



Research paper

Ode to joy: The impact of enjoyment on pre-service teacher persistence

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ABSTRACT

Persistence in teaching is a crucial matter all around the world, as teaching is related to a high level of attrition. In this paper, we are interested in how persistence in teaching may be predicted by 1) teacher emotions and 2) their self-perceived competence as well as the value placed on the teaching profession. Using self-reported questionnaires, we collected data on 655 pre-service teachers. Results revealed that value allowed to teaching and teaching self-perceived competence significantly predict emotions felt when teaching. Moreover, results highlight that value and enjoyment are positively related to the propensity to persist in teaching.

Recent statistics have highlighted that teaching is related to a relatively high probability of attrition (Ingersoll, 2001; Stokking et al., 2003), especially during the first years of professional experience. Thus it is crucial to investigate and identify protective factors for career dropout. The purpose of this study is to understand what predicts pre-service teachers' intention to persist in their work. As studies have shown that teachers' emotions were important in their everyday lives, we are interested in how emotions and their proximal antecedents (i.e., value and self-perceived competence) were related to teachers' persistence in their work. More specifically, we are interested in assessing how teaching value and teacher self-perceived competence predicted emotions felt when teaching, which in turn could predict the persistence in the work of teacher.

1. Introduction

1.1. Persistence in teaching

In the context of career choice, persistence refers to the stability of choice, and to the decision to stay in a given activity. Research has highlighted a large variety of terms used to refer to persistence, as authors refer to "intention to remain" (Bruinsma & Jansen, 2010), "persistence" (Mau et al., 2008) or "planned persistence" (Saks et al., 2021; Shirrell & Reininger, 2017), "intention to quit" (Klassen & Chiu, 2011; Madigan & Kim, 2021), "motivation to leave" (Skaalvik & Skaalvik, 2011), "teacher retention or attrition" (Borman & Dowling, 2008; Brill &

McCartney, 2008), "teacher turnover or turnover intention" (Ingersoll, 2001; Räsänen et al., 2020), or "teacher dropout" (Stokking et al., 2003). In the rest of the manuscript, we will refer to "persistence" or "intention to persist".

Teacher persistence is a global problem and thus has become of great interest in many countries, such as the Netherlands, USA, Canada, Finland, Norway, Belgium, and Korea (Bruinsma & Jansen, 2010; Ingersoll, 2001; Jeffrey & Sun, 2008; Murdoch & Lim, 2022; Räsänen et al., 2020; Saks et al., 2021; Shirrell & Reininger, 2017; Skaalvik & Skaalvik, 2011; Stokking et al., 2003). Prospective data suggests that between 2022 and 2031, Switzerland – where this study was conducted – may face a lack of teachers due to the gap between the number of students and the number of trained teachers (OFS, 2022). An important concern refers to the dropout rates – the opposite of persistence, which are extremely high in teaching (Ingersoll, 2001; Stokking et al., 2003). Dropout rates may vary from 15% to 50% depending on the study and the country (Alexander et al., 2020). Dropout is of particular concern during the first five years (Stokking et al., 2003). The transition from pre-service teacher to "real" teacher may be difficult, as it requires pre-service teachers to perform a major change in their professional identity (Bossard, 2009). This radical change may be, amongst others, an important factor explaining the huge rates of dropout amongst young teachers.

Studies show that persistence in the teaching profession depends on many different factors such as job satisfaction (Madigan & Kim, 2021; Mau et al., 2008; Skaalvik & Skaalvik, 2011), workload (Brill &

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McCartney, 2008; Räsänen et al., 2020; Saks et al., 2021) or the challenges of the interaction with educational stakeholders, colleagues, students or parents (Räsänen et al., 2020; Saks et al., 2021). Teacher persistence also depends on individual characteristics such as age, training/certification, experience (Borman & Dowling, 2008; Ingersoll, 2001), engagement (Kim & Corcoran, 2018), or emotional exhaustion (Saks et al., 2021; Skaalvik & Skaalvik, 2011) and burnout (Madigan & Kim, 2021). School characteristics and organizational conditions can also play a role, notably size, rurality, student discipline problems, school mentoring program for beginning teachers or school socioeconomic composition and percentage of students with identified disabilities (Borman & Dowling, 2008; Brill & McCartney, 2008; Ingersoll, 2001; Shirrell & Reininger, 2017; Skaalvik & Skaalvik, 2011). Teaching level also appears as a factor related to persistence, as Rots et al. (2007) report higher attrition rate in the secondary degree teachers than in primary school and in kindergartens.

Teacher commitment, which is closely related to persistence, has been defined as “the strength of psychological attachment to the target of teaching” (Wang et al., 2021, p. 3). Research highlights that commitment may predict the choice of becoming a teacher (Rots et al., 2007, 2010; Wang et al., 2021) or intention to quit (Klassen & Chiu, 2011). Commitment can be influenced by job stress, year of experience, teacher education preparation, faculty and mentoring support and teaching self-efficacy (Klassen & Chiu, 2011; Rots et al., 2007, 2010; Wang et al., 2021 for a review).

Fewer studies have been carried out on pre-service teachers than on in-service teachers regarding persistence and commitment (Wang et al., 2021). Thus, little is known about the psychological factors influencing pre-service teacher persistence (Klassen & Chiu, 2011, p. 114). Among these, research highlights inconclusive evidence as several studies suggest that primary school pre-service teachers are more committed than secondary pre-service teachers whereas others show no significant difference between the two (Wang et al., 2021).

This emphasizes how crucial it is to study pre-service teachers. As mentioned above, Switzerland is likely to have a shortage of teachers in the coming years (OFS, 2022) and recruiting and retaining teachers has become increasingly difficult (Wang et al., 2021). It therefore seems necessary to better understand (pre-service) teacher persistence and commitment.

