L-Università ta' Malta
Centre for Resilience & Socio-Emotional Health

Portraits of pre-service special education teachers: Perspectives on well-being and its association with self-efficacy and work engagement

Valeria Cavioni[a][1], Giusi Toto[a] and Veronica Ornaghi[b]

[a]Department of Humanities. Literature, Cultural Heritage, Education Sciences, University of Foggia, Foggia, Italy
[b]"R. Massa" Department of Human Sciences for Education, University of Milano-Bicocca, Milan, Italy

The well-being of teachers is a critical concern with significant implications for teaching effectiveness and student outcomes. However, there exists a notable gap in the literature concerning the well-being of pre-service teachers. Moreover, there is a scarcity of research focusing on the unique challenges faced by prospective special education teachers. This study addresses this dual gap by exploring the well-being of pre-service special education teachers and its relationship with self-efficacy and work commitment. Data was collected from a sample of 133 preservice teachers (mean age = 38,14; sd = 8.25 years) enrolled in a professional course for high school special education teachers. Employing cluster analysis, three distinct profiles based on mental health, perceived stress, and resilience z-scores were identified. We further explored how the identified well-being profiles related to self-efficacy and work engagement. The findings provide valuable insights on improving educational policies, personalized teacher training programs, and early support structures to nurture educators' well-being and equip them with the skills necessary to navigate the complex landscape of special education.

Keywords: teachers' well-being, mental health, self-efficacy, work engagement, cluster analysis

Introduction

Teaching is widely acknowledged as one of the most demanding professions (Chang, 2009; Lester et al., 2020; Schonert-Reichl et al., 2017, Toto & Limone, 2021). Findings from the recent Eurydice Report (2021) indicate that nearly half of European teachers experience significant work-related stress, with one out of four expressing

---

concerns about their mental health and overall well-being. Similarly, the preceding TALIS 2018 survey illustrated the high prevalence of workplace stress among European teachers (OECD, 2019). The research has largely recognized that teachers who exhibit high levels of mental health, resilience, and ability to cope with stressors, are able to create more nurturing and supportive classroom environments, which, in turn, positively influence students' well-being (Cavioni et al. 2020; Cavioni et al., 2023a; 2023b; Cefai et al., 2022; Jennings & Greenberg, 2009; Mansfield et al., 2012). Developing these competences serves as a protective factor for teachers' well-being and equips them with the requisite tools to engage in effective teaching practices, build healthy relationships with students, and successfully navigate the challenges of the profession (Beltman et al., 2011; Jeon et al., 2018; Mansfield & Beltman, 2019).

As widely demonstrated in the literature, teachers' well-being is associated with self-efficacy and work engagement (e.g., Mansfield & Beltman, 2014; Park & Johnson, 2019; Ortan et al., 2021; Skaalvik & Skaalvik, 2014). Teachers' self-efficacy encompasses confidence in their teaching abilities, including the capacity to manage classroom dynamics, and the effectiveness in helping students to learn and grow (Skaalvik & Skaalvik, 2007). Research has observed that teachers who considered themselves less competent in classroom management and discipline reported lower levels of well-being than teachers with a higher level of self-efficacy (e.g., Hayes et al., 2020; von Muenchhausen et al., 2021).

Prior research has also consistently demonstrated that educators experiencing a high level of well-being are inclined to remain dedicated to their profession, effectively navigate challenging circumstances and maintaining high job satisfaction and a strong commitment to their role (Beltman et al., 2011; Mansfield et al. 2012; Sinclair, 2008). While many studies in the field have explored teachers' well-being and its relationship with self-esteem and work engagement by investigating perspectives of teachers at various career stages (e.g. Brown et al., 2012; Glickman & Tamashiro, 1982; Harmsen et al., 2018; Hong, et al., 2012; Klassen & Chiu, 2010; Kelchtermans et al., 2017), there exists a notable gap in the literature when it comes to understanding the well-being of teachers before they even step into the classroom (Ahsan et al., 2013; Cavioni & Toto, 2023, in press). This gap is of special significance given that pre-service teachers are on the boundary of entering their profession, ready to influence the educational terrain in transformative ways. Their experiences during this formative period can profoundly influence their future effectiveness and longevity in the teaching profession (Mansfield & Beltman, 2019). Understanding the factors that play a key role in pre-service teachers' well-being is thus pivotal.

Furthermore, while research on pre-service teachers' well-being is limited, there is an even more pronounced scarcity of studies that focus on pre-service special education teachers. Special education teachers play a crucial role in providing support to students with a range of diverse learning needs, and their duties encompass a broad array of distinctive challenges (Aiello et al., 2018; Toto, 2021). In this context, they may encounter additional emotional demands, and their well-being is intrinsically tied to their effectiveness in providing the support and guidance needed for the holistic and healthy development of their students (Conte et al., 2023; Ornaghi et al., 2022). Despite the specialized nature of their future roles, research pertaining to

well-being as well as self-efficacy, and work engagement of special education teachers, remains conspicuously sparse (Peixoto et al., 2018).

