missing data for the pre-service teacher well-being items and 2.5–6.6% for the items measuring the external constructs. Little's missing completely at random test (Little, 1988), conducted in SPSS version 28, indicated that the missing values were distributed randomly (χ^2 = 6214.00, df = 6107, p = .166). To calculate the scale mean values for the EFA and the Spearman correlations, all valid data were used. To build sum scores, we used listwise

deletion. The full information maximum likelihood estimation approach was applied to conduct CFA and measurement invariance testing.

4.3 Results

Table 1 shows the descriptive statistics for all constructs. The skewness and kurtosis data for the questionnaire responses revealed that distributions deviate from a normal distribution, which was supported by the Shapiro-Wilk test of normality ($p < .05$).

4.3.1 Hypothesis 1 and 2: Factorial Structure of Pre-Service Teacher Well-Being and Reliability Analysis

We first conducted EFA and reliability analysis to test whether the pre-service teacher well-being questionnaire measures six reliable factors (H1). The value of the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy indicates that the current data was suitable for EFA (KMO value = 0.91). Parallel analysis suggested a six-factor structure. We excluded item 3 of the positive academic self-concept regarding ITE scale (rotated factor loading = 0.24), which cross-loaded to the positive attitudes towards ITE factor (rotated factor loading = 0.52). Subsequently, we conducted a reliability analysis of the six factors that were extracted, which led to two further adaptations. First, due to an insufficient McDonald's Omega value (ω = .47-.53), we excluded the social problems in the initial teacher education factor from further analysis. Second, we excluded item 3 of the enjoyment of ITE factor to increase reliability. We reran EFA and the reliability analysis. The remaining five factors accounted for 53.1% of the total variance with high factor loadings ranging between 0.51 and 0.87, with one exception for item 3 of the worries about ITE scale (rotated factor loading = 0.37). We decided to keep this item due to its substantial content contribution to the factor. Table 2 presents the rotated pattern matrix for the original and revised item solution. The scales with the final item solution showed acceptable reliabilities for all three subsamples (ω = .66-.90). Latent and manifest intercorrelations of the five remaining factors are reported in Table 3. Correlation coefficients indicated that the factors were conceptually and statistically distinguishable.

We expected that the adapted model with only five first-order factors could be verified and fit the data better than the model with one first-order factor or the model with one second-order factor (H2). Therefore, we ran the first confirmatory factor analysis with the hypothesized measurement model (see Figure 2, Model 1). Each factor consisted of three or four items. The five factors were free to correlate. As Table 4 shows, the hypothesized model indicated an

Table 1

Descriptive statistics for all constructs (manifest)

	Scale range	*M* CH/DE/AT	*SD* CH/DE/AT	ω CH/DE/AT	*S(SE)* CH/DE/AT	*K(SE)* CH/DE/AT
Pre-service teacher well-being questionnaire						
Positive attitudes towards ITE	1–6	4.25/4.59/4.66	0.98/0.85/1.02	.87/.81/.90	-.82/-.78/-.84 (.08/.10/.18)	.62/.69/.63 (.16/.21/.35)
Enjoyment of ITE	1–6	3.25/3.24/3.63	1.04/1.07/1.01	.69/.69/.66***	-.29/-.18/-.23 (.08/.10/.17)	-.62/-.50/.00 (.16/.21/.35)
Positive academic self-concept regarding ITE	1–6	4.48/4.20/4.60	0.73/0.85/0.81	.74/.77/.74	-.70/-.56/-.58 (.08/.10/.18)	1.25/.59/.77 (.16/.21/.35)
Worries about ITE	1–6	4.06/4.17/3.60	1.21/1.25/1.33	.73/.76/.71	-.35/-.52/-.12 (.08/.10/.17)	-.52/-.37/-.88 (.16/.21/.35)
Physical complaints related to ITE	1–6	2.64/2.70/2.42	1.36/1.33/1.29	.83/.81/.80	.59/.47/.76 (.08/.10/.17)	-.59/-.67/-.20 (.16/.21/.35)
		M CH/DE/AT	*SD* CH/DE/AT	ω CH/DE/AT	*S(SE)* CH/DE/AT	*K(SE)* CH/DE/AT
External constructs						
General hedonic well-being	0–25*	12.77/12.44/13.26	4.91/5.10/4.66	.87/.87/.85	-.17/-.27/-.21 (.08/.11/.18)	-.65/-.72/-.67 (.16/.21/.35)
General eudaemonic well-being	8–56**	46.44/43.47/47.30	5.67/ 6.80/5.19	.87/.87/.83	-1.11/-.63/-.58 (.08/.11/.18)	3.09/.36/.30 (.16/.21/.35)
Engagement in ITE	1–6	3.34/3.72/3.75	1.03/.98/1.05	.91/.90/.92	-.30/-.28/-.27 (.08/.10/.18)	-.45/-.28/-53 (.16/.21/.35)
Emotional exhaustion in ITE	1–6	3.75/3.87/3.66	1.11/1.15/1.20	.82/.85/.85	-.03/-.11/-.02 (.08/.10/.18)	-.51/-.70/-.49 (.16/.21/.35)
Stress in ITE	1–6	4.16/3.86/4.12	1.14/1.10/1.12	—	-.44/-.22/-.45 (.08/.11/.18)	.17/.03/.05 (.16/.21/.35)
Intention to quit ITE	1–6	1.58/1.74/1.54	.82/.95/.89	.84/.84/.89	1.82/1.64/2.13 (.08/.10/.18)	4.16/2.82/4.67 (.16/.21/.35)

Note. CH = Switzerland; DE = Germany; AT = Austria; N_{CH} = 989; N_{DE} = 563; N_{AT} = 197; *M* = mean; *SD* = standard deviation; ω = McDonald's omega; *S* = skewness; *K* = kurtosis; *SE* = standard error; the dash for stress in ITE indicates that it is a single-item indictor; * Scores are summed across all five items (scale range: 0–5) to obtain an overall score. ** Scores are summed across all eight items (scale range: 1–7) to obtain an overall score; *** standardized factor loadings calculating McDonald's omega (enj_ITE_1: .78/.84/.82; enj_ITE_2: .59/.50/.51; enj_ITE_4: .58/.60/.53).

Table 2

The rotated pattern matrix (including all items / including revised item solution)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
pa_ITE_1	0.58/0.59	0.16/0.16	0.02/0.05	-0.11/-0.10	-0.05/-0.09	-0.16/—
pa_ITE_2	**0.83/0.86**	0.02/0.01	-0.00/-0.00	-0.05/-0.03	0.00/0.01	-0.01/—
pa_ITE_3	**0.66/0.70**	0.02/-0.02	0.06/0.06	0.03/0.05	-0.04/-0.03	0.00/—
pa_ITE_4	**0.83/0.79**	-0.05/-0.02	-0.02/-0.03	0.04/0.04	-0.01/0.02	0.03/—
enj_ITE_1	0.23/0.04	**0.60/0.77**	-0.01/0.01	-0.01/0.00	0.00/0.04	0.05/—
enj_ITE_2	0.19/0.07	**0.41/0.51**	-0.10/-0.08	-0.05/-0.05	-0.01/0.01	0.02/—
enj_ITE_3 (*item eliminated*)	-0.05/—	**0.50**/—	0.13/—	-0.07/—	0.06/—	0.05/—
enj_ITE_4	-0.07/-0.06	**0.71/0.62**	0.00/0.04	0.02/0.02	-0.05/-0.07	-0.07/—
pasc_ITE_1	0.03/0.06	0.00/-0.03	**0.65/0.67**	-0.03/-0.01	0.00/-0.00	0.06/—
pasc_ITE_2	0.02/-0.00	-0.00/0.01	**0.62/0.66**	-0.10/-0.08	-0.04/-0.02	-0.01/—
pasc_ITE_ 3 (*item eliminated*)	**0.52**/—	0.09/—	0.24/—	-0.01/—	0.04/—	-0.01/—
pasc_ITE_4	0.01/-0.02	-0.00/0.02	**0.77/0.78**	0.03/0.04	-0.01/0.02	0.02/—
wor_ITE_1	-0.03/-0.03	-0.00/-0.01	0.01/0.00	**0.84/0.87**	-0.00/-0.01	0.03/—
wor_ITE_2	0.05/0.06	0.00/0.00	-0.10/-0.11	**0.59/0.55**	0.11/0.10	-0.08/—
wor_ITE_3	-0.03/-0.05	-0.02/-0.01	-0.06/-0.08	**0.38/0.37**	0.12/0.17	0.12/—
pc_ITE_1	0.01/0.01	0.00/-0.00	-0.01/-0.00	-0.00/-0.00	**0.73/0.74**	0.04/—
pc_ITE_2	-0.03/-0.02	0.03/0.01	0.03/0.03	0.20/0.19	**0.66/0.66**	-0.01/—
pc_ITE_3	-0.02/-0.03	0.01/0.03	-0.02/-0.01	-0.04/-0.04	**0.70/0.71**	0.02/—
pc_ITE_4	0.01/0.01	-0.05/-0.04	-0.03/-0.02	-0.05/-0.05	**0.74/0.75**	-0.03/—
sp_ITE_1 (*item eliminated*)	-0.06/—	0.14/—	0.01/—	0.00/—	0.02/—	**0.51**/—
sp_ITE_2 (*item eliminated*)	-0.17/—	-0.04/—	0.11/—	-0.01/—	0.17/—	**0.32**/—
sp_ITE_3 (*item eliminated*)	0.05/—	-0.12/—	-0.12/—	0.05/—	0.01/—	**0.53**/—

Note. pa_ITE = Positive attitudes towards ITE; enj_ITE = Enjoyment of ITE; pasc_ITE = Positive academic self-concept regarding ITE; wor_ITE = Worries about ITE; pc_ITE = Physical complaints related to ITE; sp_ITE = Social problems in ITE; bold values indicate items making up each factor; the dash indicates that there is no value because the item was not part of the revised item solution.

Table 3

Manifest (latent) correlations among the factors of pre-service teacher well-being

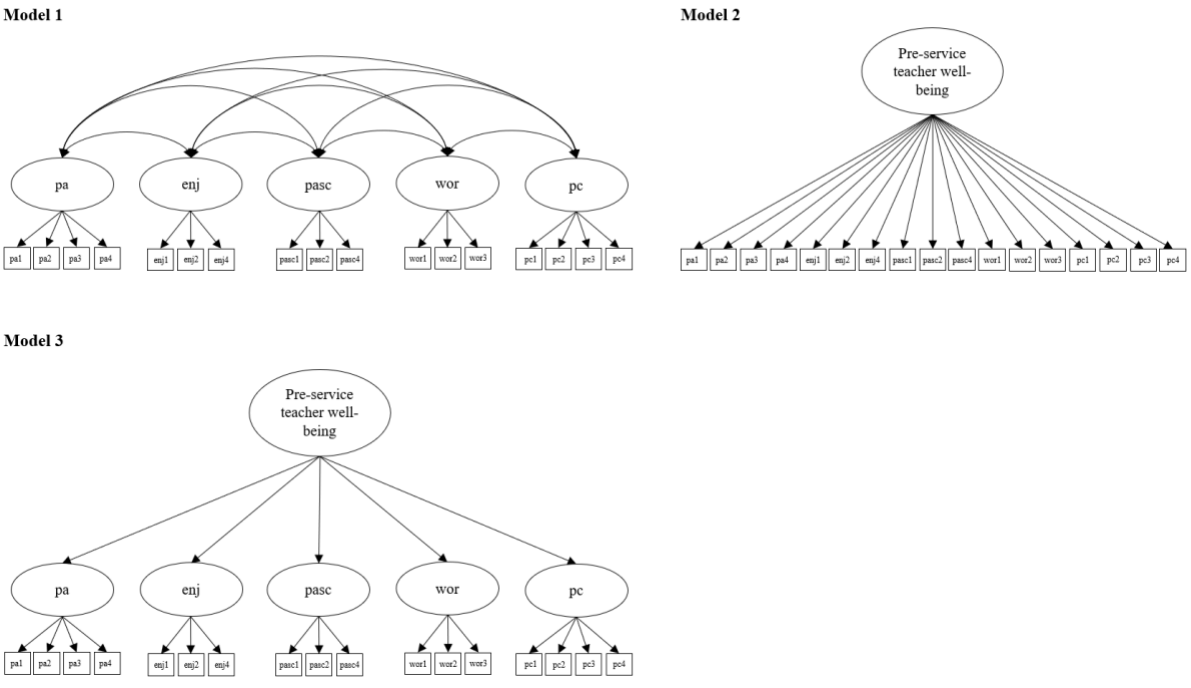
	1 CH/DE/AT	2 CH/DE/AT	3 CH/DE/AT	4 CH/DE/AT
1 Positive attitudes towards ITE				
2 Enjoyment of ITE	.55/.50/.45 (.75/.72/.59)			
3 Positive academic self-concept regarding ITE	.31/.42 /.51 (.42/.53/.64)	.18/.27/.27 (.28/.44/.45)		
4 Worries about ITE	-.26/-.38/-.45 (-.35/-.51/-.53)	-.18/-.28/-.24 (-.24/-.36/-.32)	-.41/-.39/-.55 (-.57/-.52/-.75)	
5 Physical complaints related to ITE	-.27/-.30/-.32 (-.35/-.43/-.34)	-.17/-.24/-.23 (-.22/-.35/-.25)	-.31/-.31/-.37 (-.38/-.42/-.48)	.64/.60/.53 (.80/.75/.68)

Note. CH = Switzerland; DE = Germany; AT = Austria; N_{CH} = 989; N_{DE} = 563; N_{AT} = 197; latent standardized correlations revealed by CFAs are presented in parentheses; all results $p < .01$ (two-sided).

adequate fit for Swiss, German, and Austrian pre-service teachers. Completely standardized item loadings on the five factors were all statistically significant and above .50 for all items in all three samples. Latent correlations among the five pre-service teacher well-being factors were moderate, reaching on average .48 for all subsamples. We evaluated two alternative models against Model 1 (see Figure 2). In Model 2, we specified one first-order factor and assessed an overall construct of pre-service teacher well-being in which no factors of pre-service teacher well-being were assumed. Model 3 postulated one second-order factor of pre-service teacher well-being. This means the five factors load on one higher-order pre-service teacher well-being factor. As Table 4 shows, neither of the competing models fitted better to the data than the hypothesized first-order five-factor model for Swiss, German, and Austrian pre-service teachers. In all three groups, χ^2 difference tests revealed that the comparison between Model 1 and both Models 2 and 3 was highly significant ($p < .001$), indicating that Model 1 fits the data better than the competing models. To sum up, Hypothesis 1 and Hypothesis 2 were partly confirmed, as we could not confirm the social problems in ITE factor.

Figure 2

Tested first-order five-factor (Model 1), first-order one-factor (Model 2), and second-order one-factor (Model 3) models potentially underlying pre-service teacher well-being



4.3.2 Hypothesis 3: Measurement Invariance

We tested measurement invariance across Swiss, German, and Austrian pre-service teachers with multigroup CFAs (H3). Table 5 shows the fit indices for the measurement invariance tests for the five-factor model across Swiss, German, and Austrian pre-service teachers. The results are presented for two-group comparisons: Switzerland vs. Germany, Switzerland vs. Austria, Germany vs. Austria. In all three group comparisons, configural and metric invariance were established; the models produced an acceptable fit, and ΔCFI, ΔRMSEA, and ΔSRMR were below the recommended cutoff values. For the comparison between Switzerland and Austria, scalar and residual invariance was established in the same manner. For the comparison between Switzerland and Germany, scalar invariance was slightly violated with a ΔCFI of .011 instead of .010. ΔRMSEA and ΔSRMR values were below the recommended cutoff values. Partial scalar and residual invariance were reached by freeing the intercept of one item (wor_ITE_2, see Supplementary Materials in Appendix C), which showed the highest drop in χ^2 value ($\chi^2 = 30.99$; $p < .001$). For the comparison between Germany and Austria, scalar invariance was violated with a ΔCFI of .014 instead of ≤ .010. ΔRMSEA and ΔSRMR were below the recommended cutoff values. Partial scalar and residual invariance were reached by freeing the intercepts of item enj_ITE_2 ($\chi^2 = 17.30$; $p < .001$) and of item pa_ITE_4 ($\chi^2 = 16.48$; $p < .001$). Thus, Hypothesis 3 was partly confirmed.

4.3.3 Hypotheses 4–6: Relation with External Constructs

We conducted Spearman correlations to estimate the strength of the relationships between the five pre-service teacher well-being dimensions and the external constructs. The results are presented in Table 6 separately for Switzerland, Germany, and Austria. The correlations were similar across the three countries. As expected, the three positive dimensions of pre-service teacher well-being were positively related with external positive constructs in well-being research and negatively associated with external threat-to-well-being constructs. Following the same pattern, the three negative dimensions were negatively related to the external positive constructs and positively related to the external threat-to-well-being constructs. The strength of the associations can be interpreted as small to large. Hypotheses 4–6 were therefore confirmed.

Table 4

Goodness-of-fit indices for the three models of the pre-service teacher well-being questionnaire

	χ^2	*df*	CFI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$	Δdf	*p*
Switzerland (*n* = 989)									
Model 1	298.65	109	.966	.045	.037	-	-	-	-
Model 2	3021.15	119	.554	.157	.129	1 vs. 2	2644.60	10	<.001
Model 3	657.62	114	.903	.075	.093	1 vs. 3	435.91	5	<.001
Germany (*n* = 563)									
Model 1	225.37	109	.964	.045	.037	-	-	-	-
Model 2	1286.76	119	.635	.138	.102	1 vs. 2	899.38	10	<.001
Model 3	360.46	114	.927	.063	.064	1 vs. 3	225.47	5	<.001
Austria (*n* = 197)									
Model 1	197.95	109	.927	.068	.057	-	-	-	-
Model 2	540.63	119	.646	.143	.112	1 vs. 2	359.26	10	<.001
Model 3	228.98	114	.906	.075	.071	1 vs. 3	36.80	5	<.001

Note. χ^2 = chi-square; *df* = degrees of freedom; CFI = comparative fit index (robust); RMSEA = root mean square error of approximation (robust); SRMR = Bentler standardized root mean squared residual; Δx^2 and Δdf = changes in chi-square and degrees of freedom between the hypothesized and competing models.

Table 5

Measurement invariance tests for the five-factor model across Swiss, German and Austrian pre-service teachers

Model	Overall Fit Indices					Model Comparison	Comparative Fit Indices				
	χ^2	*df*	CFI	RMSEA	SRMR		$\Delta\chi^2$	Δdf	ΔCFI	ΔRMSEA	ΔSRMR
Switzerland (*n* = 989) and Germany (*n* = 563)											
1. Configural invariance	526.42	218	.965	.045	.037	-	-	-	-	-	-
2. Metric invariance	541.39	230	.965	.044	.040	2 vs. 1	15.67	12	.000	.001	.003
3. Scalar invariance	652.21	242	.954	.049	.043	3 vs. 2	119.15*	12	**.011**	.005	.003
Partial scalar invariance [A]	623.19	241	.957	.048	.042		87.31*	11	.008	.004	.002
4. Residual invariance	689.72	259	.951	.049	.044	4 vs. 3	38.66*	17	.003	.000	.001
Partial residual invariance [A]	661.76	258	.954	.048	.044		39.30*	17	.003	.000	.002
Switzerland (*n* = 989) and Austria (*n* = 197)											
1. Configural invariance	496.69	218	.959	.050	.040	-	-	-	-	-	-
2. Metric invariance	506.67	230	.959	.049	.042	2 vs. 1	11.29	12	.000	.001	.002
3. Scalar invariance	571.82	242	.952	.051	.044	3 vs. 2	70.51*	12	.007	.002	.002
4. Residual invariance	625.21	259	.946	.053	.046	4 vs. 3	52.82*	17	.006	.002	.002
Germany (*n* = 563) and Austria (*n* = 197)											
1. Configural invariance	422.44	218	.954	.052	.042	-	-	-	-	-	-
2. Metric invariance	434.29	230	.953	.051	.045	2 vs. 1	13.05	12	.001	.001	.003
3. Scalar invariance	512.94	242	.939	.057	.048	3 vs. 2	84.80*	12	**.014**	.006	.003
Partial scalar invariance [B]	479.93	240	.945	.054	.046		47.79*	10	.008	.003	.001
4. Residual invariance	560.71	259	.931	.058	.049	4 vs. 3	46.98*	17	.008	.001	.001
Partial residual invariance [B]	528.24	257	.938	.056	.047		47.33*	17	.007	.002	.001

Note. χ^2 = chi-square; *df* = degrees of freedom; CFI = comparative fit index (robust); RMSEA = root mean square error of approximation (robust); SRMR = Bentler standardized root mean squared residual; Δ = difference between the comparison and nested model. **p* < .001. A = freeing intercept of wor_ITE_2; B = freeing intercept of enj_ITE_2 and of pa_ITE_4.

Table 6

Spearman correlations between the factors of pre-service teacher well-being and external constructs

	Positive attitudes towards ITE CH/DE/AT	Enjoyment of ITE CH/DE/AT	Positive academic self-concept regarding ITE CH/DE/AT	Worries about ITE CH/DE/AT	Physical complaints related to ITE CH/DE/AT
Positive well-being constructs					
General hedonic well-being	.37/.40/.39	.32/.34/.35	.33/.34/.37	-.49/-.46/-.46	-.57/-.47/-.59
General eudaemonic well-being	.29/.31/.49	.17/.28/.36	.34/.35/.49	-.28/-.33/-.36	-.25/-.33/-.26
Engagement in ITE	.78/.75/.80	.59/.55/.50	.22/.36/.42	-.19/-.30/-.38	-.19/-.19/-.31
Threat-to-well-being constructs					
Emotional exhaustion in ITE	-.52/-.48/-.52	-.33/-.38/-.36	-.42/-.44/-.46	.61/.62/.66	.61/.62/.63
Stress in ITE	-.22/-.31/-.19	-.16/-.20/-.17	-.34/-.26/-.22	.55/.52/.44	.56/.47/.56
Intention to quit ITE	-.32/-.42/-.52	-.19/-.21/-.24	-.26/-.24/-.50	.36/.37/.47	.27/.27/.37

Note. CH = Switzerland; DE = Germany; AT = Austria; N_{CH} = 989; N_{DE} = 563; N_{AT} = 197; all results $p < .01$ (two-sided).

4.4 Discussion

This study aimed to provide evidence for the validity of the pre-service teacher well-being questionnaire. Our approach was to adapt the concept of scholastic well-being (Hascher, 2004, 2023) for the context of ITE and investigate its internal structure and relation with external constructs. With data from pre-service teachers from Switzerland (n = 989), Germany (n = 563), and Austria (n = 197), the questionnaire demonstrated strong psychometric properties (H1 and H2) for five out of six pre-service teacher well-being dimensions, partial measurement invariance across Switzerland, Germany, and Austria (H3), and evidence supporting relations with external constructs (H4–6).

We first inspected the factorial structure and the reliability of the questionnaire (H1 and H2). EFA confirmed the six-factor structure, but we had to exclude the social problems in ITE factor due to insufficient reliability. One reason for the excluded factor's lack of internal consistency might be that social problems with other pre-service teachers, course instructors, professors, and mentors were all subsumed in a single dimension. However, this single dimension may not reflect the pre-service teachers' social relationships, which vary in at least three ways. In power, they enjoy symmetric relationships with peers but asymmetric relationships with course instructors, professors, and mentors; in closeness, they likely have more intense relationships with some peers than with others; and in roles, their mentors supervise individual pre-service teachers, but their professors are responsible for teacher education at an institutional level. Considering the importance of social aspects in ITE (Corcoran & O'Flaherty, 2022; Väisänen et al., 2017), this dimension requires revision. Reliability might be improved by focusing on specific social partners or by targeting the overall quality of relationships in ITE. Well-being theories (e.g., Ryff, 1989) suggest that social relatedness with peers could be promising. Subsequently, CFAs revealed that the model with the remaining five first-order factors fits the data better than either competing model. This finding is in line with previous research. These results support the idea of treating the five pre-service teacher well-being dimensions as conceptually and statistically distinguishable constructs, implying a multidimensional approach (Hascher & Hagenauer, 2020; Obermeier, 2021).

Subsequently, we tested measurement invariance across pre-service teachers from Switzerland, Germany, and Austria (H3). We established full measurement invariance between Switzerland and Austria. We established partial scalar and partial residual invariance for the two other country comparisons. Failing to reach full measurement invariance is not unusual with real-life data (Davidov et al., 2014; Putnick & Bornstein, 2016). We can only speculate

why the means of these three items are not conveyed the same way through mean differences in the latent factor across the three countries (Davidov et al., 2014). The different academic calendars might explain the different performance of the items. For example, between Switzerland and Germany, partial scalar and residual invariance was established by freeing up the intercept of the item "In the last few weeks, I have been worried about exams and certificates of achievement in my studies." The item might perform differently because it refers to worries about exams and because more students reported being in an exam phase in Switzerland (37.8%) than in Germany (7.1%). At least two items work similarly across the three countries for all five subscales retained; thus, partial measurement invariance is sufficient for valid mean comparisons across groups (Pokropek et al., 2019). Therefore, the pre-service teacher well-being questionnaire remains suitable for research comparing these three countries.

Last, evidence for the relations of the pre-service teacher well-being questionnaire with well-being constructs (H4–6) aligns with existing theoretical approaches and empirical findings, such as the JD-R model (Demerouti et al., 2001). Primarily, the moderate significant correlations of the well-being dimensions with general hedonic and eudaimonic well-being support the idea of differentiating between context-specific and general well-being with different measures. It seems that well-being for individuals varies by context; further investigations are needed into the effect of pre-service teacher well-being on general well-being and vice versa. The results also show that the five well-being dimensions correlate to varying degrees with an external construct. For example, engagement in ITE shows large correlations with positive attitudes towards ITE but mostly small correlations with physical complaints related to ITE across the three countries. To further investigate and understand those differences identifying well-being profiles and their associations with external constructs would be promising.

4.4.1 Limitations and Future Research

This study has at least four limitations, which should be addressed in future research. The first limitation relates to our sample. Our evidence is based on nonrepresentative samples from three countries with different ITE systems and learning settings. Future research might investigate whether these differences contribute to partial measurement invariance. Further, the psychometric properties of the questionnaire need to be tested beyond German-speaking countries. Moreover, our results might be biased because pre-service teachers experiencing low well-being in ITE may well be underrepresented due to voluntary participation in our data. Future studies would benefit from using representative samples.

Second, there are types of validity and reliability, that were not addressed in this study (e.g., content-oriented validity, predictive validity, test-retest reliability). For example, regarding content-oriented validity, we adapted an existing questionnaire of scholastic well-being to ITE and did not generate the items using deductive or inductive methods such as literature review or qualitative data (Boateng et al., 2018). Although relying on established instruments is a strength, it is not free of the risk of construct irrelevance or underrepresentation (AERA et al., 2014): The questionnaire might include items or dimensions less relevant to ITE than to school, and we may not have integrated dimensions or items that would be relevant to ITE. Therefore, future studies could supplement the findings of the current study with content-oriented evidence of validity. For example, conducting semi-structured interviews and analyzing responses to open-ended survey questions, as Holzer and colleagues (2021) did for school-related well-being, would allow construct irrelevance and construct underrepresentation to be tested. Following this procedure would also provide an opportunity to revise the items of the enjoyment in ITE factor and strengthen the reliability of the subscale.

Third, theory is lacking on how well-being measures interact with participants. This comes with the risk that researchers rely solely on statistical properties (Alexandrova & Fabian, 2022, p. 28). One way to address this issue might be to conduct cognitive interviews using the think-aloud method and probing with pre-service teachers (Beatty & Willis, 2007). This would help identify the cognitive processes of pre-service teachers when responding to the questionnaire, for example whether pre-service teachers refer to individual or social norms when responding. In addition, the influence of school practicum experiences on responses needs more clarity. Practical experiences during ITE seem especially important for pre-service teachers (Denzler & Wolter, 2009; Puustinen et al., 2018). From an ecological perspective (Bronfenbrenner, 1979), further knowledge is needed about the relation between the ITE institution and school microsystems and their influence on pre-service teacher well-being.

Fourth, the six dimensions of pre-service teacher well-being were measured with reflective statistical models on the assumption that each pre-service teacher well-being dimension is the common cause of its indicators. Theoretically, different relationships between the indicators and the latent variables would also be plausible. Future research could apply the network approach to pre-service teacher well-being research. The network model assumes that items can be conceptualized as clusters that cause each other over time (Fried, 2017).

4.4.2 Implications for Practice

ITE institutions may use the pre-service teacher well-being questionnaire as a screening tool to survey the well-being of their pre-service teachers and to indicate areas for possible

intervention. Overall, pre-service teachers scored around the theoretical scale mean (M = 3.24–3.63) on the enjoyment of ITE dimension. This finding can be viewed critically as enjoyment seems to play an important role in the learning process due to its activating character and correlates with academic achievement (Camacho-Morles et al., 2021). In addition, pre-service teachers scored above the theoretical scale mean (M = 3.60–4.17) on the worries about ITE dimension. Further research is needed on how pre-service teachers' enjoyment of ITE could be increased and to which aspects of ITE their worries are related. Seeking dialogue with pre-service teachers within ITE institutions might be a first step. Subsequently, a person-centered approach such as latent profile analysis seems beneficial. Identifying at-risk groups of pre-service teachers with a negative imbalance in the pre-service teacher well-being dimensions would then allow the development of tailored interventions.