In this study, we focus on pre-service teachers to investigate, at the beginning of their career, how emotions felt in teaching can influence pre-service teachers’ desire to continue in this path. More specifically, we are interested in how value given to teaching and self-perceived competence may predict the propensity to persist in teaching. Our hypotheses are drawn on two main theories: the Eccles expectancy-value theory (Eccles, 1993; Wigfield et al., 2017) and the control-value theory (Pekrun, 2006) which are both anchored in the expectancy-value tradition (Wigfield et al., 2017). According to the expectancy-value theory, persistence will be influenced by two factors: expectation of success (i.e., “Do I believe that I can achieved the task?”) and subjective task value (i.e., “Is the task important to me?”). According to the control-value theory, the task value and control (i.e., “Can I control the outcome of my action”) will influence motivation, persistence, and achievement *via* the emotions experienced. In both theories, task value and expectation of success (i.e., control) are central. These appraisals have also been highlighted by Frenzel (2014)’s model on teacher emotions. In this model, task value is referred to goal importance, and control to coping potential. In the following paragraphs, we define these two terms in greater detail.

1.2. Self-perceived competence

Self-perceived competence is at the center of numerous concepts such as expectation of success (Expectancy-Value Theory - EVT Eccles, 1983, 2005; Wigfield et al., 2017), control over the task (CVT, Pekrun, 2006) and self-efficacy (Bandura, 1977) or self-concept (Marsh, 1990).

Expectation of success is defined by Eccles (2005, p. 105), as “a sense of domain specific personal efficacy”, and has been operationalized recently with academic self-concept (Wigfield et al., 2017). For a review regarding the differences between these concepts see Bong and Skaalvik (2003). In the same vein, Bandura (1977) defines self-efficacy as “the idea that individuals are able to exercise control over actions that affect their lives” (Zee & Koomen, 2016, p. 983). In this work, we consider the sense of competence as “self-perceived competence” (SPC).

Teacher SPC can be defined as “individual teachers’ beliefs in their own ability to plan, organize, and carry out activities that are required to attain given educational goals” (Skaalvik & Skaalvik, 2010, p. 1059). Teacher SPC has been related to activity choice, effort and persistence (Bandura, 1977) as well as teaching effectiveness (Klassen & Tze, 2014; Zee & Koomen, 2016), students’ academic adjustment (Zee & Koomen, 2016) and job satisfaction (Skaalvik & Skaalvik, 2010) in a large variety of countries (Vieluf et al., 2013). It also has a positive impact on teacher well-being (Zee & Koomen, 2016) and has been related to lower burnout level (Skaalvik & Skaalvik, 2010; Zee & Koomen, 2016). However, it is suggested that feeling competent may have minimal impact if the individual does not value the task at hand (Harter, 1999).

Regarding pre-service teachers, many empirical studies and theoretical models have considered the feeling of competence as a central determinant of commitment or intention to persist: the more competent pre-service teachers feel, the more likely they will be committed and persist in their career (Bruinsma & Jansen, 2010; González et al., 2018; Klassen & Chiu, 2011; Rots et al., 2007, 2010; Wang et al., 2021). As suggested by Klassen and Chiu (2011) feeling competent in classroom management may allow pre-service teachers to feel less stressed and more satisfied with their work, which in turn should be negatively related to the intention to quit the profession. Similar findings were highlighted by Dos Santos (2021), who showed that pre-service teachers’ self-perceived competence was related to their career choice.

1.3. Value

Both the Expectancy-Value theory and the Control-Value theory emphasize the importance of valuing the task (Eccles, 1983, 2005; Pekrun, 2006). Both models refer to the concept of “intrinsic value” as a predictor of positive outcomes (Eccles, 1983; Pekrun, 2006). For Eccles and Wigfield (2002), this concept can be conceived as similar to the construct of intrinsic motivation proposed by Deci and Ryan (1985) and Harter (1981). This is also true for the intrinsic value mentioned by Pekrun (2006), who defines it as the fact of valuing an activity for its own sake. Several studies have shown that the value placed on one’s studies influences the intention to persist, academic engagement and ultimately the performance at the final exam (Neuville et al., 2013; Wigfield et al., 2017).

From a professional perspective, Watt and Richardson (2007) developed a framework to understand the Factors Influencing Teaching Choice (FIT-Choice) based on the expectancy-value theory. These authors highlight that intrinsic career value (i.e., the propensity to like one’s work) perceived by pre-service teachers is positively linked to planned persistence and career development aspirations.

Empirical research on pre-service teachers confirms that intrinsic motivation or value to become teacher will influence teaching commitment and persistence (Bruinsma & Jansen, 2010; Rots et al., 2010). Torsney et al. (2019) further investigated teaching value and revealed that it was constituted of three different factors, namely social utility value (SUV), personal utility value (PUV) and epistemic value. Their results further suggested that SUV significantly predicted persistence in the teaching profession, whereas all three types of value positively predicted planned effort and future professional development. Murdoch and Lim (2022) also investigated the types of values that pre-service teachers in Korea emphasized to persist and enter teaching. Their results reveal that job security (which is part of PUV) was the strongest motivation for pre-service teachers to enter teaching, but it

was moderately correlated with persistence. In contrast, general interest, which can be conceptualized as an intrinsic value, was positively associated with persistence. These results have also been found by Saks et al. (2021) in in-service teachers who emphasized that intrinsic value and perceived teaching ability formed a single factor predicting persistence.

While value and self-perceived competence have been extensively studied as proximal antecedents of academic emotions (Pekrun, 2006), few studies have focused on their implications in teacher emotions.

