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Title: Pre-service teachers' self-efficacy in implementing inclusive practices and resilience in Finland

Year: 2021

Version: Published version

Please cite the original version:

Yada, A., Björn, P. M., Savolainen, P., Kyttälä, M., Aro, M., & Savolainen, H. (2021). Pre-service teachers' self-efficacy in implementing inclusive practices and resilience in Finland. Teaching and teacher education, 105, Article 103398. https://doi.org/10.1016/j.tate.2021.103398

Research paper

Pre-service teachers' self-efficacy in implementing inclusive practices and resilience in Finland

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HIGHLIGHTS

- Pre-service teachers' self-efficacy and resilience were investigated.
- Three-factor structure for self-efficacy among pre-service teachers was confirmed.
- Pre-service teachers' self-efficacy predicted their resilience.
- Gender, teaching experience, and career choice related variables explained self-efficacy and resilience differently.

ARTICLE INFO

ABSTRACT

This study aims to explore Finnish pre-service teachers' self-efficacy in implementing inclusive education and their resilience. Survey data were collected from 105 pre-service teachers studying in a teacher education programme in one university in Finland. The relationships between pre-service teachers' self-efficacy in implementing inclusive practices, their perceived resilience, and background variables were examined using structural equation modelling. The results confirmed a three-factor structure for self-efficacy in implementing inclusive practices among the pre-service teachers. In addition, pre-service teachers' self-efficacy was the strongest variable that related to their resilience. The findings would be beneficial for developing pre- and in-service teacher education.

1. Introduction

Many countries are currently dealing with the issue of a shortage of qualified teachers, and the teacher turnover rate is especially high in the early stages of the teaching career, reaching more than ten percent in some countries (Carlo et al., 2013). It is suggested that Finland has a very high teacher retention rate, where the teacher attrition rate is only three to four percent annually (Sutcher et al., 2016). However, it has been pointed out that Finnish teachers are struggling to accommodate the diverse educational needs of children in a growing trend towards inclusive education, which further impacts teacher well-being (Nislin et al., 2015; Ojala, 2017). Previous studies have found that teachers' resilience is a vital factor associated with their motivation, persistence, and retention in the teaching profession (Brunetti, 2006; Johnson et al., 2014; Yost, 2006). Studying teacher resilience is particularly important to understand 'quality retention' of teachers (Gu & Day, 2007, p. 1314), where teachers maintain their motivation and commitment and 'thrive professionally' (Beltman et al., 2011, p. 186). Although many studies have investigated the resilience of teachers, what is lacking in the current literature is studies on pre-service teachers' resilience and related factors (Beltman et al., 2011). Yost (2006) demonstrated that it is important to develop teacher resilience and persistence in teacher education

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programmes to improve early teachers' retention. Further, Gu and Day (2013) highlighted the need to explore internal and external factors which affect the resilience of pre-service teachers. A number of studies have found that teachers' self-efficacy is one of the crucial internal factors that associates with their resilience (Pajares, 1996; Pendergast et al., 2011; Sammons et al., 2007; Yost, 2006). Teachers' self-efficacy refers to their belief in estimating their ability to produce positive impacts on student educational outcomes (Gibson & Dembo, 1984; Klassen et al., 2011; Tschannen-Moran & Woolfolk Hoy, 2001). It has been suggested that teachers' self-efficacy affects not only students' outcome such as academic performance and motivation but also teachers' attributes including their stress, burnout, and attitudes towards including children with diverse educational needs (Klassen et al., 2011; Mojavezi & Tamiz, 2012; Tschannen-Moran et al., 1998; Yada et al., 2018). However, much uncertainty still exists about the relationship between teachers' self-efficacy and their resilience, and studies on pre-service teachers are limited. Thus, the aim of the current study is to investigate pre-service teachers' resilience and its relationship with self-efficacy in implementing inclusive practices and other background variables using a quantitative approach.

2. Literature review

2.1. Teachers' self-efficacy in implementing inclusive practices

The self-efficacy concept was developed by Bandura (1977), who illustrated it as an evaluation of one's abilities in executing a desired level of performance to achieve an ideal outcome (Bandura, 1997). He indicated that self-efficacy influences a person's controlling exercise over action, motivation, thought processes, and affective and phycological states (Bandura, 1997). In addition, various studies have demonstrated that four sources affect self-efficacy: (a) mastery experience; (b) vicarious experience; (c) verbal and social persuasion; and (d) psychological and affective states (Bandura, 1977, 1997; Morris et al., 2017; Usher & Pajares, 2008). Mastery experience refers to a person's experienced accomplishment or failure in a specific situation (Bandura, 1977). This source has been considered as the strongest source of self-efficacy among the four (Bandura, 1997; Usher & Pajares, 2008). Vicarious experience can be defined as observations of others performing a challenging task, and the effect of it depends on group norms and the relationship between an observer and the observee (Bandura, 1997). The third source involves verbal and social persuasion, which a person receives from influential others (Bandura, 1997; Chen & Usher, 2013). Positive feedback can enhance the person's self-efficacy and vice-versa (Chen & Usher, 2013). Finally, self-efficacy can be affected by one's psychological and affective conditions including anxiety, stress, and fatigue (Bandura, 1997; Chen & Usher, 2013). It is known that the four sources are not influencing self-efficacy independently but intricately intertwined with each other (Bruce & Ross, 2008; Yada et al., 2019).