There are various existing frameworks on well-being, such as Ryff's model of psychological well-being (Ryff, 1989; Ryff & Keyes, 1995), which delineates six distinct facets including a positive self-attitude, fulfilling interpersonal relationships, autonomy and self-determination, a sense of competence and mastery, purpose in life, and an ongoing sense of personal development. Keyes' (1998, 2002) model of social well-being comprises five dimensions (social integration, social contribution, social acceptance, social actualization, and social coherence). In the present study we approached the multifaceted concept of well-being from a holistic perspective, encompassing mental health (Biswas-Diener, 2008; Seligman, 2011), resilience (Bonanno, 2005; Masten, 2014) and the capacity to effectively manage stressful situations (Cohen et al. 2007; Lazarus & Folkman, 1984) as key components of well-being. Through an integrated approach to mental health, resilience, and capacity to manage stressful situations, our objective is to offer a nuanced outlook on well-being specifically tailored to address the distinctive challenges and requirements faced by pre-service special education teachers.

Aims of the study and research questions

This study sought to address the following objectives: 1) to identify and describe distinct profiles among pre-service special education teachers based on their mental health, perceived stress, and resilience scores; 2) to investigate the relationship between the identified clusters and pre-service special education teachers' self-efficacy; 3) to explore how the identified clusters are associated with the pre-service special education teachers work engagement. Accordingly, the following specific research questions were formulated: 1) Are there distinctive profiles in pre-service special educational needs teachers' well-being? 2) Are there any significant differences between the different pre-service special education teachers' clusters and self-efficacy? 3) Are there any significant differences between the different pre-service special education teachers' clusters and work engagement?

Method

Participants

The participants included 133 pre-service teachers (102 female; mean age = 38, 14, *sd* = 8, 25 years; range: 22-59) enrolled in a professional course for high school special education teachers organized at the University of Foggia, in Italy. A substantial number of participants (n = 96) held master's degrees, while a smaller subset (n = 17) possessed high school diplomas. Additionally, a group of participants (n = 14) had post-lauream degrees or PhDs, and a few (n = 6) had completed bachelor's degrees as their highest level of education. The participants came from diverse academic backgrounds, primarily associated with fields such as education, psychology, and humanities. They were informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any point without consequences. Informed consent was obtained before their participation.

Measures

Data were collected through an online questionnaire. The survey consisted of multiple validated questionnaires to assess pre-service teachers' mental health, resilience, perceived stress, self-efficacy, and work engagement.

Mental health. Participants' mental health status was measured using the Italian version of the Mental Health Continuum-Short Form (MHC-SF) by Petrillo and colleagues (2015). The instrument is composed of 14 items, and it includes 3 subscales: emotional well-being, social well-being, and psychological well-being. The MHC-SF asks individuals how much of the time they functioned in a specific manner on a five-point Likert scale, from 0 (none of the time) to 5 (all the time). Higher scores indicate better mental health. In the current study, the total Cronbach's alpha coefficient was 0.91.

Resilience. The Brief Resilience Scale (BRS; Smith et al., 2008) was used to assess the ability to bounce back and recover from challenging situations (Höltge et al., 2021). The BRS 6-item is composed of 6 items; participants rate their level of agreement on a 5-point Likert-type scale (from 1=strongly disagree to 5=strongly agree), with higher scores reflecting greater resilience. In this study, Cronbach's alpha was 0.81.

Perceived Stress. The Italian version of the Perceived Stress Scale (PSS-10) was used to assess the extent to which participants perceive the situations in their lives as stressful (Mondo et al., 2021). The PSS-10 comprised 10 items rated on a 5-point Likert scale ranging from 0 (never) to 4 (very often) referring to stressful events that occurred in the month before. Higher scores indicate greater levels of perceived stress. In this study, Cronbach's alpha was .86.

Self-efficacy. The translated version of the Ohio State Teacher Efficacy Scale (OSTES; Tschannen-Moran & Woolfolk Hoy, 2001) was used to assess participants' self-efficacy. The OSTES consists of 12 items, each requiring respondents to provide ratings on a 9-point Likert Scale ranging from 0 (nothing) to 9 (a lot). It includes three subscales: efficacy for student engagement, efficacy for instructional strategies, and efficacy for classroom management. High scores indicate higher levels of self-efficacy. The total Cronbach's alpha coefficient, in this study, was .96.

Work engagement. The Italian version of the Utrecht Work Engagement Scale short form (UWES-9) was used to assess work engagement (Balducci et al., 2010). The UWES-9 is composed of 9 items comprising three subscales: vigour, dedication, and absorption. Responses to items are given on a frequency scale varying from 0 (never) to 6 (always). High scores suggest a heightened work commitment. In this study, the overall Cronbach's alpha coefficient was .92.

Data analysis strategy

Most of the research in empirical sciences tended to use variable-centered methods (e.g., regression analyses, and structural equation modelling) to study average trends and their relationships among the study variables within a group of individuals (Von Eye & Wiedermann, 2015). However, they often overlook individual variations such as the possibility that participants may originate from diverse subpopulations, where the relationships between variables may exhibit differences (Morin et al., 2011). In contrast, person-centered analyses, which are so-called because they recognize the presence of variations within an individual across a

set of variables, aim to discern unique clusters among participants, essentially creating profiles (Marsh et al., 2009). Person-centered research identifies and contrasts subgroups of individuals, for instance applying cluster analysis, who share similar patterns of variables within the population allowing for a more comprehensive perspective than typically observed in variable-centered research (Vandenberg & Stanley, 2009). Therefore, cluster analysis allows for the identification of subgroups and investigates variable groups within individual profiles (Bergman, & Magnusson, 1997; Denham et al., 2012). Such analysis can offer a more comprehensive, yet individualized, approach to provide insights into the unique characteristics and profiles that may exist among participants' characteristics (Bauer & Shanahan, 2007).

