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Original Article

Adapting Measures of Inclusion to Finnish Higher Education Teacher Educators' Context: Investigation of Validity and Reliability

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Abstract

Inclusive education requires staff commitment to the principles of inclusion, and teacher training is crucial to fulfilling its goals. However, research on higher education teacher educators' inclusive dispositions is lacking, particularly in the Finnish or Nordic context. To redress this situation, psychometrically sound research instruments are warranted. Thus, the purpose of this study was to investigate the reliability and factorial validity of two inclusion scales, namely Teacher Efficacy for Inclusive Practices (TEIP) scale and the Sentiments, Attitudes, and Concerns about Inclusive Education Revised (SACIE-R) scale, with a sample of Finnish teacher educators. Teacher educators (N = 229) from 13 higher education institutions were recruited to complete an online survey on the TEIP and the SACIE-R. Data were analyzed using McDonald's omega and several confirmatory factor analyses, and both measures displayed adequate reliability. Results indicated that TEIP had both three-factor and second-order factor models, and SACIE-R, a two-factor structure. This suggests that TEIP and SACIE-R provide adequate means to measure perceptions of inclusive education, particularly in the higher education context, and thus form a useful basis for the development of training programs to promote inclusive education.

Keywords: Inclusive education; teacher educators; TEIP; SACIE-R; validity; reliability

Introduction

Inclusive education, at its core, means that all learners have equal opportunities to participate in school, study, and develop their skills (Booth & Ainscow, 2023). Regardless of learners' individual characteristics, learning capabilities, difficulties, or backgrounds, instructional operations occur in the same learning environments and communities (Ainscow et al., 2004). Essential to inclusive education is the idea that the support for learning is organized, the diversity of learners is appreciated, and the learning environment and digital environments are accessible (European Agency for Development in Special Needs Education [EADSNE], 2011). Implementing an inclusive approach requires a wide range of actions and continuing development at all levels of the education system, from early childhood education and care to higher education learning contexts (Ainscow et al., 2004; Florian, 2008). Moreover, to be successful, inclusive education requires staff commitment to the principles of inclusion and their relevant training (Ainscow et al., 2004; Booth & Ainscow, 2023; EADSNE, 2011; Florian, 2008).

A profile of an inclusive teacher in the context of basic education was introduced over ten years ago by the EADSNE (2011). However, several questions exist about how teachers can be better prepared to respond to the diverse needs of learners in today's schools (Florian & Camedda, 2020) and, more importantly, how teachers are prepared to embody the profile of an inclusive teacher. This profile

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describes the essential values (e.g., prizing the diversity of learners, supporting all students, engaging in collaboration and professional development) and areas of competence (e.g., attitudes, perceptions, knowledge, understanding, skills, and abilities) that should be developed within education programs (EADSNE, 2011; Engelbrecht, 2013) needed to cultivate inclusive teachers. Previous studies have examined inclusive education in the pre-service teacher (e.g., Crispel & Kasperski, 2019; Florian & Camedda, 2020) and in-service school teacher contexts (e.g., Yada & Savolainen, 2017). For example, pre-service teachers (i.e., teachers in training to become in-service teachers) report they do not feel prepared for inclusive classrooms (Crispel & Kasperski, 2019; Florian & Camedda, 2020; Forlin et al., 2011), and in-service school teachers (i.e., professional teachers in the field) have concerns about inclusive education, even though their attitudes towards inclusion are neutral and their sentiments towards disabilities are positive (Yada & Savolainen, 2017). However, research that examines inclusion vis-à-vis teacher educators in higher education (HE), particularly in the Finnish or Nordic context, appears to be minimal.

Understanding how teacher educators prepare instructors to deal with learning differences and implement inclusive education policies is under active discussion within and across various national contexts (e.g., Sharma et al., 2021). It is well-established that teacher educators play a key role in the successful integration of inclusive practices in HE (Engelbrecht, 2013; Song et al., 2019). Even though inclusion is seen as pivotal in the HE context, research has concentrated more on physical disabilities (Collins et al., 2019; Nieminen, 2022) and autism spectrum conditions (Pesonen et al., 2023) than on inclusion itself. Moreover, it seems that HE institutions currently focus on models of accommodation for disabled students rather than on inclusive practices (Nieminen & Pesonen, 2022). Thus, a more up-to-date understanding of inclusion in the HE teacher training context is warranted from the perspectives of support needs, exclusionary practices, and values (cf., Nieminen & Pesonen, 2022; Stentiford & Kotsouris, 2020). As teacher self-efficacy, attitudes (Yada et al., 2022), and concerns are considered important to the success of inclusive education (Song et al., 2019), the aim of this study was to investigate the reliability and factorial validity of the TEIP scale (Sharma et al., 2012) and the SACIE-R scale (Forlin et al., 2011) with a sample of Finnish teacher educators.