4.5 Conclusions

We provide evidence for the internal structure of the pre-service teacher well-being questionnaire for five out of six pre-service teacher well-being dimensions and relations with external constructs. The questionnaire stems from the theoretical concept of scholastic well-being and measures both positive and negative well-being dimensions. Thus, the questionnaire complements measures focusing only on negative aspects such as stress and strain in ITE. In addition, adapting the construct of scholastic well-being to ITE allows comparisons between pre-service teachers, teachers, and students targeting a holistic approach. Moderate correlations between the five dimensions of pre-service teacher well-being and hedonic and eudaimonic general well-being highlight the value of a context-specific approach. The questionnaire is a tool for investigations in the relatively underdeveloped research field of pre-service teacher well-being. A plethora of questions remain open about predictors, outcomes, and the development of pre-service teacher well-being over time.

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5 Wohlbefindensprofile angehender Lehrpersonen aus der deutschsprachigen Schweiz (Study 2)

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Abstract

Despite the relevance of pre-service teacher well-being (e.g., as an indicator of education quality), there is hardly any empirical evidence of its prevalence. Therefore, we investigated the well-being of pre-service teachers from the German-speaking part of Switzerland (N = 989) with a multidimensional, context-specific, and person-centered approach applying latent profile analysis. We identified five well-being profiles: (1) Flourisher (14.1%), (2) Vulnerable flourisher (27.9%), (3) Empowered worrier (27.6%), (4) Confident distant (16.1%), and (5) At risk (14.4%). In the article, we describe the five well-being profiles and outline possible directions for promoting well-being during the initial teacher education.

Keywords: well-being, pre-service teachers, latent profile analysis

Zusammenfassung

Trotz der Relevanz des Wohlbefindens von angehenden Lehrpersonen (z. B. als Indikator für Hochschulqualität) gibt es kaum empirische Evidenz zu dessen Ausprägung. Wir haben deshalb das Wohlbefinden von angehenden Lehrpersonen aus der Deutschschweiz (N = 989) mehrdimensional, kontextspezifisch und personenzentriert mittels latenter Profilanalyse untersucht. Wir identifizierten fünf Wohlbefindensprofile: (1) Flourisher (14.1%), (2) Vulnerable Flourisher (27.9%), (3) Gestärkte Sorgenvolle (27.6%), (4) Selbstbewusst Distanzierte (16.1%) und (5) Gefährdete (14.4%). Im Beitrag werden die fünf Wohlbefindensprofile beschrieben und mögliche Handlungsfelder zur Wohlbefindensförderung skizziert.

Schlagwörter: Wohlbefinden, Lehramtsstudierende, Latente Profilanalyse

5.1 Einleitung

Der hohe Lehrpersonenbedarf stellt Bildungssysteme im deutschsprachigen Raum vor grosse Herausforderungen (Bundesministerium für Bildung Wissenschaft und Forschung, 2021; Kulturministerkonferenz, 2022; Sandmeier & Herzog, 2022). Bereits qualifizierte Lehrpersonen langfristig im Lehrberuf zu halten ist eine Strategie im Umgang mit dieser Herausforderung. Empirische Ergebnisse weisen darauf hin, dass das Wohlbefinden von Lehrpersonen ein entscheidender Faktor für die Laufbahnentwicklung und den Verbleib im Lehrberuf sein dürfte: Lehrpersonen mit hohem anstelle von geringem Wohlbefinden weisen ein geringeres Burnout-Risiko auf (Renshaw, Long & Cook, 2015) und äussern seltener die Absicht, den Lehrberuf zu verlassen (Madigan & Kim, 2021; Skaalvik & Skaalvik, 2018).

Studien zum Wohlbefinden von angehenden Lehrpersonen liegen im Vergleich zu Studien bei Lehrpersonen bisher in lediglich überschaubarer Zahl vor (Bauer, 2019; Bjorklund, Warstadt & Daly, 2021; Corcoran & O'Flaherty, 2022). Dies ist erwartungswidrig, weil das Wohlbefinden als Indikator von (Hoch)schulqualität Hinweise für eine wirkungsvolle und evidenzbasierte Gestaltung der Lehrerinnen- und Lehrerbildung liefern könnte (Hascher, Morinaj & Waber, 2018). Zudem werden bereits im Lehramtsstudium die Voraussetzungen für das Wohlbefinden im späteren Lehrberuf geschaffen (Herzog, Sandmeier & Affolter, 2021). Das Studium kann den Lehramtsstudierenden bedeutsame Lerngelegenheiten bieten, professionelle Strategien für die Entwicklung und den Erhalt des (beruflichen) Wohlbefindens zu erwerben. So zeigt sich beispielsweise die sozial-emotionale Kompetenz nicht nur von Bedeutung für das Wohlbefinden angehender Lehrpersonen (Carstensen & Klusmann, 2021), sondern auch für das Wohlbefinden im späteren Lehrberuf (Haldimann, Morinaj & Hascher, 2023; Jennings & Greenberg, 2009).

Damit das Wohlbefinden der Lehramtsstudierenden bereits in der Ausbildung gezielt gefördert werden kann, bedarf es empirisch fundierter Erkenntnisse zu dessen Ausprägung und zu Zusammenhängen mit möglichen Prädiktoren. Ziel des vorliegenden Beitrags ist es daher, Ergebnisse aus einer Studie zum Wohlbefinden von Lehramtsstudierenden in der Schweiz zu präsentieren. Abgestützt auf Arbeiten zum schulischen Wohlbefinden von Hascher (2004, 2020, 2023) adressieren wir das Wohlbefinden von angehenden Lehrpersonen mehrdimensional und kontextspezifisch und gehen mithilfe eines personenzentrierten Ansatzes der Frage nach, welche Wohlbefindensprofile sich identifizieren lassen. Aus der Ergebnisdiskussion werden hochschuldidaktische Vorschläge zur Wohlbefindensförderung bei Lehramtsstudierenden abgeleitet.

5.2 Konzeptualisierung des Wohlbefindens von Lehramtsstudierenden

Die Forschung zum Wohlbefinden von Lehramtsstudierenden ist wesentlich durch die Arbeiten zum Wohlbefinden von Lehrpersonen im Beruf beziehungsweise zum Studium allgemein bestimmt. Aus Literaturreviews zum Wohlbefinden von Lehrpersonen (z. B. Hascher & Waber, 2021; McCallum, Price, Graham & Morrison, 2017) und zum Wohlbefinden von Studierenden (z. B. Dodd et al., 2021; Khatri & Duggal, 2022) lassen sich zwei Grundprinzipien ableiten: *Erstens* wird überwiegend für eine mehrdimensionale Konzeptualisierung des Wohlbefindens argumentiert (Dodd et al., 2021; Hascher & Waber, 2021). Dies bedeutet, dass Wohlbefinden als ein komplexes Konstrukt anerkannt und entsprechend anhand von mehreren Dimensionen definiert wird. Dabei legen Forschungsbefunde eine Unabhängigkeit positiver und negativer Dimensionen des Wohlbefindens nahe (Bradburn, 1969; Diener, 1984; Van Horn, Taris, Schaufeli & Schreurs, 2004). *Zweitens* besteht ein Bedarf an einer kontextspezifischen Erfassung des Wohlbefindens (Dodd et al., 2021; Hascher & Waber, 2021), welche die jeweiligen Rollen, Aufgaben und Umweltbedingungen einer Person berücksichtigt. Dies lässt sich auch spezifisch für das Wohlbefinden im Bereich der Tertiärbildung festhalten, für dessen Konzeptualisierung vielfach auf allgemeine Wohlbefindenstheorien zurückgegriffen wird (Khatri & Duggal, 2022).

Bisher sind nur wenige Studien zum Wohlbefinden von Lehramtsstudierenden den Forderungen nach einer kontextspezifischen und mehrdimensionalen Konzeptualisierung nachgekommen (für einen Überblick ausgewählter Studien siehe Tabelle 1). Es dominieren hingegen Studien, in welchen kontextunspezifisch das allgemeine Wohlbefinden (z. B. Lebenszufriedenheit) von Lehramtsstudierenden untersucht wurde (Bjorklund et al., 2021; Corcoran & O'Flaherty, 2022; Hagger & Malmberg, 2011; Hue & Lau, 2015; Vesely, Saklofske & Nordstokke, 2014). Oder aber es liegen Studien vor, welche nur negative Dimensionen wie Stress und Burnout im Lehramtsstudium fokussierten (Fives, Hamman & Olivarez, 2007; García-Martínez, Pérez-Navío, Pérez-Ferra & Quijano-López, 2021; Hahn, Kuhlee & Porsch, 2021; Klassen & Chiu, 2011; Väisänen, Pietarinen, Pyhältö, Toom & Soini, 2018). Die Konzeptualisierung von Wohlbefinden über die alleinige Abwesenheit negativer Dimensionen kann kritisch betrachtet werden. Bereits die World Health Organization hat «Gesundheit» 1946 nicht nur als die Abwesenheit von Krankheit und Gebrechen, sondern als einen Zustand des vollständigen körperlichen, geistigen und sozialen Wohlbefindens definiert (WHO, 1946, 1984).

Tabelle 1

Ausgewählte Studien zum Wohlbefinden von Lehramtsstudierenden mit mehrdimensionaler und kontextspezifischer Konzeptualisierung

Autorinnen und Autoren (Jahr)	Konzeptualisierung Wohlbefinden	Stichprobe	Methode	Ausgewählte Ergebnisse
Väisänen, Pietarinen, Pyhältö, Toom und Soini (2017)	Empowerment und Belastung	Finnland *N* = 40	Qualitativ, Querschnitt, Interviewstudie	(Fehlende) soziale Unterstützung als relevant für das Erleben von Empowerment und Belastung im Lehramtsstudium
Sulis et al. (2021)	Komplexes, dynamisches System	Österreich, Spanien, Niederlande, Vereinigtes Königreich *N* = 6	Qualitativ, Querschnitt, Interviewstudie	Agency der Befragten als besonders systemsteuerungsrelevant
Carstensen, Lindner und Klusmann (2021)	Emotionale Erschöpfung, Studien- und Lehrveranstaltungs-zufriedenheit, Fachenthusiasmus	Deutschland *N* = 1255 (Querschnitt) *N* = 436 (Längsschnitt)	Quantitativ, Querschnitt + Längsschnitt, Schriftliche Onlinebefragung	Wahrgenommene Wertschätzung durch Dozierende als bedeutsamer Prädiktor für das Wohlbefinden der Lehramtsstudierenden
Dreer (2023)	Sieben Indikatoren (u.a. positive Emotionen, emotionale Erschöpfung)	Deutschland *N* = 222	Quantitativ, Beobachtung (Längsschnitt) + Schriftliche Onlinebefragung (Querschnittt)	Zusammenhänge des Wohlbefindens von Lehramtsstudierenden mit dem beobachteten Wohlbefinden ihrer Praxislehrpersonen (nur für den finalen von drei Beobachtungszeitpunkten)

Um diesem Forschungsdesiderat zu begegnen, untersuchen wir in der vorliegenden Studie das Wohlbefinden von Lehramtsstudierenden sowohl mehrdimensional – mit positiven und negativen Dimensionen – wie auch kontextspezifisch für die Lehrerinnen- und Lehrerbildung. Basierend auf Forschungen zum allgemeinen Wohlbefinden (z. B. Diener, 1984; Mayring, 1991; Ryff, 1989) entwickelte Hascher (2004, 2020, 2023) ein Wohlbefindensmodell für den Kontext Schule, welches sich auch auf die Ausbildung von Lehrpersonen übertragen lässt. Das adaptierte sechs-dimensionale Modell besteht aus den drei positiven Wohlbefindensdimensionen (1) Positive Einstellungen zum Studium, (2) Freude im Studium, (3) Akademischer Selbstwert sowie aus den drei negativen

Wohlbefindensdimensionen (4) Sorgen wegen des Studiums, (5) Physische Probleme wegen des Studiums und (6) Soziale Probleme im Studium. Im Modell sind sowohl emotionale, kognitive, physische wie auch soziale Aspekte des Wohlbefindens abgedeckt. Neben Wohlbefindensdimensionen mit hedonistischer Perspektive (z. B. Freude im Studium) integriert das Modell auch eudämonistische Wohlbefindensdimensionen (z. B. soziale Probleme im Studium), welche auf die Funktionsfähigkeit beziehungsweise das «Flourishing» der Lehramtsstudierenden abzielen (Deci & Ryan, 2008; Ryff, 2014). Dabei wird Wohlbefinden als eine positive Dysbalance definiert, welche sich bei einer längerfristigen Dominanz von positiven Wohlbefindensdimensionen gegenüber den negativen Wohlbefindensdimensionen einstellt.

Um der Mehrdimensionalität des Wohlbefindens methodisch gerecht zu werden, sind personenzentrierte Analyseverfahren ein vielversprechender Ansatz. Diese Verfahren ermöglichen (Risiko)gruppen an Lehramtsstudierenden zu identifizieren, welche beispielsweise eine positive oder negative Dysbalance bezüglich der sechs Wohlbefindensdimensionen aufweisen. Aus dem Bereich der Gesundheitsforschung und mit starken Bezügen zum Wohlbefinden haben beispielsweise die vier persönlichkeitsspezifischen Verhaltens- und Erlebensmuster (AVEM) nach Schaarschmidt und Fischer (1996) grosse Bekanntheit erlangt. Die zwei gesundheitlich unbedenklichen Muster («Gesundheit» und «Schonung») und die zwei Risikomuster («Übermässig engagiert» und «Burnout») wurden unter anderem in Stichproben von Lehramtsstudierenden aus Deutschland wie auch aus der Schweiz repliziert. Während in einer Studie aus Deutschland 29.5% der 711 befragten Lehramtsstudierenden dem Gesundheitsmuster zugeordnet werden konnten (Römer, Drews, Rauin & Fabricius, 2013), waren es in einer Stichprobe mit 174 Schweizer Lehramtsstudierenden für das gymnasiale Lehramt deutlich mehr mit 48.3% (Deiglmayr, Grabner, Nussbaumer & Saalbach, 2018). Nicht für Lehramtsstudierende, aber für Studierende verschiedener Fachrichtungen haben Salmela-Aro und Read (2017) basierend auf Burnout und Engagement vier Profile identifiziert: In den finnischen Daten zeigten sich die Profile engagiert (44%), engagiert-erschöpft (30%), ineffizient (19%) sowie Burnout (7%).

5.3 Forschungsfragen

Ziel unserer Studie ist das Wohlbefinden von Lehramtsstudierenden in der deutschsprachigen Schweiz empirisch zu untersuchen. Entsprechend gehen wir im Beitrag drei explorativen Forschungsfragen nach:

1) Wie ist das Wohlbefinden von Lehramtsstudierenden aus der deutschsprachigen Schweiz bezüglich der sechs Wohlbefindensdimensionen ausgeprägt?

2) Welche Wohlbefindensprofile lassen sich bei angehenden Lehrpersonen identifizieren?
3) Wie hängt die Profilzugehörigkeit mit Charakteristika des Lehramtsstudiums (Zielstufe, Semester, Prüfungs- und/oder Schulpraktikumsphase) und der Person (Geschlecht) zusammen?

5.4 Methodisches Vorgehen

5.4.1 Forschungsdesign und Stichprobe

Von April bis Juni 2022 wurden Lehramtsstudierende über Kontaktpersonen an Hochschulen in der deutschsprachigen Schweiz gebeten, an der Onlinebefragung «Lehrperson werden: Wohlbefinden im Studium»[6] teilzunehmen. Für den Zugang erhielten sie einen hochschulspezifischen Link. Die freiwillige und anonyme Beantwortung dauerte durchschnittlich 15 Minuten. Zu Beginn der Onlinebefragung wurden die Teilnehmenden im Rahmen einer Einverständniserklärung über die Verwendung ihrer Daten informiert. Neben der Einschätzung ihres Wohlbefindens im Lehramtsstudium beantworteten die Lehramtsstudierenden auch Fragen zu ihrem gewählten Lehramtsstudium (Zielstufe, Semester, Prüfungs- und/oder Schulpraktikumsphase) und zu ihrer Person (Geschlecht). In die Analysen wurden Daten von 989 Lehramtsstudierenden aufgenommen, welche mindestens ein Item zum Wohlbefinden beantwortet hatten. Es resultierte ein Missinganteil von 0.6% bis 3.5% auf den Wohlbefindensitems und von 0% bis 7.2% für die Charakteristika des Lehramtsstudiums und der Person. Der in SPSS Version 28 berechnete Missing Completely At Random (MCAR) Test nach Little (1988) deutet auf eine zufällige Verteilung der fehlenden Werte in der Stichprobe hin ($\chi^2 = 604.56$, df = 601, $p = .452$).

Im Frühjahr 2022 fanden in der Schweiz keine COVID-19-pandemiebedingten flächendeckenden Schliessungen der Hochschulen statt. Die Lehramtsstudierenden hatten entsprechend angegeben, dass 74.1% aller Kurse im Frühjahressemester 2022 als reine Präsenzveranstaltungen organisiert waren. Weitere Angaben zur Zusammensetzung der Stichprobe finden sich in Tabelle 2.

[6] https://www.edu.unibe.ch/forschung/forschungsprojekte/lehrperson_werden_wohlbefinden_im_studium/index_ger.html

Tabelle 2

Deskriptive Ergebnisse differenziert nach der Gesamtstichprobe und der fünf Wohlbefindensprofile

			Wohlbefindensdimensionen *M (SD)*					Zielstufe (%)			Semester[1] *M*(*SD*)	Studien-phase (%)		Geschlecht (%)		
	N	%	PES	FIS	ASW	SOS	PPS	KG, Prim	Sek I	Sek II		PP	SP	W	M	D
Total	989	100	4.24 (0.85)	3.26 (0.76)	4.48 (0.54)	4.06 (0.94)	2.64 (1.15)	76.8	15.5	07.7	4.37(2.42)	37.8	22.7	78.8	20.9	00.3
Profil 1	139	14.1	4.75 (0.68)	3.51 (0.76)	†5.10 (0.34)	2.57 (0.38)	1.14 (0.20)	70.5	20.1	09.4	4.58(2.41)	37.3	15.0	74.1	25.9	00.0
Profil 2	276	27.9	4.88 (0.37)	3.88 (0.33)	4.68 (0.33)	3.71 (0.44)	†2.12 (0.58)	79.3	12.3	08.3	4.07(2.76)	38.3	23.1	76.7	22.9	00.4
Profil 3	273	27.6	4.32 (0.47)	3.40 (0.45)	†4.27 (0.40)	4.84 (0.40)	3.60 (0.71) †	79.9	15.0	05.1	4.16(2.08)	45.2	32.3	85.9	13.7	00.4
Profil 4	159	16.1	3.78 (0.56)	†2.74 (0.46)	4.46 (0.38)	3.73 (0.44)	2.12 (0.50)	70.4	18.2	11.3	4.72(2.33)	27.8	12.6	75.9	24.1	00.0
Profil 5	142	14.4	2.90 (0.65)	†2.14 (0.48)	3.91 (0.63)	5.10 (0.55)	3.89 (0.93) †	79.6	14.8	05.6	4.75(2.31)	34.4	22.7	76.8	22.5	00.7

Anmerkungen. *M* = Mittelwert; *SD* = Standardabweichung; PES = Positive Einstellungen zum Studium; FIS = Freude im Studium; ASW = Akademischer Selbstwert; SOS = Sorgen wegen des Studiums; PPS = Physische Probleme wegen des Studiums; KG, Prim = Kindergarten- und Primarstufe; Sek I = Sekundarstufe I; Sek II = Sekundarstufe II für allgemeinbildende Schultypen (z. B. Gymnasium, Fachmittelschule) und Berufsbildung; Semester = Semester, in welchem für ein Lehrdiplom studiert wird; PP = In Prüfungsphase; SP = In Schulpraktikumsphase; W = Weiblich; M = Männlich; D = Divers; [1] 85.4% studierten im Bachelor, 11.7% im Master und 2.9% in einem anderweitigen Format (z. B. Fach- oder Stufenerweiterung); † = Mittelwert unterscheidet sich nicht signifikant vom theoretischen Skalenmittelwert von 3.5 (Bonferroni-Korrektur: $p < .002$).

5.4.2 Das Messinstrument «Wohlbefinden von Lehramtsstudierenden»

Zur Erfassung des Wohlbefindens von Lehramtsstudierenden wurde das Messinstrument «Wohlbefinden von Lehrpersonen» (Hascher, 2020) für den Kontext des Lehramtsstudiums adaptiert und validiert (Haldimann, Hascher & Flick-Holtsch, under review). Die sechs Wohlbefindensdimensionen wurden je mit einer Subskala erfasst und sind im Überblick in Tabelle 3 dargestellt. Die Lehramtsstudierenden schätzten die Items auf einer Likert-Skala von 1 „trifft überhaupt nicht zu“ bis 6 „trifft völlig zu“ ein.

Tabelle 3

Messinstrument «Wohlbefinden von Lehramtsstudierenden» adaptiert von Hascher (2020)

Skala	Beispielitem	Item-anzahl	Skalierung [a]	ω
Positive Dimensionen				
Positive Einstellungen zum Studium	Mein Studium scheint mir sinnvoll.	4	1-6	.87
Freude im Studium	In den letzten Wochen habe ich mich im Studium gefreut, weil ich zeigen konnte, was ich kann bzw. was ich dazugelernt habe.	3	1-6	.69
Akademischer Selbstwert	Ich kann Herausforderungen im Studium leicht lösen.	3	1-6	.74
Negative Dimensionen				
Sorgen wegen des Studiums	In den letzten Wochen habe ich mir Sorgen gemacht wegen Prüfungen und Leistungsnachweisen im Studium.	3	1-6	.73
Physische Probleme wegen des Studiums	In den letzten Wochen kam es vor, dass ich wegen des Studiums starke Kopfschmerzen hatte.	4	1-6	.83
Soziale Probleme im Studium *(ausgeschlossen)*	In den letzten Wochen kam es vor, dass ich Probleme mit Studienkolleginnen und -kollegen hatte.	3	1-6	.51

Anmerkungen. [a] Skala von 1 „trifft überhaupt nicht zu“ bis 6 „trifft völlig zu“; ω = McDonald’s Omega.

5.4.3 Datenanalyse

Deskriptive Analysen sowie die Überprüfung der Faktorenstruktur wurden in *R* Version 4.0.3 (R Core Team, 2023) mit den Paketen *misty* Version 0.5.3 (Yanagida, 2023) und *lavaan*

Version 0.6-7 (Rosseel, 2012) durchgeführt. Zur Beurteilung der Reliabilität wurde McDonalds Omega berechnet (Tabelle 3). Die Dimension «Soziale Probleme im Studium» wurde wegen ungenügender Reliabilität ($\omega = .51$) für die weiteren Analysen ausgeschlossen. Bei der konfirmatorischen Faktorenanalyse erzielte das Fünf-Faktorenmodell erster Ordnung gute Fit-Werte (CFI = .97, RMSEA = .05, SRMR = .04). Zwischen den fünf Wohlbefindensdimensionen resultierten signifikante Spearman-Korrelationen von |.17| bis |.64|.

Latente Profilanalyse. Zur Identifikation der Wohlbefindensprofile führten wir in M*plus* Version 8.7 (Muthén & Muthén, 1998-2017) eine latente Profilanalyse durch, wobei wir die fünf Wohlbefindensdimensionen als Indikatoren für die Profilbildung verwendeten. Dazu extrahierten wir nach der Methode von Little, Slegers und Card (2006) skalierte latente Faktorscores. Wir testeten Profillösungen mit einem bis zu sieben Profilen. Um der Komplexität individueller Erfahrungen gerecht zu werden, wurden die Varianzen frei geschätzt und die Kovarianzen auf null fixiert (Morin et al., 2011). Es wurde der robuste Maximum Likelihood Schätzer (MLR) verwendet und fehlende Werte wurden mit dem Full Information Maximum Likelihood-Algorithmus (FIML) geschätzt. Um eine lokale Lösung zu verhindern, überprüften wir die erfolgreiche Replikation des besten Log-Likelihood-Werts für alle Modelle. Für die Auswahl der Profillösung waren eine sinnvolle inhaltliche Interpretation und statistische Kennwerte ausschlaggebend (Nylund-Gibson & Choi, 2018). Differenzen zwischen den Mittelwerten der fünf Wohlbefindensdimensionen (Gesamt- und Profilstichproben) sowie dem theoretischen Skalenmittelwert von 3.5 wurden mit der Option MODEL CONSTRAINT in M*plus* auf statistische Signifikanz überprüft. Wir haben eine Bonferroni-Korrektur vorgenommen und nur Mittelwertunterschiede mit $p < .002$ als signifikant interpretiert (berechnet aus 0.05/25).

Zusammenhänge der Profilzugehörigkeit mit Kovariaten. Zusammenhänge der Profilzugehörigkeit mit Kovariaten (Charakteristika des Lehramtsstudiums und der Person) haben wir in M*plus* mittels multinomialer logistischer Regression anhand der R3STEP-Option analysiert. Die R3STEP-Option hat den Vorteil, dass die Unsicherheit der Klassifizierung mitberücksichtigt und nicht von einer eindeutigen Profilzugehörigkeit ausgegangen wird (Asparouhov & Muthén, 2014; Vermunt, 2010). Die fehlenden Werte auf den Kovariaten wurden mittels multipler Imputation geschätzt. Es werden unstandardisierte Beta-Koeffizienten, Standardfehler und Odds Ratios (OR) – zu interpretieren als relative Chancen – berichtet.

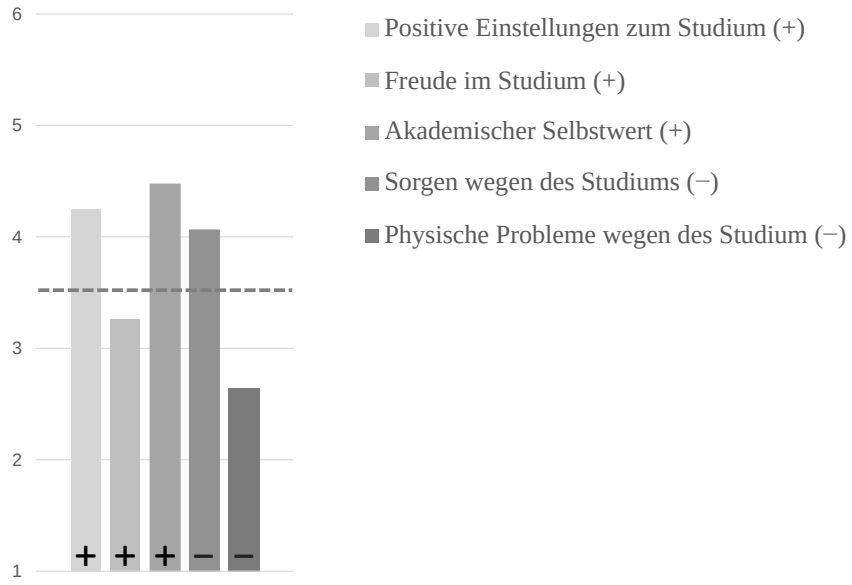
5.5 Ergebnisse

5.5.1 Forschungsfrage 1: Ausprägung der Wohlbefindensdimensionen

Die deskriptiven Ergebnisse zu den fünf Wohlbefindensdimensionen sind Tabelle 2 zu entnehmen. Die Mittelwerte sind in Abbildung 1 ersichtlich. Die Lehramtsstudierenden schätzten sich auf den positiven Dimensionen «Positive Einstellungen zum Studium» und «Akademischer Selbstwert» signifikant über dem theoretischen Skalenmittelwert von 3.5 ein, d. h. die Werte sind als (eher) zustimmend zu interpretieren. Für die positive Dimension «Freude im Studium» fällt der Mittelwert (M = 3.26) signifikant unterhalb von 3.5 aus. Während der Mittelwert für die negative Dimension «Physische Probleme wegen des Studiums» signifikant unter dem theoretischen Skalenmittelwert liegt, zeigen sich eher kritische Werte, d. h. Werte signifikant über dem Skalenmittelwert für die negative Dimension «Sorgen wegen des Studiums» (M = 4.06).

Abbildung 1

Mittelwerte der fünf Wohlbefindensdimensionen in der Gesamtstichprobe (N = 989 Lehramtsstudierende)



Anmerkung. Alle Mittelwerte unterscheiden sich signifikant ($p < .001$) vom theoretischen Skalenmittelwert von 3.5 (gestrichelte Linie).

5.5.2 Forschungsfrage 2: Identifikation von Wohlbefindensprofilen

Die statistischen Kennwerte der getesteten Profillösungen sind in Tabelle 4 aufgeführt (für eine Definition der einzelnen Kennwerte vgl. Bauer, 2022; Nylund-Gibson & Choi, 2018;

Nylund, Asparouhov & Muthén, 2007). Ein erstellter Elbow-Plot mit den Informationskriterien AIC, BIC sowie SSA-BIC weist darauf hin, dass die optimale Lösung in der Tendenz drei, vier oder fünf Profile enthält. Der Lo-Mendell-Rubin-Test fällt bei der Vier-, Sechs- und Siebenprofillösung nicht signifikant aus und legt nahe, dass die Profillösung mit *K-1* Profilen, das heisst eine Drei- oder Fünfprofillösung, vorzuziehen ist. Die Entropiewerte liegen über .80 und weisen auf eine gute Profilseparierung aller getesteten Profillösungen hin (Asparouhov & Muthén, 2014). Werden die Lösungen mit drei, vier und fünf Profilen aus inhaltlicher Perspektive betrachtet, zeigt sich, dass auch die Fünfprofillösung distinkte Profilmuster enthält und damit qualitativ einen Mehrwert gegenüber der Drei- und der Vierprofillösung darstellt (Morin et al., 2017). Wir haben uns deshalb für eine Fünfprofillösung entschieden. Die fünf identifizierten Wohlbefindensprofile sind in Abbildung 2 dargestellt. Diese lassen sich entlang dem Verhältnis von positiven und negativen Wohlbefindensdimensionen beschreiben.