Teachers' self-efficacy has been defined particularly to refer to the teaching profession, and it has been investigated in terms of specific teaching contexts (e.g., teaching math, language, and science) and in general situations relevant to most school settings (Klassen et al., 2011; Tschannen-Moran et al., 1998). A considerable amount of research on teachers' self-efficacy pays particular attention to their efficacy beliefs in implementing inclusive practices, echoing international trends towards inclusive education (UNESCO [The United Nations Educational, Scientific and Cultural Organization], 1994; United Nations, 2006; United Nations General Assembly, 2015). While teachers' self-efficacy has been reported by many authors, only in recent years has there been research assessing teachers' efficacy belief in their ability to implement inclusive practices (Sharma et al., 2012). The existing

literature on teachers' self-efficacy in implementing inclusive practices is extensive and focuses particularly on how it affects teachers' attributes. For instance, a large number of studies investigated whether teachers' self-efficacy associate with their attitudes towards inclusive education and/or intention to teach in inclusive classrooms and found that there were positive relationships between them (Avramidis et al., 2019; Sharma & Jacobs, 2016; Yada et al., 2018). Moreover, recent evidence suggested that teachers' self-efficacy towards inclusion of children with intellectual disabilities predicted their self-reported inclusive behavior (Wilson et al., 2019).

One of the most used scales in this research area is the Teacher Efficacy for Inclusive Practices (TEIP) scale (Sharma et al., 2012). The scale was initially developed to measure a domain-specific self-efficacy construct in regard to inclusive practices (Sharma et al., 2012) and can thus in today's school be generalised to all teachers because inclusive practices are relevant to every school level and teaching subject (Yada, 2020). A reason for selecting the TEIP scale for use in the current study is that one review paper (Beltman et al., 2011, p. 189) identified potential risk factors for teacher resilience including 'classroom management/disruptive students', 'meeting needs of disadvantaged students', and 'relationships with students' parents/colleagues'. The TEIP scale measures teachers' self-efficacy in those contexts: self-efficacy in instruction; self-efficacy in collaboration; and self-efficacy in managing behaviour.

In recent years, a considerable amount of literature has been built around the theme of pre-service teachers' self-efficacy in implementing inclusive education with great interest in how teacher education programmes can develop their student-teachers' self-efficacy so that they can be ready for the demanding job of teaching already in the first year of their career. Previous research has indicated that pre-service teachers with higher self-efficacy would be more likely to implement inclusive practices efficiently in actual classrooms (Sharma et al., 2012). Further, some evidence suggests that pre-service teachers' higher self-efficacy was related to more positive attitudes towards including children with diverse educational needs (Cansiz & Cansiz, 2018; Malinen, Savolainen, & Xu, 2013). Much of the current research on pre-service teachers' self-efficacy pays particular attention to factors that could enhance their self-efficacy in inclusive education during the teacher education programmes. For example, Sharma and Nuttal (2016) compared pre-service teachers' self-efficacy in implementing inclusive practices before and after a nine-week university course concerning inclusive education and found that gaining acquaintance with inclusive teaching techniques, other educational professionals, and a disability significantly improved their self-efficacy. Besides, an empirical study reported that the experience of co-teaching in multi-professional teams in inclusive classes expanded their beliefs about inclusive education (Ritter, Wehner, Lohaus, & Krämer, 2019).

Thus far, some studies have examined in-service teachers' self-efficacy in implementing inclusive practices in Finland (Malinen, Savolainen, Engelbrecht, et al., 2013; Yada et al., 2019; Yada et al., 2018) and found that self-efficacy in managing problematic behaviour of pupils was the lowest among the three self-efficacy sub-constructs among Finnish teachers (i.e., self-efficacy in instruction, self-efficacy in collaboration, and self-efficacy in managing behaviour; Savolainen et al., 2012). However, there are almost no prior studies investigating the self-efficacy of Finnish pre-service teachers in implementing inclusive practices, nor its relationship with teacher resilience.

2.2. Teacher resilience

To date, several studies in different disciplines have investigated the construct of resilience. However, it has been suggested that the definition of resilience remains ambiguous with little consensus on the previous theoretical and research literature, and varying definitions of resilience have been proposed in the past (Luthar et al., 2000). For instance, Rutter (1987) uses the term 'resilience' to refer to the positive end of the differences of individuals in responding to stress and adversity. For Masten (1994), resilience refers to the class of phenomena involving successfully adapting oneself when exposed to significant threats to development. Research into resilience has a long history, with the first discussions and analyses of resilience emerging in the 1970s, focusing on maladaptive behaviour of patients with severe disorders (Luthar et al., 2000). In parallel, the research has started to focus on the resilience of children of mothers diagnosed with schizophrenia, because children's resilience has been seen as a crucial factor for coping, even when they have high-risk status (Garmezy, 1974; Luthar et al., 2000). In spite of the existence of well-documented studies focusing on children's resilience, only recently have researchers shown an increased interest in the resilience of adults, including teacher resilience (Luthar & Brown, 2007).

More discussion on the definition of teacher resilience is needed because research on the topic is an emerging field (Beltman et al., 2011). Teacher resilience can be understood as teachers' capacity for continuing to bounce back and successfully recovering strengths in the face of challenging conditions and setbacks (Brunetti, 2006; Sammons et al., 2007). It is also suggested that teacher resilience is a dynamic construct resulting from an interaction between personal and environmental factors (Gu & Day, 2007; Sammons et al., 2007; Tait, 2008). Beltman et al. (2011) have reviewed a number of articles on teacher resilience and identified two types of protective factors that sustain teachers when they face adversity. The first type is individual protective factors, consisting of teachers' personal attributes (e.g., altruistic and a strong intrinsic motivation for teaching, positive attitudes, and female gender), sense of self-efficacy, professional reflection, skills of coping, teaching, and self-care (Beltman et al., 2011). The other is contextual protective factors, which consist of various sources of support including a school leadership group, mentors, colleagues, families, friends, and peers from teacher education programmes (Beltman et al., 2011). Similarly, Gu and Day (2007) found that there are three dimensions of mediating influences on teacher resilience: (a) the personal, relating to their outside school life such as support from families and friends; (b) the situated, relating to their school life and including support from school leadership/colleagues and student-teacher relationships; and (c) the professional, relating to values and beliefs as a teacher and interaction between them, as well as external contexts such as educational policies and systems. The present study explores how pre-service teachers' personal attributes (e.g., self-efficacy and gender), as well as contextual factors (e.g., career choice affected by having teachers in their family), are related to their resilience.