Teacher's self-efficacy and constructs of inclusive education

Teacher self-efficacy beliefs regarding inclusion may positively influence students and teaching practices (Wray et al., 2022). Specifically, teacher self-efficacy is described as teachers' beliefs and capacities to carry out their educational goals and values in an educational context (Bandura, 1997; Skaalvik & Skaalvik, 2010). It is domain-specific, so teachers may have different levels of self-efficacy across different domains (Lindblom-Ylänne et al., 2006; Perera et al., 2019). Teachers' self-efficacy beliefs affect not only their general orientation to the educational process but also their specific teaching practices and feelings (Bandura, 1993). Generally speaking, teachers with high self-efficacy are more likely to set higher educational goals both for themselves and for their students; they are also willing to adjust their teaching for diverse students and use varying teaching approaches to improve students' thinking, motivation, and engagement, thereby facilitating good learning outcomes (Dixon et al., 2014). Moreover, they may be willing to support students with difficulties in learning and achievement (Ashton & Webb, 1986). As teachers with lower self-efficacy tend to apply a more teacher-focused approach in their pedagogy (Chichekian & Shore, 2016), self-efficacy in inclusion is an important element in improving inclusive practices in (higher) education. For example, higher self-efficacy is positively related to the inclusion of all students in the class (e.g., Ahmmed et al., 2014; Sokal & Sharma, 2014), and training for inclusive or special educational practices has a positive impact on self-efficacy in pedagogical inclusion (Sokal & Sharma, 2014; Sharma et al., 2015).

Attitudes to teaching and learning can be viewed from several perspectives. One is Ajzen's (1991) Theory of Planned Behavior (TPB), in which attitudes are an important factor in teacher behavior (e.g.,

incorporating inclusive practices in teaching). In the inclusive education context, the attitude toward inclusion (i.e., behavior) refers to teachers' feelings as unfavorable or favorable about performing any behavior (Yan & Sin, 2014); positive attitudes toward inclusion are seen as important (e.g., Avramidis & Norwich, 2002; Yada et al., 2022), and negative attitudes as major obstacles to inclusion (Evans & Lunt, 2002). However, research results related to the attitudes of inclusion are varied. For example, older teachers are found to have less positive attitudes toward inclusion than younger teachers (Ahmmed et al., 2014), similar to the contrast between more experienced in-service teachers and novice pre-service teachers (Avramidis et al., 2000). Notably, training for inclusive or special education does seem to improve the positive attitudes of teachers (Varcoe & Boyle, 2014).

As with attitude, concerns for inclusive education can be reflected based on TPB (cf., Song et al., 2019). Concerns for inclusion may be related to low confidence levels in teaching students with special education needs as well as to a lack of resources and time (e.g., Takala et al., 2022; Wray et al., 2022). Moreover, according to Song et al. (2019), having a better understanding of, and more positive attitudes toward, inclusion does not directly mean less concerns for inclusive education among teachers. Thus, teacher education may play a significant role in diminishing concerns by addressing them in teacher training (Sharma et al., 2008; Sokal & Sharma, 2014). However, this has been minimally investigated, particularly from the teacher-educator perspective. Also, contradictory results have been found, indicating that teacher education may not diminish teachers' concerns toward inclusion (e.g., Woodcock et al., 2012), but this may be related to several factors such as quality and understanding of concern measurement as well as self-efficacy and attitudes.

Measuring self-efficacy for inclusion

Perhaps the two most well-known measures related to teachers' self-efficacy for inclusion are the Teacher Efficacy for Inclusive Practices (TEIP) scale (Sharma et al., 2012) and the Sentiments, Attitudes, and Concerns about Inclusive Education Revised (SACIE-R) scale (Forlin et al., 2011).