Tabelle 4

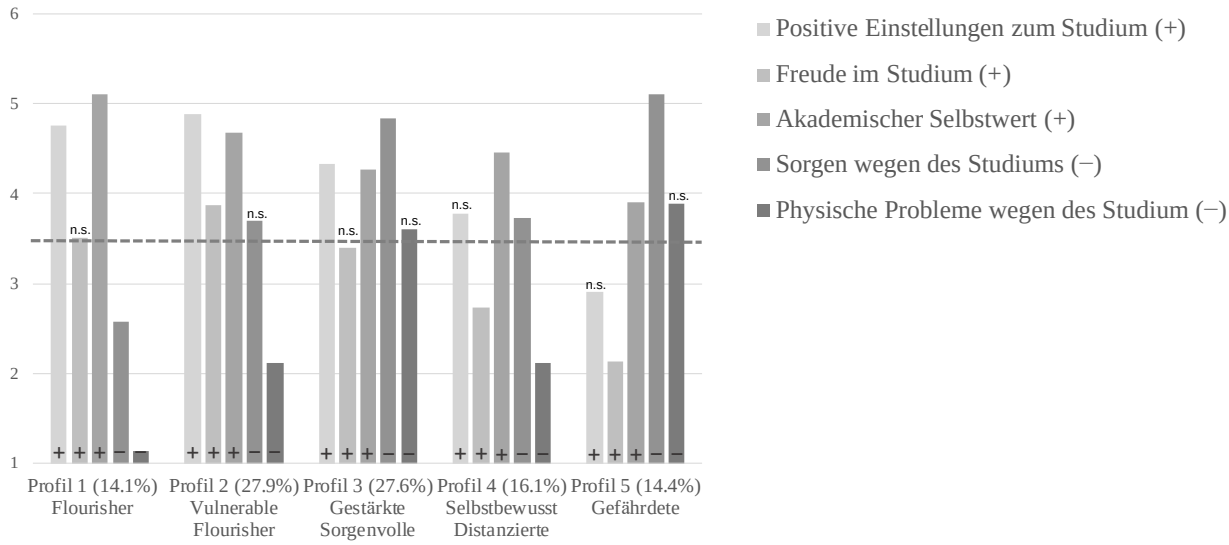
Statistische Kennwerte der latenten Profilanalyse (Lösungen mit eins bis sieben Profilen)

Profile	AIC	BIC	SSA-BIC	*p*LMR	Entropie	Kleinste Profilhäufigkeit
1	12140.35	12189.32	12157.56	-	-	-
2	10610.73	10713.56	10646.86	.000	0.83	49.7%, *N* = 492
3	9935.38	10092.08	9990.44	.000	0.84	27.1%, *N* = 268
4	9503.08	9713.64	9577.07	.198	0.86	16.9%, *N* = 167
5	**9159.64**	**9424.06**	**9252.56**	**.021**	**0.87**	**14.1%, *N* = 139**
6	8937.56	9255.84	9049.40	.143	0.86	10.7%, *N* = 106
7	8815.00	9187.15	8945.77	.253	0.86	08.0%, *N* = 79

Anmerkungen. *N* = 989; AIC = Akaike information criterion; BIC = Bayesian information criterion; SSA-BIC = sample-size-adjusted-BIC; *p*LMR = *p*-Wert des adjusted Lo-Mendel-Rubin Likelihood Ratio Test.

Abbildung 2

Die fünf identifizierten Wohlbefindensprofile (N = 989 Lehramtsstudierende)



Anmerkungen. n.s = Mittelwert unterscheidet sich nicht signifikant vom theoretischen Skalenmittelwert von 3.5 (Bonferroni-Korrektur: $p < .002$).

Lehramtsstudierende des Wohlbefindensprofils 1 *Flourisher* lassen sich durch hohe Ausprägungen (signifikant über dem theoretischen Skalenmittelwert von 3.5) auf zwei der drei positiven Wohlbefindensdimensionen in Kombination mit geringen Ausprägungen (signifikant unterhalb des theoretischen Skalenmittelwerts von 3.5) auf den beiden negativen Wohlbefindensdimensionen charakterisieren. Auf der Wohlbefindensdimension «Freude im Studium» weisen Lehramtsstudierende dieses Wohlbefindensprofils moderate Ausprägungen (nicht signifikant unterschiedlich des theoretischen Skalenmittelwerts von 3.5) auf. Dieses Wohlbefindensprofil umfasst 14.1% aller Lehramtsstudierenden. Das Wohlbefindensprofil 2 *Vulnerable Flourisher* weist wie das Wohlbefindensprofil 1 *Flourisher* eine positive Dysbalance auf. Lehramtsstudierende dieses Profils haben auf allen drei positiven Wohlbefindensdimensionen hohe Ausprägungen in Kombination mit moderaten Ausprägungen auf der Wohlbefindensdimension «Sorgen wegen des Studiums» und geringen Ausprägungen auf der Wohlbefindensdimension «Physische Probleme wegen des Studiums». Zu diesem Wohlbefindensprofil gehören 27.9% der Lehramtsstudierenden. Des Weiteren identifizierten wir in der Stichprobe zwei Wohlbefindensprofile, welche sich durch gemischte Ausprägungen auf den positiven sowie negativen Wohlbefindensdimensionen auszeichnen. Lehramtsstudierende des Wohlbefindensprofils 3 *Gestärkte Sorgenvolle* weisen auf allen fünf

Wohlbefindensdimensionen moderate bis hohe Ausprägungen auf. 27.6% der Lehramtsstudierenden werden diesem Wohlbefindensprofil zugeordnet. In Kontrast dazu lassen sich Lehramtsstudierende des Wohlbefindensprofils 4 *Selbstbewusst Distanzierte* durch mehrheitlich geringe bis moderate Ausprägungen auf allen fünf Wohlbefindensdimensionen charakterisieren. Dieses Wohlbefindensprofil umfasst 16.1% der Lehramtsstudierenden. Abschliessend identifizierten wir in der Stichprobe auch Lehramtsstudierende, bei welchen sich in den Ausprägungen auf den fünf Wohlbefindensdimensionen eine negative Dysbalance abzeichnet. Lehramtsstudierende des Wohlbefindensprofils 5 *Gefährdete* zeichnen sich durch mehrheitlich geringe bis moderate Ausprägungen auf den positiven Wohlbefindensdimensionen aus in Kombination mit moderaten bis hohen Ausprägungen auf den negativen Wohlbefindensdimensionen. Dieses Wohlbefindensprofil weisen 14.4% der Lehramtsstudierenden auf.

5.5.3 Forschungsfrage 3: Zusammenhänge der Profilzugehörigkeit mit Charakteristika des Lehramtsstudiums und der Person

Folgend wird berichtet, inwiefern sich Zusammenhänge zwischen der Profilzugehörigkeit und ausgewählten Charakteristika des Lehramtsstudiums (Zielstufe, Semester, Prüfungs- und/oder Schulpraktikumsphase) sowie der Person (Geschlecht) zeigen. Die prozentuale Verteilung der Charakteristika innerhalb der fünf Wohlbefindensprofile ist Tabelle 2 zu entnehmen. Die Ergebnisse der multivariaten logistischen Regression aller möglichen Profilvergleiche sind in Tabelle 5 aufgeführt. Mit Ausnahme der Zielstufe erwiesen sich die Prädiktoren bei einzelnen Profilvergleichen als signifikant für die Profilzugehörigkeit.

Das Absolvieren einer Schulpraktikumsphase und das Geschlecht der Lehramtsstudierenden stellten sich als signifikante Prädiktoren bei insgesamt der Hälfte aller Profilvergleiche heraus: So weisen Lehramtsstudierende in einer Schulpraktikumsphase sowie weibliche Lehramtsstudierende eine signifikant höhere Chance auf, zum Wohlbefindensprofil 3 *Gestärkte Sorgenvolle* zu gehören als zum Wohlbefindensprofil 1 *Flourisher* (Schulpraktikumsphase: OR = 2.93; Weiblich: OR = 2.34), zum Wohlbefindensprofil 2 *Vulnerable Flourisher* (Schulpraktikumsphase: OR = 1.75; Weiblich: OR = 2.15) oder zum Wohlbefindensprofil 4 *Selbstbewusst Distanzierte* (Schulpraktikumsphase: OR = 3.52; Weiblich: OR = 2.10). Lehramtsstudierende in einer Schulpraktikumsphase haben zudem eine signifikant höhere Chance, zum Wohlbefindensprofil 5 *Gefährdete* zu gehören als zum Wohlbefindensprofil 4 *Selbstbewusst Distanzierte* (OR = 2.22). Weibliche Lehramtsstudierende haben eine höhere Chance, zum Wohlbefindensprofil 3 *Gestärkte Sorgenvolle* zu gehören als zum Wohlbefindensprofil 5 *Gefährdete* (OR = 2.25). Ob

Lehramtsstudierende angegeben haben, sich in einer Prüfungsphase zu befinden oder nicht, hat sich für einen Profilvergleich als relevant erwiesen: Lehramtsstudierende in einer Prüfungsphase haben eine signifikant höhere Chance, zum Wohlbefindensprofil 3 *Gestärkte Sorgenvolle* zu gehören als zum Wohlbefindensprofil 4 *Selbstbewusst Distanzierte* (OR = 1.94). Auch die Semesteranzahl hat sich für einen Profilvergleich als signifikant gezeigt: Mit zunehmender Anzahl an studierten Semestern haben Lehramtsstudierende eine signifikant höhere Chance, zum Wohlbefindensprofil 5 *Gefährdete* zu gehören als zum Wohlbefindensprofil 2 *Vulnerable Flourisher* (OR = 1.17).

Tabelle 5

Relative Chancen (Odds Ratio) der Zugehörigkeit zu den Wohlbefindensprofilen nach Zielstufe, Studienphase, Prüfungsphase, Schulpraktikumsphase und Geschlecht

	β (*SE*)	OR	β (*SE*)	OR	β (*SE*)	OR	β (*SE*)	OR	β (*SE*)	OR
	Vulnerable Flourisher (P2) vs. Flourisher (P1)		Gestärkte Sorgenvolle (P3) vs. Flourisher (P1)		Selbstbewusst Distanzierte (P4) vs. Flourisher (P1)		Gefährdete (P5) vs. Flourisher (P1)		Gestärkte Sorgenvolle (P3) vs. Vulnerable Flourisher (P2)	
Sekundarstufe I	-0.53	0.59	-0.15	0.86	-0.26	0.77	-0.73	0.48	0.38	1.46
Referenz: Kindergarten/Primarstufe	(0.37)		(0.35)		(0.38)		(0.40)		(0.32)	
Sekundarstufe II	-0.31	0.73	-0.42	0.66	0.28	1.33	-0.61	0.54	-0.11	0.90
Referenz: Kindergarten/Primarstufe	(0.45)		(0.47)		(0.45)		(0.55)		(0.44)	
Semester	-0.09	0.91	-0.04	0.96	0.05	1.05	0.07	1.07	0.06	1.06
	(0.09)		(0.06)		(0.07)		(0.06)		(0.07)	
Prüfungsphase	-0.07	0.93	0.20	1.23	-0.46	0.63	-0.26	0.77	0.27	1.31
Referenz: Keine Prüfungsphase	(0.25)		(0.25)		(0.30)		(0.29)		(0.21)	
Schulpraktikumsphase	0.52	1.68	1.07**	2.93	-0.19	0.83	0.61	1.84	0.56*	1.75
Referenz: Keine Schulpraktikumsphase	(0.34)		(0.31)		(0.42)		(0.36)		(0.25)	
Weiblich	0.08	1.09	0.85**	2.34	0.11	1.12	0.04	1.04	0.77**	2.15
Referenz: Männlich	(0.29)		(0.32)		(0.31)		(0.32)		(0.29)	
	Selbstbewusst Distanzierte (P4) vs. Vulnerable Flourisher (P2)		Gefährdete (P5) vs. Vulnerable Flourisher (P2)		Gestärkte Sorgenvolle (P3) vs. Selbstbewusst Distanzierte (P4)		Gestärkte Sorgenvolle (P3) vs. Gefährdete (P5)		Gefährdete (P5) vs. Selbstbewusst Distanzierte (P4)	
Sekundarstufe I	0.27	1.31	-0.20	0.82	0.11	1.12	0.58	1.79	-0.47	0.62
Referenz: Kindergarten/Primarstufe	(0.38)		(0.39)		(0.36)		(0.40)		(0.40)	
Sekundarstufe II	0.59	1.81	-0.30	0.74	-0.71	0.49	0.19	1.21	-0.90	0.41
Referenz: Kindergarten/Primarstufe	(0.42)		(0.52)		(0.45)		(0.57)		(0.52)	
Semest	0.14	1.15	0.16*	1.17	-0.08	0.92	-0.11	0.90	0.02	1.02
	(0.09)		(0.08)		(0.06)		(0.05)		(0.05)	
Prüfungsphase	-0.39	0.68	-0.19	0.83	0.66*	1.94	0.46	1.59	0.20	1.22
Referenz: Keine Prüfungsphase	(0.27)		(0.25)		(0.27)		(0.27)		(0.31)	
Schulpraktikumsphase	-0.70	0.50	0.10	1.10	1.26***	3.52	0.46	1.59	0.80*	2.22
Referenz: Keine Schulpraktikumsphase	(0.38)		(0.31)		(0.36)		(0.30)		(0.40)	
Weiblich	0.03	1.03	-0.05	0.95	0.74*	2.10	0.81*	2.25	-0.07	0.93
Referenz: Männlich	(0.29)		(0.29)		(0.33)		(0.34)		(0.33)	

Anmerkungen: Multinomiale logistische Regression mit der R3STEP-Option (Asparouhov & Muthén, 2014; Vermunt, 2010); OR: Relative Chance (Odds Ratio); *SE* = Standardfehler; β = Unstandardisierte Beta-Koeffizienten; *** $p < .001$; ** $p < .01$; * $p < .05$.

5.6 Diskussion und Ausblick

Das Ziel des vorliegenden Beitrags bestand darin, das Wohlbefinden von angehenden Lehrpersonen aus der deutschsprachigen Schweiz zu beschreiben. Basierend auf einer sechsdimensionalen Konzeptualisierung des Wohlbefindens von Lehramtsstudierenden (adaptiert von Hascher, 2004, 2020, 2023) stand neben der Ausprägung der sechs Wohlbefindensdimensionen auch die personenzentrierte Identifikation von Wohlbefindensprofilen im Zentrum.

Beim Vergleich der Ausprägungen der Wohlbefindensdimensionen (*Forschungsfrage 1)* wird deutlich, dass die Freude im Studium eher gering und die Sorgen wegen des Studiums relativ hoch eingeschätzt wurden. Dies kann kritisch betrachtet werden, weil der Freude als positive Emotion mit aktivierendem Charakter eine wichtige Rolle im Lernprozess zukommt (Hagenauer, 2011; Pekrun, 2006) und Zusammenhänge mit der akademischen Leistung aufweist (Camacho-Morles et al., 2021). Durch den Ausschluss der Dimension «Soziale Probleme im Studium» aufgrund zu geringer Reliabilität liegen keine Befunde zu sozialen Aspekten vor. Explorativ sind auf Itemebene Hinweise für soziale Probleme in den Daten vorhanden: 17.6% der befragten Lehramtsstudierenden haben angegeben, sich (eher) als Aussenseiterin oder Aussenseiter im Lehramtsstudium zu fühlen. Inwiefern dieser Befund durch die pandemiebedingten Einschränkungen der vorherigen Semester zu deuten ist, kann mit den vorliegenden Daten nicht beantwortet werden. Die soziale Eingebundenheit ist eine wichtige Voraussetzung erfolgreicher Lernprozesse (Ryan & Deci, 2000) – auch in der Lehrerinnen- und Lehrerbildung.

Wir identifizierten in der Stichprobe fünf Wohlbefindensprofile (*Forschungsfrage 2*). Von den befragten Lehramtsstudierenden gehören 42% zum Wohlbefindensprofil 1 *Flourisher* oder zum Wohlbefindensprofil 2 *Vulnerable Flourisher*, d. h. weisen nach der gewählten Konzeptualisierung ein hohes Wohlbefinden auf. Während 43.7% der Lehramtsstudierenden ein moderates Wohlbefinden aufweisen (Wohlbefindensprofil 3 *Gestärkte Sorgenvolle* und Wohlbefindensprofil 4 *Selbstbewusst Distanzierte*), sind Lehramtsstudierende des Wohlbefindensprofils 5 *Gefährdete* (14.4%) als Risikogruppe hervorzuheben. Jede siebte Studentin beziehungsweise jeder siebte Student hat mehrheitlich geringe bis moderate Ausprägungen auf den positiven Wohlbefindensdimensionen sowie moderate bis hohe Ausprägungen auf den negativen Wohlbefindensdimensionen.

Die fünf identifizierten Wohlbefindensprofile weisen Ähnlichkeiten mit den vier Profilen von Salmela-Aro und Read (2017) auf. Ähnlich wie bei Wohlbefindensprofil 3 *Gestärkte Sorgenvolle* zeigte sich in den finnischen Daten, dass Studierende verschiedener

Fachrichtungen Engagement bei gleichzeitiger emotionaler Erschöpfung erleben können. Es lassen sich auch Bezüge zu den vier persönlichkeitsspezifischen Verhaltens- und Erlebensmuster (AVEM) nach Schaarschmidt und Fischer (1996) herstellen. Insbesondere zwischen dem Schonungsmuster – charakterisiert durch ein geringes Engagement bei gleichzeitiger ausgeprägter Distanzierungsfähigkeit zum Studium kombiniert mit einem insgesamt positiven Lebensgefühl – und dem Wohlbefindensprofil 4 *Selbstbewusst Distanzierte* lassen sich Bezüge vermuten, welche weiter untersucht werden könnten.

Für die Profilzugehörigkeit zeigte sich lediglich die Zielstufe der Lehramtsstudierenden, das heisst, ob sich die Lehramtsstudierenden für eine Lehrtätigkeit auf der Primarstufe, der Sekundarstufe I oder der Sekundarstufe II vorbereiten, als nicht signifikanter Prädiktor (*Forschungsfrage 3*). Zwei weitere Befunde möchten wir an dieser Stelle hervorheben: Erstens zeichnete sich in den Daten die Tendenz ab, dass Lehramtsstudierende in einer Schulpraktikumsphase sowie weibliche Lehramtsstudierende eine signifikant höhere Chance aufweisen, dem Wohlbefindensprofil 3 *Gestärkte Sorgenvolle* zugeordnet zu werden als drei Alternativprofilen. Moderate bis hohe Ausprägungen auf den positiven Dimensionen (z. B. positive Einstellung zum Studium) begleitet von Sorgen sowie physischen Problemen wie Kopfschmerzen und Schlafproblemen wegen des Studiums scheinen besonders bei Frauen sowie in Schulpraktikumsphasen präsent zu sein. Dieser Befund ist anschlussfähig mit Ergebnissen aus der Schulpraktikumsforschung, welche zeigt, dass Schulpraktika für Lehramtsstudierende neben positiven Emotionen auch mit Sorgen, Ängsten und Nervosität verknüpft sein können (Hascher & Hagenauer, 2016). In der Studie von Salmela-Aro und Read (2017) berichteten auch die Studentinnen im Vergleich zu den Studenten sowohl von höherem Engagement aber auch von höherer emotionaler Erschöpfung im Studium. Zweitens möchten wir den Befund hervorheben, dass Studierende höherer Semester eine höhere Chance aufweisen, zum Risikoprofil 5 *Gefährdete* zu gehören als zum Wohlbefindensprofil 2 *Vulnerable Flourisher*. Dieser Befund deckt sich mit dem in Studien gefundenen negativen Zusammenhang zwischen Burnout und dem Fortschritt im Studium (z. B. Asikainen, Nieminen, Häsä & Katajavuori, 2022). Um die Wirkrichtung zwischen dem Wohlbefinden und der Studiendauer zu untersuchen, werden zukünftig längsschnittlich angelegte Studien benötigt. Denn so kann durchaus auch argumentiert werden, dass geringeres Wohlbefinden zu einer Verlängerung des Studiums führen kann.

5.6.1 Limitationen und zukünftige Forschung

Die vorliegende Studie weist Limitationen auf. Die Ergebnisse basieren auf einer nicht repräsentativen Stichprobe bestehend aus Lehramtsstudierenden acht verschiedener

Hochschulen aus der deutschsprachigen Schweiz, welche heterogene Lernsettings aufweisen. Die Teilnahme an der Onlinebefragung war freiwillig, was das Risiko birgt, dass sich Lehramtsstudierende mit geringem Wohlbefinden nicht an der Onlinebefragung beteiligt haben und es sich bei der Risikogruppe mit einem Anteil von 14.4% vermutlich um eine Unterschätzung handelt. Ebenfalls ist hervorzuheben, dass die identifizierten Wohlbefindensprofile durch die vorliegenden Querschnittdaten eine Momentaufnahme darstellen.

Die Studie liefert Hinweise zum Wohlbefinden von Lehramtsstudierenden, wobei weitere Analysen für ein vertieftes Verständnis benötigt werden. *Erstens* scheint eine Überarbeitung und Integration der Dimension «Soziale Probleme im Studium» in zukünftigen Analysen wichtig, da Forschungsbefunde die Bedeutsamkeit sozialer Aspekte im Lehramtsstudium (Corcoran & O'Flaherty, 2022; Sulis, Mercer, Mairitsch, Babic & Shin, 2021) und im Lehrberuf (Hascher & Waber, 2021; McCallum et al., 2017) betonen. *Zweitens* würde sich das Replizieren der Wohlbefindensprofile in einer weiteren Stichprobe anbieten, um deren Robustheit zu überprüfen. Mit einem Mixed-Methods-Design (Creswell, 2014) könnten in einer vertiefenden Interviewstudie weiterführende Erkenntnisse, beispielsweise zum Zusammenspiel der fünf Wohlbefindensdimensionen innerhalb der identifizierten Wohlbefindensprofile, gewonnen werden. *Drittens* fehlt es an Modellen zur Systematisierung von Prädiktoren des Wohlbefindens von Lehramtsstudierenden. Insbesondere für Ausbildungssysteme mit integrierter Berufspraxis wäre ein Modell zum Zusammenwirken der Lernwelten Hochschule und Schule nötig. Arbeiten basierend auf dem ökosystemischen Ansatz nach Bronfenbrenner (1979) bieten dazu einen vielversprechenden Ansatz (Price & McCallum, 2015; Sulis, Mercer, Babic & Mairitsch, 2023). *Viertens* wäre in Längsschnittstudien zu prüfen, inwiefern die identifizierten Wohlbefindensprofile über den Verlauf eines Semesters oder des Studiums stabil bleiben und wie das Wohlbefinden im Lehramtstudium mit dem beruflichen Wohlbefinden sowie der Unterrichtsqualität im späteren Lehrberuf zusammenhängt. Denn inwiefern Ergebnisse zum Wohlbefinden von Lehramtsstudierenden auf Lehrpersonen übertragen werden können und vice versa, gilt es zu prüfen. Dazu werden Studien benötigt, welche längsschnittlich das Wohlbefinden während des Übergangs vom Lehramtsstudium in den Lehrberuf untersuchen und dabei die unterschiedlichen, kontextuellen Rahmenbedingungen (z. B. Verantwortung für eigene Klasse) berücksichtigen. Es stellt sich beispielsweise die Frage, welche Strategien Lehramtsstudierende erlernen können, welche sich sowohl positiv auf das Wohlbefinden im Lehramtsstudiums wie auch auf das Wohlbefinden im späteren Lehrberuf auswirken.

5.6.2 Skizzierung zweier Handlungsfelder für die Lehrerinnen- und Lehrerbildung

Anhand der Ergebnisse der vorliegenden Studie lassen sich zwei Handlungsfelder mit möglichen Impulsen für die Weiterentwicklung der Lehrerinnen- und Lehrerbildung skizzieren.

Handlungsfeld 1: Das Wohlbefinden von (angehenden) Lehrpersonen in der Lehrerinnen- und Lehrerbildung mitdenken

Die Ergebnisse zeigen, dass fast die Hälfte der befragten Schweizer Lehramtsstudierenden ein moderates (43.7%) oder geringes (14.4%) Wohlbefinden im Lehramtsstudium aufweisen. Wird dieses Ergebnis als ein Indikator der Hochschulqualität interpretiert, wird Handlungsbedarf zur Förderung des Wohlbefindens von angehenden Lehrpersonen deutlich. Lehrerinnen- und Lehrerbildungsinstitutionen könnten in einem ersten Schritt der Frage nachgehen, welches Verständnis des Wohlbefindens von Lehramtsstudierenden aus Lehrenden wie auch aus Studierendensicht an ihrer Hochschule vorliegt. Ausgangspunkt weiterführender Überlegungen kann sein, wie das Wohlbefinden von (angehenden) Lehrpersonen in den Curricula verankert ist (vgl. dazu auch den Beitrag von Hascher & Krummenacher in diesem Heft) und wie dieses – mit Blick auf das Lehramtsstudium sowie mit Bezug auf die spätere Tätigkeit als Lehrperson – adressiert wird. Ein Dialog mit den Lehramtsstudierenden bietet sich an – beispielsweise um vertiefende Erkenntnisse zu gewinnen, wie deren Erleben von Freude gesteigert werden könnte und auf welche Aspekte des Studiums die Sorgen zurückzuführen sind. Denn sowohl über alle Wohlbefindensprofile hinweg wie auch innerhalb der fünf Wohlbefindensprofile zeigten sich in der Tendenz geringe bis moderate Werte für das Freudeerleben im Studium sowie moderate bis hohe Werte für ihre Sorgen wegen des Studiums.

Handlungsfeld 2: Für die Förderung des Wohlbefindens von angehenden Lehrpersonen allgemeine sowie themen- und gruppenspezifische Angebote entwickeln

Aus der Identifikation der fünf Wohlbefindensprofile lässt sich schlussfolgern, neben einer Adressierung des Wohlbefindens auf allgemeiner Ebene auch gruppen- und themenspezifische Angebote an den Hochschulen zu konzipieren. In der Lehrerinnen- und Lehrerbildung könnten Schulpraktikumsphasen gezielt genutzt werden, Lehramtsstudierende für das (professionelle) Wohlbefinden zu sensibilisieren und im Sinne eines Resilienzprozesses vorgängig erlernte Strategien zur Stärkung des Wohlbefindens zu erproben und weiterzuentwickeln (vgl. AWaRE-Modell von Hascher, Beltman & Mansfield, 2021). In der Literatur finden sich beispielsweise positive Zusammenhänge des Wohlbefindens von Lehramtsstudierenden mit der Achtsamkeit (Birchinall, Spendlove & Buck, 2019), der

emotionalen Intelligenz (Vesely et al., 2014) oder der sozial-emotionalen Kompetenz (Carstensen & Klusmann, 2021). Auch die Förderung der Well-Being Literacy – definiert als die bewusste Verwendung von Sprache, Wissen und Fähigkeiten für den Erhalt und die Förderung des eigenen Wohlbefindens wie auch des Wohlbefindens anderer (Hou, Chin, Slemp & Oades, 2021; Oades et al., 2021) – ist im Hinblick auf eine ganzheitliche Wohlbefindensförderung aller (hoch)schulischen Akteurinnen und Akteuren ein möglicher Ansatz. Neben der Stärkung individueller Ressourcen sind auch kontextuell wohlbefindenfördernde Strukturen an den Lernorten Hochschule und Schule zu etablieren (Mairitsch et al., 2021; Price & McCallum, 2015). Lehrerinnen- und Lehrerbildungsinstitutionen könnten beispielsweise den Workload der Lehramtsstudierenden reflektieren (Jacobs & Dodd, 2003), wobei eine Differenzierung zwischen objektiven Arbeitsstunden und dem subjektiven Zeiterleben aufschlussreich wäre (Thompson, Creagh, Stacey, Hogan & Mockler, 2023). Auch auf die Unterstützung während Schulpraktikumsphasen durch Dozierende und Praxislehrpersonen könnte ein Fokus gelegt werden (z. B. Fives et al., 2007; Varol, Weiher, Wenzel & Horz, 2023), um beispielsweise Sorgen der Lehramtsstudierenden konstruktiv aufzugreifen. Spezifische Mentoring- und Beratungsangebote könnten eine Möglichkeit sein, Lehramtsstudierende des Risikoprofils 5 mit geringem Wohlbefinden zu erreichen. Auch wenn erst wenig Forschung zum Wohlbefinden von Lehramtsstudierenden vorhanden ist, zeichnen sich bereits zum jetzigen Zeitpunkt Handlungsmöglichkeiten auf verschiedenen Ebenen der Lehrerinnen- und Lehrerbildung ab. Greifen die Institutionen diese auf, setzen sie sich nicht nur für die Bildungsqualität an ihrer Hochschule ein, sondern leisten auch einen bedeutsamen Beitrag für das Wohlbefinden (angehender) Lehrpersonen und deren Verbleib im Lehrberuf.