While much of the research on teacher resilience provided significant insights into its understanding and development, Beltman et al. (2011) highlighted some research gaps in the current literature. For instance, there are methodological challenges in measuring teacher resilience because of its nature of being influenced by various factors changing over time and in contexts (Beltman et al., 2011). Thus, many of the existing studies relied on teachers' self-reports collected by means of the interview since robust measures of teacher resilience had not been developed (Beltman et al., 2011). Only recently, a few scales, such as the Teacher Resilience Questionnaire (Mansfield & Wosnitza, 2015),

were developed and validated (Peixoto et al., 2020). Furthermore, a previous study documented the relative importance of support from families and friends outside schools in several aspects of life such as career choice (Beltman & Wosnitza, 2008); however, very little is currently known about how those support groups affect teacher resilience (Beltman et al., 2011). Finally, there was little research specifically focusing on pre-service teachers, with only six studies on pre-service teacher resilience (e.g., Kaldi, 2009; Le Cornu, 2009; Yates et al., 2008) out of fifty papers mentioned in a literature review by Beltman et al. (2011). For example, a qualitative case study by Yates et al. (2008) investigated protective factors for pre-service teachers' resilience and found three types of factors: family and community factors (e.g., influence from parents and siblings), individual factors (e.g., motivation to succeed and influences from their faith/religion), and school factors (e.g., the high expectation for performance raised by their teachers and relationships with mentors). Further, Le Cornu (2009) examined the role of teaching experience in building pre-service teacher resilience using a framework for a learning communities model. The study indicated that support from pre-service teachers' peers/mentors and their self-awareness in particular skills and attitudes were key components to enhance pre-service teachers' resilience through a teaching practicum (Le Cornu, 2009). On the other hand, Kaldi (2009) collected survey data from 170 pre-service teachers to assess the various variables that affect their perceptions of self-competence and found that friends, family, mentors, or students in the school were not considered as significant sources of emotional and intellectual support during their teaching practicum.

2.3. The association between teacher self-efficacy and resilience

Several previous studies have suggested a relationship between teachers' self-efficacy and their resilience (Pajares, 1996; Pendergast et al., 2011; Sammons et al., 2007; Yost, 2006). The significant effect of self-efficacy on one's resilience was already proposed by Bandura (1977, p. 193), who wrote: '(self-efficacy) affect both initiation and persistence of coping behaviour'. Moreover, in the field of positive psychology, the quality of relationships with people surrounding a teacher, such as family and community, has been seen as particularly important, which reinforces one's innate strength, and, in turn, enhances one's resilience (Luthar & Brown, 2007). In light of the link between teacher self-efficacy and resilience, it was indicated that teachers' belief in their capability affects their persistence and resilience in the face of difficult situations (Tschannen-Moran & Woolfolk Hoy, 2001). In this vein, Johnson et al. (2014) studied the experience of 60 early-career teachers and found that more resilient teachers revealed a high level of self-awareness, motivation to learn, and self-reflection, which affected their sense of efficacy and personal agency. On the other hand, a quantitative study by Chan (2008) reached different conclusions, finding no significant independent prediction of teachers' self-efficacy on their active coping. Much uncertainty still exists about the relationship between teacher resilience and self-belief, especially in the study of pre-service teachers. This paper is the first of its kind to examine pre-service teachers' resilience in relation to their self-beliefs and various background variables.

2.4. Context of the study: inclusive education and teacher education programme in Finland

Finland has promoted inclusive education in its educational policies and systems in response to several international documents (UNESCO, 1994; United Nations, 2006; United Nations General Assembly, 2015). Concrete educational arrangements that have been supportive of inclusive education in Finland are: (a)

systematic learning support by part-time special needs education; and (b) a multi-tiered support system. First, part-time special needs education was introduced in the 1970s, to respond to various needs of students (Kivirauma & Ruoho, 2007). At least one special needs education teacher, who does not take charge of a classroom, is allocated to every school and provides support by educational assessment of students, co-teaching with classroom teachers, and group and individual teaching depending on students' needs. This service has been offered immediately when teachers and parents have agreed on the support without any medical diagnosis or bureaucratic processes (Savolainen, 2009). Second, the multi-tiered support system was launched in 2010, following the policy document called the "Strategy of Special Education" (Ministry of Education of Finland, 2007). It is mandatory for all schools to provide support that consists of three levels: general support, intensified support, and special support (see details in Björn et al., 2016; Björn et al., 2018). In this support system emphasis is on providing a good education for all by general support (e.g., differentiation, co-teaching, etc.) and more intensive support is given only when general support is not adequate. For the more intensive support, not only classroom and special needs education teachers but also other professionals (e.g., principal, school psychologist, school nurse, and school social worker) form a student welfare team and discuss possible support in collaboration with parents and even students (Vainikainen et al., 2015).

The current study was undertaken at a teacher education programme in a Finnish university of approximately 15,500 undergraduate students. At the time of this study, there were teacher candidates enrolled in the various teacher education programmes aiming at a teaching certificate in either primary, secondary, special needs education, or guidance and counselling. In Finland, the teaching profession is considered an attractive and highly valued profession, and, thus, entry into any teacher education programme is very competitive. It should also be noted that, in Finland, a master's degree is required to obtain a formal qualification to be a teacher. Therefore, all student-teachers participate in a programme that has a relatively demanding research orientation requiring completion of both a bachelor's thesis and master's thesis.

The data analysed in this study was collected in a project called 'Opettajien arviointiosaaminen oppimisen, osallisuuden ja tuen toteutumisen edistämiseksi (OPA) [Developing teacher assessment skills to enhance learning, engagement and interactions]'. The project has been funded by the Ministry of Culture and Education for the years 2018−2021 aiming to develop different types of assessment practices.