To address the first objective of our study, we carried out a person-centred analysis based on the use of cluster analysis (Aldenderfer & Blashfield, 1984; Kusurkar et al., 2021). All measurement scores for the study variables were standardized by transforming them into z-scores. Standardizing scores is essential in cluster analysis to ensure that variables with different Likert scales can be effectively compared, making the results more meaningful, interpretable, and consistent. This process allows for a fair assessment of the relationships between variables and the identification of distinct clusters based on meaningful patterns within the data (Barbaranelli, 2011). To create groups of participants with similar characteristics, we clustered together the variables of mental health, resilience, and perceived stress. The K-means clustering approach was used to create distinct clusters among the participants. The application of the K-means clustering approach, as opposed to other non-overlapping and hierarchical methods like Ward's method, was preferred for a number of reasons. In non-hierarchical techniques such as K-means, the iterative process allows for the potential reassignment of individuals, enabling a more dynamic exploration of distinct clusters within the data. In contrast, hierarchical methods like Ward's method, maintain the initial groupings throughout the entire clustering process, offering stability in cluster composition but potentially missing out on a more comprehensive depiction of the dataset's underlying structures. Hence, Ward's method tends to create clusters of roughly equal sizes, which may not be suitable for datasets with inherently imbalanced or unequal cluster structures (Ferreira & Hitchcock, 2009). Applying the algorithm K-means clustering, groups were created according to their distance from the centre of a cluster and group assignment was not probabilistic (Garcia-Dias et al., 2019; Jack et al., 2018). This enabled the creation of non-overlapping clusters, facilitating a clear distinction between different pre-service teachers' well-being profiles.

In relation to the second and third objectives of the study, namely to examine the relationships between cluster membership and self-efficacy, and work engagement respectively, we conducted multivariate analyses of variance (MANOVA) and Bonferroni's post-hoc tests. These analyses enabled us to determine whether significant differences existed among the clusters in terms of self-efficacy and work engagement.

The diagnostic measures for identifying outliers, influential observations, and model misconfigurations, indicated that there were not any extreme outliers, highly influential data points, or issues with model misspecifications.

Results

Objective 1: Creation of well-being profiles

After reviewing several cluster solutions, the three-cluster solution was identified as the best one, with findings yielding distinct well-being profiles that had adequate interpretation. Results of Bonferroni's post-hoc analyses revealed statistically significant differences ($p.<.05$) among the three profiles for each study variable. Table I provides an overview of the descriptive statistics of the three clusters.

Table I. Mean Z-scores descriptive statistics for pre-service special education teachers' well-being profiles.

Instruments and subscales	Cluster 1 (n=51)	Cluster 2 (n=72)	Cluster 3 (n=10)	F	p	η2
MHC_EWB	M = .66; sd =.41	M = -0.17; sd = .77	M = -2.14; sd=1.16	72,627	<.001	.52
MHC_SWB	M = .74; sd =.64	M = -.28; sd = .78	M = -1.78; sd=.51	63,239	<.001	.49
MHC_PWB	M = .6; sd=.43	M = -.11; sd = .79	M = -2.28; sd=.86	76,584	<.001	.54
MHC_TOT	M = .77; sd=.42	M = -.21; sd = .63	M = -2.38; sd=.78	138,744	<.001	.68
BRS_TOT	M = .70; sd=.62	M = -.36; sd = .85	M = -1.02; sd=1.38	33,058	<.001	.28
PSS-10_TOT	M = -.57; sd=.78	M = .22; sd =.78	M = 1.32; sd=1.51	25,781	<.001	.28

Note: MHC = Mental Health Continuum-Short Form; EWB = Emotional well-being subscale; SWB= Social well-being subscale; PWB = Psychological well-being subscale; Tot=Total score; BRS = Brief Resilience Scale: PSS-10 = Perceived Stress Scale.

The participants in Cluster 1 exhibited notably high levels of mental health, suggesting strong emotional, social, and psychological well-being. Their resilience scores were also notably high, indicating a robust ability to cope with challenges and adversity and adapt to changing circumstances (Cavioni et al., 2018; Grazzani et al., 2022). In contrast, educators in this cluster reported lower levels of perceived stress, suggesting that they tend to experience less stress in their daily lives (Mansfield & Beltman, 2019). This group may also demonstrate higher abilities in the use of effective stress management strategies or lower susceptibility to stressors.

The participants in Cluster 2 displayed moderate levels of mental health, indicating a balanced psychological, social, and emotional well-being. They might experience some fluctuations in their emotional state but maintain a moderate level of mental health. Resilience scores for this cluster were also moderate, indicating a reasonable ability to cope with difficulties, compared to Cluster 1. Teachers in this cluster reported moderate levels of stress, suggesting that they may encounter typical stressors but have moderate stress management capabilities.
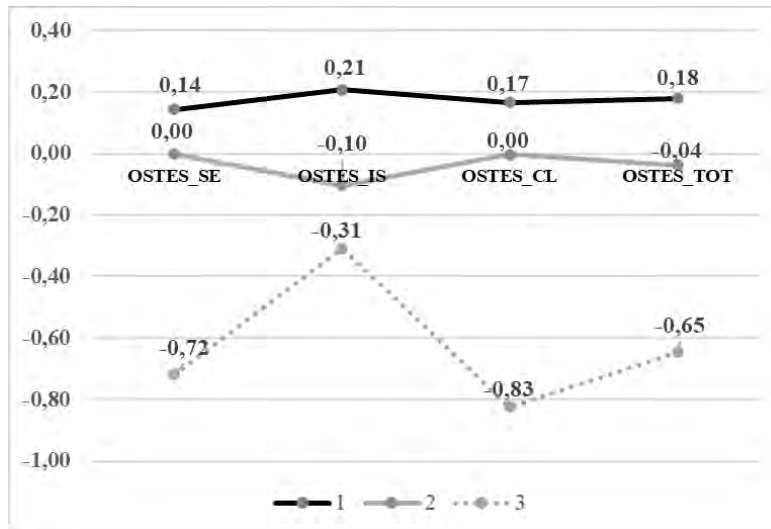
The Cluster 3 participants reported lower levels of mental health, indicating potential challenges in psychological, social, and emotional states. They may experience emotional distress and psychological difficulties more frequently. Resilience scores for this cluster were lower, suggesting that individuals in this group may struggle more with coping, adapting, and bouncing back from stressors (Beltman, 2015). Perceived stress was markedly high among teachers in this cluster, indicating that they were inclined to experience higher levels of stress in their daily lives. They may also have faced multiple stressors or had limited stress management assets (Hong, 2012).