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6 Well-Being Profiles of Pre-Service Teachers: Links with Resources and Retention-Related Outcomes (Study 3)

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Abstract

Recent work has highlighted well-being as a critical factor in teachers' career development and retention. Using person-centered analyses, we identified six well-being profiles among 2867 Austrian pre-service teachers, including two adaptive, two mixed, and two maladaptive profiles. We also tested several factors (e.g., practicum quality, teacher self-efficacy) that predicted profile membership in distinct ways. Some profiles also differed in levels of initial teacher education quitting intentions and profession quitting intentions. The results call for well-being interventions that are specific to the unique nature of the different profiles.

Keywords: teacher well-being, job demands-resources model, self-efficacy, initial teacher education, latent profile analysis

Teachers play a pivotal role in students' educational success (Hattie, 2009). However, many countries are confronted with teacher shortages (UNESCO Institute for Statistics, 2016). Recent work has highlighted the importance of well-being for teachers' career development and retention (Zhou et al., 2024). While there is a growing body of literature on well-being among practicing teachers (Hascher & Waber, 2021), there is more limited understanding of well-being among pre-service teachers. Enhancing understanding of pre-service teachers holds relevance for supporting well-being among individuals in general—which is a worthy and valid goal (Organization for Economic Cooperation and Development [OECD], 2017). Building knowledge is also important for ensuring that pre-service teachers are best supported to enter the profession from a strong foundation of well-being (Herzog et al., 2021), which is relevant to boosting retention in the profession. This latter point is particularly relevant given that pre-service teachers will enter a demanding workplace with high teacher shortages (OECD, 2024; Viac & Fraser, 2020). As such, further knowledge on pre-service teacher well-being is relevant to efforts aiming to support these individuals as they are embarking on a new career.

In the literature, well-being is widely conceptualized as a multidimensional construct (Alexandrova & Fabian, 2022; Linton et al., 2016), including both positive and negative well-being dimensions (Diener, 1984). Prior research on (pre-service) teacher well-being has mainly applied a variable-centered approach, which generally assumes population homogeneity—that is, variables are assumed to be associated in similar ways across the population. However, emerging work indicates evidence of population heterogeneity, where there are subpopulations of pre-service teachers for whom well-being experiences co-occur in ways that vary from the broader population (Haldimann et al., 2024b). In the current study, we apply a person-centered approach to further unravel well-being experiences among pre-service teachers, and to identify and advance understanding of distinct subpopulations (or profiles). Such research will help to reveal the specific needs of different types of pre-service teachers and thus help researchers to better tailor interventions accordingly. Moreover, understanding how contextual and personal resources predict profile membership is important for complementing prior variable-centered research in this area, and will provide additional information for supporting pre-service teachers to thrive during initial teacher education (ITE) and persist in the teaching profession.

The aim of the present study, therefore, was to investigate the well-being of pre-service teachers taking a person-centered approach. Specifically, we identified well-being profiles based on distinct combinations of positive and negative well-being dimensions. Furthermore, we investigated the extent to which two ITE resources (practicum quality, practicum-university coherence), one personal resource (teacher self-efficacy), and several pre-service teacher

characteristics (gender, age, study program, enrolled study year, part-time job as a teacher, caring responsibilities) predicted profile membership, and also how pre-service teachers in the well-being profiles differed in their reports of ITE quitting intentions and profession quitting intentions. Figure 1 demonstrates the hypothesized model for the current study.

6.1 Pre-Service Teacher Well-Being

In the limited literature on pre-service teacher well-being, different conceptualizations of the construct exist. While most of the prior studies examined the personal well-being of pre-service teachers (e.g., Bjorklund et al., 2021; Corcoran & O'Flaherty, 2022; Daniels et al., 2017; Hagger & Malmberg, 2011), the current study emphasizes a context-specific approach by applying the theory of scholastic well-being to ITE (Hascher, 2007, 2023). The theory of scholastic well-being is rooted in hedonic and eudaimonic well-being traditions from general well-being research, such as the concept of subjective well-being (e.g., Diener, 1984) and the concept of psychological well-being (e.g., Ryff, 1989). It is built on three main premises (Hascher, 2007, 2023). First, to understand scholastic well-being, one needs to consider the specific role and environment that students and teachers encounter within the school context. Second, scholastic well-being is more than "feeling well in school" and, therefore, is captured by a variety of well-being dimensions, covering emotions, cognitions, and physical sensations related to school. Scholastic well-being includes the presence of positive dimensions, such as enjoyment in school, and negative dimensions, such as worries related to school, as research suggests their co-existence (e.g., Bradburn, 1969; Diener, 1984). Scholastic well-being is experienced—and flourishing in school contexts occurs—when positive dimensions are dominant over the negative ones. The greater the dominance of the positive over the negative, the greater the level of scholastic well-being. Third, there is a temporal differentiation between well-being experienced in a specific moment ("state") and longer-term habitual well-being ("trait") experienced over the course of several weeks. In the present study, we considered the longer-term habitual well-being of pre-service teachers.

Based on these premises, Hascher (2007, 2023) developed a six-dimensional model to capture habitual well-being of students. The model emphasizes the co-existence of three positive dimensions and three negative dimensions. The three positive dimensions are (1) *positive attitudes towards school* referring to cognitive evaluations about school and its purpose, (2) *enjoyment in school* related to aspects such as learning processes, and (3) *positive academic self-concept* capturing students' cognitive evaluation about their academic-related abilities. The three negative dimensions are (4) *worries in school* referring to cognitive evaluations about potential negative and school-related events such as exams, (5) *physical*

complaints in school covering negative psychosomatic experiences such as headaches, and (6) *social problems in school* capturing negative social experiences in school such as feeling excluded from peers. The six dimensions have been well supported among school students (e.g., Hascher & Mori, 2024; Obermeier et al., 2021).

Recently, Hascher's (2007, 2023) model was applied to pre-service teachers and the context of ITE (Haldimann et al., 2024a) following a model-determined approach to examine well-being (Collie & Hascher, 2024). This research provided general support for the dimensions among pre-service teachers, but did indicate that a five-dimensional model, excluding the sixth dimension (Social problems in ITE), was most appropriate given some differences in how this population interprets the items (for details, see Haldimann et al., 2024a). This prior work revealed the five dimensions to be associated with a range of predictors and outcomes, as we describe next.

6.1.1 Potential Well-Being Profiles Among Pre-Service Teachers

Variable-centered research (e.g., such as correlations or path analysis) is valuable for understanding how variables are connected. Another way of considering these variables and their interplay is via person-centered research (e.g., latent profile analysis). Person-centered research acknowledges the potential presence of multiple subpopulations reflecting different well-being profiles within the sample (Morin et al., 2017). For instance, some pre-service teachers have been found to display high positive well-being dimensions and low negative well-being dimensions (in accordance with sample-wide correlations), whereas others have simultaneously displayed high values on both positive and negative well-being dimensions (in contrast with sample-wide correlations; Haldimann et al., 2024b). This approach thus reveals complementary information to variable-centered approaches and is particularly relevant for efforts aiming to design interventions targeted to the precise needs of pre-service teachers within different well-being profiles.

6.1.1.1 Conceptual Support for Well-Being Profiles

We propose that there are conceptual and empirical grounds to expect a range of distinct well-being profiles based on the five well-being dimensions (for an overview, see Table 1). More precisely and based on the premise of scholastic well-being (Hascher, 2007, 2023), we initially hypothesized that there would be three types of pre-service teacher well-being profiles: Adaptive well-being profiles characterized by a dominance of positive dimensions over negative ones, maladaptive well-being profiles characterized by a dominance of negative dimensions over positive ones, and mixed well-being profiles with a more balanced presence

of positive and negative dimensions (e.g., equivalent values on both positive and negative dimensions).

To further nuance our hypotheses about potential well-being profiles and elaborate on the idea of (mal)adaptive well-being profiles, we refer to the quadripolar model of need achievement theory (Covington & Müeller, 2001). The model establishes that two main motives drive individuals to promote and protect their self-worth in the context of achievement such as in ITE: Success orientation and failure avoidance (Covington & Omelich, 1985). Success orientation relates to promoting one's sense of self-worth by investing in proactive and adaptive efforts to succeed (Covington & Müeller, 2001). In contrast, failure avoidance relates to protecting one's self-worth by avoiding poor performance. Covington and Müeller (2001) proposed that success orientation and failure avoidance are two independent motives that drive individuals to various extents and, therefore, lead to four main typologies. Individuals belonging to the first typology, *success-approach,* display a high success orientation and low failure avoidance (Covington & Müeller, 2001). They are regarded as the most adaptive type as they constructively appraise success and failure (Parker & Martin, 2011). The second typology is the *failure-fearer* who displays low success orientation and high failure avoidance (Covington & Müeller, 2001). They are often characterized by maladaptive behavior, low levels of academic self-concept, and high doubts (Martin & Marsh, 2003; Parker & Martin, 2011). The third typology is the *failure-acceptor*, who displays low success orientation and low failure avoidance (Covington & Müeller, 2001). They are regarded as disengaged from fear and success (Martin & Marsh, 2003) and often exhibit low levels of adaptive and maladaptive cognition and behavior (Parker & Martin, 2011). Finally, the *overstriver* displays high success orientation and high failure avoidance (Covington & Müeller, 2001). Despite their orientation to success, the underlying motivation of this type is to evade failure. As they feel that a potential failure may expose their inadequacy and threaten their self-worth, they typically experience anxiety and doubts (Parker & Martin, 2011).

Even though the quadripolar model of need achievement theory (Covington & Müeller, 2001) and the two underlying motives of success orientation and failure avoidance were initially developed to explain motivation, they also provide an understanding of well-being (Parker & Martin, 2011) and, therefore, inform what potential well-being profiles we might expect among pre-service teachers. Linking back to the current study, the motive of high success orientation implies positive cognitions towards achievement situations, ascribing high relevance and meaning to education, optimism, a high academic self-concept, and adaptive and proactive task-orientation (Covington & Omelich, 1985; Parker & Martin, 2011). In the current study, then,

success orientation is likely manifested in high values on the three positive well-being dimensions of positive attitudes towards ITE, enjoyment of ITE, and a positive academic self-concept regarding ITE. In contrast, failure avoidance is likely manifested in high values on the two negative well-being dimensions (Fives et al., 2007; Parker & Martin, 2011): worries about ITE and physical complaints related to ITE. More precisely, worries about ITE are often driven by failure avoidance, and physical complaints are often psychosomatic manifestations of fear of failure (e.g., Scherer, 1984; Scherer & Moors, 2019). Together then, it is understandable that high levels of the two negative dimensions are relevant to failure avoidance.

In sum, pre-service teachers differ in the extent they are driven by the motives of success orientation and failure avoidance. We propose that this is reflected in their values on positive and negative well-being dimensions, which in turn are helpful in identifying teacher well-being profiles. Moreover, the four main typologies established in the quadripolar model align with the three overarching types of hypothesized profiles we proposed earlier based on the scholastic well-being model (Hascher, 2007, 2023): Adaptive, maladaptive, and mixed well-being profiles. More precisely, pre-service teachers in adaptive well-being profiles are expected to score high on positive well-being dimensions and low on negative well-being dimensions, reflecting a *success-approach* profile. In contrast, pre-service teachers in maladaptive profiles are anticipated to score low on positive well-being dimensions and high on negative well-being dimensions, reflecting a *failure-fearer* profile. Turning to the mixed profiles, the quadripolar model indicates two distinct mixed well-being profiles. Specifically, pre-service teachers in the first mixed profile are expected to score low on both positive and negative well-being dimensions (e.g., low enjoyment of ITE and low worries about ITE), reflecting a *failure-acceptor* profile. In contrast, pre-service teachers in the second mixed profile are anticipated to score high on both positive and negative dimensions (e.g., high enjoyment of ITE and high worries about ITE), reflecting an *overstriver* profile. Taken together then, we broadly hypothesized these four profiles. At the same time, we also recognize that there may also be other potential profiles given that individuals can hold values between the two extremes of high and low (Covington & Müeller, 2001).

6.1.1.2 Prior Research on Well-Being Profiles

Research is beginning to apply person-centered approaches to examine well-being of (pre-service) teachers (e.g., Laitinen, 2022; Lee et al., 2024) and related areas such as burnout (Pyhältö et al., 2021), stress (Collie & Mansfield, 2022) or coping strategies (Aulén et al., 2021) supporting our assumption of sample heterogeneity. To our knowledge, there is only one study that has examined well-being profiles among pre-service teachers using the same five well-

being dimensions from Hascher (2007, 2023). Using data of 989 Swiss pre-service teachers, Haldimann and colleagues (2024b) identified five well-being profiles that generally align with our hypothesized profile solution (for an overview, see Table 1).

6.1.1.3 Summary

Taken together, we conceptualized pre-service teacher well-being as a context-specific and multidimensional construct (Haldimann et al., 2024a). To take account of the multidimensionality, a better understanding of the interplay of positive and negative well-being dimensions within subpopulations of pre-service teachers is needed. Based on rationales grounded in scholastic well-being (Hascher, 2007, 2023) and the quadripolar model of need achievement theory (e.g., Covington & Müeller, 2001), and evidence from previous research (Haldimann et al., 2024b), we broadly hypothesized that there would be evidence of at least one adaptive well-being profile, one maladaptive well-being profile, and two distinct types of mixed well-being profiles.

6.2 Predictors and Outcomes of Profile Membership: Job Demands-Resources Theory

Although the main aim of the present study was to identify well-being profiles among pre-service teachers, we were also interested in how ITE resources, personal resources, and pre-service teacher characteristics predict profile membership and, in turn, how profile membership is related to retention-related outcomes. As a guiding conceptual framework we refer to job demands-resources (JD-R) theory (Bakker & Demerouti, 2017). JD-R theory was introduced to the scientific literature more than twenty years ago and has since been extensively investigated (Bakker et al., 2023). JD-R theory proposes two types of resources that promote employee well-being and, in turn, occupational outcomes such as quitting intentions (Bakker et al., 2023). *Job resources* are facets of work that hold a motivational character and support employees in attaining their work goals (e.g., social support from colleagues). *Personal resources* of employees, such as self-efficacy, are also considered important for employee well-being (Xanthopoulou et al., 2007). So far, JD-R theory has been widely used to examine the work experiences of teachers (e.g., Dicke et al., 2018; Granziera et al., 2022). JD-R theory was designed for employees in the first place, but variations like the Academic Demands-Resources model (Martin & Collie, 2022) and the Study Demands-Resources model (Lesener et al., 2020; Salmela-Aro et al., 2022) have expanded the theory to educational contexts. For example,

Table 1

Conceptual and Empirical Support for Potential Well-Being Profiles Among Pre-Service Teachers

Types of well-being profiles	Values on well-being dimensions	Conceptual support	Empirical support
		Quadripolar model of need achievement theory (Covington & Müeller, 2001)	Pre-service teacher well-being profiles (Haldimann et al., 2024b)
Adaptive well-being profiles	Above-average to high values on positive dimensions and below-average to low values on negative dimensions	Success-approach (high success orientation and low failure avoidance)	Flourisher, Vulnerable Flourisher
Maladaptive well-being profiles	Below-average to low values on positive dimensions and above-average to high values on negative dimensions	Failure-fearer (low success orientation and high failure avoidance)	Vulnerable Worrier
Mixed well-being profiles	Below-average to low values on positive dimensions and below-average to low values on negative dimensions	Failure-accepter (low success orientation and failure avoidance)	Confident Distant
	Above-average to high values on positive dimensions and above-average to high values on negative dimensions	Overstriver (high success orientation and high failure avoidance)	Empowered Worrier

previous variable-centered research demonstrates the important role of contextual and personal resources for pre-service teacher well-being (e.g., Dreer, 2021; Lin & Datu, 2023; Zimmermann et al., 2018). The current study extends that work to examine pre-service teachers' contextual and personal resources as predictors of membership in well-being profiles and how different well-being profiles differ regarding retention-related outcomes. We now introduce the predictors and outcomes in turn. Information on important pre-service teacher characteristics to consider are presented in the Supplementary Materials (Appendix D).

6.2.1 Contextual and Personal Resources for Pre-Service Teacher Well-Being

The current study focuses on the role of two contextual resources and one personal resource in relation to pre-service teacher well-being profiles. Starting with the two contextual resources, we investigate ITE resources related to teaching practicums: the practicum quality and the practicum-university coherence. Teaching practicums are important learning opportunities for pre-service teachers during ITE (e.g., Darling-Hammond, 2014; Zeichner, 2012). Pre-service teachers gain insight into the real classroom environment, acquire their first teaching experiences, and familiarize themselves with their future teacher responsibilities (Cohen et al., 2013; Hascher et al., 2004). As the first ITE resource, we focus on the practicum quality, referring to how pre-service teachers perceive their learning gains during teaching practicums in ITE such as content knowledge and didactic skills. As the second ITE resource, we focus on the extent to which pre-service teachers perceive that their ITE institutions succeed in aligning university courses and teaching practicums (e.g., adequately preparing for teaching practicums in university courses or addressing challenges that arose in school practice in university courses) (Darling-Hammond, 2014; Zeichner, 2010). We also examined one personal resource for pre-service teachers, specifically their teacher self-efficacy. Self-efficacy is described as the foundation of human agency and refers to an individual's belief in their ability to produce desired outcomes by their actions (Bandura, 1999). It is discussed as an important personal resource for teachers (e.g., Granziera, 2022; Tschannen-Moran & Woolfolk Hoy, 2001; Zee & Koomen, 2016), also at the beginning of the teaching career (Klassen & Chiu, 2011). We focus on three self-efficacy domains that align with practices in models of effective teaching (e.g., Hamre et al., 2013): self-efficacy for emotional support (e.g., responsivity to students' needs), classroom organization (e.g., prevention of behavioral issues), and instructional support (e.g., diversity of instructional methods). These three domains were examined under one overarching factor of teacher self-efficacy.

To date, there is limited empirical evidence on how contextual and personal resources predict pre-service teacher well-being and even less on how resources predict membership in

well-being profiles. Regarding ITE resources, prior research has focused primarily on pre-service teacher well-being during one single teaching practicum (e.g., Dreer, 2021). A qualitative study indicated that pre-service teacher well-being might be challenged by a perceived disbalance between theory and practice during ITE (Sulis et al., 2023). Regarding personal resources, prior variable-centered research among pre-service teachers has linked teacher self-efficacy with constructs such as life satisfaction (Bjorklund et al., 2021), stress and anxiety (Vesely et al., 2014), and burnout (Fives et al., 2007).

Taken together, prior research provides some evidence that ITE resources and teacher self-efficacy are salient for pre-service teacher well-being. However, limited research has conducted person-centered analyses, highlighting the need for more work in this area to understand what predictors are salient for predicting membership in different well-being profiles. According to JD-R theory (Bakker & Demerouti, 2017), resources are linked with pre-service teacher well-being as they enhance positive well-being experiences. Therefore, we anticipate that pre-service teachers who perceive higher practicum quality, university-practicum coherence, and teacher self-efficacy are more likely to be in adaptive well-being profiles rather than mixed or maladaptive profiles.

6.2.2 Retention-Related Outcomes: Differences by Profile Membership

In the current study, we examined how two retention-related outcomes differed by profile membership: ITE quitting intentions and profession quitting intentions. Based on the theory of planned behavior and its premise that behavior intentions predict actual behavior (Ajzen et al., 2009), quitting intentions are regarded as a reliable indicator for retention. Prior research has demonstrated that teacher well-being is associated with lower profession quitting intentions (e.g., Madigan & Kim, 2021; Skaalvik & Skaalvik, 2018). However, research focusing on whether pre-service teacher well-being predicts quitting intentions is limited. This is important for understanding what subpopulations of pre-service teachers may require additional support to remain within the profession. For pre-service teachers, there are two main time points to leave the teaching profession. First, pre-service teachers may intend to leave the profession during their ITE program. The development of ITE quitting intentions is described as a complex decision-making process influenced by a variety of factors (Roberts, 2012). So far, factors such as stress, self-efficacy, and social integration have been identified (e.g., Bohndick, 2020; Klassen & Chiu, 2011; Roberts, 2012). Second, some pre-service teachers may intend to complete ITE and then leave the teaching profession (e.g., Struyven & Vanthournout, 2014; Trent, 2019). How pre-service teacher well-being relates to profession quitting intentions at this point is an open empirical question. However, based on our conceptual frameworks (Bakker &

Demerouti, 2017; Covington & Müeller, 2001), we hypothesized that pre-service teachers belonging to adaptive well-being profiles would display the lowest levels of both types of quitting intentions given that well-being and success approach motives lead to adaptive outcomes.

6.3 Aims of the Study

The aim of the current study was to extend knowledge of pre-service teacher well-being by taking a multidimensional, context-specific, and person-centered approach. Our objectives were twofold: In the first step, we aimed to understand how positive and negative well-being dimensions may co-occur within individuals by identifying well-being profiles among pre-service teachers. In the second step, we were interested in predictors and outcomes of these potential profiles. Specifically, we aimed to investigate the extent to which these profiles were predicted by two ITE resources related to teaching practicums, one personal resource, and six pre-service teacher characteristics, and how these profiles differed in the reports of their ITE quitting intentions and profession quitting intentions. The hypothesized model is displayed in Figure 1. Based on prior research presented in the literature review, the following hypotheses and research questions were developed to guide our study.

H1: We hypothesized the identification of at least three types of well-being profiles among pre-service teachers: one adaptive well-being profile with high values on the positive dimensions and low values on the negative dimensions, one maladaptive well-being profile with low values on the positive dimensions and high values on the negative dimensions, and at least one mixed well-being profile with more balanced levels of the positive and negative well-being dimensions.

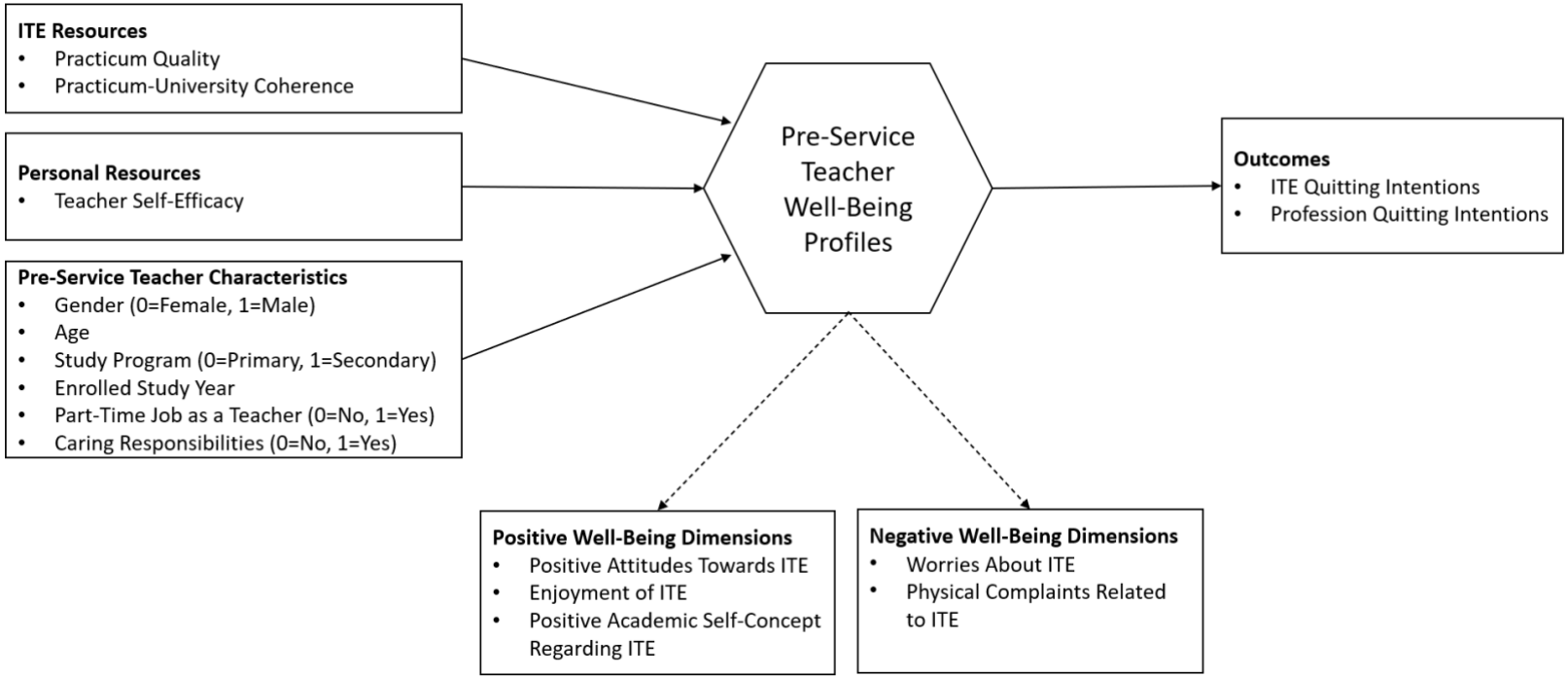
H2: We expected that perceptions of higher resources would be associated with membership in more adaptive well-being profiles.

H3: We anticipated that membership in more adaptive well-being profiles would be linked with lower levels of both types of quitting intentions.

RQ1: To what extent are the six pre-service teacher characteristics (gender, age, study program, enrolled study year, part-time job as a teacher, and caring responsibilities) linked with profile membership?

Figure 1

Hypothesized Model



Note. Dashed lines lead to the indicator variables that were used to identify profiles.

6.4 Methods

6.4.1 Sample and Procedure

ITE in Austria is integrated into the tertiary education system. Aspiring primary and secondary (general) school teachers both pursue sequential bachelor's and master's degrees. The bachelor's program spans four years for both tracks, while the master's program duration differs: at least one year for primary school and two years for secondary school. ITE curricula incorporate mandatory practical components in the form of teaching practicums, providing classroom experience (Federal Ministry of Education, Science and Research [BMBWF], 2024). Upon completing ITE, the beginning teachers are expected to undergo a one-year induction phase. During this period, graduates are paired with experienced mentors who guide them as they transition into their professional roles (Prenzel et al., 2021).

The current study involved 2867 pre-service teachers from universities across Austria, of whom 51.7% were training to be primary school teachers and 48.3% to be secondary school teachers. Pre-service teachers identified as female (81.0%), male (18.5%), or gender-diverse (0.5%). The average age was 24.69 years (*SD* = 5.36 years). Pre-service teachers were enrolled in ITE for their 1st year (14.5%), 2nd year (17.8%), 3rd year (19.2%), 4th year (22.5%), 5th year (14.7%), 6th year (7.2%), or 7th year and higher (4.2%). They were either studying for a Bachelor's degree (80.1%) or a Master's degree (19.9%). All participants had completed at least one teaching practicum (*M* = 4.51; *SD* = 2.63), and 17.1% stated they also worked part-time as teachers during their studies. Of all pre-service teachers, 15.4% responded of having caring responsibilities (e.g., for children). The coding for pre-service teacher characteristics is described below in Measures.

Data result from the evaluation project "Evaluation and further development of teacher education NEW in Austria" (Flick-Holtsch et al., 2023). The project included an online survey, which pre-service teachers completed voluntarily and anonymously from May to July 2021. At this time, most lectures were online due to the COVID-19 pandemic. Via contact persons at all Austrian universities responsible for ITE, we sent emails to lecturers and pre-service teachers emphasizing the importance of participation. These emails also contained the access link for the online survey for forwarding to students. A consent form was obtained from all pre-service teachers at the beginning of the online survey. In total, 39.3% of the pre-service teachers included in our sample stated that they completed the online survey during a lecture.

6.4.2 Measures

Except for the subscales measuring pre-service teacher well-being, we slightly adapted established scales for the evaluation context and ITE (e.g., linguistic adjustments, adaptation of the response format; see Supplementary Materials in Appendix D for adapted items in German). All items were rated on a six-point Likert scale ranging from 1 = *not true at all* to 6 = *totally true*.

6.4.2.1 Pre-Service Teacher Well-Being

We measured the five well-being dimensions using the pre-service teacher well-being questionnaire (Haldimann et al., 2024a). The following five factors of pre-service teacher well-being were measured: (1) Positive attitudes towards ITE (4 items, e.g., "My studies make sense to me"), (2) Enjoyment of ITE (3 items, e.g., "In the last few weeks, I have experienced enjoyment in my studies because I could show what I can or what I had learned"), (3) Positive academic self-concept regarding ITE (2 items, e.g., "I can easily solve challenges in my studies"), (4) Worries about ITE (3 items; e.g., "In the last few weeks, I have been worried about exams and certificates of achievement in my studies"), and (5) Physical complaints related to ITE (4 items; e.g., "In the last few weeks, because of my studies I could not sleep well"). All subscales showed adequate reliabilities (ω = .76-.90).

6.4.2.2 Initial Teacher Education Resources

We measured two ITE resources related to teaching practicums. The construct "Practicum quality" was measured using five items (Flagmeyer & Hoppe-Graff, 2006, in Kauper et al., 2009; e.g., "When I think about my teaching practicums, I have learned a lot about working with students"). The construct "Practicum-university coherence" was measured using seven items (Klemenz et al., 2014; e.g., "The university courses prepared me well for school practice"). Reliability was adequate for the practicum quality (ω = .81) and the practicum-university coherence (ω = .94).