2.5. Research questions

This study aims to investigate Finnish pre-service teachers' self-efficacy in implementing inclusive practices in relation to their perceived resilience. In addition, the study explores the relationship between pre-service teachers' self-efficacy, resilience, and several background variables. The background variables include individual factors (i.e., gender) and contextual factors (i.e., career choice affected by having both biological parents as teachers, having one parent/caregiver as a teacher, and having relatives (other than parents) in the teaching profession; Beltman et al., 2011). Furthermore, several lines of evidence suggested that previous teaching experience had an influence on teachers' self-efficacy (e.g., Beltman et al., 2011; Yada et al., 2018); thus, the relationships between pre-service teachers' previous teaching experience, self-efficacy, and resilience are also examined. The research questions (RQs) to be answered are as follows:

RQ 1. Can the three-factor structure (efficacy in using inclusive instructions, efficacy in managing behaviour, and efficacy in collaboration) of teacher self-efficacy in implementing inclusive practices be found in the current Finnish pre-service teacher sample?

RQ 2. Is pre-service teachers' self-efficacy for inclusive practices related to their self-rated resilience?

RQ 3a. Do pre-service teachers' demographic variables (i.e., gender, previous teaching experience, career choice affected by having both biological parents as teachers, having one parent/caregiver as a teacher, and having relatives (other than parents) in the teaching profession) predict pre-service teachers' self-rated resilience and self-efficacy?

RQ 3b. Do pre-service teachers' demographic variables indirectly relate to their perceived resilience via self-efficacy?

3. Method

3.1. Participants

Altogether, 324 pre-service teacher students participated in a six-week-long teaching training period at one Finnish university and 105 of them responded to the electronic questionnaire sent to them. The survey return rate was 32%. Table 1 summarises participants' demographic characteristics. Of the respondents, 82 (78.1%) were female, 22 (21.0%) were male, and one (0.9%) did not mention their gender. Participants' age ranged from 18 to 48 years (M age = 25.07, SD = 5.96).

3.2. Research instruments

The online questionnaire included a cover letter describing the purpose of the study, confidentiality of the collected information, voluntary nature of participation in the survey, and their right to withdraw at any point. The questionnaire contained the questions regarding participants' demographic characteristics and the two scales illustrated below.

Pre-service teachers' self-efficacy in implementing inclusive practices was measured using the TEIP scale (Sharma et al., 2012). The scale contains 18 items, in which participants were required to respond to a Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree). Sharma et al. (2012) indicated that the scale consists of three sub-scales, namely 'efficacy in instruction', 'efficacy in collaboration', and 'efficacy in managing behaviour'. The higher score of the TEIP represented the higher level of a participant's self-efficacy. The original version of the scale was written in English and was translated into Finnish for a previous study (Savolainen et al., 2012). The reliability of the Finnish version was high (Cronbach's α = 0.88), and the construct validity of the scale was shown between Finland and other countries (Malinen, Savolainen, Engelbrecht, et al., 2013; Savolainen et al., 2012; Yada et al., 2018). Cronbach's alpha for the TEIP scale in the current study was also high (α = 0.93).

A new scale that contained nine items was developed in the OPA project to measure pre-service teachers' perceived resilience (see Appendix). All items in the scale are derived from the relevant research literature. The questionnaire was developed and presented in Finnish. Reliability analysis was conducted using Cronbach's alpha for the nine-item resilience scale. The Cronbach's Alpha was 0.787, which is acceptable (Nunnally & Bernstein, 1994).

3.3. Data analysis

The data management and analyses were performed using the

Table 1
Participants' demographic characteristics ($N = 105$).

	Contents	
Gender (%)	Female: 82 (78.1%)	Male: 22 (21.0%)
Mean age (SD)	25.07 (5.96)	
Mean number of credits completed (SD)[a]	135.24 (63.60)	
Field of study (%)	Classroom teacher: 43 (41.0)	
	Subject teacher: 32 (30.5)	
	Special needs education teacher: 20 (19.0)	
	Combination: 10 (9.5)	
Previous teaching experience (%)	No: 92 (87.6)	Yes: 13 (12.4)
Mean previous teaching experience in year (SD)	0.91 (3.45) ranging from 0 to 21 years	
Career choice affected by:		
Having both biological parents as teachers[b] (%)	No: 95 (90.5)	Yes: 8 (7.6)
Having one parent/caregiver as a teacher[b] (%)	No: 79 (75.2)	Yes: 25 (23.8)
Having relatives (other than parents) in the teaching profession[b] (%)	No: 88 (83.8)	Yes: 17 (16.2)

Note.

[a] In Finland, 180 ECTS credits are required for a university-level bachelor's degree and 120 ECTS credits for a university-level master's degree (Study in Finland, 2020).

[b] These separate background questions are created based on a similar item 'How did you build up your perception of the teaching profession' (Carlo et al., 2013, p. 378).

SPSS software (IBM [International Business Machines Corporation], 2012) version 24 and the Mplus version 7.0 statistical program for Mac (Muthén & Muthén, 2012). The factor structure of pre-service teachers' self-efficacy in implementing inclusive practices was tested using confirmatory factor analysis. In addition, structural equation modelling (SEM) was conducted to explore the potential importance of the self-efficacy factor and some background variables as predictors of pre-service teachers' perceived resilience. Further, the model included not only direct effects but also mediating effects. Mediation analysis (Sobel, 1982) enables researchers to examine the indirect effects of the specific variables. More precisely, it analyses whether the background variables make changes in self-efficacy, which in turn influences a teacher's perceived resilience. The Full Information Maximum Likelihood (FIML) method with a robust standard error and scale corrected chi-square value (MLR estimator in Mplus) was utilised to estimate the model parameters. The total missing values accounted for 0.2% of the data with only zero to two missing values in each item. The result of Little's missing completely at random test was statistically significant for all variables ($p = 0.02$), which indicates that the variables were not assumed as missing completely at random. Missing At Random (MAR) assumption was applied because the missingness of each item was not associated with any students' variables (Schafer & Graham, 2002). To evaluate the model fit, Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) were used in this study, and a value of Comparative Fit Index (CFI) was also checked as reference. It is suggested that an RMSEA value ranging between 0.08 and 0.10 shows a mediocre fit and below 0.08 indicates a sufficient fit (MacCallum et al., 1996). Further, the generally acceptable value for SRMR is below 0.08 (Hu & Bentler, 1999). A threshold level used for the CFI is 0.90 (Cheung & Rensvold, 2002).