1.4. Teacher Emotions

Teacher emotions are defined as “emotions experienced in the context of [teachers’] professional engagement as teachers” (Frenzel et al., 2020, p. 2). Research has highlighted that teachers experience a wide range of emotions, which can vary in intensity, quality and valence (Burić et al., 2018). Teachers report both pleasant (i.e., enjoyment, love, pride) and unpleasant emotions (i.e., anger, anxiety, and frustration; Frenzel et al., 2020). As highlighted by Farouk’s definition of teacher emotions, these emotions “are integral to the ways in which [teachers] relate to and interact with their students, colleagues and parents” (Farouk, 2012, p. 419). Enjoyment, anxiety and anger are the principal emotions investigated in research focusing on teacher emotions (Atmaca et al., 2020). As shown by Lohbeck et al. (2018), these emotions have been highlighted within the literature as the most salient and frequent emotions experienced by teachers. More specifically, as Frenzel (2014) highlights, teachers report experiencing joy 97% of their daily lives, 44% report anger and 25% report anxiety.

Enjoyment is the most salient emotion reported by teachers (Sutton & Wheatley, 2003). It can either emerge from 1) an upcoming desirable event, 2) the participation to an enjoyable activity or 3) past enjoyable activity or positive outcomes. These types of enjoyment refer to anticipatory joy, activity-related enjoyment or outcome-related enjoyment, respectively. As suggested by Frenzel (2014), enjoyment is a highly valued, socially acceptable emotion. Thus, it is possible that teachers exaggerate their experience of enjoyment. Teacher enjoyment is positively related to how students perceive their teacher’s monitoring, elaboration and comprehensibility (Frenzel, Goetz, Lüdtke, et al., 2009; Frenzel, Goetz, Stephens, & Jacob, 2009). Moreover, enjoyment is related to the quality of the relation between students and their teachers (Hagenauer et al., 2015) as well as with students’ motivation (Aldrup et al., 2017), engagement (Hagenauer et al., 2015). Regarding the teachers themselves, enjoyment is positively related to job satisfaction (Atmaca et al., 2020), well-being (Nalipay et al., 2019) and health (F.-C. Chang et al., 2013; Taxer & Frenzel, 2015).

In contrast to enjoyment, anger is a negative, socially undesirable emotion – and particularly for teachers (Sutton, 2007). It can be either directed toward oneself or at other people (Ellsworth & Tong, 2006), depending on how people feel responsible toward the undesirable event they face (Kuppens et al., 2003). Anger is reported as the negative emotion most often felt by teachers (Frenzel, 2014). The sources of anger are multiple: teachers may be angry at themselves when they are not satisfied with how they designed their teaching; teachers can feel anger towards their students if they misbehave or towards the parents if they question the grades of their children.

Finally, anxiety is the most studied emotion in the classroom. While research has been focusing on test-anxiety (e.g., Zeidner, 2014), teacher anxiety has not been studied thoroughly. Anxiety is related to physiological components such as sweating or shaking, but also to cognitive components such as willingness to escape the situation or worries (Frenzel, 2014). Anxiety arises when people face uncertainty or when they feel they are not able to cope with the situation. In the context of teaching, anxiety has been shown to be related to lack of preparedness, disciplinary issues and dissatisfaction toward teaching performance (see Frenzel, 2014). In that sense, seniority in teaching may help diminish such feeling of anxiety (see M.-L. Chang, 2009).

While many studies have emphasized the importance of emotional intelligence (Chesnut & Cullen, 2014; Corcoran & Tormey, 2012; Di Fabio & Palazzeschi, 2008; Hawkey, 2006; Mérida-López & Extremera, 2020; Turner & Stough, 2020) in pre-service teachers, few studies have focused on emotions *per se*. The notable exceptions found in the literature are reported below. Hascher and Hagenauer (2016) reported that pre-service teachers who had been participating to a practicum reported more positive emotions than negative ones. This was supported by Ji et al. (2022). However, Ji et al. (2022) reported that between the beginning and the end of the practicum, positive emotions decreased whereas negative emotions increased. Pre-service teachers attribute the rise of negative emotions to school leadership, social culture and education reform. Timoštsuk and Ugaste (2012) further emphasized that both positive and negative emotions in pre-service teachers were crucial to build their professional identity and that practice was related to self-efficacy enhancement (Martins et al., 2015). Self-efficacy is related to emotions, as highlighted by DeMauro and Jennings (2016)’s study. The authors more specifically suggested that anxiety was not a significant predictor of pre-service teachers’ self-efficacy, while depressive symptoms were (DeMauro & Jennings, 2016). In contrast, Bach and Hagenauer (2022) highlighted that joy, anger, anxiety predicted self-efficacy beliefs related to instructional strategies, classroom management, and student engagement. While these studies used emotions as predictors of self-efficacy beliefs, Hascher and Hagenauer (2016) suggested that pre-service teacher self-efficacy predicted joy and anxiety during teaching. Another line of research has been focusing on pre-service teachers in their “students” role, and thus investigated their emotions regarding their studies. Of particular relevance, Nalipay et al. (2021) showed that positive and negative emotions in pre-service teachers were significantly related to their learning engagement. Furthermore, Audrin and Hascoët (2021) revealed that pre-service teachers’ boredom was negatively related to the intention to persist in their studies.