The distribution of our sample across the three identified clusters was noteworthy. Cluster 1, characterized by high mental health, resilience, and low stress, comprised a substantial sample of 51 teachers. This suggested that a significant portion of our study population demonstrated robust mental health, resilience, and effective stress management strategies. Cluster 2, representing a moderate well-being profile with balanced mental health, resilience, and modest stress, included 72 teachers. This cluster constituted the largest subgroup in our analysis, indicating that a sizable portion of pre-service special education teachers in our sample fall within this category. In contrast, Cluster 3, the subgroup displaying low mental health, resilience, and high perceived stress, consisted of a smaller sample size, with only 10 teachers. This finding suggested that a minority of our participants faced great challenges related to their mental health and resilience as well as experienced elevated stress levels.

Objective 2: Group differences in self-efficacy

To assess potential differences among the three identified profiles in relation to self-efficacy, we conducted multivariate analyses of variance (MANOVA). We then further explored the nature of these differences by employing Bonferroni's post hoc tests. In comparing these three identified profiles, several noteworthy patterns emerged in participants' self-efficacy across the OSTES subscales (see Fig. 1).

Overall, the results of the MANOVA indicated statistically significant differences in efficacy for student engagement, [$F(2, 130) = 3.21$, $p = .04$], $\eta^2 = .04$, efficacy for classroom management, [$F(2, 130) = 4.42$, $p = .01$, $\eta^2 = .06$], as well as in total score [$F(2, 130) = 3.05$, $p = .05$, $\eta2 = .04$], among the three profiles. Bonferroni post-hoc tests comparison revealed significant differences in the student engagement sub-scale between profiles 1 and 3 ($p = .04$), in the efficacy for classroom management sub-scale between profiles 1 and 3 ($p = .001$) and profiles 2 and 3 ($p = .04$), and in the OSTED total score between profiles 1 and 3 ($p = .05$). No significant differences were found in the efficacy for the instructional strategies subscale among the three profiles.
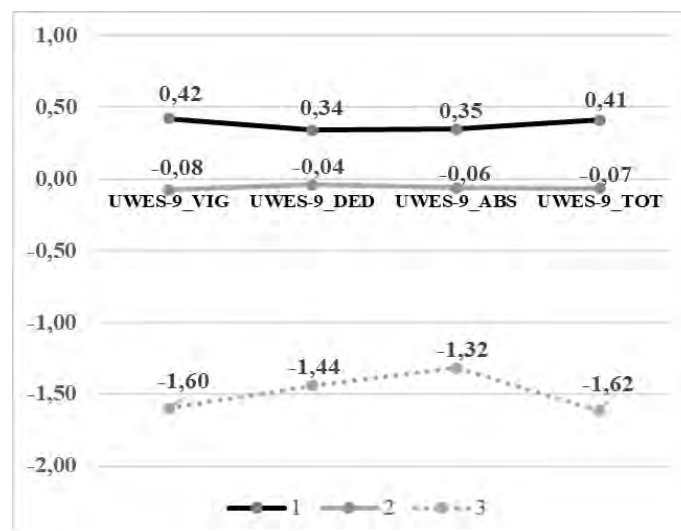
Figure 1. Mean Z-scores for pre-service special education teachers' self-efficacy across the three profiles.

Objective 3: Group differences in work engagement

To examine potential disparities among the three identified profiles in work engagement, we conducted multivariate analyses of variance (MANOVA), followed MANOVA followed by Bonferroni's post hoc tests. A comparison of the three recognized profiles showed notable trends in work engagement across the UWES subscales and the total score, as depicted in Figure 2.

Figure 2. Mean Z-scores for pre-service special education teachers' commitment to work across the three profiles.

The findings of the MANOVA revealed statistically significant differences in the vigour ($F(2, 130) = 23.44$, $p < .001$, $\eta^2 = .26$), dedication ($F(2, 130) = 16.47$, $p < .001$, $\eta^2 = .04\ .2$), and absorption ($F(2, 130) = 14.26$, $p < .001$, $\eta^2 = .18$) subscales, as well as in UWES-9 total score ($F(2, 130) = 23.5$, $p < .001$, $\eta^2 = .26$) among the three profiles. Bonferroni post hoc tests further confirmed significant differences in the vigour subscale between profiles 1 and 2 ($p = .006$), 1 and 3 ($p < .0001$), and 2 and 3 ($p < .0001$). In the dedication subscale, significant differences have been observed between profiles 1 and 3 ($p < .0001$) as well as 2 and 3 ($p < .0001$). In the absorption subscale, significant differences were found between profiles 1 and 2 ($p = .04$), 1 and 3 ($p < .0001$), and 2 and 3 ($p < .0001$). Finally, in the total UWES-9 score, significant differences were observed between 1 and 2 profiles ($p = .009$), 1 and 3 ($p = <.0001$) and 2 and 3 ($p < .0001$).