4. Results

4.1. Factor structure of the TEIP scale for pre-service teachers

Confirmatory factor analysis was conducted to test whether the three-factor structure, which the authors of other studies suggested (e.g., Malinen, Savolainen, & Xu, 2013; Sharma et al., 2012), is found with the current data for Finnish pre-service teachers (see Table 2). The scale items were assumed to load only on the expected latent factor. A model fit was sufficient (RMSEA = 0.060, SRMR = 0.061, CFI = 0.948) after some error covariances between items in the

same latent factor were added according to modification indices. The result confirmed the three-factor structure of the TEIP scale as indicated in previous research.

The mean scores of overall and specific types of self-efficacy for pre-service teachers were presented in Table 3. Compared to the results of a previous study on Finnish in-service teachers, the Finnish pre-service teachers' overall self-efficacy for inclusive practices in our study was lower ($M = 3.94$, $SD = 0.69$, which ranged from 1 to 6; according to Savolainen et al. (2012) the mean score of in-service teachers was 4.53). Of the three sub-scales of self-efficacy, self-efficacy in applying inclusive instruction was lower ($M = 3.82$, $SD = 0.71$) than the other two, with barely non-overlapping 95% confidence intervals, although the differences were not significant.

4.2. Relationship between self-efficacy, resilience, and demographic variables

The mean score of Finnish pre-service teachers' perceived resilience measured by the new scale was 4.50 ($SD = 0.61$). Since the scale was ranging from 1 to 6, the Finnish pre-service teachers' perceived resilience was above the neutral mid-point (3.5).

The relationship between teachers' self-efficacy factor and their resilience (the sum score of the resilience scale) was examined using SEM. Although the three-factor model fit well to the data, the three latent factors highly correlated with each other (0.827, 0.736, and 0.733, respectively). It is suggested that a second-order factor model is suitable when first-order factors have high correlations and the higher-order factor(s) likely to explain the relationship between them (Chen et al., 2005). Therefore, the second-order factor model was adopted, in which the three first-order factors were set to load on a higher-order factor named 'general teacher self-efficacy for inclusive practices'. This solution was also presented in previous research (Malinen, Savolainen, & Xu, 2013; Yada et al., 2018) and the second-order factor was named accordingly. In addition to the general self-efficacy factor as an independent variable, the relationships between the five demographic variables and pre-service teachers' perceived resilience were tested. The demographic variables were gender, previous teaching experience, career choice affected by having both biological parents as teachers, having one parent/caregiver as a teacher, and having relatives (other than parents) in the teaching profession. From these five variables, previous teaching experience was assumed to have some kind of influence on self-efficacy based on the previous literature

Table 2
Confirmatory factor analysis for the TEIP scale (*N* = 105).

Item	Factor 1	Factor 2	Factor 3
I can use a variety of assessment strategies (e.g. portfolio assessment, modified tests, performance-based assessment, etc.). (TEIP_1_1)	0.472		
I am able to provide an alternate explanation or example when students are confused. (TEIP_2_1)	0.632		
I am confident in designing learning tasks so that the individual needs of students with disabilities are accommodated. (TEIP_3_1)	0.733		
I can accurately gauge student comprehension of what I have taught. (TEIP_4_1)	0.840		
I can provide appropriate challenges for very capable students. (TEIP_5_1)	0.705		
I am confident in my ability to get students to work together in pairs or in small groups. (TEIP_6_1)	0.488		
I am confident in my ability to prevent disruptive behaviour in the classroom before it occurs. (TEIP_1_2)		0.697	
I can control disruptive behaviour in the classroom. (TEIP_2_2)		0.835	
I am able to calm a student who is disruptive or noisy. (TEIP_3_2)		0.766	
I am able to get children to follow classroom rules. (TEIP_4_2)		0.842	
I am confident when dealing with students who are physically aggressive. (TEIP_5_2)		0.752	
I can make my expectations clear about student behaviour. (TEIP_6_2)		0.760	
I can assist families in helping their children do well in school. (TEIP_1_3)			0.804
I am able to work jointly with other professionals and staff (e.g. aids and other teachers) to teach students with disabilities in the classroom. (TEIP_2_3)			0.635
I am confident in my ability to get parents involved in school activities of their children with disabilities. (TEIP_3_3)			0.799
I can make parents feel comfortable coming to school. (TEIP_4_3)			0.817
I can collaborate with other professionals (e.g. school nurse or school counsellor) in designing educational plans for students with disabilities. (TEIP_5_3)			0.717
I am confident in informing others who know little about laws and policies relating to the inclusion of students with disabilities. (TEIP_6_3)			0.574

Note. Factor 1 = Efficacy in instructions, Factor 2 = Efficacy in managing behaviour, Factor 3 = Efficacy in collaboration, each item description was referred from Sharma et al. (2012).

Table 3
Overall and sub-scale mean scores of TEIP scale and 95% confidence interval (CI).