1.5. Aims and hypothesis

The purpose of this study is to understand what predicted pre-service teachers’ intention to persist in their work. More specifically, we are interested in assessing how teacher SPC and value given to teaching predict emotions felt when teaching, which in turn can predict the intention to persist in the work of teacher. As highlighted in the literature review above, literature on pre-service teachers has shown interest in these concepts, but no study has investigated them together yet. More specifically and in line with the theoretical models presented earlier (Eccles, 1983; Frenzel, 2014; Frenzel et al., 2020; Pekrun et al., 2017), we hypothesize that 1) the value allowed to teaching and 2) teacher SPC will be positively related to joy but negatively to anger and anxiety felt when teaching by pre-service teachers. We further hypothesized that joy will be positively related to the propensity to persist in teaching. In contrast, we hypothesize that anger and anxiety will be negatively related to propensity to persist in teaching. Moreover, we hypothesize that value and teachers SPC will be positively related to teachers’ propensity to persist in teaching. Finally, as previous literature highlights inconclusive results regarding teachers’ persistence in primary and secondary pre-service teachers, we are interested in assessing whether there are significant differences between the two groups regarding their intention to persist as well as their emotional experience.

2. Method

2.1. Sample

Participants were 655 pre-service teachers of University of Teacher Education (500 women, 149 men, 4 non-binary and 2 non response). Among them, 433 pre-service teachers (66%) were studying at the bachelor’s degree level with the aim of becoming a primary school

teacher, while 222 pre-service teachers (34%) were studying at the master’s degree level with the aim of becoming a secondary school teacher. In the institution where the data was collected, all the pre-service teachers must complete an internship in primary or secondary school as soon as they start their first year of training. The data was collected at the end of the academic year (in May) to ensure that all teachers had had access to teaching practice.

2.2. Measures

Teacher Emotions were measured using the Teacher Emotion Scale (TES – Frenzel et al., 2016), which has already been used in pre-service teachers (e.g., Bach & Hagenauer, 2022; Waber et al., 2021). This scale consists of 12 items measuring 1) joy - 4 items (alpha = 0.82, omega = 0.84) such as “I generally teach with enthusiasm”, 2) anger - 4 items (alpha = 0.69, omega = 0.72) such as “I often have reasons to be angry while I teach and 3) anxiety - 4 items (alpha = 0.79, omega = 0.80) such as “I generally feel tense and nervous while teaching”. We used the French version of this scale (Audrin et al., 2023). Participants answered on a scale ranging from 1 (not agree at all) to 7 (totally agree).

Teacher SPC was measured by the Teacher’s Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001; translated in French by Valls et al., 2020) which has previously been used with pre-service teachers (e.g., Klassen & Chui, 2011; Rots et al., 2007). In this scale, participants are presented with 12 items, which measure 1) their perceived efficacy regarding how they feel they are able to involve students in learning (“Engagement” subscale, four items (alpha = 0.81, omega = 0.82) such as “How much can you do to motivate students who show low interest in school work?”), 2) their perceived effectiveness in using teaching strategies (“Instruction” subscale, four items (alpha = 0.79, omega = 0.80) such as “To what extent can you provide an alternative explanation or example when students are confused?”) and 3) their perceived effectiveness regarding classroom management (“Classroom” subscale, four items (alpha = 0.89, omega = 0.91) such as “How much can you do to get children to follow classroom rules”). Participants answered on a scale ranging from 1 (not agree at all) to 7 (totally agree). This scale can be used as a 3-dimension score or as a unique second order factor. In this study we modeled this scale as a second order factor.

To measure the Value pre-service teachers gave to their work, we used the scale of Warr et al. (1979) as it is designed to measure “the degree to which a person wants to work well in his/her job in order to

achieve intrinsic satisfaction” (Warr et al., 1979, p. 133). The scale had an acceptable reliability (alpha = 0.71, omega = 0.83) and consisted of six items such as “I feel satisfied when I do my job well”. Participants answered on a scale ranging from 1 (not agree at all) to 7 (totally agree).

Finally, to measure the Intention to Persist in their work – work persistence, we used the scale of Blau (1985). While this scale was originally designed to measure commitment, research suggests that it also assesses intention to continue a career (Carson & Bedeian, 1994). This scale had a good reliability (alpha = 0.81, omega = 0.83), and consisted of ten items such as “I really want to make my career in teaching”. Participants answered on a scale ranging from 1 (not agree at all) to 7 (totally agree).

2.3. Data analyses

Data were analyzed with R using the lavaan package (Rosseel et al., 2020). We first report descriptive analysis of our sample. More specifically, we report descriptive statistics regarding 1) teacher SPC – engagement, instruction and classroom, 2) value of teaching, 3) teacher emotions - joy, anger and anxiety, 4) work persistence. We further report correlation between these dimensions. Then we focus on Structural Equation Modeling (SEM). Our SEM model is represented in Fig. 1, and was designed to test how study teacher SPC and value were related to the emotions felt when teaching, which in turn could be related to work persistence.

Items were kept defining their latent factor if their loadings were equal or higher than 0.40. To assess the model’s goodness-of-fit, we used indices having complementary measurement properties, as recommended by Hu and Bentler (1998). We relied on the root mean-square error of approximation (RMSEA), the comparative fit indices (CFI) and the Tucker-Lewis index (TLI). Browne and Cudeck (1992) highlight that models with RMSEA below 0.05 are indicative of good fit, and that values up to 0.08 reflect reasonable errors of approximation. The CFI statistic (McDonald & Ho, 2002) reflects the “distance” of the model from the perfect fit. It is generally acknowledged that a value greater than 0.90 reflects an acceptable distance to the perfect fit. We also reported the Tucker–Lewis index (TLI; Tucker & Lewis, 1973), which accounts for the model complexity. The TLI indicates how the model of interest improves the fit in relation to the null model. As for the CFI statistic, a TLI value equaled or greater than 0.90 reflects an acceptable distance to the perfect fit.