Discussion

Understanding the intricate relationship between well-being, self-efficacy, and work engagement is essential in the context of teacher education, particularly for pre-service special education teachers. This study adopted a person-centred approach applying cluster analysis (Aldenderfer & Blashfield, 1984; Bauer & Shanahan, 2007) that showed three distinct profiles among this particular cohort of educators. In line with our research questions, the results provide three main findings as discussed below.

Well-being profiles

Our analysis revealed three distinct profiles based on mental well-being indicators, which included measures of mental health, perceived stress, and resilience. Profile 1 emerged as a group characterized by high levels of mental health and resilience, and low perceived stress. In contrast, profile 3 represented teachers with lower mental health, reduced resilience, and elevated perceived stress levels. Profile 2 occupied an intermediate position, featuring moderate scores across the three dimensions. These profiles offer a nuanced portrayal of the diverse well-being experiences among pre-service special education teachers.

Well-being and self-efficacy

An interesting finding was the strong association between participants' levels of well-being and self-efficacy. Specifically, profile 1 participants exhibited higher levels of self-efficacy. This is in line with previous research that suggested that teachers with higher mental health, resilience, and ability to manage stressful situations, generally reported a greater belief in their ability to engage students effectively and manage classrooms efficiently, and overall, they feel more confident in their teaching capabilities (e.g, Brown, 2012; Schwarzer & Hallum, 2008).

Secondly, profile 2 participants displayed moderate scores in the OSTES subscales and total score. This profile represents teachers with a balanced level of self-efficacy, falling between the high self-efficacy levels of profile 1 and the low self-efficacy levels of profile 3. This suggests that teachers in profile 2 have a moderate level of confidence in their teaching abilities across the measured domains. Lastly, participants in cluster 3 reported lower self-efficacy than the other two groups. This finding may indicate that participants in

Profile 3 have a reduced belief in their ability to engage students, employ effective instructional strategies, and manage their classrooms. Overall, these results highlight the importance of underlying well-being as a potential contributor to self-efficacy in the context of pre-service teacher education.

Well-being and work engagement

Profile 1 participants exhibited notably higher levels of work engagement, indicating a heightened sense of vigour, dedication, and absorption in their work. Therefore, they are more likely to be enthusiastic, committed, and deeply engrossed in their teaching roles. Profile 2, on the other hand, displayed moderate scores across the UWES-9 scores. Participants, in this profile exhibited a balanced level of work engagement, falling between the high work engagement of profile 1 and the low work engagement of profile 3. This can suggest that individuals in profile 2 maintained a moderate level of enthusiasm, commitment, and absorption in their work. Conversely, profile 3 was characterized by lower scores on the UWES-9 scores, with lower levels of work engagement. These findings suggest that well-being difficulties may be associated with decreased work engagement and difficulties in sustaining enthusiasm motivation and in their special education teaching role.

This study underscores the importance of fostering well-being as a foundational element in pre-service special needs teacher education. The diversity of profiles in the present study underlines the need for a holistic approach to teacher support (Cavioni et al., 2023b), focusing not only on pedagogical skills but also on their well-being which can, in turn, improve self-efficacy and work engagement. Consistent with this perspective, it's worth highlighting that a recent study conducted by Ornaghi and colleagues (2023) observed that heightened work engagement among educators is associated with a reduced likelihood of experiencing stress and burnout. This shows the pivotal role played by work engagement as a safeguard against emotional challenges and as a protective factor for the overall well-being of teachers.

The findings of our study hold important implications for teacher education and support programs. Firstly, recognizing the diverse well-being profiles among pre-service special education teachers is essential. Tailored interventions and support strategies need to be developed to address the unique needs of each profile of teachers. For instance, educators in profile 3 might benefit from targeted well-being programs to improve their wellbeing as well as their self-efficacy and work engagement before or at the beginning of their teaching profession. Rather than implementing one-size-fits-all interventions, our research advocates for tailored strategies that consider individual educators' well-being profiles. This approach aligns with the current trend in education, emphasizing the need for personalized professional development and support to address the diverse needs of educators (Schifter, 2016).

Secondly, teachers who exhibit higher levels of mental health and who benefit from substantial support when needed, bring a distinctive capability in cultivating nurturing and intellectually enriching learning environments (Nalipay et al., 2021). These educators assume the role of catalysts in nurturing a school climate that fosters positivity and wellbeing amongst students (Ornaghi et al., 2022). This, in turn, sparks their engagement and promotes their academic accomplishments (Cavioni et al., 2023a). As a result, when teachers are allowed to make their well-being a priority, they initiate a domino effect that resonates across the entire

educational environment, transcending the boundaries of their personal and professional development (Lester et al., 2020).