	Mean (*SD*)	Lower CI	Upper CI
TEIP overall	3.94 (0.69)	3.81	4.07
Inclusive instruction	3.82 (0.71)	3.69	3.96
Managing behaviour	3.98 (0.80)	3.83	4.14
Collaboration	4.02 (0.84)	3.85	4.18

(Malinen, Savolainen, Engelbrecht, et al., 2013; Yada et al., 2018), and, thus, was added first into the model. Next, gender was added to the model because it has been suggested to be related to teachers' resilience (Beltman et al., 2011). Finally, three family-related variables were added to see the effect of contextual factors (Beltman et al., 2011). Of those variables, career choice affected by having both biological parents as teachers and having one parent/caregiver as a teacher did not have a statistically significant connection with either self-efficacy or resilience; thus, they were taken out from the final predictive model. All remaining variables were entered into the path model simultaneously (see Fig. 1), and it had an acceptable fit to the data (RMSEA = 0.079, SRMR = 0.071, CFI = 0.886). The analysis revealed that pre-service teachers' self-efficacy had a significantly positive relationship with their perceived resilience (std. Beta = 0.496, $p < 0.001$). Considering background variables, previous teaching experience predicted pre-service teachers' self-efficacy positively (std. Beta = 0.272, $p < 0.01$), indicating that pre-service teachers with more previous teaching experience had higher self-efficacy in implementing inclusive practices. In addition, the analysis showed that career choice affected by having relatives (other than parents) in the teaching profession was a weak but significant predictor of self-efficacy (std. Beta = 0.190, $p < 0.05$). Furthermore, gender (female = 1, male = 2) predicted pre-service teachers' perceived resilience negatively (std. Beta = −0.196, $p < 0.05$), which suggests that females expressed higher resilience than males.

4.3. Testing indirect effects of demographic variables on resilience through self-efficacy

Finally, mediation analysis was performed to examine the indirect effects of demographic variables on pre-service teachers' perceived resilience. The analysis revealed that the mediating effect of previous teaching experience on resilience (std. Beta = 0.135, $p < 0.05$) via self-efficacy was statistically significant. On the other hand, the mediating effect of career choice affected by having relatives (other than parents) in the teaching profession on resilience (std. Beta = 0.094, $p = 0.051$) via self-efficacy was not statistically significant, although the p-value was slightly above the 5% alpha level.

5. Discussion

5.1. Factor structure of pre-service teacher self-efficacy in implementing inclusive practices

The aim of this study was to explore Finnish pre-service teachers' self-efficacy in implementing inclusive practices and their perceived resilience, as well as the association between them and their demographic variables. The first research question sought to investigate whether the three-factor structure of the TEIP scale can be found in our Finnish pre-service teachers' data. Our results were in line with those of the earlier studies in both Finland and other countries (Savolainen et al., 2012; Sharma et al., 2012; Yada et al., 2018) that the TEIP scale consists of three separate but correlating sub-domains: efficacy in instructions; efficacy in managing behaviour; and efficacy in collaboration. In addition, the TEIP scale had high internal consistency, and thus, the findings provided additional support to the reliability and validity of the instrument to be used for pre-service teachers.

Finnish pre-service teachers' self-efficacy in implementing inclusive practices (*M* = 3.94, *SD* = 0.69, 95% CI [3.81, 4.07]) was lower than for in-service teachers compared to the results of a previous study, which measured Finnish in-service teachers' self-efficacy in implementing inclusive practices (according to Savolainen et al. (2012), *M* = 4.53, 99% CI [4.48, 4.58] for Finnish in-service teachers). Further, pre-service teachers' self-efficacy in Finland was lower than that reported in previous research for pre-service teachers in different countries (Loreman et al., 2013; Sharma et al., 2015). Conversely, Finnish in-service teachers' self-efficacy was found to be at the same level as or higher than in-service
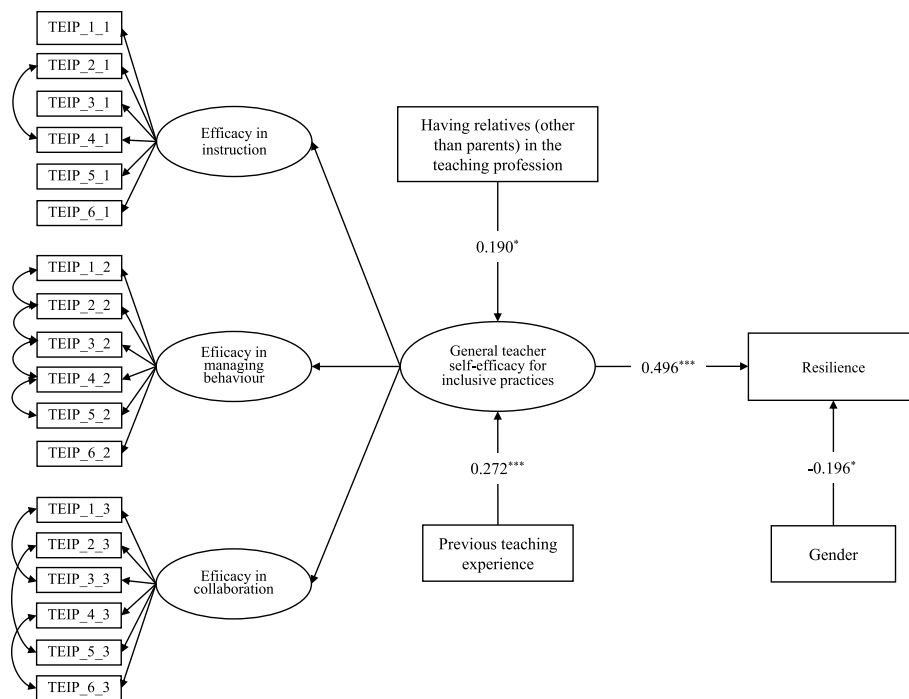
Fig. 1. SEM model for explaining pre-service teachers' self-efficacy and perceived resilience.

teachers from other countries (Savolainen et al., 2012; Yada & Savolainen, 2017). However, with the comparison of mean scores of self-efficacy, caution must be applied, as there is a potential for response bias influenced by cultural and contextual effects (Mitchell, 2005). Therefore, future studies are recommended on how Finnish pre-service teachers' self-efficacy in different dimensions is developed or undermined during and after pre-service teacher education.