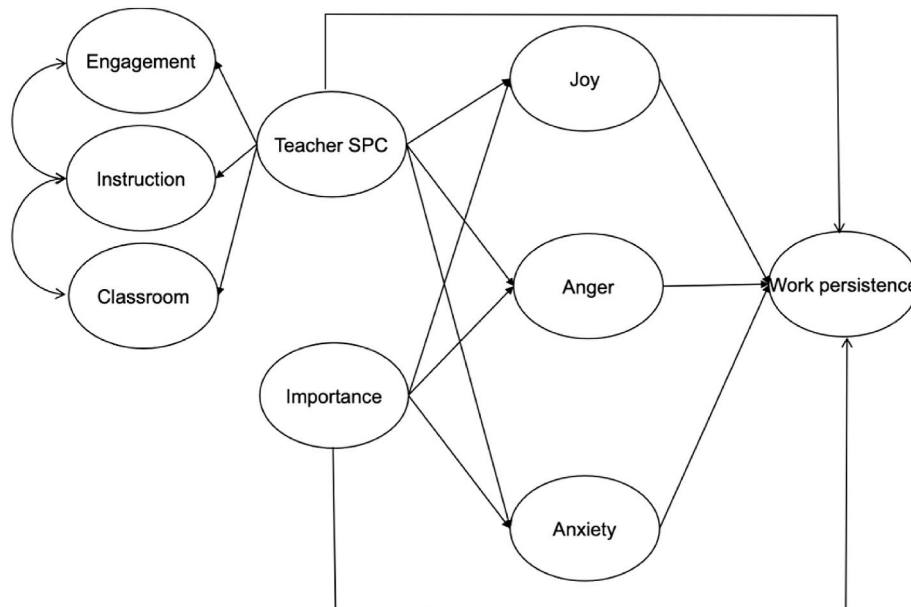


Fig. 1. Hypothesized model.

3. Results

3.1. Descriptive results

Descriptive results (i.e., mean, standard deviation (SD) and range) are reported in Table 1, and correlations between each variable are reported in Table 2. Descriptive statistics suggest that Teacher SPC is relatively high, especially regarding the instruction dimension ($M = 5.29$, $SD = 0.94$). Moreover, participants report high value toward teaching ($M = 6.06$, $SD = 0.71$) and a high intention to persist in their work ($M = 5.68$, $SD = 1.10$). Finally, participants report more positive emotions ($M_{\text{joy}} = 4.35$, $SD = 0.61$) than negative ($M_{\text{anger}} = 1.52$, $SD = 0.59$, $M_{\text{anxiety}} = 2.47$, $SD = 0.88$). The results of a MANOVA show that pre-service teachers studying primary education feel more joy ($F(1, 653) = 9.87$, $p < .01$, $\eta^2 = 0.02$; $M_{\text{Primary}} = 4.40$; $M_{\text{Secondary}} = 4.25$) and less anger ($F(1, 653) = 10.06$, $p < .01$, $\eta^2 = 0.02$; $M_{\text{Primary}} = 4.40$; $M_{\text{Secondary}} = 4.25$) than secondary pre-service teachers. They also feel more competent in two dimensions: the classroom ($F(1, 653) = 9.92$, $p < .01$, $\eta^2 = 0.02$; $M_{\text{Primary}} = 5.00$; $M_{\text{Secondary}} = 4.70$) and the engagement dimension ($F(1, 653) = 18.15$, $p < .01$, $\eta^2 = 0.03$; $M_{\text{Primary}} = 5.20$; $M_{\text{Secondary}} = 4.85$). Finally they declare a higher intention to persist in their work ($F(1, 653) = 22.35$, $p < .01$, $\eta^2 = 0.03$; $M_{\text{Primary}} = 5.83$; $M_{\text{Secondary}} = 5.68$).

Correlations reveal positive links between the sub-dimensions of Teacher SPC ($r = [0.62; 0.70]$). Moreover, Teacher SPC is positively related to teaching value ($r = [0.22; 0.28]$). Teaching value is positively related to joy ($r = 0.42$), but negatively to anger ($r = -0.18$) and not significantly to anxiety ($r = 0.01$). In the same vein, the sub-dimensions of teacher SPC are positively related to joy ($r = [0.43; 0.48]$), but negatively to anger ($r = [-0.41; -0.29]$) and anxiety ($r = [-0.41; -0.34]$). Finally, work persistence is positively related to the sub-dimensions of teacher SPC ($r = [0.31; 0.37]$), value ($r = 0.39$) and joy ($r = 0.63$) but negatively to anger ($r = -0.36$) and anxiety ($r = -0.32$).

3.2. SEM results

As we highlighted differences between primary and secondary teachers, we tested if the SEM model was the same in the two samples. Therefore, we ran MultiGroup Confirmatory Factor Analysis (MG-CFA, Hong et al., 2003; Steenkamp & Baumgartner, 1998; Zhou et al., 2019), and tested the configural (parameters are not constrained across groups), metric (factors loadings are constrained as equal across the groups) and scalar invariances (factors loadings and intercepts are constrained as equal across the groups) of the model between primary versus secondary pre-service teachers. As the three models are nested, this allows us to compare the difference of fit indices between the different models (configural model vs. metric model and metric vs. scalar model). All the difference in the indices between the metric and configural model and between the scalar and metric model were below the recommended threshold (DCFI < 0.10 ; DSRMR < 0.01 ; DRMSEA < 0.015 ; Steenkamp and al., 1998; Hong et al., 2003). This highlights that the

Table 1

Descriptive statistics of Teacher SPC, Teaching value, Teacher emotions and Work persistence.