6.4.2.3 Personal Resources

Teacher self-efficacy was measured with three subscales: Emotional support (Baumert et al., 2009; 4 items, e.g., "I can build trust with my students"), classroom organization (translated items from Tschannen-Moran & Woolfolk Hoy, 2001, adapted from Kunter et al., 2017; 3 items; e.g., "I can react appropriately to challenging students"), and instructional support (Gröschner & Schmitt, 2009, 3 items, e.g., "I can teach students learning strategies"). Given relatively strong intercorrelations, we calculated an overarching self-efficacy factor to avoid multicollinearity. The reliability was adequate (ω = .84).

6.4.2.4 Retention-Related Outcomes

Pre-service teachers' ITE quitting intentions were measured using three items (Kunter et al., 2017; e.g., “I am planning to quit ITE”). The reliability was adequate (ω = .82). Profession quitting intentions were measured using a single item (“I am not planning to work as a teacher”).

6.4.2.5 Pre-Service Teacher Characteristics

Pre-service teacher characteristics included gender, age, study program, enrolled study year, part-time work as a teacher, and caring responsibilities. Gender was scored 0 (female) and 1 (male). Study program was scored 0 (primary school) and 1 (secondary school). Age and the enrolled study year were continuous variables measured in years. Working part-time as a teacher and holding caring responsibilities were both scored 0 (no) and 1 (yes).

6.4.3 Data Analysis

Analyses involved confirmatory factor analysis (CFA) and latent profile analysis (LPA) conducted with M*plus* 8.11 (Muthén & Muthén, 1998-2017) using the maximum likelihood robust to non-normality (MLR) estimator. A total of 4684 participants opened the online questionnaire link. Participants who had not indicated that they completed at least one teaching practicum were excluded (n = 1686) because we wanted to ensure that the participants had some experience in the classroom to inform their responses. In a second step, participants who had no responses on any of the well-being items were excluded (n = 131). Excluded cases were not associated with pre-service teacher characteristics. This left the final sample of 2867. Unless otherwise indicated, remaining missing data (<3%) were handled using full information maximum likelihood estimation procedures (Enders, 2010).

6.4.3.1 Preliminary Analyses

First, descriptive statistics (means, standard deviations, skewness, and kurtosis) were calculated. Second, CFAs were run separately for (a) pre-service teacher well-being (including the five well-being dimensions), (b) predictors, and (c) the one retention-related outcome that was measured via multiple items (ITE quitting intentions). Reliability estimates (McDonald’s omega) were calculated, and factor scores were retrieved. Manifest scores of the pre-service teacher characteristics and the single item measuring the profession quitting intentions were also saved. Latent correlations were retrieved from a simultaneous CFA. Pre-service teacher characteristics and the single item to measure the profession quitting intentions were entered with loading set to 1 and residual set to 0.

6.4.3.2 Latent Profile Analysis

We conducted a latent profile analysis applying similar procedures as prior studies investigating teacher well-being (e.g., Granziera et al., 2022). We used the factor scores of the five well-being dimensions as profile indicator variables. Solutions with up to eight profiles were tested using 15 000 random sets of start values, 1000 iterations, and 500 final stage optimizations. Means and variances were freely estimated across profiles to credit the complexity of individual experiences (Morin et al., 2011). We ensured that the best log-likelihood value was replicated for each model to avoid converging on a local solution. To determine the optimal solution, we combined fit indices and meaningful interpretation (Nylund-Gibson & Choi, 2018). The following fit indices were used, whereby smaller values reflect a better model fit: the Akaike Information Criteria (AIC), the Consistent AIC (CAIC), the Bayesian Information Criteria (BIC), and the sample-size-adjusted BIC (SSA-BIC). We used elbow plots to visualize the drop in those fit indices, wherein the model solution is preferred before the slope visibly flattens (Morin et al., 2016). We also present the *p*-value of the Lo-Mendell-Rubin Likelihood Ratio Test (*p*LMR). A significant *p*-value indicates that the model with *k* profiles does not provide a significantly better fit than the model with $k - 1$ profiles. Entropy values were also consulted.

After identifying the optimal profile solution, we applied the manual BCH three-step approach (Vermunt, 2010) to examine predictors and retention-related outcomes of profile membership. The BCH three-step approach is particularly suitable for preventing shifting in the profile solution, and when the variance of distal outcomes varies considerably across profiles (Asparouhov & Muthén, 2021). We examined predictors of profile membership using a multinomial logistic regression (Vermunt, 2010). Missing data of the predictor variables was handled using multiple imputation. We reordered the profiles using the SVALUES option to obtain alternative reference groups prior to data imputation. Unstandardized beta coefficients, standard errors, and odds ratios (OR) are reported for this analysis. Subsequently, we examined the retention-related outcomes using the M*plus* MODEL CONSTRAINT option, which is based on the delta method for tests of significant differences (McLarnon & O'Neill, 2018; Raykov & Marcoulides, 2004).

6.5 Results

6.5.1 Preliminary Analyses

Means, standard deviations, skewness, kurtosis, reliability estimates, and factor loadings (mean and range) are presented in Table 2. Latent correlations among all constructs are

presented in Table 3. Skewness and kurtosis values suggest a deviation from normality in the distribution of the data. We used an estimator that was robust in the face of non-normal data.

6.5.2 Latent Profile Analysis

6.5.2.1 Profile Enumeration

First, we consulted the fit statistics and entropy values for the tested profile solutions displayed in Table 4. The information criteria AIC, CAIC, BIC, and SSA-BIC decreased when adding profiles to the model. This is also visible in the elbow plot (Figure 2), whereby the slopes start to flatten slightly after four profiles but continue to decrease. The *p*LMR remains significant for all tested profile solutions. The entropy values are above .80 and indicate a good profile separation of all tested profile solutions (Asparouhov & Muthén, 2014). Second, we looked closer at the parsimony and conceptual relevance of the tested profile solutions. Solutions with up to six profiles consisted of qualitatively distinguishable and meaningful profiles ("shapes") and, therefore, added theoretical value (Morin et al., 2017). In contrast, the seven-profile solution did not add a profile with a new shape and duplicated an already existing one. Taking those findings together, we opted for a six-profile solution.

6.5.2.2 Profile Interpretation

Table 5 displays the descriptives, profile sizes, and hypothesized profile names of the six pre-service teacher well-being profiles. Figure 3 shows the identified profiles in the form of bar charts. We identified two adaptive, two mixed, and two maladaptive well-being profiles. Profile 1 (5.9% of the sample) is characterized by high values on the positive well-being dimensions and low values on the negative ones; hence, qualitatively representing an adaptive well-being profile. This profile was named *success-approach* as it is characterized by high success orientation and low failure avoidance. Pre-service teachers corresponding to profile 2 (9.5%) displayed high positive attitudes towards ITE, high enjoyment of ITE, and above-average positive academic self-concept related to ITE, below-average worries about ITE, and average physical complaints related to ITE. This profile was named *cautious-striver* as it is characterized by an overall high success orientation like profile 1; however, it is paired with

Table 2

Descriptive, Reliability, and CFA Statistics for All Constructs

	Scale range	Mean	*SD*	Skewness	Kurtosis	ω	Loading mean (range)
Pre-service teacher well-being							
Positive attitudes towards ITE	1–6	4.60	1.02	-0.94	0.58	.90	0.83 (0.78-0.92)
Enjoyment of ITE	1–6	3.63	1.02	-0.32	-0.61	.78	0.73 (0.62-0.87)
Positive academic self-concept regarding ITE	1–6	4.88	0.73	-0.90	1.17	.76	0.78 (0.72-0.84)
Worries about ITE	1–6	3.56	1.18	0.14	-1.03	.77	0.72 (0.60-0.88)
Physical complaints related to ITE	1–6	2.29	1.14	0.81	-0.23	.83	0.74 (0.68-0.81)
ITE resources							
Practicum quality	1–6	4.96	0.74	-1.75	3.27	.81	0.66 (0.41-0.91)
Practicum-university coherence	1–6	3.36	1.10	-0.06	-0.54	.94	0.84 (0.76-0.90)
Personal resource							
Teacher self-efficacy	1–6	4.66	0.60	-0.92	1.32	.84	0.80 (0.71-0.87)
Retention-related outcomes							
ITE quitting intentions	1–6	1.28	0.59	3.90	17.44	.82	0.77 (0.61-0.92)
Profession quitting intentions	1–6	1.47	1.04	2.57	6.36	–	–

Note. $N = 2867$; Scale range: All items were rated on a six-point Likert scale ranging from 1 = *not true at all* to 6 = *totally true*; *SD* = standard deviation; ω = McDonald's omega; the dash indicates that it is a single-item indicator.

Table 3

Latent Standardized Correlations Among All Constructs

		1	2	3	4	5	6	7	8	9
Pre-service teacher well-being										
1	Positive attitudes towards ITE	–								
2	Enjoyment of ITE	0.64	–							
3	Positive academic self-concept regarding ITE	0.57	0.40	–						
4	Worries about ITE	-0.36	-0.24	-0.54	–					
5	Physical complaints related to ITE	-0.34	-0.19	-0.48	0.73	–				
ITE resources										
6	Practicum quality	0.26	0.22	0.23	-0.14	-0.15	–			
7	Practicum-university coherence	0.47	0.51	0.26	-0.16	-0.18	0.26	–		
Personal resource										
8	Teacher self-efficacy	0.22	0.25	0.41	-0.23	-0.16	0.36	0.22	–	
Retention-related outcomes										
9	ITE quitting intentions	-0.39	-0.22	-0.40	0.31	0.29	-0.25	-0.13	-0.27	–
10	Profession quitting intentions	-0.25	-0.13	-0.17	0.15	0.12	-0.19	-0.07[a]	-0.21	0.53

Note. All results $p < .001$ (2-sided) unless otherwise indicated; [a] $p < .01$ (2-sided).

Table 4

Fit Statistics and Entropy for Latent Profile Analysis Solutions

	Log-likelihood	Free parameters	AIC	CAIC	BIC	SSA-BIC	*p*LMR	Entropy
1 profile	-21145.59	10	42311.19	42380.80	42370.80	42339.02	–	–
2 profiles	-18582.64	21	37207.28	37353.47	37332.47	37265.74	<.001	0.84
3 profiles	-17376.41	32	34816.82	35039.57	35007.57	34905.90	<.001	0.86
4 profiles	-16743.36	43	33572.73	33872.05	33829.05	33692.43	<.001	0.88
5 profiles	-16257.34	54	32622.68	32998.58	32944.58	32773.00	0.02	0.86
6 profiles	-15878.94	65	31887.88	32340.34	32275.34	32068.81	0.01	0.87
7 profiles	-15550.17	76	31252.33	31781.37	31705.37	31463.89	<.001	0.88
8 profiles	-15239.11	87	30652.21	31257.82	31170.82	30894.39	<.001	0.86

Note. AIC = Akaike Information Criteria; CAIC = Consistent Akaike Information Criteria; BIC = Bayesian Information Criteria; SSA-BIC = sample-size-adjusted Bayesian Information Criteria; *p*LMR = *p*-value of the Lo-Mendell-Rubin Likelihood Ratio Test.

Figure 2

Elbow Plot based on the AIC, CAIC, BIC, and SSA-BIC for One to Eight Profile Solutions

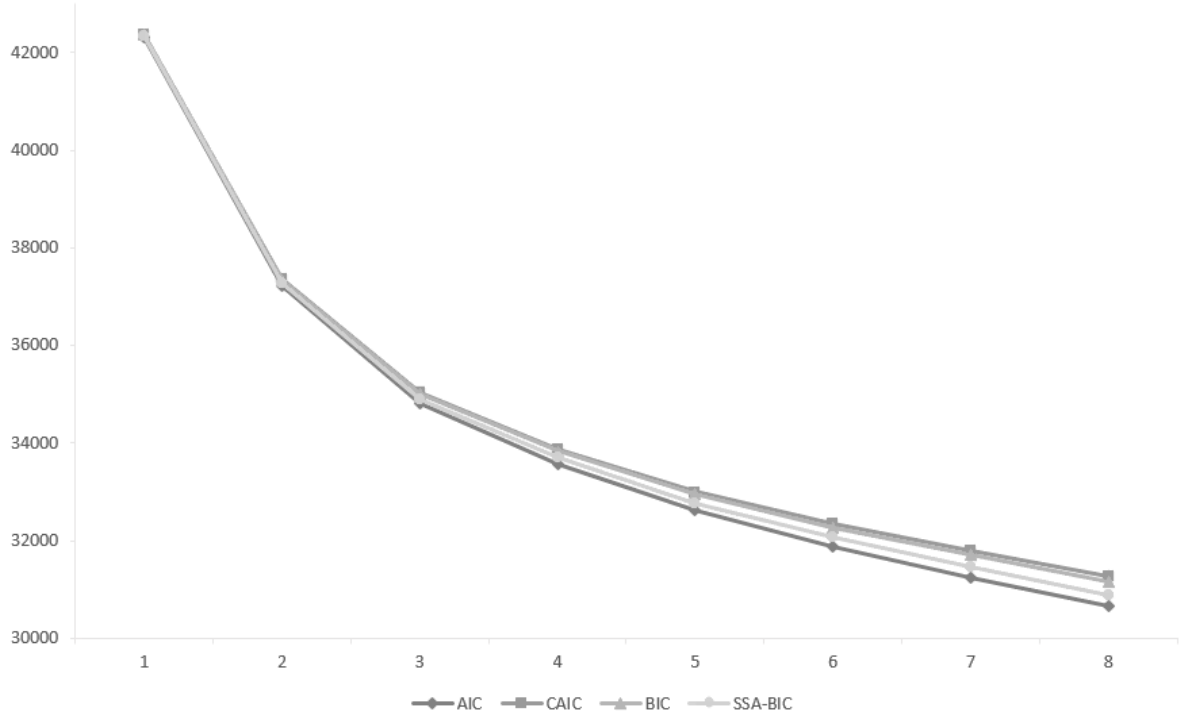


Table 5

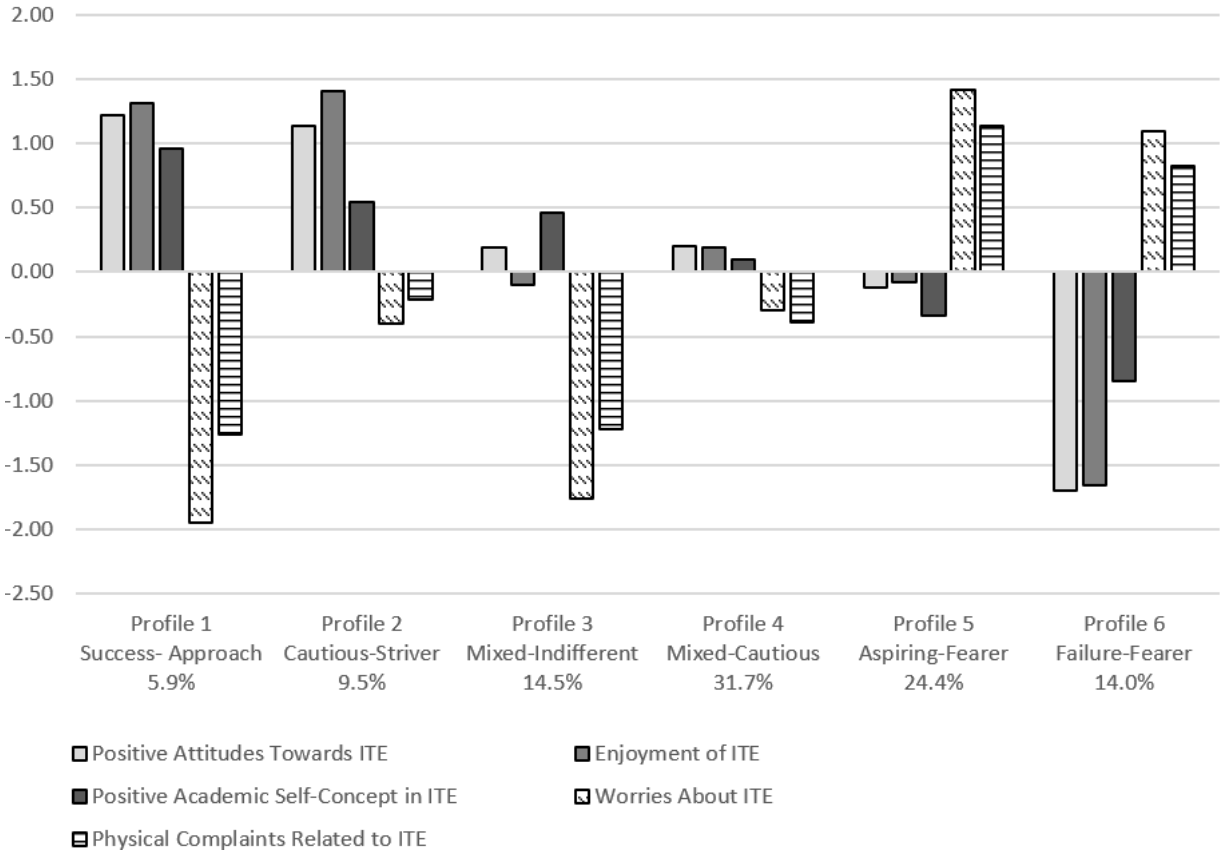
Descriptives, Profile Sizes, and Hypothesized Profile Names of the Six Pre-Service Teacher Well-Being Profiles

Profile	Hypothesized profile name	Profile indicator variables					Profile size (relative size)
		Positive attitudes towards ITE	Enjoyment of ITE	Positive academic self-concept in ITE	Worries about ITE	Physical complaints related to ITE	
1	Success-approach	1.22	1.31	0.96	-1.95	-1.26	168 (5.9%)
2	Cautious-striver	1.14	1.41	0.55	-0.41	-0.21	272 (9.5%)
3	Mixed-indifferent	0.19	-0.10	0.46	-1.76	-1.22	417 (14.5%)
4	Mixed-cautious	0.21	0.19	0.10	-0.30	-0.39	909 (31.7%)
5	Aspiring-fearer	-0.12	-0.08	-0.34	1.42	1.14	699 (24.4%)
6	Failure-fearer	-1.70	-1.66	-0.85	1.10	0.83	402 (14.0%)

Note. Profile indicator variables were standardized ($M = 0$; $SD = 1$) to aid interpretation.

Figure 3

Graphical Representation of the Six-Profile Solution



some levels of failure avoidance suggesting a certain cautiousness. Moving on, we identified two mixed well-being profiles. Pre-service teachers corresponding to profile 3 (14.5%) displayed average positive attitudes towards ITE, average enjoyment of ITE, and above-average positive academic self-concept in ITE, but also low worries about ITE and low physical complaints related to ITE. With an average success orientation and low failure avoidance, this profile is approaching the failure acceptor typology, suggesting a certain level of detachment or indifference regarding ITE. Hence, this profile was named *mixed-indifferent.* Pre-service teachers corresponding to profile 4 (31.7%) displayed average positive attitudes towards ITE, average enjoyment of ITE, an average positive academic self-concept in ITE, below-average values on worries about ITE, and below-average physical complaints related to ITE. This profile was named *mixed-cautious* as the motive of success orientation was almost averagely present; however, combined with also some levels of failure avoidance similarly pronounced as in the cautious-striver profile. Last, we identified two maladaptive well-being profiles. Pre-service teachers corresponding to profile 5 (24.4%) displayed average positive attitudes towards

ITE, average enjoyment of ITE, a below-average positive academic self-concept in ITE, high worries in ITE, and high physical complaints related to ITE. This profile was named *aspiring-fearer* as pre-service teachers displayed average success orientation and high failure avoidance. Pre-service teachers corresponding to profile 6 (14.0%) displayed low values on the three positive well-being dimensions and high values on the two negative ones. We named this profile *failure-fearer* as it is characterized by low success orientation and high failure avoidance.

6.5.2.3 Predictors of Profile Membership

After we identified the six-profile solution, we were interested in how ITE resources, personal resources, and pre-service teacher characteristics predict profile membership. The results of the multivariate logistic regression of all possible profile comparisons (using one latent profile as a reference group) are reported in Table 6. The results regarding pre-service teacher characteristics are presented in the Supplementary Materials (Appendix D).

Both examined ITE resources predicted profile membership. Pre-service teachers who perceived greater practicum quality were, for 8 out of 15 profile comparisons, more likely to belong to a more adaptive well-being profile than a less adaptive one (OR: 1.61-2.02). Pre-service teachers who perceived greater practicum-university coherence were, for 12 out of 15 profile comparisons, more likely to belong to a more adaptive well-being profile than a less adaptive one (OR: 1.16-4.74). For one additional profile comparison, the pattern was inverse. Pre-service teachers who perceived greater practicum-university coherence were less likely to belong to Profile 3 mixed-indifferent than to Profile 4 mixed-cautious (OR: 0.75).

Regarding personal resources, teacher self-efficacy proved to be a significant predictor of profile membership. Following the main pattern as for ITE resources, pre-service teachers who indicated greater teacher self-efficacy were, for 13 out of 15 profile comparisons, more likely to belong to a more adaptive well-being profile than a less adaptive one (OR: 1.53-6.72).

6.5.2.4 Outcomes of Profile Membership

Examining the outcomes of profile membership, some profiles differed regarding the reports of ITE quitting intentions and profession quitting intentions with lower levels displayed in more adaptive well-being profiles. (Table 7). Starting with the ITE quitting intentions, profile 1 success-approach (M = -0.26) displayed the lowest levels, which were similar to profile 2 cautious-striver (M = -0.21). Profile 3 mixed-indifferent (M = -0.21) displayed the next lowest levels, which were similar to profile 2 cautious-striver, followed by profile 4 mixed-cautious (M = -0.12), profile 5 aspiring-fearer (M = 0.10), and profile 6 failure-fearer (M = 0.56). Turning to the profession quitting intentions, profile 1 success-approach (M = -0.27), profile 2

cautious-striver (M = -0.26), and profile 3 mixed-indifferent (M = -0.17) displayed the lowest levels, followed by profile 4 mixed-cautious (M = -0.07), which were similar to profile 3 mixed-indifferent, followed by profile 5 aspiring-fearer (M = 0.09), and profile 6 failure-fearer (M = 0.46).

6.6 Discussion

Our study examined well-being profiles among pre-service teachers. Findings revealed six profiles: Success-approach (5.9%), cautious-striver (9.5%), mixed-indifferent (14.5%), mixed-cautious (31.7%), aspiring-fearer (24.4%), and failure-fearer (14.0%). Analyses showed several significant associations between predictors and profile membership. In particular, ITE resources and teacher self-efficacy predicted profile membership with the tendency of pre-service teachers declaring higher resources being more likely to belong to more adaptive well-being profiles than less adaptive well-being profiles. Additionally, profiles also differed in levels of quitting intentions for the ITE program and the teaching career, with lower quitting intentions for more adaptive well-being profiles. Key findings are discussed below.

6.6.1 Six Pre-service Teacher Well-Being Profiles

Aligning with hypothesis one, we identified two adaptive, two maladaptive, and two mixed well-being profiles supporting prior research (Haldimann et al., 2024b). The two adaptive profiles were characterized by a dominance of positive well-being dimensions over the negative ones. The success-approach profile (representing 5.9% of pre-service teachers) displayed high values on the positive well-being dimensions and low values on the negative ones. The cautious-striver profile (representing 9.5% of pre-service teachers) displayed mostly high values on the positive well-being dimensions and average to below-average values on the negative ones. As with the success-approach profile, pre-service teachers were driven by their success orientation but were more critical regarding their academic abilities to succeed in ITE (above-average rather than high value on positive academic self-concept). They also displayed below-average worries about ITE and average physical complaints related to ITE (instead of low values), indicating a certain cautiousness. Pre-service teachers of both adaptive profiles thrived in ITE despite the challenging circumstances in Austria, where most lectures were still conducted online due to the COVID-19 pandemic. This finding highlights the capacity of some individuals to establish or maintain their well-being in mostly online learning environments.

In contrast, the two maladaptive profiles were characterized by a dominance of negative

Table 6

The Role of Initial Teacher Education Resources, Personal Resources, and Pre-Service Teacher Characteristics in Predicting Profile Membership

	P1 vs. P2			*P1 vs. P3*			*P1 vs. P4*			*P1 vs. P5*			*P1 vs. P6*		
	b	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*
ITE resources															
Practicum quality	0.09	0.32	1.09	0.59*	0.25	1.80	0.57*	0.24	1.76	0.69**	0.24	2.00	0.70**	0.25	2.02
Practicum-university coherence	-0.07	0.12	0.94	0.69***	0.12	1.99	0.40***	0.11	1.50	0.55***	0.11	1.74	1.49***	0.13	4.43
Personal resources															
Teacher self-efficacy	0.72*	0.34	2.06	0.84**	0.30	2.32	1.31***	0.29	3.72	1.48***	0.29	4.41	1.91***	0.31	6.72
Pre-service teacher characteristics															
Gender (0=female, 1=male)	0.43	0.39	1.54	-0.85**	0.31	0.43	-0.57*	0.29	0.56	-0.11	0.31	0.89	-0.88**	0.32	0.41
Age	0.06**	0.02	1.07	0.04*	0.02	1.04	0.05**	0.02	1.05	0.07***	0.02	1.08	0.03	0.02	1.03
Study program (0=primary, 1=secondary)	-0.24	0.23	0.79	0.47*	0.22	1.60	-0.18	0.19	0.83	-0.47*	0.20	0.63	-0.20	0.24	0.82
Enrolled study year	0.04	0.08	1.04	-0.24**	0.08	0.79	-0.19**	0.07	0.83	-0.17*	0.07	0.85	-0.42***	0.08	0.65
Part-time job as a teacher (0=no, 1=yes)	-0.10	0.33	0.91	-0.40	0.30	0.67	-0.02	0.28	0.99	0.19	0.30	1.20	-0.55	0.31	0.58
Caring responsibilities (0=no, 1=yes)	-0.46	0.30	0.63	-0.13	0.30	0.88	-0.07	0.27	0.93	0.05	0.29	1.05	-0.08	0.32	0.92
	P2 vs. P3			*P2 vs. P4*			*P2 vs. P5*			*P2 vs. P6*			*P3 vs. P4*		
	b	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*
ITE resources															
Practicum quality	0.50*	0.25	1.65	0.48*	0.24	1.61	0.60*	0.24	1.83	0.61*	0.24	1.85	-0.02	0.11	0.98
Practicum-university coherence	0.76***	0.11	2.13	0.47***	0.09	1.60	0.62***	0.09	1.86	1.56***	0.12	4.74	-0.29***	0.07	0.75
Personal resources															
Teacher self-efficacy	0.12	0.25	1.13	0.59**	0.23	1.81	0.76**	0.23	2.14	1.18***	0.26	3.27	0.47**	0.15	1.60
Pre-service teacher characteristics															
Gender (0=female, 1=male)	-1.28***	0.33	0.28	-1.00**	0.31	0.37	-0.54	0.32	0.58	-1.31***	0.33	0.27	0.27	0.17	1.32
Age	-0.03	0.02	0.97	-0.02	0.02	0.98	0.01	0.02	1.01	-0.04	0.02	0.96	0.01	0.02	1.01
Study program (0=primary, 1=secondary)	0.71**	0.22	2.02	0.05	0.19	1.05	-0.23	0.19	0.79	0.04	0.23	1.04	-0.65***	0.16	0.52
Enrolled study year	-0.27***	0.07	0.76	-0.23**	0.07	0.80	-0.20**	0.07	0.82	-0.46***	0.08	0.63	0.05	0.05	1.05
Part-time job as a teacher (0=no, 1=yes)	-0.30	0.28	0.74	0.08	0.27	1.09	0.28	0.28	1.33	-0.46	0.30	0.63	0.38*	0.19	1.46
Caring responsibilities (0=no, 1=yes)	0.33	0.27	1.39	0.39	0.24	1.48	0.51*	0.26	1.66	0.38	0.30	1.46	0.06	0.21	1.06
	P3 vs. P5			*P3 vs. P6*			*P4 vs. P5*			*P4 vs. P6*			*P5 vs. P6*		
	b	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*	*b*	*SE*	*OR*
ITE resources															
Practicum quality	0.10	0.11	1.11	0.12	0.12	1.12	0.12	0.09	1.13	0.14	0.10	1.14	0.01	0.10	1.01
Practicum-university coherence	-0.14	0.08	0.87	0.80***	0.10	2.22	0.15*	0.06	1.16	1.09***	0.09	2.96	0.94***	0.10	2.55
Personal resources															
Teacher self-efficacy	0.64***	0.16	1.90	1.06***	0.17	2.89	0.17	0.12	1.19	0.59***	0.15	1.81	0.42**	0.16	1.53
Pre-service teacher characteristics															
Gender (0=female, 1=male)	0.73***	0.20	2.08	-0.04	0.21	0.96	0.46**	0.18	1.58	-0.31	0.18	0.73	-0.77***	0.22	0.46
Age	0.04*	0.02	1.04	-0.01	0.02	0.99	0.03	0.02	1.03	-0.02	0.02	0.98	-0.05*	0.02	0.96
Study program (0=primary, 1=secondary)	-0.94***	0.17	0.39	-0.67**	0.20	0.51	-0.29*	0.14	0.75	-0.01	0.18	0.99	0.27	0.20	1.31
Enrolled study year	0.07	0.05	1.07	-0.19**	0.06	0.83	0.02	0.04	1.02	-0.24***	0.05	0.79	-0.26***	0.06	0.77
Part-time job as a teacher (0=no, 1=yes)	0.58**	0.22	1.79	-0.16	0.22	0.85	0.20	0.21	1.22	-0.54**	0.21	0.58	-0.74**	0.24	0.48
Caring responsibilities (0=no, 1=yes)	0.18	0.23	1.19	0.05	0.25	1.05	0.12	0.20	1.12	-0.01	0.23	0.99	-0.13	0.27	0.88

Note. *$p < .05$, **$p < .01$, ***$p < .001$; *b* = multinomial logistic regression coefficient; OR = odds ratio; P = profile.