In terms of three sub-domains of teacher self-efficacy (i.e., efficacy in inclusive instruction, managing behaviour, and collaboration), it is interesting to note that, in the previous study, the results indicated that Finnish in-service teachers' self-efficacy in managing behaviour was significantly lower than the other two self-efficacy factors (Savolainen et al., 2012); however, such a tendency was not found among the pre-service teachers. This result may partly be explained by the fact that Finnish teachers regarded students with attention-deficit hyperactivity disorders (AD/HD) as more difficult to include in regular classrooms than students with other types of disabilities (Yada & Savolainen, 2019), which may be due to the long history of considering AD/HD as one of the most challenging needs in schools (Honkasilta et al., 2014). Since this mindset might still exist especially in elder teachers, their self-efficacy in managing problematic behaviour was lower than the other two, and such tendency might not be found in the younger generation as pre-service teachers. Another possible explanation is that teachers' self-efficacy in managing behaviour was undermined when teachers encounter students' problematic behaviour in actual practices (i.e., mastery experience of failure; Bandura, 1997), and pre-service teachers have not yet experienced such a situation. Further work is needed to fully understand how three sub-domains of teacher self-efficacy increase or decrease during and after pre-service teacher education.

5.2. Relationship between pre-service teacher self-efficacy and resilience

The second research question was to examine whether there is a relationship between pre-service teachers' self-efficacy in implementing inclusive practices and their self-rated resilience. The results of this study showed that pre-service teachers' self-efficacy significantly and positively predicted their perceived resilience. This finding is consistent with the previous literature, indicating that teachers' self-efficacy is crucial for their resilience, as it is consistently associated with the development of their resilient qualities (Beltman et al., 2011; Gu & Day, 2007). Our findings further confirmed that it is important to enhance pre-service teachers' self-efficacy in teacher education programmes to educate resilient teachers before they start their demanding jobs.

5.3. Direct and indirect effects of demographic variables on self-efficacy and resilience

With respect to the third question about the relative importance of pre-service teachers' demographic variables on their self-efficacy and perceived resilience, this study found that previous teaching experience had a significant positive effect on self-efficacy. The result matches those observed in earlier studies which showed that teachers' self-efficacy in implementing inclusive practices was influenced by previous teaching experience regarding students with disabilities (Malinen, Savolainen, Engelbrecht, et al., 2013; Yada et al., 2018). Previous research has suggested that mastery experiences, that is, one's perception on successful or unsuccessful performance, is the strongest source of self-efficacy (Bandura, 1997; Tschannen-Moran & Woolfolk Hoy, 2007; Usher & Pajares, 2008). It can be assumed that pre-service teachers with more previous

teaching experience have gained more mastery experiences, which further enhanced their self-efficacy. Moreover, the result of mediation analysis revealed that previous teaching experience had a positive indirect association with pre-service teachers' perceived resilience via self-efficacy. Thus, previous teaching experience led to positive changes in self-efficacy and in turn positively affected teachers' resilience. To draw a full picture of what is important in developing pre-service teachers' self-efficacy and resilience, additional studies will be needed where not only length but also quality and content of previous teaching experience are taken into account.

Another variable that had a significant effect on pre-service teachers' self-efficacy was career choice affected by having relatives (other than parents) in the teaching profession. This result is difficult to explain, but a possible reason might be that pre-service teachers gained vicarious experience from their relative(s), that is, experience observing and modelling others, which has been suggested to affect self-efficacy (Bandura, 1977, 1997). However, if higher self-efficacy is because of vicarious experience, having both biological parents as teachers or one parent/caregiver as a teacher should also have some effect on their self-efficacy. Therefore, there is a possibility that the significant result was due to mere coincidence, and, therefore, the result needs to be interpreted with caution. It is somewhat surprising that no relationship was found between pre-service teachers' perceived resilience and family factors (i.e., career choice affected by having both biological parents as teachers, having one parent/caregiver as a teacher, and having relatives (other than parents) in the teaching profession) because several prior studies have noted the importance of influence from families on their resilience (Gu & Day, 2007; Yates et al., 2008). However, our results are in agreement with Kaldi's (2009) findings which showed that pre-service teachers did not rate family and community factors, including friends, families and mentors, as strong sources of intellectual and emotional support during their teaching practice. It may be that receiving teacher training in a teacher education programme is considered as a rather independent process for pre-service teachers (Kaldi, 2009). Another possible explanation for this inconsistency might be that having teacher(s) among relatives and families did not influence pre-service teacher resilience, rather the quality and strength of family relationships may affect their resilience. Since this study has been unable to demonstrate what kinds of relationships pre-service teachers have with their families and friends, further research should be conducted to explore the quality of relationships with people around pre-service teachers and its association with resilience.

Finally, the only demographic background variable that had a direct significant relationship with pre-service teachers' perceived resilience was gender, in which female students showed higher scores on the resilience scale. This finding is consistent with that of Demetriou et al. (2009) who found that female teachers devoted more effort and importance to teaching than male teachers and indicated that female teachers may be more likely to retain their teaching profession. However, a review article by Beltman et al. (2011) found that only two of fifty studies indicated gender differences in teacher resilience. Therefore, further studies which account for gender variables will need to be conducted.