Limitations and further research direction

While the present study provides interesting insights, three limitations must be acknowledged. First, the study is based on a sample of pre-service special education teachers attending a professional course for high school special education teachers. Another potential limitation is the skewed gender composition of the sample, with most participants being female. While this gender distribution may be considered representative of the typical demographic composition of the teaching profession in Italy, it is important to acknowledge that this may limit the generalizability of the findings to male pre-service special education teachers. Another limitation is the diverse academic backgrounds of the participants. While this diversity may reflect the broad range of academic disciplines that pre-service special education teachers come from, it could also impact the generalizability of the study's findings to other teacher populations. Future research could benefit from larger, more diverse and representative samples. Another limitation is related to the reliance on self-report measures. While self-report instruments are commonly used in research, they may introduce response bias due to social desirability or participants' subjective interpretations, particularly when self-reporting on sensitive topics such as mental health (Weston et al., 2018). Finally, the cross-sectional nature of the study doesn't allow the identification of causal relationships between the study variables.

Our study opens several new questions and areas for further research. For instance, longitudinal studies can explore the trajectories of these well-being profiles as pre-service teachers transition into the profession, examining whether they remain stable, undergo changes, or converge over time. Another line of research could investigate the influence of teachers' diverse well-being profiles on student learning, behaviour, and overall well-being. Lastly, another potential research direction is to conduct a comparative analysis to compare the well-being profiles of pre-service special education teachers with those of practising teachers.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest in this paper.

References

Aiello, P., Pace, E. M., Dimitrov, D. M., & Sibilio, M. (2018). A study on the perceptions and efficacy towards inclusive practices of teacher trainees. *Italian Journal of Educational Research, 19*, 13-28.

Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster analysis*. Sage Publications.

Ahsan, M. T., Deppeler, J. M. & Sharma, U. (2013). Predicting pre-service teachers' preparedness for inclusive education: Bangladeshi pre-service teachers' attitudes and perceived teaching-efficacy for inclusive education. *Cambridge Journal of Education, 43*(4), 517–535.

Barbaranelli, C. (2011). *Analisi dei dati con SPSS II. Le analisi multivariate*. Led.

Balducci, C., Fraccaroli, F., & Schaufeli, W. B. (2010). Psychometric properties of the Italian version of the Utrecht Work Engagement Scale (UWES-9): A cross-cultural analysis. *European Journal of Psychological Assessment, 26*(2), 143-149.

Bauer, D. J., & Shanahan, M. J. (2007). Modeling complex interactions: Person-centered and variable-centered approaches. In T. D. Little, J. A. Bovaird, & N. A. Card (Eds.), *Modeling contextual effects in longitudinal studies* (pp. 255–283). Lawrence Erlbaum Associates Publishers.

Beltman, S. (2015). Teacher professional resilience: Thriving not just surviving. In N. Weatherby-Fell (Ed.), *Learning to teach in the secondary school* (pp. 20–38). Cambridge University Press.

Beltman, S., Mansfield, C., & Price, A. (2011). Thriving not just surviving: A review of research on teacher resilience. *Educational Research Review, 6*(3), 185-207.

Bergman, L. R., & Magnusson, D. (1997). A person-oriented approach in research on developmental psychopathology. *Development and Psychopathology, 9*(2), 291-319.

Biswas-Diener, R. (2008). Material wealth and subjective well-being. In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 307–322). The Guilford Press.

Bonanno, G. A. (2005). Clarifying and Extending the Construct of Adult Resilience. *American Psychologist, 60*(3), 265–267.

Brown, C. G. (2012). A systematic review of the relationship between self-efficacy and burnout in teachers. *Educational & Child Psychology, 29*(4), 47-63.

Cavioni, V., Conte, E., Grazzani, I., Ornaghi, V., Cefai, C., Anthony, C., … Pepe, A. (2023a). Validation of Italian students' self-ratings on the SSIS SEL brief scales. *Frontiers in Psychology, 14*,1229653.

Cavioni, V., Grazzani, I., & Ornaghi, V. (2020). Mental health promotion in schools: A comprehensive theoretical framework. *International Journal of Emotional Education, 12*(1), 65-82.

Cavioni, V., Grazzani, V., Ornaghi, V., Agliati, A., Gandellini, S., Cefai, C., …Conte, E. (2023b). A multi-component curriculum to promote teachers' mental health: Findings from the PROMEHS program. *International Journal of Emotional Education, 15*(1), 34-52.

Cavioni. V. & Toto, G. (2023, in press). Exploring pre-service special education teachers' self-perceptions in addressing students' academic, social, and emotional needs. In C. Cefai (Ed.), *Nurturing students' wellbeing and learning. In honour of Paul Cooper*. Peter Lang.

Cavioni, V., Zanetti, M. A., Beddia, G., & Lupica Spagnolo, M. (2018). Promoting resilience: A European curriculum for students, teachers and families. In M. Wosnitza, F. Peixoto, S. Beltman & C. Mansfield (Eds.)*, Resilience in Education: Concepts, Contexts and Connections* (pp. 313-332)*.* International Publishing.

Cefai, C., Camilleri, L., Bartolo, P., Grazzani, I, Cavioni, V., Conte, E., …& Colomeischi, A. (2022). The effectiveness of a school-based, universal mental health programme in six European countries. *Frontiers in Psychology, 13*, 925614.

Cefai, C., Cavioni, V., Bartolo, B., Simões, C., Ridicki Miljevic, R., Bouillet, D., …& Eriksson, C. (2015). Social inclusion and social justice: a resilience curriculum for early years and elementary schools in Europe. *Journal of Multicultural Education, 9*(3), 122-139.

Chang, M. L. (2009). An appraisal perspective of teacher burnout: Examining the emotional work of teachers. *Educational Psychology Review, 21*(3), 193-218.

Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. *Journal of the American Medical Association, 298,* 1685-1687.

Conte, E., Cavioni, V., Ornaghi, V., Agliati, A., Gandellini, S., Frade Santos., M., … & Grazzani, I. (2023). Supporting preschoolers' mental health and academic learning through the PROMEHS program: *A training study. Children, 10*(6), 1070.

Denham, S. A., Bassett, H. H., Mincic, M., Kalb, S., Way, E., Wyatt, T., & Segal, Y. (2012). Social-emotional learning profiles of preschoolers' early school success: a person-centered approach. *Learning and Individual Differences, 22*(2),178-189.

Eurydice Report (2021). *Teachers in Europe. Careers, development and well-being*. Publications Office of the European Union.

Ferreira, L., & Hitchcock, D. B. (2009). A Comparison of Hierarchical Methods for Clustering Functional Data. *Communications in Statistics - Simulation and Computation, 38*(9),1925-1949.

Garcia-dias, R., Vieira, S., Lopez Pinaya, W. H., & Mechelli, A. (2019). Clustering analysis. In A. Mechelli & S. Vieira (Eds.), *Machine Learning: Methods and Applications to Brain Disorders* (pp. 227-247). Elsevier. .

Glickman, C. D., & Tamashiro, R. T. (1982). A comparison of first-year, fifth-year, and former teachers on efficacy, ego development, and problem-solving. *Psychology in the Schools, 19*(4), 558-562.

Grazzani, I., Agliati, I., Cavioni, V., Conte, E., Gandellini, G., Lupica Spagnolo, M., …& O'riordan, M. R. (2022). Adolescents' resilience during COVID-19 pandemic and its mediating role in the association between SEL and mental health. *Frontiers in Psychology, 7*(13), 801761.

Hayes, R., Titheradge, D., Allen, K., Allwood, M., Byford, S., Edwards, V., …& Ford, T. (2020). The Incredible Years® Teacher Classroom Management programme and its impact on teachers' professional self-efficacy, work-related stress, and general well-being: Results from the STARS randomized controlled trial. *British Journal of Educational Psychology, 90*(2), 330-348.

Harmsen, R., Helms-Lorenz, M., Maulana, R., & van Veen, K. (2018). The relationship between beginning teachers' stress causes, stress responses, teaching behaviour and attrition. *Teachers and Teaching, 24*(6), 626-643.

Höltge, J., Jefferies, P., Cowden, R. G., Govender, K., Maximo, S. I., Carranza, J. S., …& Ungar, M. (2021). A cross-country network analysis of adolescent resilience. *Journal of Adolescent Health, 68*(3), 580-588.

Hong, J. Y. (2012). Why do some beginning teachers leave the school, and others stay? Understanding teacher resilience through psychological lenses. *Teachers and Teaching: Theory and Practice, 18*(4), 417-440.

Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research, 79*(1), 491-525.

Jeon, L., Buettner, C. K., & Grant, A. A. (2018). Early childhood teachers' psychological well-being: Exploring potential predictors of depression, stress, and emotional exhaustion. *Early Education and Development, 29*(1), 53-69.

Jack, R. E., Crivelli, C., & Wheatley, T. (2018). Data-driven methods to diversify knowledge of human psychology. *Trends in Cognitive Sciences, 22*(1), 1-5.

Keyes, C. L. M. (1998). Social well being. *Social Psychology Quarterly, 61*(2), 121–140.

Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Behavior Research, 43*(2), 207-222.

Kelchtermans, G. (2017). 'Should I stay or should I go?': unpacking teacher attrition/retention as an educational issue. *Teachers and Teaching, 1*(17), 961-977.

Klassen, R. M., & Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology, 102*(3), 741-756.

Kusurkar R. A., Mak-van der Vossen, M., Kors, J., Grijpma, J. W., van der Burgt, S. M. E., Koster, A. S., & de la Croix (2021). A. 'One size does not fit all': The value of person-centred analysis in health professions education research. *Perspectives on Medical Education, 10*(4), 245-251.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.

Lester, L., Cefai, C., Cavioni, V., Cross, D., & Barnes, A. (2020). A whole-school approach to promoting staff wellbeing. *Australian Journal of Teacher Education, 45*(2), 1-22.

Mansfield, C. F., & Beltman, S. (2014). Teacher motivation from a goal content perspective: Beginning teachers' goals for teaching. *International Journal of Educational Research* 65, 54-64.

Mansfield, C., & Beltman, S. (2019). Promoting resilience for teachers: pre-service and in-service professional learning. *The Australian Educational Researcher*, 46, 583–588.

Mansfield, C. F., Wosnitza, M., & Beltman, S. (2012). Goals for teaching: Towards a framework for examining motivation of graduating teachers. *Australian Journal of Educational & Developmental Psychology, 12,* 21-34.

Masten, A. S. (2014). Global perspectives on resilience in children and youth. *Child Development, 85*(1), 6-20.

Marsh, H. W., Lüdtke, O., Trautwein, U., & Morin, A. J. S. (2009). Classical latent profile analysis of academic self-concept dimensions: Synergy of person- and variable-centered approaches to theoretical models of self-concept. *Structural Equation Modeling, 16*(2), 191-225.

Mondo, M., Sechi, C., & Cabras, C. (2021). Psychometric evaluation of three versions of the Italian Perceived Stress Scale. *Current Psychology, 40*, 1884-1892.