	Mean	Standard Deviation	Range
Teacher SPC	5.09	0.92	[1.0; 7.0]
Engagement	5.08	1.02	[1.0; 7.0]
Instruction	5.29	0.94	[1.0; 7.0]
Classroom	4.90	1.18	[1.0; 7.0]
Teaching Value	6.06	0.71	[3.0; 7.0]
Teaching Emotions			
Joy	4.35	0.61	[2.0; 5.0]
Anger	1.52	0.59	[1.0; 5.0]
Anxiety	2.47	0.88	[1.0; 5.0]
Work persistence	5.68	1.10	[1.0; 7.0]

measurement model can be considered as equivalent across groups. We then tested the invariance of the predicted model between both groups by constraining regression paths. When comparing this model to the model where no distinctions between the groups are made (i.e., our initially hypothesized model), results show that the difference of fit between these models is not significant. This suggests that both groups have the same pattern of prediction path. Therefore, we hereafter present the results for primary and secondary teachers in the same model.

The model provided good fit with robust indices (RMSEA = 0.047, SRMR = 0.062, CFI = 0.924, TLI = 0.917, Chi2/df = 2.16). Factor loadings are reported in Appendix 1 and regression coefficients are reported in Table 3.

Results reveal that teacher SPC as well as teaching value are significant predictors of teaching emotions. More specifically, our results highlight that Teacher SPC positively predicts teaching joy ($b = 0.24$, 95% CI = [0.11; 0.37], $z = 3.65$, $p < .001$) but negatively predicts teacher anger and anxiety ($b = -0.33$, 95% CI = [-0.04; -0.20], $z = -4.41$, $p < .001$; $b = -0.42$, 95% CI = [-0.55; -0.29], $z = -5.65$, $p < .001$, respectively). Teaching value is also positively related to teaching joy ($b = 0.61$, 95% CI = [0.48; 0.74], $z = 6.97$, $p < .001$) but negatively to teaching anger and anxiety ($b = -0.33$, 95% CI = [-0.48; -0.18], $z = -4.22$, $p < .001$; $b = -0.16$, 95% CI = [-0.20; -0.03], $z = -2.27$, $p = .02$, respectively). This reveals that the more pre-service teachers value teaching and that they feel competent in their teaching, the more they will experience positive emotions and the less they will experience negative emotions when they teach.

Our results further highlight a significant link between teaching joy and teachers' propensity to persist in their work: the more participants reported teaching joy, the more they would persist in teaching ($b = 0.58$, 95% CI = [0.42; 0.74], $z = 6.41$, $p < .001$). Interestingly, teaching anger and teaching anxiety were not significantly related to the propensity to persist in teaching ($b = -0.06$, 95% CI = [-0.16; -0.05], $z = -1.04$, $p = .30$; $b = -0.01$, 95% CI = [-0.11; -0.05], $z = -0.21$, $p = .83$, respectively). Finally, our results further highlight a significant direct link between teaching value and work persistence ($b = 0.24$, 95% CI = [0.07; 0.41], $z = 2.77$, $p < .001$).

These results suggest that the value allowed to teaching as well as the perception of one's competence toward teaching are important predictors of the emotions felt during teaching – both positive (i.e., joy) and negative (i.e., anger, anxiety) emotions. However, joy is the only emotion significantly related to persistence in teaching.

4. Discussion

The purpose of this study was to understand what predicted pre-service teachers' intention to persist in their work. More specifically, we were interested in assessing how pre-service teacher SPC and teaching value predicted emotions felt when teaching, which in turn could predict the intention to persist in the work of teacher. To test this, 655 pre-service teachers were recruited to participate to our study and filled self-reported questionnaires. Our results partially support our hypotheses. More specifically, they show that (a) value allowed to teaching and (b) teaching SPC significantly predicted emotions felt when teaching, and that (c) joy is related to the propensity to persist in teaching but not anxiety nor anger. Moreover, our results highlighted that value was a significant predictor of propensity to persist in teaching for pre-service teachers.

Our results support our hypotheses as they highlight that value given to teaching is positively related to the propensity to persist in teaching: the more pre-service teachers valued their work, the more they wanted to go on in being a teacher. This is in line with previous models highlighting how value is an important predictor of academic persistence (e.g., Neuville et al., 2013). Surprisingly however, our results highlight a non-significant effect of pre-service teacher SPC on work persistence. This is in contrast with our hypothesis and is in contradiction with previous evidence which highlight that the more one feels competent in

Table 2
Correlation matrix between Teacher SPC, Teacher emotions, Teaching value and Work Persistence.

	1	2	3	4	5	6	7	8
1. Engagement	1							
2. Instruction	0.70**	1						
3. Classroom	0.67**	0.62**	1					
4. Value	0.27**	0.28**	0.22**	1				
5. Teaching joy	0.48**	0.43**	0.43**	0.42**	1			
6. Teaching anger	-0.36**	-0.29**	-0.41**	-0.18**	-0.43**	1		
7. Teaching anxiety	-0.34**	-0.37**	-0.41**	0.014	-0.46**	0.42**	1	
8. Work persistence	0.37**	0.32**	0.31**	0.39**	0.63**	-0.36**	-0.32**	1

Note. ** = $p < .01$.

Table 3
Regression coefficients between Teaching emotions (joy, anger and anxiety), Teacher SPC, Teaching value and Work persistence.