Table 7

Mean-Level Differences in Outcomes

	Success-approach (P1)	*Cautious-striver* (P2)	*Mixed-indifferent* (P3)	*Mixed-cautious* (P4)	*Aspiring-fearer* (P5)	*Failure-fearer* (P6)
ITE quitting intentions	-0.26 [a]	-0.21 [a, b]	-0.21 [b]	-0.12	0.10	0.56
Profession quitting intentions	-0.27 [a]	-0.26 [a]	-0.17 [a, b]	-0.07 [b]	0.09	0.46

Note. [a,b] Mean comparisons were not significantly different. All other mean comparisons were significantly different $p < .05$. Variables were standardized ($M = 0$; $SD = 1$) to aid interpretation.

well-being dimensions over positive ones and, therefore, indicating at-risk pre-service teachers. The failure-fearer profile (representing 14.0% of pre-service teachers) displayed low values on the positive well-being dimensions and high values on the negative ones. The aspiring-fearer profile (representing 24.4% of pre-service teachers) displayed mostly average values on the positive well-being dimensions and high values on the negative ones. In total, almost two out of five pre-service teachers belonged to one of the two maladaptive profiles. This rather high proportion of pre-service teachers belonging to maladaptive well-being profiles might be linked with the experience of uncertainty in ITE due to the COVID-19 pandemic (e.g., worries related to ITE). Additionally, broader circumstances, such as ongoing ITE reforms in Austria (Schnider et al., 2023), might also play a role. It is important to work out what may help them transition to a more adaptive profile (discussed below).

The final two profiles were mixed profiles: The mixed-indifferent profile (representing 14.5% of pre-service teachers) displayed mostly average values on the positive well-being dimensions and low values on the negative ones. They are neither very strongly striving for success nor trying to avoid failure. They are, in a way, unconcerned and, hence, to a certain degree, indifferent towards ITE. This profile does not represent the classic failure acceptor typology (i.e., low success orientation, low failure avoidance), but is approaching it. Other studies also identified pre-service teachers with a similar tendency, showing restricted effort in ITE paired with an energy-saving attitude (e.g., Römer et al., 2013; Zimmermann et al., 2012). Moving on, the mixed-cautious profile displayed a more balanced relationship between positive and negative well-being dimensions with average values on the positive ones and below-average values on the negative ones. This profile stands out due to its wide distribution in the sample as almost one-third of all pre-service teachers belonged to this profile (31.7%). It would be promising to take a longitudinal perspective to analyze whether pre-service teachers stay in this profile throughout ITE or if they move from or towards one of the four typologies with more pronounced values on the two motives of success orientation and failure avoidance (high and/or low values).

To sum up with respect to the four typologies outlined in the quadripolar model of need achievement (Covington & Müeller, 2001), the adaptive profiles map on the success-approach typology and the maladaptive profiles onto the failure-fearer typology. However, the other two typologies, failure-acceptor (low success orientation, low failure avoidance) and overstriver (high success orientation, high failure avoidance), did not emerge in our sample. Comparing our findings with Haldimann and colleagues (2024b) illustrates that profiles broadly correspond within the two samples. Notably, though, they had a similar profile to our mixed-indifferent

profile but called this a flourisher profile. We feel that the use of the quadripolar model of need achievement allows a more nuanced understanding of this profile, who at first blush appear to be flourishing based on the general positive dominance, but on closer inspection appear to reflect a level of indifference (given their average levels of enjoyment and low worries). This is also evident in the unstandardized results (see Supplementary Materials in Appendix D), which show enjoyment of ITE for this profile was at the theoretical midpoint of the scale, representing neither true nor untrue and thus reflecting some indifference. Indeed, this mixed-indifferent nature of the profile was further supported when looking at the differentiation evident in the outcomes (as described below).

In our sample, we also identified two unique adaptive profiles that were not identified in the Haldimann and colleagues' study (2024b). Thus, we were better able to tease about adaptive experiences during ITE with this sample. We cannot determine why this was the case, but the collection of data in a different population and the use of theory to guide our profile selection may have contributed to this finding. Future research is needed to explore possible reasons, such as the role of sample-specific characteristics (e.g., Austrian ITE versus Swiss ITE).

Taken together, the profiles reveal new insights into pre-service teacher well-being by integrating Hascher's scholastic well-being framework (2007, 2023) and the quadripolar model of need achievement (Covington & Müeller, 2001). Merging two theoretical models to understand and interpret well-being profiles advances prior research (Haldimann et al., 2024b). It extends our understanding by suggesting that the three positive well-being dimensions may represent the motive of success orientation, while the negative well-being dimensions may represent the motive of failure avoidance. By considering the underlying motives of success orientation and failure avoidance in these profiles, we gain a more comprehensive and theoretical-driven explanation of why certain combinations of well-being dimensions co-occur. The two-dimensional nature of the quadripolar model of need achievement (Covington & Müeller, 2001) particularly emphasizes distinct combinations of success orientation and failure avoidance, beyond sample-wide correlations. Our results demonstrated that these combinations are also present among pre-service teachers. For instance, while both the mixed-indifferent profile and the mixed-cautious profile displayed average success orientation, they differed in terms of failure avoidance—low levels for the mixed-indifferent profile and below-average levels for the mixed-cautious profile. These findings underscore the need for interventions tailored to these nuanced needs, which are discussed below.

6.6.2 Predictors and Outcomes of Profile Membership

Aligning with hypothesis two, the perception of higher resources was associated with membership in more adaptive well-being profiles further supporting the distinctiveness of the six well-being profiles. The most consistent and strongest predictor was teacher self-efficacy. For 13 out of 15 profile comparisons pre-service teachers with higher teacher self-efficacy were up to almost seven times more likely to belong to an adaptive well-being profile instead of a less adaptive one. This finding extends prior evidence showing the importance of teacher self-efficacy not only for teacher well-being (e.g., Zee & Koomen, 2016), but also for pre-service teachers by taking different well-being profiles into account. This might be due to pre-service teachers with higher teacher self-efficacy being more oriented towards success and less trying to avoid failure and being revealed as inexperienced (Covington & Müeller, 2001). Moreover, a sense of self-efficacy might reassure pre-service teachers that they are making progress on their path to becoming a teacher (Bjorklund et al., 2021), therefore leading, for example, to more positive attitudes towards ITE and fewer worries related to ITE.

The two ITE resources related to teaching practicums were also important for pre-service teacher well-being. The second most consistent and strongest predictor was the perceived practicum-university coherence. For 12 out of 15 profile comparisons, pre-service teachers who perceived greater practicum-university coherence were up to almost five times more likely to belong to a more adaptive well-being profile instead of a less adaptive one. Also, pre-service teachers who perceived greater practicum quality were up to two times more likely for 8 out of 15 profile comparisons to belong to a more adaptive well-being profile instead of a less adaptive one. Thus, our study makes a novel contribution by illustrating the consideration of teaching practicums not only as important learning opportunities during ITE (e.g., Darling-Hammond, 2014), but also their alignment with university courses and quality as important resources for pre-service teacher well-being. Together, the results demonstrate the salience of both ITE resources and personal resources for pre-service teacher well-being as theoretically suggested by JD-R theory (Bakker & Demerouti, 2017). Consequently, both types of resources might be targeted in efforts to promote pre-service teacher well-being. These findings corroborate the more extensive discussion on teacher well-being, which points to assigning the responsibility for well-being not only to individuals but also to institutions by creating an environment that enables individuals to flourish (e.g., McCallum et al., 2017).

As expected in hypothesis three, the well-being profiles were differentially associated with the outcomes, with the two maladaptive profiles displaying the highest levels of quitting intentions. For ITE quitting intentions, the success-approach displays the lowest levels that were

similar to the cautious-striver. The mixed-indifferent profile displayed the next lowest levels (which were similar to the cautious-striver), followed by the mixed-cautious profile, the aspiring-fearer, and finally, the failure-fearer. For profession quitting intentions, the results were less differentiated, but some differences were evident: the success-approach, cautious-striver, and mixed-indifferent profiles had the lowest levels, followed by the mixed-cautious profile (which were similar to the mixed-indifferent), followed by the aspiring-fearer, and then the failure-fearer. These findings align with JD-R theory (Bakker & Demerouti, 2017) and provide empirical evidence for the importance of pre-service teacher well-being for teacher retention. Particularly, the current study complements prior research focusing solely on ITE quitting intentions by also highlighting the importance of pre-service teacher well-being for profession quitting intentions. Pre-service teachers belonging to the failure-fearer and aspiring-fearer profiles indicated significantly higher ITE quitting intentions and profession quitting intentions than the two adaptive and mixed well-being profiles, which makes targeted support for those two profiles particularly important. The results regarding the research question of how pre-service teacher characteristics predicted profile membership are discussed in Supplementary Materials (Appendix D).

6.6.3 Implications for Practice

The findings of the current study are relevant for stakeholders involved in ITE at different levels (e.g., policymakers, management, lecturers, mentors) given the possible relevance of pre-service teacher well-being for learning processes during ITE (e.g., El Ansari & Stock, 2010) and its potential links with teacher retention as demonstrated in the current study. Efforts that solely address positive well-being dimensions, such as fostering a positive academic self-concept, may overlook issues related to negative well-being dimensions, like worries about ITE. Therefore, our findings suggest that multifaceted interventions, which address both positive and negative well-being dimensions, may be crucial for long-term effectiveness. In particular, these should be targeted to the specific requirements of each profile. For example, the success-approach profile would benefit from maintaining their levels of the well-being dimensions, whereas the mixed-indifferent profile would likely aid from efforts to boost their positive attitudes and enjoyment of ITE. Specifically, interventions might target pre-service teachers' autonomy during ITE (e.g., choice of modules) to boost positive attitudes towards ITE (Deci & Ryan, 2008; Zimmermann et al., 2018), they might address pre-service teachers' value and control appraisals of achievement situations in ITE to boost enjoyment of ITE (Pekrun, 2006), and they might address the feedback culture during university courses to boost pre-service teachers positive academic self-concept (Marsh & Seaton, 2013). Interventions might also

include mindfulness practices to lower worries about ITE and physical complaints related to ITE (Birchinall et al., 2019; Hue & Lau, 2015). Besides targeting the five well-being dimensions, our results also suggest targeting ITE resources and personal resources. ITE institutions may implement strategies to promote the quality of teaching practicums and coherence between teaching practicums and university courses by establishing high-quality mentorship (Dreer, 2021) or integrating theoretical and practical ITE elements into a coherent curriculum (Darling-Hammond, 2014; Zeichner, 2010). Finally, mastery experiences during teaching practicums might be one way to promote teacher self-efficacy (Bandura, 1999).

6.6.4 Limitations and Future Directions

There are several limitations to the current study that require discussion and should be addressed in future studies. First, our study is based on a selective sample of pre-service teachers studying at different ITE institutions across Austria. In future research, a representative sample is needed to reflect better pre-service teachers across various ITE institutions in Austria. Moreover, it would be beneficial to investigate institution-specific characteristics (e.g., emphasis on well-being topics in the ITE curriculum) as predictors of profile membership by applying multilevel modeling. Also, cross-cultural studies including pre-service teachers from different ITE systems would have the potential to enhance our understanding of contextual and universal factors related with pre-service teacher well-being. Second, we tested our hypothesized model based on cross-sectional data. Future studies would benefit from longitudinal designs to test causality and the profile solution's stability over an academic year or the ITE program. Longitudinally, it would also be insightful to investigate how well-being profiles among pre-service teachers predict their well-being as early-career teachers to support the transition into the profession. Third, we measured the retention-related outcomes using self-report measures of quitting intentions. For future studies, it would be beneficial to include actual dropout rates as objective measures and differentiate between various motives for leaving the teaching profession, including personal reasons (e.g., parenthood). Fourth, it might be argued that pre-service teachers with more personal resources are presumed to have access to more ITE resources, and pre-service teachers with more ITE resources are presumed to have more access to personal resources (Bakker et al., 2023). Future research might investigate to what extent the perception of practicum quality and practicum-university coherence is reciprocally linked with teacher self-efficacy. Fifth, we included three resources in our study; however, there is a need to consider other resources, such as social support, and also to integrate ITE demands such as workload or time pressure and personal demands such as perfectionism (Bakker & Demerouti, 2017; Martin & Collie, 2022). Also, the interconnectedness of pre-service teacher well-being

with other life domains, such as home, needs further attention (Bakker et al., 2023). Sixth, in the current study, we took a quantitative approach to examine the well-being profiles among pre-service teachers and to investigate associations with other constructs. Future research would benefit from extending the study into an explanatory sequential mixed-methods design (Creswell, 2014) to sharpen our understanding of the specific needs of pre-service teachers belonging to the different well-being profiles.

6.7 Conclusions

In this study, we used latent profile analysis to identify six distinct well-being profiles among pre-service teachers, including adaptive, maladaptive, and mixed profiles. The study illustrates the importance of pre-service teacher well-being for teacher retention and extends previous research by emphasizing the distinct ITE quitting intentions and profession quitting intentions. The findings shed light on the little-explored research field of pre-service teacher well-being and call for multidimensional intervention studies tailored to the specific needs of different profiles. Promoting ITE resources such as the quality of teaching practicums and practicum-university coherence and personal resources such as teacher self-efficacy may be one way to do so.

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7 Summary and Discussion

The well-being of pre-service teachers seems particularly important due to its potential link to successful learning processes (Hascher, 2023; Kaya & Erdem, 2021). Moreover, ITE may also offer pre-service teachers the opportunity—even before career entry—to learn how to manage their well-being sustainably (Dreer, 2021a; Mairitsch et al., 2021; Price & McCallum, 2015). However, there has been little research on pre-service teacher well-being to date. Critical knowledge gaps are unexplored, including how to conceptualize and measure well-being among pre-service teachers using a multidimensional and context-specific approach; the distinct well-being patterns and profiles that may exist among pre-service teachers due to the multidimensional nature of well-being; and how pre-service teacher characteristics, resources, and retention-related outcomes are related to these profiles. The publication-based dissertation addresses these gaps by providing deeper insights into pre-service teacher well-being, harnessing multidimensional, context-specific, and person-centered approaches.

Study 1 adapts the multidimensional model of scholastic well-being (Hascher, 2004, 2023) to the context of ITE. The study collected evidence on the validity and reliability of the pre-service teacher questionnaire. Building upon the first study, Study 2 employed latent profile analysis to identify potential well-being profiles among pre-service teachers in the German-speaking part of Switzerland. It shows how different well-being dimensions manifest within subgroups of pre-service teachers and investigates the associations between these profiles and pre-service teacher characteristics. To strengthen the construct validity of the identified profiles (Morin et al., 2017), Study 3 replicates the profile solution from Study 2 using a sample of Austrian pre-service teachers. Additionally, this study examines the relationship between pre-service teacher characteristics, contextual resources, and personal resources and well-being profiles and subsequently explored how these profiles differed in terms of retention-related outcomes. The current chapter opens with a summary and discussion of the four research questions addressed in this dissertation based on the key findings of the three studies (Sections 7.1-7.4). Then, the chapter discusses implications for practice (Section 7.5), acknowledges limitations, and suggests avenues for future research (Section 7.6).

7.1 Research Question 1: What Is the Evidence to Support the Validity and Reliability of the Pre-Service Teacher Well-Being Questionnaire?

Based on Hascher's (2004, 2023) model of scholastic well-being and its application to ITE, the pre-service teacher well-being questionnaire was designed to measure positive and negative dimensions with one subscale each. The strength of the pre-service teacher

questionnaire lies in its multidimensional and context-specific approach. It represents a measure that taps both into feeling well and functioning effectively during ITE, integrating hedonic and eudaimonic elements. Moreover, it captures pre-service teacher well-being holistically and is suited for a variety of ITE systems, study programs, and learning environments. Using the model-determined approach, the pre-service teacher well-being questionnaire has a solid theoretical foundation, which is important given that a jingle jangle fallacy (Collie & Hascher, 2024) is already also becoming apparent in this emerging research field.

The evidence from Study 1 supports the validity and reliability of the pre-service teacher well-being questionnaire for five out of six well-being dimensions (for a detailed discussion, see Chapter 4): positive attitudes towards ITE, enjoyment of ITE, positive academic self-concept regarding ITE, worries about ITE, and physical complaints related to ITE. The dimension of social problems in ITE was excluded due to insufficient reliability. The findings support the hypothesized first-order, five-factor structure among samples of Swiss, German, and Austrian pre-service teachers. Specifically, expected sample-wide associations between the five well-being dimensions were revealed: Both the positive (e.g., positive attitudes towards ITE and enjoyment of ITE) and the negative dimensions (e.g., worries about ITE and physical complaints related to ITE) are positively intercorrelated, and the positive and negative dimensions (e.g., positive attitudes towards ITE and worries about ITE) are inversely correlated with each other. Latent correlations among the five well-being dimensions were mostly moderate to strong, according to Cohen (1988), suggesting they tap into related yet different well-being dimensions. Particularly strong correlations were found between the dimensions positive attitudes towards ITE and enjoyment of ITE and between the well-being dimensions worries about ITE and physical complaints related to ITE (similar results in Study 3). These strong correlations support the assumption of close interconnectedness between cognitive, emotional, and psychosomatic aspects of well-being (Hascher, 2004, 2007). Moreover, Study 1 also provides evidence for (partial) measurement invariance across Swiss, German, and Austrian pre-service teachers and for external validity with established well-being constructs. Even though Study 3 was not tailored to research question 1, the findings—based on a second sample—corroborate the findings of Study 1 regarding the factor structure and reliability of the dimensions.

The omission of the well-being dimension “Social problems in ITE” due to insufficient reliability of the scale measuring this dimension reduced construct validity analyses to five instead of the originally proposed six well-being dimensions. This dimension also yielded insufficient reliability in Study 3, strengthening the decision to exclude it. The reliability issue

likely stems from the scale's broad coverage of negative social interactions, including both symmetric peer interactions and asymmetric interactions with lecturers or mentors. This approach potentially oversimplifies the complex social experiences of pre-service teachers during ITE. Given the critical importance of social aspects in ITE (O' Brien et al., 2022; Squires et al., 2022; Väisänen et al., 2017), the dimension requires careful revision (discussed below). Taken together, the dissertation provides evidence for the adaption of the scholastic well-being model (Hascher, 2004, 2023) to the context of ITE and for the pre-service teacher well-being questionnaire as a multidimensional and context-specific measure. However, complementary evidence regarding content validity is needed to further support this adaptation.

7.2 Research Question 2: What Well-Being Profiles Are Evident among Pre-Service Teachers?

Given the multidimensional nature of well-being and since sample-wide associations between the well-being dimensions were confirmed taking a variable-centered approach, the co-occurrence of these well-being dimensions within individuals was also explored. Taking a person-centered approach, Study 2 and Study 3 examined patterns in pre-service teachers' levels of positive and negative well-being dimensions to yield further insight into the extent to which distinct well-being profiles may exist among pre-service teachers. In both studies, five respectively six well-being profiles were identified, supporting the assumption of sample heterogeneity in pre-service teacher well-being. Each well-being profile can be classified into one of three profile types: adaptive, maladaptive, and mixed (for an overview of the identified profile solutions in both studies, see Table 3). Adaptive well-being profiles were characterized by a dominance of positive well-being dimensions over negative ones, representing pre-service teachers flourishing in ITE. In contrast, the maladaptive profiles were characterized by a dominance of negative well-being dimensions over positive ones, indicating at-risk pre-service teachers. In between, different mixed well-being profiles were identified with more balanced positive and negative well-being dimensions. Concretely, in Study 2, five well-being profiles (two adaptive, one maladaptive, and two mixed profiles) were identified among 989 Swiss pre-service teachers. In Study 3, six well-being profiles (two adaptive, two maladaptive, and two mixed profiles) were identified among 2,867 Austrian pre-service teachers. When comparing unstandardized profile solutions across both studies, the profiles broadly corresponded, strengthening their construct validity (Morin et al., 2017). These findings align with prior research identifying high, moderate, and low well-being profiles (Cavioni et al., 2023; Lee, Fung, Datu, et al., 2024), however, they also provide a more nuanced understanding of this

sample heterogeneity, such as with the identification of different mixed profiles (for a discussion of these profile solutions including their comparison, see Chapter 5 and Chapter 6).

On a general note, the latent profile analysis in Study 3 encompasses the one conducted in Study 2 both in terms of the theoretical foundation underlying potential well-being profiles and in terms of the methodology regarding the implemented profile classification approach. The latent profile analysis in Study 3 was conducted with more substantial theoretical reasoning about potential well-being profiles than in Study 2. The profile solution in Study 2 was solely framed by the model of scholastic well-being (Hascher, 2004, 2023) and no hypotheses about potential well-being profiles were formulated. Study 3 also incorporated the quadripolar model of need achievement (Covington & Müeller, 2001) to develop a more comprehensive, theory-driven understanding of why certain well-being dimension combinations might co-occur among pre-service teachers (Hofmans et al., 2020; Morin et al., 2017). Specifically, the three positive well-being dimensions represent the motive of success orientation, while the negative dimensions represent failure avoidance. This theoretical framework supports the emergence of two distinct mixed well-being profiles (see Table 3): failure acceptor (low success orientation and low failure avoidance) and over-striver (high success orientation and high failure avoidance). Formulating hypotheses about potential profiles based on a sound theoretical background contributed to an enhanced understanding of the construct.

Methodologically, the studies differed in their profile classification approach. Study 2 used an unstandardized profile solution to classify adaptive, maladaptive, and mixed profiles (values above the theoretical mean were considered high; values below the theoretical mean were considered low). The unstandardized profile solution has the advantage of providing a meaningful scaling metric (Little et al., 2006). However, this approach also has limitations, as the theoretical mean may not accurately represent the "real-world" tipping point between high and low values, and this threshold could vary across different well-being dimensions. To address this limitation, Study 3 employed a standardized profile solution, classifying profiles based on the sample-wide mean of each well-being dimension (values above the sample-wide mean were considered high; values below the sample-wide mean were considered low). However, to allow for comparisons of the profile solution with Study 2, the unstandardized solution was provided alongside the standardized one.

The method of latent profile analysis still retains exploratory aspects, necessitating caution when interpreting profile solutions (Hofmans et al., 2020). Discourse on the methodology remains limited on whether to interpret unstandardized or standardized profile solutions. As demonstrated in Study 3, interpreting standardized versus unstandardized profile

solutions can yield substantial differences in profile distribution: In the standardized profile solution, 15.4% of all pre-service teachers belonged to an adaptive profile, and in the unstandardized profile solution, 61.6%. In the standardized profile solution, 38.4% of all pre-service teachers belonged to a maladaptive profile, and in the unstandardized profile solution, 14.0%. Finally, in the standardized profile solution 46.2% of all pre-service teachers belonged to a mixed profile, and in the unstandardized profile solution 24.4%. The most pronounced difference was observed in adaptive well-being profiles. In the standardized profile solution, two profiles were considered adaptive (the success-approach profile and the cautious-striver profile). By contrast, the unstandardized solution identified two additional adaptive profiles (the mixed-indifferent profile and the mixed-cautious profile). This discrepancy stems from using the sample-wide mean as the tipping point between low and high well-being values, instead of the theoretical mean of 3.5, which resulted in a stricter identification of adaptive well-being profiles.

Table 3

Overview of the identified profile solutions in Study 2 and Study 3

Types of well-being profiles	Values on well-being dimensions	Conceptual support	Empirical support for well-being profiles		
		Quadripolar model of need achievement theory (Covington & Müeller, 2001)	Study 2	Study 3	
			Unstandardized solution	Unstandardized solution	Standardized solution
Adaptive well-being profiles	Above-average to high values on positive dimensions and below-average to low values on negative dimensions	Success approach (high success orientation and low failure avoidance)	Flourisher[A] (14.1%) Vulnerable flourisher[B] (27.9%)	Success approach (5.9%) Cautious striver (9.5%) Mixed indifferent[A] (14.5%) Mixed cautious[B] (31.7%)	Success approach (5.9%) Cautious striver (9.5%)
Maladaptive well-being profiles	Below-average to low values on positive dimensions and above-average to high values on negative dimensions	Failure fearer (low success orientation and high failure avoidance)	At risk[C] (14.4%)	Failure fearer[C] (14.0%)	Failure fearer (14.0%) Aspiring fearer (24.4%)
Mixed well-being profiles	Below-average to low values on positive dimensions and below-average to low values on negative dimensions	Failure acceptor (low success orientation and failure avoidance)	Confident distant (16.1%)	—	Mixed indifferent (14.5%) Mixed cautious (31.7%)
	Above-average to high values on positive dimensions and above-average to high values on negative dimensions	Over-striver (high success orientation and high failure avoidance)	Empowered worrier[D] (27.6%)	Aspiring fearer[D] (24.4%)	—

Note. A-D indicate profiles with similar shapes identified in Study 2 and Study 3 (based on the unstandardized profile solution). It must be noted that similar profiles were labeled differently across the two studies (e.g., "at risk" in Study 2 and "failure fearer" in Study 3). For future research, consistency in profile naming is recommended when profiles share similar shapes. This would facilitate profile comparison and mitigate profile proliferation.

7.3 Research Question 3: To What Extent Are Pre-Service Teacher Characteristics and Resources Associated with Well-Being Profiles?

The relationship between three general pre-service teacher characteristics (gender, age, and caring responsibilities) and five ITE-related ones (study program, enrolled study semester/year, experience of exam phase, experience of teaching practicum phase, and part-time job as a teacher besides ITE) and well-being profiles was investigated. The findings revealed a nuanced and complex picture reflecting the contradictory body of research (see Section 2.5.1). Study 2 examined five pre-service teacher characteristics and predominantly showed non-significant results, with only 10 out of 50 profile comparisons being significant. Nonetheless, some notable tendencies emerged: Pre-service teachers in later semesters of their course and those undergoing practicum phases were more likely to belong to less adaptive profiles. Additionally, during exam phases, pre-service teachers were more likely to belong to the "empowered worrier" profile rather than the "confident distant" profile. Gender associations yielded mixed findings, and there was no significant relationship between the study program and well-being profiles. Study 3 also predominantly showed non-significant results, with only 38 out of 90 profile comparisons being significant. Male and younger pre-service teachers, those training for secondary general education, students in higher study years, and those without caring responsibilities tended to be more likely to belong to less adaptive well-being profiles. Regarding pre-service teachers working part-time as teachers besides ITE, findings were mixed.

Across both studies, three similar pre-service teacher characteristics were examined (gender, study program, and enrolled study semester/year). The relationship between gender and profile differed per study (Study 2: mixed; Study 3: male pre-service teachers in less adaptive profiles), and the same applied to the relationship between study program and profile (Study 2: not significant; Study 3: secondary general education students in less adaptive profiles). However, across both studies, pre-service teachers enrolled in later study semesters/years were more likely to belong to less adaptive well-being profiles. This contradicts the finding of Squires et al. (2022) of a non-significant relationship among Canadian pre-service teachers. However, when looking at higher education students in general, the finding aligns with prior person-centered research, which found that students at the beginning of their studies were typically more engaged, while students who had been enrolled the longest were more likely to be burned out (Salmela-Aro & Read, 2017). To what extent this finding might be related to pre-service teachers entering the teaching profession while still being enrolled in ITE (e.g., Helm et al., 2024; Schweizerische Koordinationsstelle für Bildungsforschung [SKBF], 2023) needs further investigation. To sum up, these findings remain exploratory, necessitating

further research. Particularly in terms of the study program, the findings are based on pre-service teachers from different ITE institutions across Switzerland and Austria, making it difficult to draw inferences due to substantial differences in study programs within and across these countries (Criblez, 2016; Schnider et al., 2023).

The relationship between resources and well-being profiles is stronger. The findings reveal that both contextual and personal resources are associated with well-being profiles, supporting SD-R theory (Bakker & Mostert, 2024). In terms of contextual resources, pre-service teachers who reported higher teaching practicum quality and who perceived greater coherence between teaching practicums and university courses were consistently more likely to belong to more adaptive well-being profiles than less adaptive ones. This finding offers a novel perspective on the role of teaching practicums as not only important learning environments in ITE (Cohen et al., 2013; Darling-Hammond, 2014), but their quality and alignment are also significant resources for pre-service teacher well-being. In terms of personal resources, teacher self-efficacy has a strong relationship with well-being profiles. Specifically, pre-service teachers reporting higher teacher self-efficacy were more likely to belong to more adaptive well-being profiles. This strong link between teacher self-efficacy and pre-service teacher well-being is aligned with prior variable-centered (e.g., Bjorklund et al., 2021; Ngui & Lay, 2018) and emerging person-centered research (Cavioni et al., 2023; Lee, Fung, Datu, et al., 2024). As teacher self-efficacy also represents a powerful personal resource for teacher well-being after career entry (e.g., Granziera, 2022; Zee & Koomen, 2016; Zhou et al., 2024) it might hold a key to well-being promotion during ITE and beyond.