The TEIP scale

The 18-item TEIP scale measures teacher educators' self-efficacy for readiness to teach in inclusive settings and includes three dimensions: teaching efficacy in using inclusive instruction, in managing behavior, and in collaboration (Sharma et al., 2012). The first subscale—teaching efficacy in using inclusive instruction—is related to a teacher's ability to encourage inclusion in the classroom, and is a significant element that directly contributes to a teacher's effectiveness (Darling-Hammond, 2006). The second subscale—efficacy in managing behavior—represents perceptions that teacher's self-efficacy with regard to inclusion structures learners' success and behavior, similar to instructors' behavior and classroom leadership (Ahsan et al., 2012; Tschannen-Moran & Woolfolk-Hoy, 2001). The third subscale—efficacy in collaboration—requires teachers to consider their efficacy for the inclusion of students with special educational needs, and to coordinate with families, co-workers, and other professionals when instructing them (Loreman et al., 2013).

According to Sharma and colleagues (2012), the TEIP was originally developed and investigated with participants from four different countries (Canada, Australia, Hong Kong and India). In the TEIP development, DeVellis (2003) scale development recommendations were used with item generation, content validation (Delphi approach) and empirical investigation (e.g., item inter-correlations, exploratory factor analysis [EFA], and internal consistency with Cronbach alpha [α]) (Sharma et al., 2012). The final results of the original investigation yielded an 18-item scale with appropriate inter-correlations ($r > .30$ to $r < .80$), three-factor structure with EFA (explaining 64,25 % of variance), and adequate internal consistency for the three sub-scales ($\alpha = .85$-$.93$) based on EFA. Numerous studies have investigated the reliability (i.e., internal consistency) and factorial validity of the TEIP scale worldwide in various cultures and with 13 languages (e.g., Arabic, Chinese, Czech, Finnish, English,

Italian, Spanish) (cf., Sahli Lozano et al., 2023; Pivarč, 2024). Generally, results have found reliability to be adequate (e.g., Alnahdi, 2019; Chao et al., 2016; Malinen et al., 2013a; Sharma et al., 2012). However, the results of factorial validity have been inconsistent, ranging from rather poor fit indices in Arabic (e.g., Alnahdi, 2019; Emam & Al-Mahdy, 2019) and Chinese (e.g., Chao et al., 2016) to adequate in Arabic (e.g., Alnahdi & Schwab, 2021) and Chinese (e.g., Malinen et al., 2012) and excellent in Chinese (e.g., Malinen et al., 2013b), Czech (e.g., Pivarč, 2024) and Finnish (e.g., Malinen & Savolainen, 2016; Yada et al., 2021). Moreover, the factor structure has been found to be poor, with misfitting items or fluctuations from unidimensional to three-factorial models in Arabic, Chinese, Finnish and South African (e.g., Alnahdi, 2019; Malinen et al., 2012, 2013a, 2013b). In their scoping review, Selenius and Ginner Hau (2023) concluded that more research is warranted, as the psychometric properties of the TEIP scale still seem to fluctuate with three or less factors. Moreover, Yada and colleagues (2021) suggested the possible existence of a higher-order factorial structure of teachers' self-efficacy for inclusion. TEIP factor structure with bi-factorial or secondary-order factor models are minimally investigated; moreover, TEIP research has been dominated by pre-service and in-service level studies. Thus, very few—if any—teacher educator research studies exist.

The SACIE scale

According to Savolainen, Malinen and Schwab (2022), one of the most used combinations of instruments in examining teachers' attitudes toward inclusive education and on teachers' self-efficacy has been the SACIE scale (Loreman et al., 2007) or its revised version (SACIE-R) (Forlin et al., 2011), and the TEIP scale (Sharma et al., 2012). The original SACIE scale was developed and investigated as internationally relevant in Australia, Canada, Singapore and Hong Kong by the reduction of 60 items from three pre-existing scales to a 19-item scale (Loreman et al., 2007). The final development of the SACIE scale was based on Forlin et al.'s (2011) study in which it was re-named as SACIE-R and consists of 15 items. The Sentiments section of SACIE-R measures how teachers feel about engaging with people with disabilities, the Attitudes section measures how teachers accept learners with different support needs, and the Concerns section addresses teachers' concerns about inclusive education (Forlin et al., 2011).

Forlin and colleagues' (2011) development and investigation of SACIE-R scale followed a four-stage process. Stage 1; Initial validation (Principal Component Analysis [PCA]) that explained 61,20 % of variance and reported adequate internal consistency (α = .70-.86). Stage 1 was conducted with data from Australia, Canada, Singapore and Hong Kong. Stage 2; Revision of the SACIE-R with independent data (from Australia, Singapore and Hong Kong) from stage 1 resulted similar result with PCA (no variance reported) and adequate internal consistency (α = .83-.85). However, the stage 2 results were slightly problematic. Stage 3; Thus, additional independent data (from Canada and Hong Kong) were collected, and the investigation resulted in 15 items. The same structure explained 58.3 % of variance (no α reported). Stage 4; In the final stage, a further data set from Canada, India, Hong Kong and the US was used to investigate the structure with PCA. This resulted in a similar structure with 47.3 variance explained and internal consistency (α) ranging from .65 to .75.