Dependent variable	Predictor	Standardized estimate	SE	z	p-value	95% CI	
						LL	UL
Teaching joy	Teacher SPC	.24	.05	3.65	.001	0.11	0.37
	Teaching value	.61	.10	6.97	.001	0.48	0.74
Teaching anger	Teacher SPC	-.33	.05	-4.41	.001	-0.46	-0.20
	Teaching value	-.33	.08	-4.22	.001	-0.48	-0.18
Teaching anxiety	Teacher SPC	-.42	.09	-5.65	.001	-0.55	-0.29
	Teaching value	-.16	.13	-2.27	.020	-0.29	-0.03
Work persistence	Teacher joy	.58	.20	6.41	.001	0.42	0.74
	Teaching anger	-.06	.14	-1.04	.300	-0.16	0.05
	Teaching anxiety	-.01	.07	-0.21	.830	-0.11	0.09
	Teacher SPC	-.13	.11	-1.87	.060	-0.26	0.00
	Teaching value	.24	.22	2.77	.001	0.07	0.41

Note. SE = standard error.

a domain, the more it is related to a willingness to pursue the activity (e.g., Bandura, 1977; Eccles, 1983; Harter, 1999).

Interestingly however, single correlations highlight that the different dimensions of SPC were significantly related to work persistence. Thus, this suggests that after controlling participants' emotions and value, SPC becomes a non-significant predictor of work persistence. As highlighted in our introduction section, literature has shown that emotions and teacher SPC were related (Bach & Hagenauer, 2022; Hascher & Hagenauer, 2016). This is confirmed by our results, as correlations between emotions and pre-service teachers SPC were moderate but significant. As descriptive statistics of pre-service teacher SPC's levels are relatively high, variability within teacher SPC may be explained by emotions, and more specifically by joy, which leaves it with no room to explain persistence. However, such hypothesis should be investigated more deeply as it may provide interesting avenues to understand predictors of work persistence.

Our results support previous literature on emotions (Frenzel, 2014; Frenzel, Goetz, Stephens, & Jacob, 2009; Pekrun, 2006). While previous literature has shown that emotions were important regarding teachers' motivation and engagement (Burić & Macuka, 2018), well-being (Burić et al., 2018) and effectiveness (Sutton, 2005), our results suggest that emotions can also be an important factor in work persistence for pre-service teachers. More specifically, our results showed that anger and anxiety were not significantly related to work persistence. They however revealed that joy is an important (protective) factor for teachers, as it favors work persistence. Such result is consistent with previous research which highlights that work persistence is related to job satisfaction (Madigan & Kim, 2021; Mau et al., 2008).

Job satisfaction has been conceptualized "as the positive or negative evaluative judgments that people make about their job" (Skaalvik & Skaalvik, 2015, p. 181). Research has suggested that positive affects such as enjoyment and job satisfaction were positively related. While several authors (Brackett et al., 2013; Burić & Moè, 2020; Moè et al., 2010) suggested that positive affective states predicted job satisfaction, Henne and Locke (1985, cited by Madigan & Kim, 2021) proposed that (job) satisfaction was related to enhanced enjoyment. Taken together,

these results suggest a virtuous circle between positive affect and job satisfaction. We believe however that further research is needed to disentangle the links between emotions, job satisfaction and persistence in teaching (e.g., Burić & Moè, 2020).

Our results further revealed that value and pre-service teacher SPC were both positively related to joy but negatively to anxiety and anger. This supports our hypotheses. It also suggests that these appraisals are particularly related to the valence of emotions. This contrasts with Frenzel's (2014) work who suggests that value should be related to emotion intensity, whereas attainment can be related to both valence and intensity. Further studies should investigate deeper how value and teacher SPC may predict emotional valence and intensity. Moreover, we only tested how each appraisal independently predicted emotions. As mentioned by Frenzel et al. (2020), previous research highlights that there may be a multiplicative combination of appraisals, at least for students' emotions. While we tested each appraisals' impact separately, future study may explore how proximal antecedents of emotions such as value and teacher SPC may interact to predict teachers' emotions. For example, intense anxiety may result from a combined effect of low teacher SPC and high value.

Finally, our results show that pre-service teachers studying primary education report a more positive teaching experience (felt more joy, less anger and feel more competent) and have a higher intention to persist in their career than secondary teachers. These results complement the contradictory findings on the relationship between educational level and persistence (Wang et al., 2021). However, our predictive model shows that the links between the antecedents and work persistence are identical for primary and secondary pre-service teachers. Thus, while the initial levels may be different, the processes at work appear similar for the two groups.

Our results provide interesting intervention avenues regarding pre-service teachers' education. First, they highlight that teaching is a highly emotional profession. Teacher education programs should emphasize how emotional their work is going to be and teach them what emotions are. Indeed, emotions are important in teachers but also in pupils/students and thus need to be acknowledged in the classroom.

Also, teacher education programs would need to emphasize the benefit of dual training, which alternates between theoretical and practical training. As highlighted above, practicum is crucial to enhance teacher identity, but it may also benefit pre-service teachers as it allows them to experience the emotional load of teaching. Experiencing this in parallel with the theoretical input regarding what emotions are, how they can be managed and how they can impact both teachers and students may be highly profitable for pre-service teachers. In the same vein, continuous education focusing on emotions would also be relevant. This may be relevant not only for novice teachers who might feel overwhelmed by the emotional dimension of their work, but also for older in-service teachers who haven't necessarily been taught with these concepts during their initial training.

As highlighted in our results, teaching is related to the emergence of highly arousing emotions (e.g., Fontaine et al., 2022). Thus, we believe that promoting emotional competence may be an important follow-up to our results and for teacher education. Emotional competence consists of identification, understanding, expression, regulation, and use of emotions (Mikolajczak et al., 2020). As highlighted by Letor (2006), emotional competence is central for teachers, and it may favor not only high-quality teaching but also teacher well-being. Moreover, as shown by Keller and Becker (2021), teachers emotion expression - be it fake or authentic - has an impact on students' learning. Finally, teachers' emotion regulation has also shown to be important in teachers' everyday life: they often modify their emotions either by deep (i.e., internalizing the emotion so that the expressed emotions match the felt emotions) or by surface acting (i.e., expressing an unfeared emotion). Thus, teaching pre-service teachers how to handle their emotions and the emotions in the classroom may be beneficial for the whole classroom.