Taken together, these findings suggest a dual approach to promoting pre-service teacher well-being: It is essential to target both contextual resources related to the two main learning environments of ITE institutions and schools during practicums and personal resources, specifically teacher self-efficacy. The results illustrate the potential that ITE institutions hold to create learning environments that allow pre-service teachers to flourish during ITE.

7.4 Research Question 4: To What Extent Do Potential Well-Being Profiles Differ in Terms of Retention-Related Outcomes?

Two retention-related outcomes were investigated as outcomes of well-being profile membership in Study 3: ITE quitting intentions and profession quitting intentions. The difference between the two is laid that some pre-service teachers may not intend to quit the ITE program but then the teaching profession after graduation (Struyven & Vanthournout, 2014). The two maladaptive profiles (failure fearer and aspiring fearer) consistently and significantly demonstrated the highest ITE quitting intentions and profession quitting intentions compared

to the mixed and adaptive well-being profiles. In alignment with the SD-R theory in higher education (Bakker & Mostert, 2024), these results extend the critical importance of teacher well-being for teacher retention (Skaalvik & Skaalvik, 2018; Zhou et al., 2024) as this dissertation provides evidence that this link exists already prior to career entry. Moreover, these results illustrate the importance of well-being promotion, especially for pre-service teachers in maladaptive profiles. On a positive note, both ITE and profession quitting intentions were relatively low across all profiles (ITE quitting intentions: M = 1.28; profession quitting intentions: M = 1.47, rated on a six-point Likert scale from 1 = "not true at all" to 6 = "totally true") despite the COVID-19 pandemic interrupting ITE in Austria during spring 2021. Also, Schriek et al. (2024) found rather low quitting intentions among German pre-service teachers in January 2021, however, quitting intentions did increase during the following semesters calling for future research.

7.5 Implications for Practice

The results of the dissertation offer insights for enhancing pre-service teacher well-being initiatives during ITE. This section explores how these findings can inform practice and presents specific recommendations for supporting pre-service teacher well-being during ITE. The first implication for practice is related to the pre-service teacher well-being questionnaire. The evidence presented in this dissertation supports its use to measure pre-service teacher well-being. It could be used within ITE institutions as a screening tool to measure well-being among pre-service teachers within the ITE institution or specific study programs. The findings might then be used to initiate a discourse about pre-service teacher well-being and to plan future actions to target pre-service teacher well-being. Besides targeting well-being on an organizational level, it seems equally important on an individual level to raise awareness and empower pre-service teachers to manage their well-being during ITE (Dreer, 2021a; Price & McCallum, 2015). Therefore, the pre-service teacher well-being questionnaire might be used for formative self-assessment and self-reflection purposes. For instance, in the current investigation, participating pre-service teachers could download the completed pre-service teacher well-being questionnaire as a PDF file and use it for portfolios or mentoring sessions. Emerging research indicates that pre-service teachers are interested in learning more about their well-being (Benincasa & Springob, 2024; Zito et al., 2024) than just "some brief information on support services on campus" on "the very last PowerPoint slide" (Benincasa & Springob, 2024, p. 17).

The second implication for practice relates to the theoretical understanding of pre-service teacher well-being as dominance of positive dimensions over negative ones, which this

dissertation supports. This means it is recommended to promote well-being by boosting positive well-being dimensions and reducing negative ones. Given the demonstrated interrelatedness of these well-being dimensions in this investigation, it would be beneficial to target them simultaneously. To address them throughout ITE also seems important, as the current investigation revealed that pre-service teachers enrolled in later semesters/study years are more likely to belong to less adaptive well-being profiles. To boost positive attitudes towards ITE, institutions may offer module choice flexibility (Zimmermann et al., 2018) or encourage pre-service teachers to reflect on their initial motivation for pursuing ITE (Wach et al., 2016). To boost enjoyment of ITE, targeting value and control appraisals seems promising (Pekrun, 2006). This may involve offering clearly structured and cognitively activating tasks but also informing pre-service teachers about strategies to carry out these appraisals themselves (e.g., actively linking newly acquired knowledge with previous knowledge and informing themselves about assessment criteria). To boost the positive academic self-concept, improving feedback culture (Marsh & Seaton, 2013) and developing a growth mindset (Zarrinabadi et al., 2022) are recommended. Integrating mindfulness practices into ITE might represent one possibility to reduce worries about ITE and physical complaints related to ITE (Birchinall et al., 2019; Hue & Lau, 2015).

The third implication for practice concerns the identified adaptive, maladaptive, and mixed well-being profiles. Besides addressing the well-being dimensions separately, well-being promotion could be tailored to these distinct profiles. For adaptive well-being profiles, the focus may be on raising awareness and positively reinforcing the behaviors and strategies these pre-service teachers already apply, reflected in their high success orientation and low fear of failure (Covington & Müeller, 2001). Efforts might also focus on the transferability of these behaviors and strategies to the context of teaching after career entry. In contrast, when targeting pre-service teachers belonging to maladaptive profiles, the focus could be on boosting the positive well-being dimensions and reducing the negative ones. Pre-service teachers within these risk profiles may require additional support through counseling services or a more intensive intervention program than pre-service teachers in other profiles. This may also include reflections on alternative career paths besides ITE if the teaching profession no longer matches their career aspiration. For the mixed well-being profiles, interventions should vary depending on whether the profile falls into the failure-acceptor typology or the over-striver typology (Covington & Müeller, 2001). For instance, when targeting mixed profiles with low values on all dimensions (confident distant, mixed indifferent, mixed cautious)—reflecting the failure-avoidance typology—enhancing their focus on learning activities and progress through

personal best goals might be one way to address their indifference towards or detachment from ITE (Martin & Marsh, 2003). In contrast, pre-service teachers belonging to the mixed profiles with high values on all dimensions (empowered worrier)—reflecting the over-striver typology—may particularly benefit from changing the potential driver of their efforts in ITE from fear of failure to a success orientation. One possibility to put these tailored interventions into practice might be via digital learning platforms (Moldavan et al., 2022). For instance, the learning platform may prompt content and exercises to boost, maintain, or reduce well-being dimensions according to participants' scores. When targeting well-being across these profiles, stereotyping should be avoided, as these profiles are prototypical in nature, featuring probabilistic profile assignments (Hofmans et al., 2020). They intend to provide guidance but represent only a snapshot and simplified model of a complex phenomenon.

The fourth implication for practice concerns the finding that the perception of higher contextual and personal resources was associated with membership in more adaptive well-being profiles. Even if no causal conclusions can be drawn based on the cross-sectional design applied in this dissertation, targeting these resources for promoting pre-service teacher well-being could be effective. Starting with contextual resources, ITE institutions may improve practicum quality by establishing a high-quality mentor-mentee relationship (Dreer-Goethe, 2023). Attempts to promote coherence in ITE may include aligning and interweaving courses at ITE institutions and teaching practicums (e.g., analyzing challenges from teaching practicums during ITE courses) and establishing "third spaces" in which teachers from ITE institutions and schools jointly create learning opportunities for pre-service teachers (Darling-Hammond, 2014; Zeichner, 2010). Turning to personal resources, vicarious experiences and mastery experiences might enhance teacher self-efficacy (Bandura, 1999; Clark & Newberry, 2019). During vicarious experiences, pre-service teachers observe and learn from mentor teachers and peers how they manage complex teaching challenges. During mastery experiences, pre-service teachers accomplish these tasks themselves and build confidence. Taken together, the dissertation thus has important implications for practice. However, methodologically profound intervention studies are needed to provide evidence of the effectiveness of these interventions (discussed below).

7.6 Limitations and Future Directions

Although this research yielded insight into the multidimensional nature of pre-service teacher well-being and potential well-being profiles, it is important to acknowledge limitations that must be considered and that warrant attention in future research. The first limitation relates to the literature review presented in Chapter 2, which considered empirical evidence on pre-

service teacher well-being. For future research, a systematic literature review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021) would offer a more comprehensive and structured overview, including detailed flow charts. Additionally, the literature search could be expanded by incorporating additional electronic databases such as Web of Science, PsycInfo, and Science Direct. Furthermore, studies examining well-being among German pre-service teachers in their second phase of ITE were initially excluded due to the strong similarity with the induction phase in other countries. However, integrating these studies in future literature reviews might provide valuable insights into well-being during the critical transition from ITE to independent teaching after career entry.

The second limitation concerns missing evidence for the content validity of the pre-service teacher well-being questionnaire. While using a model-determined approach (Collie & Hascher, 2024) comes with its advantages, such as being strongly grounded theoretically, the model of scholastic well-being (Hascher, 2004, 2023) was not applied as is but was adapted to the context of ITE. This means that items were not generated using deductive or inductive methods such as a literature review or qualitative data (Boateng et al., 2018), which has potential drawbacks. There is a risk that the adaption applied in this dissertation contains items irrelevant to the construct or underrepresented items (AERA et al., 2014). The questionnaire might contain dimensions more suited to school settings than ITE while potentially missing crucial ITE-specific well-being dimensions. For example, the current model only covers pre-service teachers' negative social functioning during ITE through the dimension "Social problems related to ITE," and it might be beneficial to integrate an indicator that captures their positive social functioning in ITE (Bjorklund et al., 2021; Keyes, 1998). However, such adaptions would need to be theoretically grounded, justifying the inclusion as an indicator and not a predictor of pre-service teacher well-being while also keeping the parsimony of the model in mind. To address this limitation, future research could enhance the findings by gathering evidence regarding content-oriented validity. This might involve conducting semi-structured interviews or analyzing responses to open-ended survey questions (Chen et al., 2024; Holzer et al., 2021). With such a procedure, the proposed well-being dimensions of the pre-service teacher well-being questionnaire could be aligned with the perspective of pre-service teachers themselves.

The third limitation refers to excluding the well-being dimension "Social problems in ITE" from all three studies due to insufficient reliability. This exclusion compromised construct validity analyses and reduced the latent profile analyses from the theoretically proposed six

well-being dimensions to five. Two alternative approaches for revising the scale in future research are: (1) measuring overall negative social functioning experienced by pre-service teachers (e.g., "In the last few weeks, I experienced conflicts and misunderstandings in my studies") or (2) concentrating on social problems with a specific social partner instead of several, such as fellow students (e.g., "In the last few weeks, I experienced conflicts and misunderstandings with my fellow students"). Two potential scales based on these approaches are detailed in Appendix E for future research consideration. Once a scale with sufficient reliability is developed, it becomes crucial to investigate whether similar profile solutions and associations between pre-service teacher characteristics, resources, and retention-related outcomes emerge when incorporating the "Social problems in ITE" dimension as an additional profile indicator.

The fourth limitation concerns the fact that pre-service teacher well-being and the other constructs of interest were measured using quantitative self-report questionnaires. While self-reporting is a common practice to grasp the subjective nature of well-being (Diener, Lucas, et al., 2018; Diener, Oishi, et al., 2018; Diener et al., 2010), this approach does have certain limitations that should be recognized. On the one hand, there is a risk that social desirability may have influenced responses (Richman et al., 1999), even though participants were ensured that their data would be anonymized. On the other hand, there is little knowledge of how well-being measures interact with participants, such as whether participants draw upon individual or social norms when responding (Alexandrova & Fabian, 2022). To mitigate this limitation, in future studies, cognitive interviews using the think-aloud method might be used to gain insight into the cognitive processes of pre-service teachers when answering the questionnaire (Beatty & Willis, 2007). Future research could also complement these findings by utilizing objective and observational data or by integrating perspectives from other ITE stakeholders, such as lecturers (Chigeza, 2023; Sonnentag, 2015). A related limitation is the quantitative nature of the investigation; integrating qualitative and quantitative data could provide a deeper and richer insight into well-being experiences (Fox et al., 2020; Hascher, 2008). Applying a mixed-methods study design might be a promising avenue to investigate pre-service teacher well-being more comprehensively. For instance, extending the current investigation into a sequential explanatory design (Creswell & Plano Clark, 2018) by conducting semi-structured interviews with pre-service teachers from different well-being profiles could offer deeper insights into their experiences. Specifically, using well-being timelines as visual support to stimulate reflections during interviews might be particularly effective in capturing nuanced well-being narratives (Pihlainen et al., 2024).

The fifth limitation lies in the cross-sectional study designs. Although the order of resources and retention-related outcomes of pre-service teacher well-being was in line with established theories (JD-R theory, Bakker & Demerouti, 2017; SD-R theory, Bakker & Mostert, 2024), it is important to highlight that the cross-sectional data did not allow to test for causality. Further research using longitudinal research designs is needed to test the direction of empirical links identified in this investigation. For example, although teacher self-efficacy was positioned as a predictor of pre-service teacher well-being in Study 3, it might also be an outcome of pre-service teacher well-being (Zee & Koomen, 2016). Moreover, longitudinal data would allow for testing the stability of well-being profiles over the course of ITE (Morin et al., 2020). Capturing short-term fluctuations ("states") through shorter time lags (e.g., daily measurement points using diaries or experience sampling methods would allow investigating nuanced well-being dynamics (Dormann & Griffin, 2015; Hascher, 2008; Sonnentag, 2015; Wentzel, 2024).

Sixth, there are several limitations regarding the generalizability of the findings: First, the samples in this investigation were restricted to pre-service teachers from German-speaking countries (Switzerland, Germany, and Austria). It is important to also provide evidence for the pre-service teacher well-being questionnaire and the identified well-being profiles across diverse linguistic settings. Second, all studies used convenience sampling strategies, resulting in non-representative samples with pre-service teachers from different ITE institutions and a variety of different study programs (Teddlie & Yu, 2007). This may have introduced bias due to the potential underrepresentation of pre-service teachers with low well-being, since study participation involved extra work. Examining pre-service teachers within specific ITE institutions or study programs—to better account for the contextuality of well-being—and integrating the questionnaire within courses with attendance (still ensuring voluntary participation) would be a promising avenue for future research. Third, data was collected during different phases of the COVID-19 pandemic. The data collection for Study 3 in spring 2021 captured the well-being of Austrian pre-service teachers studying mainly in distance learning settings. One year later in spring 2022, the data was collected for Study 1 and Study 2. Most COVID-19 restrictions had been lifted after almost two years and face-to-face learning was possible again (Dittler & Kreidl, 2023). These pre-service teachers learned mostly in a face-to-face setting; however, pre-service teachers enrolled in higher study years had to build on (a lack of) experiences from almost two years of restricted ITE. Therefore, it is important to test whether the identified profiles and links with pre-service teacher characteristics, resources, and retention-related outcomes also apply to post-pandemic ITE contexts. Particularly, the distribution within the profiles must be interpreted with caution, as it might be linked to these

challenging circumstances such as the uncertainty of the situation or canceled teaching practicums (Kan et al., 2022; Pausits et al., 2021).

Seventh, the dissertation investigated two contextual resources (practicum quality and practicum-university coherence), one personal resource (teacher self-efficacy), and two retention-related outcomes (ITE quitting intentions and profession quitting intentions). Future research could explore additional salient factors that might be relevant to pre-service teacher well-being. In terms of contextual resources, investigating factors linked to the three basic psychological needs in self-determination theory—competence, autonomy, and relatedness (Ryan & Deci, 2000, 2022)—appears promising. Potential contextual resources could include a constructive feedback culture, sense of belonging to the program, or perceived support for autonomy during teaching practicums (Bjorklund et al., 2021; Pan et al., 2025). For personal resources, exploring social-emotional competencies and mindfulness could provide valuable insights. These resources have been identified as critical for teacher well-being (Collie & Perry, 2019; Hwang et al., 2017), with emerging variable-centered research also suggesting significant links to pre-service teacher well-being (Braun & Hooper, 2024; Hirshberg et al., 2020; Hue & Lau, 2015). Retention-related outcomes could be expanded beyond quitting intentions to include measures of occupational commitment (Klassen & Chiu, 2011) and persistence (Kim & Corcoran, 2018). Furthermore, specific evidence for pre-service teachers is needed for outcomes such as achievement in ITE. Beyond resources and outcomes of well-being, SD-R theory (Bakker & Mostert, 2024) also emphasizes the importance of integrating study demands. Potential ITE demands identified by qualitative research include time pressure and workload (Mairitsch et al., 2021; Malone et al., 2024; O' Brien et al., 2022; Thompson et al., 2020). Moreover, Bakker and Mostert (2024) suggested expanding SD-R theory to other life domains, presenting an intriguing avenue for future research. This could involve examining resources and demands from home contexts, such as social connections with family and friends outside of ITE (Squires et al., 2022), but the work context also seems promising, as many pre-service teachers work part-time as teachers besides ITE due to teacher shortages (Meyer et al., 2024; Scheidig & Holmeier, 2022; SKBF, 2023). While relations between working part time as a teacher besides ITE and well-being profiles yielded mixed results in Study 3, it would be interesting to also consider resources and demands from the job context in schools to further enhance our understanding (Helm et al., 2024).

Eighth, while the person-centered research allowed the identification of well-being profiles beyond sample-wide correlational patterns, variable-centered research, such as structural equation modeling, may shed further light on distinct associations between resources,

well-being dimensions, and outcomes. Investigating positive and negative well-being dimensions separately would allow for testing the postulated motivational process (Bakker & Mostert, 2024) that resources are strongly and positively related with the positive well-being dimensions and, according to the dual process hypothesis (Collie, 2023), weakly and negatively associated with the negative well-being dimensions. When also including ITE demands, this would further allow for testing the health impairment process and potential buffering and boosting effects postulated by SD-R theory (Bakker & Mostert, 2024). The proposition of SD-R theory (Bakker & Mostert, 2024) that resources and demands are directly related to outcomes and indirectly related through the mediation of well-being could also be tested. For example, Granziera et al. (2022) combined both a person- and variable-centered approach to investigate JD-R theory among teachers, demonstrating that this complementary approach allowed a more nuanced understanding of teachers' psychological functioning at work.

Ninth, the current dissertation provided some suggestions for promoting pre-service teacher well-being; however, intervention studies are required to test their effectiveness (Hascher & Schmitz, 2010). Interventions that have been tested so far to promote pre-service teacher well-being include mindfulness-based programs (Hirshberg et al., 2020; Hue & Lau, 2015), a PROSPER-based intervention (Lee et al., 2023), emotional intelligence training (Vesely et al., 2014), a yoga-based intervention (Hepburn et al., 2021a), a positive psychology-based intervention (Dreer, 2021a), and a stress management and social-emotional learning program (Boke et al., 2024). However, these studies focused mainly on general well-being, thus more research is required. Future avenues for intervention studies might include study crafting interventions that engage pre-service teachers in proactively using strategies to optimize study resources and demands, which has already proven successful for university students (Körner et al., 2023). Besides study crafting, job crafting strategies during teaching practicums could also be investigated, such as increasing job resources (e.g., establishing a network that provides social support or developing organizational skills) and decreasing hindering job demands (e.g., setting boundaries to reduce workload or separating work and spare time) to support well-being (Aulén et al., 2024). In this way, even before career entry, pre-service teachers could learn how to optimize resources and demands in the teaching workplace and increase their well-being. When designing such intervention studies, it might be helpful to build on experience from well-being intervention studies for teachers (for reviews, see Beames et al., 2023; Cann et al., 2024; Dreer & Gouasé, 2022) and university students (for reviews, see Ferrari et al., 2022; Upsher et al., 2022), such as high-quality reporting, multimodal interventions, implementing co-design with participants, or technology-assisted intervention programs. In the context of the ongoing

digital transformation, the relationship between artificial intelligence use in education and well-being is becoming increasingly important and represents a promising avenue for potential intervention studies (Alsayed et al., 2024; Bittencourt et al., 2024; Ehrlich et al., 2023). For example, Bittencourt et al. (2024) coined the term Positive Artificial Intelligence in Education (P-AIED), which aims to promote learning and well-being in education through the application of artificial intelligence (e.g., positive learning analytics, positive educational data mining, or positive intelligent tutoring systems).

Tenth, future research could link the discourse of pre-service teacher well-being with the discourse on teacher professionalism and occupational health. Establishing a professional understanding in the teaching profession, in which maintaining well-being as a lifelong developmental process forms an integral part, seems promising (Herzog et al., 2021; Sandmeier, 2024). Recently, Thönes (2024) has illustrated how well-being relates to professional competencies as encompassing professional knowledge, beliefs, motivational orientations, and self-regulation skills (Baumert & Kunter, 2013). For instance, Thönes (2024) anchored strategies for maintaining well-being in the facet of self-regulation, encompassing responsible management of personal resources and the ability to balance professional engagement with adequate distancing from work. In this regard, it would also be beneficial to develop an integrative framework that supports conceptual clarification of (pre-service) teacher well-being and the construct of occupational health. This would allow for a link between the extensive research on patterns of work-related coping behavior in the teaching profession (e.g., Kieschke & Schaarschmidt, 2008) and the identified adaptive, maladaptive, and mixed well-being profiles. At the core of the work lies the identification of four patterns, which are based on the interplay of professional commitment, coping capacity, and subjective well-being in the context of work (Kieschke & Schaarschmidt, 2008), and which were also identified in samples with German and Swiss pre-service teachers (Deiglmayr et al., 2018; Römer et al., 2013; Zimmermann et al., 2012).

Finally, this dissertation focused on the well-being of pre-service teachers and thus on one stakeholder in ITE. Future research could initiate scientific discourse about the well-being of all stakeholders involved in ITE, such as lecturers in ITE institutions, mentor teachers, and students in schools. In this regard, knowledge is very limited. For example, emerging qualitative research from Germany and the Netherlands suggests that university student well-being and lecturer well-being is linked through their relationship (Kiltz et al., 2020). In Germany, Dreer (2023b) quantitatively discovered links between pre-service teacher well-being and the well-being of their mentor teachers during teaching practicums. Future research is needed to enhance

the understanding of these links. Particularly, through the advocacy role of ITE institutions in educational systems, their connectedness with schools, and their impact on future teachers (Ell et al., 2019), ITE institutions hold a significant key to promoting flourishing in education and beyond.

8 Conclusion

This dissertation illuminated pre-service teacher well-being by investigating its multidimensionality and exploring well-being profiles. It addressed significant research gaps in this under-explored field through three interconnected studies. In terms of the conceptualization and measurement of the construct, the dissertation first provided a comprehensive overview of how pre-service teacher well-being has been conceptualized in prior empirical research. A notable finding was the significant heterogeneity of conceptualizations employed in studies, which challenges cumulative research. By developing the pre-service teacher well-being questionnaire, the dissertation directly addressed the critical need for a validated, theoretically grounded instrument that encompasses both positive and negative well-being dimensions and that accounts for the ITE context. Through latent profile analyses, the research illustrated the diverse well-being experiences among two independent pre-service teacher samples, revealing adaptive, maladaptive, and mixed well-being profiles. Methodologically, the findings also highlighted potential differences in profile solutions when using standardized versus unstandardized factor scores, thereby calling for a stronger methodological discourse in this regard. The research suggests that multidimensional interventions targeting both positive and negative well-being dimensions—and tailored to the unique needs of different profiles—could be beneficial for addressing pre-service teacher well-being. Moreover, promoting ITE resources, such as high-quality teaching practicums and improved practicum-university coherence, alongside personal resources like teacher self-efficacy, emerges as a promising approach to supporting pre-service teacher well-being. Critically, the dissertation underscored the importance of pre-service teacher well-being for teacher retention—a particularly relevant insight given that many educational systems around the globe are facing teacher shortages. However, numerous questions remain about how to best support pre-service teachers to feel well on their path to becoming teachers and prepare them to flourish within school communities once they enter the profession. A promising next step might be to extend the scientific discourse on pre-service teacher well-being to other stakeholders in ITE, making flourishing a shared priority in education.

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Appendix A

Table A1

Overview of empirical studies (n = 57) included in the literature review

Author(s) and Year	Title	Methods [a]	Conceptualization of pre-service teacher well-being			
			Model-determined [b]	Model-informed	Context-unspecific	Context-specific
Asici (2021)	Social entrepreneurship and psychological well-being in teaching candidates: Mediator role of hope	Quantitative		•	•	
Atabek et al. (2019)	Psychological well-being of prospective teachers: The case of pedagogical formation students	Quantitative		•	•	
Bingöl and Batık (2019)	Unconditional self-acceptance and perfectionistic cognitions as predictors of psychological well-being	Quantitative		•	•	
Bjorklund et al. (2021)	Finding satisfaction in belonging: Preservice teacher subjective well-being and its relationship to belonging, trust, and self-efficacy	Quantitative		•	•	
Boke et al. (2024)	Two for one: Effectiveness of a mandatory personal and classroom stress management program for preservice teachers	Quantitative		•	•	
Braun and Hooper (2024)	Social and emotional competencies predict pre-service teachers' occupational health and personal well-being	Quantitative		•	•	•
Bredehöft (2023)	The importance of job-related self-insight, not self-reflection, for well-being and burnout in student teachers	Quantitative		•	•	
Carstensen et al. (2021)	Wahrgenommene Wertschätzung im Lehramtsstudium: Fachunterschiede und Effekte auf Wohlbefinden und Abbruchsintention	Quantitative		•		•
Cavioni et al. (2023)	Portraits of pre-service special education teachers: Perspectives on well-being and its association with self-efficacy and work engagement	Quantitative		•	•	
Chigeza (2023)	Preservice teachers' wellbeing in mathematics education	Quantitative + Qualitative		•		•

Author(s) and Year	Title	Methods [a]	Conceptualization of pre-service teacher well-being			
			Model-determined [b]	Model-informed	Context-unspecific	Context-specific
Ciyin and Erturan-İlker (2014)	Student physical education teachers' well-being: Contribution of basic psychological needs	Quantitative		•	•	
Corcoran and O'Flaherty (2022)	Social and emotional learning in teacher preparation: Pre-service teacher well-being	Quantitative	•		•	
Daniels et al. (2017)	Combinations of personal responsibility: Differences on pre-service and practicing teachers' efficacy, engagement, classroom goal structures and wellbeing	Quantitative		•	•	
Datu and Lin (2022)	The mental health benefits of kind university climate: Perception of kindness at university relates to longitudinal increases in well-being	Quantitative		•	•	
Datu et al. (2023)	Leveraging technology for pre-service teachers' well-being: The effectiveness of a multicomponent positive psychology intervention in pre-service preschool teachers in Hong Kong	Quantitative	•		•	•
de Albéniz-Garrote and Gómez (2020)	The innovative and research professional identity of future early years and primary school teachers and their relationship with psychological well-being	Quantitative		•	•	
Dreer (2021a)	Fostering well-being over the radio? An empirical study investigating the effects of an audio podcast-based intervention program on student teachers' well-being	Quantitative		•	•	•
Dreer (2021b)	The significance of mentor–mentee relationship quality for student teachers' well-being and flourishing during practical field experiences: a longitudinal analysis	Quantitative	•			•
Dreer (2023b)	Witnessing well-being in action: Observing teacher well-being during field experiences predicts student teacher well-being	Quantitative	•			•
Gustems-Carnicer and Calderón (2013)	Coping strategies and psychological well-being among teacher education students	Quantitative		•	•	
Gustems and Calderón (2014)	Character strengths and psychological wellbeing among students of teacher education	Quantitative		•	•	

Author(s) and Year	Title	Methods [a]	Conceptualization of pre-service teacher well-being			
			Model-determined [b]	Model-informed	Context-unspecific	Context-specific
Hagger and Malmberg (2011)	Pre-service teachers' goals and future-time extension, concerns, and well-being	Quantitative		•	•	
Hartl et al. (2022)	Promoting student teachers' well-being: A multi-study approach investigating the longitudinal relationship between emotional exhaustion, emotional support, and the intentions of dropping out of university	Quantitative		•		•
Hepburn et al. (2021a)	Promoting stress management and wellbeing for teachers, a pilot study	Quantitative		•	•	
Hepburn et al. (2021b)	The relationship between mindful attention awareness, perceived stress and subjective wellbeing	Quantitative		•	•	
Hirshberg et al. (2020)	Integrating mindfulness and connection practices into preservice teacher education improves classroom practices	Quantitative		•	•	
Howells and Cumming (2012)	Exploring the role of gratitude in the professional experience of pre-service teachers	Qualitative		•		•
Hue and Lau (2015)	Promoting well-being and preventing burnout in teacher education: a pilot study of a mindfulness-based programme for pre-service teachers in Hong Kong	Quantitative + Qualitative		•	•	
Kasapoglu and Didin (2019)	Life skills as a predictor of psychological well-being of pre-service pre-school teachers in Turkey	Quantitative		•	•	
Kaya and Çenesiz (2020)	The predictor roles of life-satisfaction, and intrinsic-extrinsic motivation on the psychological well-being of pre-service teachers	Quantitative		•	•	
Kendrick et al. (2024)	Streaking and self-care planning: the influence of integrating a well-being initiative in one teacher education program	Quantitative + Qualitative		•		•
Lee et al. (2023)	The effects of a PROSPER-based intervention on well-being among pre-service preschool teachers during the COVID-19 pandemic: a randomized control trial	Quantitative	•		•	•