Morin, A. J. S., Morizot, J., Boudrias, J.-S., & Madore, I. (2011). A multifoci person-centered perspective on workplace affective commitment: A latent profile/factor mixture analysis. *Organizational Research Methods, 14*(1), 58-90.

Nalipay, M. J. N., King, R. B., Haw, J. Y., Mordeno, I. G., & Dela Rosa, E. D. (2021). Teachers who believe that emotions are changeable are more positive and engaged: The role of emotion mindset among in- and preservice teachers. *Learning and Individual Differences, 92*, 102050.

OECD (2019). *Teaching and Learning International Survey - TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners, TALIS*. OECD Publishing.

Ornaghi, V., Conte, E., Agliati, A., & Gandellini, S. (2022). Early-childhood teachers' emotion socialization practices: a multi-method study. *Early Child Development and Care, 192*(10), 1608-1625.

Ornaghi, V., Conte, E., Cavioni, V., Farina, E., & Pepe, A. (2023). The role of teachers' socio-emotional competence in reducing burnout through increased work engagement. *Frontiers in Psychology, 14*, 1295365.

Ortan, F., Simut, C., Simut, R. (2021). Self-efficacy, job satisfaction and teacher well-being in the K-12 educational system. *International Journal of Environmental Research and Public Health, 18*(23),12763.

Park, K. A., & Johnson, K. R. (2019). Job satisfaction, work engagement, and turnover intention of CTE health science teachers. *International Journal for Research in Vocational Education and Training, 6*(3), 224-242.

Peixoto, F., Wosnitza, M., Pipa, J., Morgan, M., & Cefai, C. (2018). *A multidimensional view on preservice teacher resilience in Germany, Ireland, Malta and Portugal*. In M. Wosnitza, F. Peixoto, S. Beltman, & C. F. Mansfield (Eds.), *Resilience in education: Concepts, contexts and connections* (pp. 73-89). Springer International Publishing.

Petrillo, G., Capone, V., Caso, D., & Keyes, C. L.M. (2015). The Mental Health Continuum–Short Form (MHC–SF) as a measure of well-being in the Italian context. *Social indicators research, 121*(1), 291-312.

Ryff, C. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069-1081.

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69*(4), 719-727.

Schifter, C. C. (2016). Personalizing professional development for teachers. In M. Murphy, S. Redding, & J. Twyman (Eds.), *Handbook on personalized learning for states, districts, and schools* (pp. 221–235). Temple University, Center on Innovations in Learning

Schonert-Reichl, K. A., Kitil, M. J., & Hanson-Peterson, J. (2017). *To reach the students, teach the teachers: A national scan of teacher preparation and social and emotional learning*. A report prepared for the

Collaborative for Academic, Social, and Emotional Learning (CASEL). University of British Columbia.

Schwarzer, R., & Hallum, S. (2008). Perceived teacher self-efficacy as a predictor of job stress and burnout: Mediation analysis. *Applied Psychology: An International Review, 57*, 152-171.

Seligman, M. (2011). *Flourish: A Visionary New Understanding of Happiness and Well-being.* Free Press.

Sinclair, C. (2008). Initial and changing student teacher motivation and commitment to teaching. *Asia-Pacific Journal of Teacher Education, 36*(2), 79-104.

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: assessing the ability to bounce back. *International Journal of Behavioral Medicine, 15*(3), 194-200.

Skaalvik, E. M., & Skaalvik, S. M. (2007) Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of Educational Psychology, 99*(3), 611-625.

Skaalvik, E. M., & Skaalvik, S. M. (2014) Teacher self-efficacy and perceived autonomy: Relations with teacher engagement, job satisfaction, and emotional exhaustion. *Psychological Reports, 114*(1), 68-77.

Toto, G. A. (2021). *Percezioni di efficacia e sviluppo professionale dei docenti*. Progedit.

Toto, G. A. & Limone, P. (2021). Motivation, stress and impact of online teaching on Italian teachers during COVID-19. *Computers, 10*(6), 75. https://doi.org/10.3390/computers10060075.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*(7), 783-805.

Vandenberg, R. J., & Stanley, L. J. (2009). Statistical and methodological challenges for commitment researchers: Issues of invariance, change across time, and profile differences. In H. J. Klein, T. E. Becker, & J. P. Meyer (Eds.), *Commitment in organizations: Accumulated wisdom and new directions* (pp. 383–416). Routledge/Taylor & Francis Group.

Weston, K., Ott, M., & Rodger, S. (2018). Yet one more expectation for teachers. In A. W. Leschied, D. H. Saklofske, & G. L. Flett (Eds.), *Handbook of school-based mental health promotion. An evidence-informed framework for implementation* (pp.105-126). Springer.

Von Eye, A., & Wiedermann, W. (2015). Person-centered analysis. In Ben-Yehoyada, N., Bestor, T. C., DiMaggio, P., Eccles, J. S., Howell, W., Laibson, D., & Nass, C. (Eds.), Emerging Trends in the Social and Behavioral Sciences: An Interdisciplinary, Searchable, and Linkable Resource (pp 1–18). Wiley. https://doi.org/10.1002/9781118900772.etrds0251.

von Muenchhausen, S., Braeunig, M., Pfeifer, R., Göritz, A. S., Bauer, J., Lahmann, C., & Wuensch, A. (2021). Teacher self-efficacy and mental health-their intricate relation to professional resources and attitudes in an established manual-based psychological group program. *Frontiers in Psychiatry, 28*(12), 510183.