6. Limitations

Although the present study has gone some way towards enhancing our understanding of pre-service teachers' self-efficacy and resilience, there are some limitations. First, the results cannot be generalised to the teacher candidate population as a whole because the data used in this study was small and collected only from one university via convenience sampling. Therefore, further research using larger samples from different universities and countries could shed more light on pre-service teachers' self-efficacy and resilience. Another limitation of this study is that participant's responses to the self-report questionnaire can be distorted by response bias such as social desirability bias (Edwards, 1953) or modesty bias. Although it was emphasised before the survey that the responses do not affect the evaluation of the course, there are possibilities that students tend to answer in a favourable way. The reverse is also true: it has been demonstrated that Finnish people generally consider modesty as one of the important virtues (Nishimura et al., 2008), and, thus, Finnish students could underestimate their self-efficacy and resilience. Third, no qualitative data were utilised, as the main purpose of this study was to examine pre-service teachers' self-efficacy and resilience quantitatively. However, as mentioned in the previous literature, teacher resilience is influenced by different factors, which are changing over time and in contexts (Beltman et al., 2011; Gu & Day, 2007; Tait, 2008). Thus, qualitative data will be needed to gain more in-depth information related to pre-service teachers' resilience and its relationship with self-efficacy and other background variables. Fourth, our findings are based on the cross-sectional data, which cannot indicate causal relationships between self-efficacy and resilience. Further longitudinal research is required to establish the predictive role of self-efficacy on resilience and to understand how pre-service teachers' self-efficacy and resilience increase/decrease over time and interact with each other during their teacher education. Finally, an intervention strategy is missing in the previous literature as well as the current study, which was mentioned by Beltman et al. (2011). Future work, using intervention methodology, needs to be done to understand how pre-service teachers develop their self-efficacy, which further enhances their resilience.

7. Conclusion

Notwithstanding the above limitations, the findings of this study confirmed the three-factor structure of self-efficacy among the Finnish pre-service teachers, which contributes to existing knowledge of teachers' self-efficacy by providing the reliability and validity of using the TEIP scale for pre-service teachers. It has been suggested that teachers' self-efficacy is one of the most crucial elements influencing their behaviour (e.g., using a new strategy for instruction and working harder to achieve a higher goal) and affect (e.g., stress, burnout, and commitment to profession) as well as student outcomes (Klassen et al., 2011; Klassen & Tze, 2014; Ross & Bruce, 2007; Skaalvik & Skaalvik, 2007; Tschannen-Moran et al., 1998). Thus, there are pressing needs to develop pre-service teachers' self-efficacy already in the teacher education programmes before they enter the teaching profession, and the TEIP scale can be one option for measuring pre-service teachers' self-efficacy and continuously assessing whether pre-service teacher

education is working well or not.

Furthermore, this was probably the first study that showed pre-service teachers' self-efficacy was the strongest factor associated with their perceived resilience among several background variables. Continued efforts are needed to develop pre-service teachers' self-efficacy during their teacher education programme to educate more resilient teachers who are more ready to meet the challenges and possible setbacks to be expected as novice teachers.

8. Implications for practice

The findings of this study have a number of important implications for future practice, especially to increase pre-service teachers' self-efficacy and resilience. One way of developing self-efficacy is to approach the sources of self-efficacy. Previous studies found that mastery experience is the strongest source of self-efficacy (Bandura, 1997; Tschannen-Moran & Woolfolk Hoy, 2007; Usher & Pajares, 2008), and verbal persuasion may have some independent effect on self-efficacy (Yada et al., 2019). Thus, future teacher education programmes should be carried out to increase pre-service teachers' opportunities to gain those experiences. As is done within the Finnish teacher education programmes, pre-service teachers gain positive initial teaching experience in their teaching practices so that they may further develop efficient teaching practices, and, in turn, enhance their self-efficacy (Fackler, Sammons, et al., 2021). As everyone has personal experiences of teachers and teaching based on previous school years, there is a lot that needs to be done to change those sometimes negative experiences of teaching situations at school. One example practice has been organising guided internships and supervision programmes, where pre-service teachers can observe and get feedback from older peers and/or experienced teachers (i.e., vicarious experience and verbal persuasion) (see also, Fackler, Malmberg, et al., 2021).

Moreover, although we ran a latent model with all the three sub-domains of self-efficacy loading on the first-order factor because it was statistically justifiable, it would be theoretically worthwhile to approach each sub-domain in order to see how the sub-domains are related to resilience and to study what factors predict these specific domains of efficacy. For instance, the experience of co-teaching in multi-professional teams in teaching practices (Ritter et al., 2019) may increase pre-service teachers' self-efficacy in collaboration. Besides, our discussion along with previous findings indicated that there are pressing needs to improve pre-

and in-service teachers' self-efficacy in managing student behaviour (Savolainen et al., 2012). Together these subskills form the basis for a long-lasting and evolving career as a teacher. Gaining knowledge of intervention studies concerning students' behaviour problems (e.g., positive behavioural interventions and supports; Närhi et al., 2015) during the teacher education programmes could enhance pre-service teachers' self-efficacy in managing behaviour, which make them resilient when they actually in front of students' problematic behaviour. The aforementioned contents will be useful not only for pre-service teachers but also for in-service teachers to improve their self-efficacy in implementing inclusive education. Ensuring appropriate training systems and support for pre- and in-service teachers should be a priority for governments and policymakers.

Authors statement

Akie Yada: Conceptualisation, Methodology, Validation, Formal analysis, Resources, Software, Writing - original draft, Writing - review & editing, Visualisation.

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Minna Kyttälä: Conceptualisation, Methodology, Validation.

Mikko Aro: Conceptualisation, Methodology, Validation.

Hannu Savolainen: Conceptualisation, Methodology, Validation, Formal analysis.

Appendix

Teachers' resilience scale in English

		1 Strongly disagree	2 Disagree	3 Disagree somewhat	4 Agree somewhat	5 Agree			6 Strongly agree	
1.	It is likely that I will stay in the teaching profession for a long time.					1	2	3	4	5	6
2.	I believe that I will change my profession at some point. (Note: coding reversed)					1	2	3	4	5	6
3.	I welcome new challenges with enthusiasm.					1	2	3	4	5	6
4.	It is easy for me to learn new things.					1	2	3	4	5	6
5.	I am able to assimilate/accommodate new things with my prior knowledge.					1	2	3	4	5	6
6.	I encounter bravely problem situations.					1	2	3	4	5	6
7.	I persistently keep trying even if I encounter problems or first make a mistake.					1	2	3	4	5	6
8.	I do not give up.					1	2	3	4	5	6
9.	My friends often ask for my advice on different things.					1	2	3	4	5	6

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