Author(s) and Year	Title	Methods [a]	Conceptualization of pre-service teacher well-being			
			Model-determined [b]	Model-informed	Context-unspecific	Context-specific
Lee, Fung and Chung (2024)	Reciprocal relationships between early childhood education teachers' well-being and self-efficacy: a cross-lagged panel design	Quantitative	•		•	•
Lee, Fung, Datu, et al. (2024)	Well-being profiles of pre-service teachers in Hong Kong: Associations with teachers' self-efficacy during the COVID-19 pandemic	Quantitative		•	•	•
Lemon (2021)	Wellbeing in initial teacher education: using poetic representation to examine pre-service teachers' understanding of their self-care needs	Qualitative		•		•
Lin and Datu (2023)	Perception of kindness at university relates to emotion regulation and well-being outcomes among Chinese early childhood pre-service teachers during the COVID-19 pandemic	Quantitative		•	•	
Mairitsch et al. (2021)	Being a student, becoming a teacher: The wellbeing of pre-service language teachers in Austria and the UK	Qualitative		•		•
Malone et al. (2024)	How primary trainee teachers' intersectionality exacerbates issues of wellbeing	Qualitative		•		•
Meulenbroek et al. (2012)	The impact of the voice in relation to psychosomatic well-being after education in female student teachers. A longitudinal, descriptive study	Quantitative		•	•	
Nalipay et al. (2019)	Implicit beliefs about teaching ability, teacher emotions, and teaching satisfaction	Quantitative		•		•
Ngui and Lay (2018)	Investigating the effect of stress-coping abilities on stress in practicum training	Quantitative		•	•	
Nimasari et al. (2024)	How do Indonesian student-teachers experience wellbeing during research supervision? A qualitative interview study	Qualitative	•			•
O' Brien et al. (2020)	Levels of wellbeing, resilience, and physical activity amongst Irish pre-service teachers: a baseline study	Quantitative		•	•	
O' Brien et al. (2022)	Physical education student teachers' wellbeing during Covid-19: Resilience resources and challenges from school placement	Qualitative		•		•

Author(s) and Year	Title	Methods [a]	Conceptualization of pre-service teacher well-being			
			Model-determined [b]	Model-informed	Context-unspecific	Context-specific
Pihlainen et al. (2024)	Timelines in researching student teachers' well-being during teaching practice	Qualitative		•		•
Price and McCallum (2015)	Ecological influences on teachers' well-being and "fitness"	Qualitative		•		•
Sak and Gurbuz (2024)	Dynamic changes in pre-service language teacher well-being in the classroom ecology: A micro approach	Quantitative + Qualitative		•		•
Schriek et al. (2024)	Pandemic rollercoaster: University students' trajectories of emotional exhaustion, satisfaction, enthusiasm, and dropout intentions pre-, during, and post-COVID-19	Quantitative		•		•
Squires et al. (2022)	Understanding self perceptions of wellbeing and resilience of preservice teachers	Quantitative + Qualitative		•	•	•
Sulis et al. (2021)	Pre-service language teacher wellbeing as a complex dynamic system	Qualitative		•		•
Thompson et al. (2020)	Averting the crisis in trainee teacher well-being – learning lessons across European contexts: a comparative study	Qualitative		•		•
Väisänen et al. (2017)	Social support as a contributor to student teachers' experienced well-being	Qualitative		•		•
Varol et al. (2023)	Practicum in teacher education: the role of psychological detachment and supervisors' feedback and reflection in student teachers' well-being	Quantitative		•		•
Vesely et al. (2014)	EI training and pre-service teacher wellbeing	Quantitative		•	•	
Wang et al. (2022)	Formality or reality: Student teachers' experiences of ethical dilemmas and emotions during the practicum	Qualitative		•		•
Ye and Wang (2024)	Profession-related support and subjective well-being in a sample of Chinese student teachers: the role of professional identity and trait gratitude×gender	Quantitative		•	•	

Author(s) and Year	Title	Methods [a]	Conceptualization of pre-service teacher well-being			
			Model-determined [b]	Model-informed	Context-unspecific	Context-specific
Zhao et al. (2022)	Profiles of teacher professional identity among student teachers and its association with mental health	Quantitative		•	•	

Note. [a] The methodological approach that was taken to examine the construct of pre-service teacher well-being. [b] Studies were classified as taking the model-determined approach when all of the proposed model dimensions were examined individually (e.g., only measuring life satisfaction as part of the concept of subjective well-being or measuring the six-dimensional construct of psychological well-being using a one-dimensional scale was classified as model-informed approach)

Appendix B

Information Letters for Study Participation

Lehrperson werden: Wohlbefinden im Studium

Liebe Kollegin, lieber Kollege

Wir entwickeln derzeit ein Erhebungsinstrument, mit dem wir das Wohlbefinden von Lehramtsstudierenden mehrdimensional erfassen möchten. Für die empirische Validierung des Fragebogens möchten wir Studierende um ihre Mitarbeit in der folgenden Onlinebefragung bitten:

Zielgruppe: Lehramtsstudierende aller Zielstufen und aller Fachrichtungen
Dauer: 10 bis 15 Minuten
Zeitraum: heute bis zum 25. Mai 2022
Zugang: https://feh2.phsg.ch/SR/Survey/1998

In dem Zusammenhang möchten wir mit der folgenden Anfrage und Bitte an Sie gelangen: Wäre es Ihnen möglich, unsere Onlinebefragung in Ihren Lehrveranstaltungen zu integrieren? Um den Aufwand möglichst gering zu halten, finden Sie im Anhang das Anschreiben mit der Einladung für die Studierenden (PDF-Datei «Wohlbefinden_Einladung Studierende»).

Die Studierenden haben am Ende der Onlinebefragung die Möglichkeit, ihre Selbsteinschätzungen als PDF-Datei herunterzuladen und beispielsweise für ein Portfolio weiterzuverwenden. Um einen Eindruck der Onlinebefragung zu erhalten, können Sie diese gerne als Gast über denselben Zugang (Link und QR-Code) ausfüllen. Um Mehrfachteilnahmen zu vermeiden, kann die Onlinebefragung nur einmal beantwortet werden.

Die Daten der Studierenden werden selbstverständlich anonymisiert erfasst sowie vertraulich behandelt. Als Dank für Ihre Unterstützung und falls von Ihnen gewünscht, stellen wir Ihnen gerne die Daten Ihrer Hochschule nach Ablauf eines einjährigen Embargos zur Verfügung. Bitte melden Sie sich bei Interesse bei Manuela Haldimann (manuela.haldimann@phsg.ch). Ab Oktober 2022 finden Sie auf unserer Projektwebsite erste Studienergebnisse aufgeführt.

Bei Fragen gibt Ihnen Manuela Haldimann (manuela.haldimann@phsg.ch) gerne Auskunft. Wir wünschen Ihnen eine gute, gesunde und energiereiche Zeit.

Herzliche Grüsse,
Prof.in Dr.in Tina Hascher (Universität Bern)
Prof.in Dr.in Doreen Holtsch (Pädagogische Hochschule St.Gallen)
M. Sc. Manuela Haldimann (Pädagogische Hochschule St.Gallen)

Lehrperson werden: Wohlbefinden im Studium

Liebe Studentin, lieber Student

Wie geht es Ihnen in Ihrem Studium? Mit der Teilnahme an dieser Onlinebefragung haben Sie die Gelegenheit, eine Rückmeldung zu Ihrem Wohlbefinden im Studium zu geben.

Warum ist Ihre Teilnahme von Bedeutung?

- Ihre Antworten helfen uns, das Wohlbefinden von Studierenden auf dem Weg in den Lehrberuf besser zu verstehen.
- Sie haben durch die Onlinebefragung eine wertvolle Gelegenheit zur Selbstreflexion. Am Ende der Onlinebefragung haben Sie die Möglichkeit, Ihre Selbsteinschätzungen als PDF-Datei herunterzuladen (z. B. für ein Portfolio).

Die Onlinebefragung kann bis zum **25. Mai 2022** über alle gängigen Geräte (Smartphone, Computer, Tablet) und Betriebssysteme ausgefüllt werden und dauert **10 bis 15 Minuten**. Die Daten werden anonymisiert erfasst und vertraulich behandelt. Die Teilnahme ist freiwillig. Um aussagekräftige Ergebnisse zu erhalten, ist jedoch die Teilnahme möglichst vieler Studierenden – auch von Ihnen – sehr wichtig. Falls Sie diese Einladung bereits erhalten und die Onlinebefragung beantwortet haben, ist eine weitere Teilnahme nicht mehr möglich.

Via Link oder QR-Code haben Sie direkt Zugang zur Befragung:

Wir danken Ihnen für Ihre Unterstützung! Bei Fragen gibt Manuela Haldimann (manuela.haldimann@phsg.ch) gerne Auskunft. Bei Interesse finden Sie ab Oktober 2022 auf unserer Projektwebsite erste Studienergebnisse aufgeführt.

Herzliche Grüsse,
Prof.in Dr.in Tina Hascher (Universität Bern, Schweiz)
Prof.in Dr.in Doreen Holtsch (Pädagogische Hochschule St.Gallen, Schweiz)
M. Sc. Manuela Haldimann (Pädagogische Hochschule St.Gallen, Schweiz)

Appendix C

Supplementary Materials (Study 1)

The pre-service teacher well-being questionnaire

[with original German version in brackets]

Scoring

1. Not true at all [Trifft überhaupt nicht zu]
2. Not true [Trifft nicht zu]
3. Partly not true [Trifft teilweise nicht zu]
4. Partly true [Trifft teilweise zu]
5. True [Trifft zu]
6. Totally true [Trifft völlig zu]

Question: We would like to know how you rate your well-being during your initial teacher education studies. To what extent do the following statements apply to you? [Wir möchten gerne erfahren, wie Sie Ihr Wohlbefinden im Lehramtsstudium einschätzen. Inwiefern treffen die folgenden Aussagen auf Sie zu?]

Factor		Item wording
1 Positive attitudes towards ITE [Positive Einstellungen zum Lehramtsstudium]	pa_ITE_1	I feel well in my studies. [Ich fühle mich in meinem Studium wohl.]
	pa_ITE_2	I like doing my studies. [Ich absolviere mein Studium gerne.]
	pa_ITE_3	What ever happens, there is something positive about my studies. [Was auch immer passiert, mein Studium hat etwas Gutes.]
	pa_ITE_4	My studies make sense to me. [Mein Studium scheint mir sinnvoll.]
2 Enjoyment of ITE [Freude im Lehramtsstudium]		In the last few weeks, I have experienced enjoyment in my studies because … [In den letzten Wochen habe ich mich im Studium gefreut, weil …]
	enj_ITE_1	… I could show what I can or what I had learned. […ich zeigen konnte, was ich kann bzw. was ich dazugelernt habe.]
	enj_ITE_2	… I have had the feeling that I can influence important things in my everyday study life. […ich das Gefühl hatte, wichtige Dinge im Studienalltag beeinflussen zu können.]
	enj_ITE_3	… I have performed well in an exam / certificate of achievement.
	item eliminated	[…mir eine Prüfung / ein Leistungsnachweis gut gelungen ist.]
	enj_ITE_4	… I have received recognition from others (e.g., other students, course instructors / professors, mentors). […ich von anderen (z. B. Studierenden, Lehrveranstaltungsleiter:innen / Professor:innen, Praxislehrpersonen) Anerkennung erhalten habe.]
3 Positive academic self-concept	pasc_ITE_1	I am able to do the tasks in my studies as good as most other students.

Factor		Item wording
regarding ITE [Positives akademisches Selbstkonzept im Lehramtsstudium]		[Ich bin fähig, Dinge im Studium ebenso gut zu tun, wie die meisten anderen Studierenden.]
	pasc_ITE_2	I can easily solve challenges in my studies. [Ich kann Herausforderungen im Studium leicht lösen.]
	pasc_ITE_ 3	I am satisfied with the way I am progressing in my studies.
	item eliminated	[Ich bin zufrieden mit der Art und Weise, wie ich mich im Studium weiterentwickle.]
	pasc_ITE_4	I learn things quickly in my studies. [Ich lerne Dinge im Studium schnell.]
4 Worries about ITE [Sorgen wegen des Lehramtsstudiums]		In the last few weeks, I have been worried … [In den letzten Wochen habe ich mir Sorgen gemacht …]
	wor_ITE_1	… about my studies. [... wegen des Studiums.]
	wor_ITE_2	… about exams and certificates of achievement in my studies. [… wegen Prüfungen und Leistungsnachweisen im Studium.]
	wor_ITE_3	… how it will continue in my studies or how it will continue after my studies. [… wie es im Studium weitergeht oder wie es nach dem Studium weitergeht.]
5 Physical complaints related to ITE [Physische Probleme wegen des Lehramtsstudiums]		In the last few weeks, because of my studies I … [In den letzten Wochen kam es vor, dass ich wegen des Studiums …]
	pc_ITE_1	… had a stomachache. [… Bauchschmerzen hatte.]
	pc_ITE_2	… could not sleep well. [… nicht gut schlafen konnte.]
	pc_ITE_3	… had a severe headache. [… starke Kopfschmerzen hatte.]
	pc_ITE_4	… had no appetite. [… keinen Appetit hatte.]
6 Social problems in ITE [Soziale Probleme im Lehramts-studium] *factor eliminated*		In the last few weeks, I experienced … [In den letzten Wochen kam es vor, dass …]
	sp_ITE_1	… problems with other students.
	item eliminated	[… ich Probleme mit Studienkolleg:innen hatte.]
	sp_ITE_2	… problems with course instructors / professors / mentors.
	item eliminated	[... ich Probleme mit Lehrveranstaltungsleiter:innen / Professor:innen / Praxislehrpersonen hatte.]
	sp_ITE_3	… feeling like an outsider in my studies.
	item eliminated	[... ich mich im Studium als Aussenseiter:in fühlte.]

Appendix D

Supplementary Materials (Study 3)

1 Adapted German Items Used in the Study

The German items used to assess initial teacher education (ITE) resources, personal resources, and retention-related outcomes are shown in Table D1-D3. All items were rated on a six-point Likert scale:

1 = trifft überhaupt nicht zu [Not true at all]
2 = trifft nicht zu [Not true]
3 = trifft teilweise nicht zu [Partly not true]
4 = trifft teilweise zu [Partly true]
5 = trifft zu [True]
6 = trifft völlig zu [Totally true]

Table D1

Adapted German Items Used to Measure Initial Teacher Education Resources

Practicum quality (adapted from Flagmeyer & Hoppe-Graff, 2006, in Kauper et al., 2009)	
	Wenn ich an meine Praktika zurückdenke, dann… [When I think about my teaching practicums, then ...]
1	…habe ich viel Fachliches dazugelernt. […I have learned a lot about the subject matter.]
2	…habe ich viel über das Unterrichten gelernt. […I have learned a lot about teaching.]
3	…habe ich viel über die Arbeit mit Schüler:innen gelernt. […I have learned a lot about working with students.]
4	…ist es mir leichtgefallen, mich in die Rolle der Lehrperson zu versetzen. […it was easy for me to put myself in the role of a teacher.]
5	…habe ich erfahren, was eine Lehrperson über das Unterrichten hinaus tun muss. […I have learned what a teacher must do beyond teaching.]
Practicum-university coherence (adapted from Klemenz et al., 2014)	
	Weiter möchten wir gerne wissen, wie Sie die Begleitlehrveranstaltungen an der Hochschule bewerten, in denen Sie auf die Schul- und Unterrichtspraktika vor- und nachbereitet wurden. [Further, we would like to know how you evaluate the accompanying courses at the university that prepared you for and followed up on your teaching practicums.]
1	Ich habe mich durch die Lehrveranstaltungen gut auf die Schulpraxis vorbereitet gefühlt. [The university courses prepared me well for school practice.]
2	Die Informationen zur Schulpraxis in den Lehrveranstaltungen waren ausreichend. [The information about school practice in the university courses was sufficient.]
3	Die Lehrveranstaltungen konnten einen Bezug zur Schulpraxis herstellen. *(own construction)* [The university courses were able to establish a connection to school practice.]
4	Die Lehrveranstaltungen haben mir geholfen, mich in der Schulpraxis zurechtzufinden. [The university courses helped me find my way in school practice.]
5	Durch die Lehrveranstaltungen wusste ich, was in der Schulpraxis auf mich zukommt. [Through the university courses, I knew what to expect in school practice.]
6	Die Inhalte der Lehrveranstaltungen waren auf das zugeschnitten, was mich in der Schulpraxis erwartete. [The content of the university courses was tailored to what awaited me in school practice.]
7	Die Lehrveranstaltungen haben mir geholfen, in der Schulpraxis aufkommende Probleme zu lösen. *(own construction)* [The university courses helped me solve problems that arose in school practice.]

Table D2

Adapted German Items Used to Measure Personal Resources

Emotional support (adapted from Baumert et al., 2009)	
1	Ich kann meinen Schüler:innen helfen, wenn sie schulische Probleme haben. [I can help my students when they have school-related problems.]
2	Ich kann zu meinen Schüler:innen Vertrauen aufbauen. [I can build trust with my students.]
3	Ich kann Bedürfnisse meiner Schüler:innen erkennen. *(own construction)* [I can recognize the needs of my students.]
4	Ich kann auf die Bedürfnisse meiner Schüler:innen eingehen. *(own construction)* [I can respond to the needs of my students.]
Classroom organization (translated items from Tschannen-Moran & Woolfolk Hoy, 2001, adpted from Kunter et al., 2017)	
1	Ich kann verhindern, dass einige Schüler:innen meine Unterrichtsstunde massiv stören. [I can prevent some students from severely disrupting my lesson.]
2	Ich kann meinen Schüler:innen deutlich machen, was für ein Verhalten ich von ihnen erwarte. [I can make clear to my students what behavior I expect from them.]
3	Ich kann auf herausfordernde Schüler:innen angemessen reagieren. [I can react appropriately to challenging students.]
Instructional support (adapted from Gröschner & Schmitt, 2009)	
1	Ich kann die Auswahl von Aufgaben für den Unterricht inhaltlich und methodisch begründen. [I can justify the selection of tasks for the lesson in terms of content and methodology.]
2	Ich kann Lernsituationen für Schüler:innen klar strukturieren. [I can clearly structure learning situations for students.]
3	Ich kann Schüler:innen Lernstrategien vermitteln. [I can teach students learning strategies.]

Note. Items were introduced with «Stellen Sie sich vor, Sie unterrichten morgen selbständig in einer Schule. Nach Ihrem heutigen Stand: Inwieweit treffen die folgenden Aussagen auf Sie zu? [Imagine you are teaching independently at a school tomorrow. Based on your current status: To what extent do the following statements apply to you?]" (adapted from Schmitz et al., 2020).

Table D3

Adapted German Items Used to Measure Retention-Related Outcomes

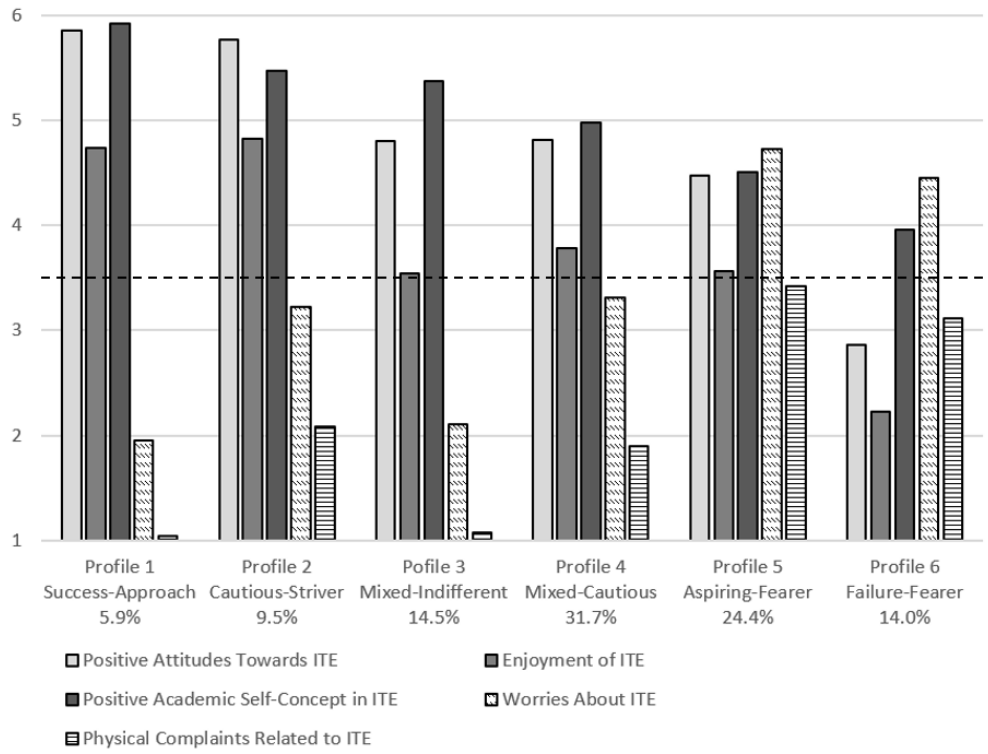
Initial teacher education quitting intentions (adapted from Kunter et al., 2017)	
1	Ich denke darüber nach, das Lehramtsstudium aufzugeben. [I am thinking about giving up initial teacher education.]
2	Ich habe vor, das Lehramtsstudium abzubrechen. [I am planning to quit initial teacher education.]
3	Ich werde voraussichtlich die Studienrichtung wechseln. [I will likely change my field of study.]

2 Unstandardized Profile Solution

Figure D1 displays the graphical representation of the unstandardized six-profile solution. Table D4 displays the descriptives, profile sizes, and hypothesized profile names of the unstandardized six pre-service teacher well-being profiles.

Figure D1

Graphical Representation of the Unstandardized Six-Profile Solution



Note. The dashed line indicates the theoretical mean of 3.5.

Table D4

Descriptives, Profile Sizes, and Hypothesized Profile Names of the Unstandardized Six Pre-Service Teacher Well-Being Profiles

Profile	Hypothesized profile name	Profile indicator variables *M* (*SD*)					Profile size (relative size)
		Positive attitudes towards ITE	Enjoyment of ITE	Positive academic self-concept in ITE	Worries about ITE	Physical complaints related to ITE	
1	Success-approach	5.85 (0.12)	4.74 (0.69)	5.92 (0.03)	1.95 (0.31)	1.04 (0.11)	168 (5.9%)
2	Cautious-striver	5.77 (0.14)	4.82 (0.47)	5.47 (0.29)	3.22 (0.89)	2.08 (0.86)	272 (9.5%)
3	Mixed-indifferent	4.80 (0.83)	3.54 (0.98)	5.37 (0.33)	2.11 (0.33)	1.08 (0.08)	417 (14.5%)
4	Mixed-cautious	4.81 (0.51)	3.79 (0.71)	4.98 (0.42)	3.31 (0.62)	1.90 (0.51)	908 (31.7%)
5	Aspiring-fearer	4.48 (0.61)	3.57 (0.74)	4.51 (0.49)	4.72 (0.59)	3.42 (0.85)	700 (24.4%)
6	Failure-fearer	2.86 (0.79)	2.23 (0.65)	3.96 (0.83)	4.46 (1.05)	3.11 (0.24)	402 (14.0%)

3 Pre-Service Teacher Characteristics as Predictors of Profile Membership

To enhance our understanding of pre-service teacher well-being, paying attention to the role played by pre-service teacher characteristics is also important. In the current study, six pre-service teacher characteristics were investigated in relation to the well-being profiles: pre-service teacher's gender, age, study program, enrolled study year, part-time job as a teacher, and caring responsibilities. Prior research shows these factors may be implicated in well-being. For example, research involving gender has been mixed (Hascher & Waber, 2021), whereas older students may belong to more adaptive than maladaptive well-being profiles due to prior (professional) experiences (McCune et al., 2010). The study program (preparing to teach at primary or secondary school) may also have an impact on profile membership. Other work has shown that pre-service teachers enrolled in higher study years are more likely to belong to maladaptive than adaptive well-being profiles (Haldimann et al., 2024), but findings are mixed regarding the impact of having a part-time job (as a teacher) alongside ITE (e.g., Beer et al., 2020; Hahn et al., 2021). Finally, having caring responsibilities involves challenges in combining family commitments and studies, which can impact well-being—such as during the COVID-19 pandemic due to (partial) school closures in Austria, which was the timeframe of data collection for this study (Bock-Schappelwein & Famira-Mühlberger, 2021).

All pre-service teacher characteristics predicted, in varying degrees, profile membership (Table 6). Male compared to female pre-service teachers were, for 7 out of 15 profile comparisons, less likely to belong to a more adaptive well-being profile than a less adaptive one (OR: 0.27-0.56). In contrast, they were more likely to belong to profile 3 mixed-indifferent (OR: 2.08) or to profile 4 mixed-cautious (OR: 1.58) than to profile 5 aspiring-fearer. Older pre-service teachers were, for 5 out of 15 profile comparisons, more likely to belong to a more adaptive well-being profile than a less adaptive one (OR: 1.04-1.08). In contrast, they were less likely to belong to profile 5 aspiring-fearer than to profile 6 failure-fearer (OR: 0.96). Pre-service teachers training to be a secondary school teacher compared to pre-service teachers training to be a primary school teacher were, for 5 out of 15 profile comparisons, less likely to belong to a more adaptive well-being profile than a less adaptive one (OR: 0.39-0.75). In contrast, they were more likely to belong to profile 1 success-approach (OR: 1.60) or to profile 2 cautious-striver (OR: 2.02) than to profile 3 mixed-indifferent. Pre-service teachers enrolled in higher study years were, for 11 out of 15 profile comparisons, less likely to belong to a more adaptive well-being profile than a less adaptive one (OR: 0.63-0.85). Pre-service teachers working part-time as a teacher were more likely to belong to profile 3 mixed-indifferent than to profile 4 mixed-cautious (OR: 1.46) or to profile 5 aspiring-fearer (OR: 1.79). In contrast,

they were less likely to belong to profile 4 mixed-cautious (OR: 0.58) or to profile 5 aspiring-fearer (OR: 0.48) than to profile 6 failure-fearer. Finally, pre-service teachers with caring responsibilities were more likely to belong to profile 2 cautious-striver than to profile 5 aspiring-fearer (OR: 1.66). Taken together, female and older pre-service teachers, pre-service teachers training to be primary school teachers, lower study year pre-service teachers, and those with caring responsibilities tended to belong to more adaptive profiles. However, the relationship between part-time teaching during ITE and profile membership yielded mixed results.

Regarding the research question of to what extent pre-service teacher characteristics (gender, age, study program, enrolled study year, part-time job as a teacher, and caring responsibilities) are linked with profile membership, we highlight three key findings. First, the most consistent predictor among the pre-service teacher characteristics was the enrolled study year with lower study year pre-service teachers belonging to more adaptive profiles (11 out of 15 profile comparisons), which is in alignment with prior research (Haldimann et al., 2024). This finding implies targeting well-being initiatives for pre-service teachers in higher study years to bolster their well-being. Second, female pre-service teachers were, for almost half of all profile comparisons, more likely to belong to a more adaptive well-being profile than a less adaptive one. However, for two profile comparisons, they were less likely to belong to the two mixed profiles than a maladaptive one. This result raises the question of whether the resumed mixed results among prior studies on gender and teacher well-being (e.g., Hascher & Waber, 2021) are perhaps present precisely because well-being is investigated in overall samples, and the existence of different subpopulations (or profiles) is overlooked. Third, due to the high teacher demand in countries like Austria, some pre-service teachers enter the profession and work in schools before graduating as teachers (e.g., Flick-Holtsch et al., 2023). Regarding pre-service teachers working part-time as teachers, our findings are mixed, with some profile comparisons between mixed and maladaptive profiles being significant. Further research taking the study and teaching load of pre-service teachers into account might deliver further insights.

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Appendix E

Table E1

Revised scale to measure the well-being dimension "Social problems in ITE"

Revised scale		Item wording
Version I		In the last few weeks, I experienced …
		[In den letzten Wochen kam es vor, dass …]
	sp_ITE_1	… conflicts and misunderstandings in my studies.
		[... ich im Studium Konflikte und Missverständnisse erlebte.]
	sp_ITE_2	… feeling that I wasn't recognized and valued in my studies.
		[... ich mich im Studium unbeachtet und nicht wertgeschätzt fühlte.]
	sp_ITE_3	… feeling like an outsider in my studies.
		[... ich mich im Studium als Aussenseiter:in fühlte.]
	sp_ITE_4	… being left on my own with my studies.
		[...ich im Studium auf mich alleine gestellt war.]
	sp_ITE_5	… the need for more meaningful social relationships in my studies.
		[... ich das Bedürfnis nach bedeutsameren Beziehungen im Studium verspürte.]
	sp_ITE_6	… that I did not like how others treated me in my studies.
		[…ich nicht zufrieden war, wie andere mich im Studium behandelten.]
Version II		In the last few weeks, I experienced …
		[In den letzten Wochen kam es vor, dass …]
	sp_ITE_1	… conflicts and misunderstandings with my fellow students.
		[... ich Konflikte und Missverständnisse mit meinen Mitstudierenden erlebte.]
	sp_ITE_2	… feeling that I wasn't recognized and valued by my fellow students.
		[... ich mich von meinen Mitstudierenden unbeachtet und nicht wertgeschätzt fühlte.]
	sp_ITE_3	… feeling like an outsider in my studies.
		[... ich mich im Studium als Aussenseiter:in fühlte.]
	sp_ITE_4	… feeling that I could not count on my fellow students.
		[...ich nicht auf meine Mitstudierenden zählen konnte.]
	sp_ITE_5	… the need for more meaningful social relationships with my fellow students.
		[... ich das Bedürfnis nach bedeutsameren Beziehungen mit meinen Mitstudierenden verspürte.]
	sp_ITE_6	… feeling that I did not like how my fellow students treated me.
		[…ich unzufrieden war, wie meine Mitstudierenden mich behandelten.]