Finally, our results highlight that joy is an important factor for work persistence, this suggests that joy should be emphasized in the daily life of every teacher and more specifically in pre-service teachers. Interventions designed to enhance happiness at work (e.g., Allen & McCarthy, 2016) may thus provide interesting resources for teachers. Another approach regarding pre-service teachers has been proposed by He (2009) and consisted in mentoring using strength-based approach. He (2009) suggested that such mentoring may foster positive emotions such as joy for both mentors and mentees.

This research suffers from several limitations. First, we used self-reported questionnaires. While this provides interesting results on a large sample of pre-service teachers and is necessary to test hypotheses such as the ones we had, it can create biases. In the case of teaching, it is particularly socially desirable to feel joy and undesirable to feel anger

Appendix 1

Factor loadings for Teacher SPC: engagement, instruction and class management, Teacher emotions: joy, anxiety, anger, Teaching value and Work Persistence.

Item	Standardized estimate	SE	z	p-value	95% CI	
					LL	UL
Engagement						
SPC 1	.58	.027	21.00	.001	.53	.64
SPC 2	.74	.024	30.00	.001	.69	.78
SPC 3	.74	.025	30.00	.001	.69	.78
SPC 4	.82	.018	44.00	.001	.78	.86
Instruction						
SPC 5	.78	.021	36.00	.001	.73	.82
SPC 6	.68	.030	23.00	.001	.62	.74
SPC 7	.60	.030	20.00	.001	.54	.66
SPC 8	.65	.028	23.00	.001	.59	.71
Classroom management						
SPC 9	.75	.024	32.00	.001	.71	.80

(continued on next page)

(Sutton, 2007). Thus, the level of joy might have been evaluated too positively whereas the level of anger might have been evaluated too negatively. Also, as we used only one type of method (i.e., self-reported questionnaire) to collect our data, our data may be subject to common variance biases. We took several precautions prior to collecting our data (i.e., use validated questionnaires, use different number of scale points in different concepts, insert proximal separations between predictors, mediators and dependent variables as well as make sure that participants knew their data would be fully anonymized (Podsakoff et al., 2012)). However, we did not account for common bias in our analyses, as we did not have any relevant marker (Williams & O'Boyle, 2015) nor had sufficient sample size to perform relevant analyses (i.e., Ding et al., 2023; Podsakoff et al., 2003). We thus believe that it would be particularly interesting and relevant for future research to collect data from various sources and to focus on a mixed-method research design. Indeed, we believe that our results may benefit from complementary qualitative research designs which may allow for a deeper understanding and exploration of the emotions felt by teachers in the classroom. Finally, we focused on between-person variations in all our measurements. However, as highlighted by Frenzel et al. (2020), there is substantial within-person variance within teacher emotions. While our results cannot be used to develop interventional programs oriented toward a specific teacher, they allow for implications about interindividual psychological functioning, and are relevant for policies regarding teacher education.

To conclude, our results reveal that value is a significant predictor of pre-service teachers' intention to persist in their work. Moreover, our results highlight the importance of emotions, particularly joy, to predict pre-service teachers' intention to persist in their work. These results highlight the relevance of emphasizing joy in the daily life of pre-service teachers, thus encouraging interventions designed to enhance happiness at work. Our results further call for teaching pre-service teachers emotional skills to help them when faced with teaching in challenging contexts and situations.

Declaration of competing interest

Both authors notify the editor that there's no financial/personal interest or belief that could affect their objectivity.

Data availability

The authors do not have permission to share data.

(continued)

Item	Standardized estimate	SE	z	p-value	95% CI	
					LL	UL
SPC 10	.86	.017	51.00	.001	.82	.89
SPC 11	.82	.018	47.00	.001	.79	.85
SPC 12	.84	.018	46.00	.001	.80	.88
Teacher SPC						
Engagement	.94	.020	47.00	.001	.90	.98
Instruction	.92	.023	41.00	.001	.88	.97
Classroom management	.80	.026	31.00	.001	.75	.85
Teaching Value						
Value 1	.70	.035	20.00	.001	.63	.76
Value 2	.70	.030	23.00	.001	.64	.76
Value 3	.81	.024	34.00	.001	.77	.86
Value 4	.58	.038	15.00	.001	.50	.65
Teaching joy						
Joy 2	.67	.027	25.00	.001	.62	.73
Joy 1	.78	.037	21.00	.001	.71	.85
Joy 3	.74	.030	25.00	.001	.68	.80
Joy 4	.71	.036	19.00	.001	.64	.78
Teaching anger						
Anger 1	.66	.042	16.00	.001	.58	.74
Anger 2	.63	.042	15.00	.001	.55	.72
Anger 3	.50	.049	10.00	.001	.41	.60
Anger 4	.60	.047	13.00	.001	.51	.70
Teaching anxiety						
Anxiety 1	.75	.027	27.00	.001	.69	.80
Anxiety 2	.69	.030	23.00	.001	.64	.75
Anxiety 3	.64	.036	18.00	.001	.57	.71
Anxiety 4	.62	.035	18.00	.001	.55	.69
Work persistence						
Persistence 1	.85	.020	43.00	.001	.81	.89
Persistence 2	.60	.037	16.00	.001	.52	.67
Persistence 3	.85	.017	51.00	.001	.81	.88
Persistence 4	.80	.023	34.00	.001	.76	.85
Persistence 5	.62	.032	19.00	.001	.55	.68
Persistence 6	.59	.036	17.00	.001	.52	.66
Persistence 7	.60	.037	16.00	.001	.53	.68

Note. SE = standard error.

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