The reliability and construct validity of SACIE-R has been studied in different countries. It has been argued that enough evidence seems to suggest the use of the scale in identifying changes in pre-service teachers' dispositions towards inclusion, their sentiments regarding engaging with people with a disability, their attitudes towards accepting learners with various needs in regular classrooms, and their concerns about implementing inclusive practices (Forlin et al., 2011). Research has also confirmed that the scale is a reliable and valid research tool, and that SACIE-R and TEIP were largely comparable and equally sensitive (Vogiatzi et al., 2023). Notably, however, Vogiatzi and colleagues (2023), with Greek data, found the two-factor model of SACIE-R with attitudes and concerns psychometrically sound. The results of a Spanish sample showed that the psychometric properties of the scale were suitable for the

general group, the students, and the teachers, and that the SACIE-R is a useful tool for measuring the inclusive attitudes of undergraduate education students and in-service teachers (Mateu et al., 2020).

Savolainen and colleagues (2012) replicated the findings with Finnish and South African data, in the "attitudes" factor as reported in the earlier studies of SACIE-R. However, in the "concerns" factor, one item—1: "I am concerned that students with disabilities will not be accepted by the rest of the class"—had a small loading and was thus removed. It is notable that this removed item was the only one that addresses teachers' concern for the acceptance of disabled students by their peers. The remaining four variables address the concerns the teacher has about the consequences of inclusion on his/her work. Savolainen et al. (2012) found that the "sentiments" factor was more problematic and seemed to divide into two separate factors. They found that the best solution was when they removed two items—2: "I dread the thought that I could eventually end up with a disability"; and 9: "I would feel terrible if I had a disability"—from the model. These two items measure sentiments by asking the person about their feelings toward becoming disabled themselves. The other three items describe sentiments toward interacting with other persons with disabilities and thus form a theoretically sound construct.

The present study

The TEIP and SACIE-R scales have been used primarily in pre-service teacher education and with in-service teachers. However, research on teacher educators'—i.e., those who train and influence future and present teachers' perspectives—self-efficacy, attitudes, and concerns for inclusion is scarce. As teacher educators play an important role as facilitators for inclusion, and as the questions of inclusion are not merely related to education but deeply also to social justice and human rights (e.g., Florian, 2008; Sapon-Shevin, 2003), it is of utmost importance to investigate inclusive perceptions of teacher educators in higher education. Even though qualitative research on faculty members' beliefs about inclusive education exists (Márquez & Melero-Aguilal, 2022), quantitative data is lacking. Thus, the TEIP and SACIE-R structures must be investigated thoroughly, and psychometrically sound research instruments are required for future research. Additionally, the psychometric properties must be re-investigated and re-established to use a measurement instrument in another culture, country, or context (American Educational Research Association, American Psychological Association & National Council on Measurement in Education, 2018). Geisinger (1994) points out that investigations are especially needed when the measure is significantly modified (e.g., translation or modification) or used with a population different from the one for which it was originally developed. Thus, the purpose of this study was to investigate the reliability and factorial validity of the TEIP scale (Sharma et al., 2012) and the SACIE-R scale (Forlin et al., 2011) with a sample of Finnish teacher educators.

Methods

Participants and procedures

The data included a convenience sample of 229 Finnish teacher educators from eight scientific universities and five universities of applied sciences. All of these institutions provide teacher education, and the sample covered all of the teacher education institutions in Finland. The data were collected via an electronic questionnaire as part of two projects: (1) Strengthening Finnish Teacher Educators' Special Educational Skills and Digital Guidance Skills (HOHTO, 2021–2022), funded by the Ministry of Education and Culture, and (2) Research for Pedagogical Renewal of Teacher Education (OPUT, 2021–2022), funding from the University of Jyväskylä designated for research on teacher education (National collaboration group for teacher education and research; KOPTUKE). Both projects aim to strengthen teacher educators' special educational, technological and pedagogical skills to support the well-being and learning of pre-service teachers and children and young people these future teachers will work with.

Study participants were recruited via email or other information channels/forums (e.g., Intraweb). First, the deans of faculties or the heads of departments/schools were approached through an email from

the projects. Second, they were asked to provide an invitation letter to the staff of their faculties, departments, or schools. Third, participants were asked to respond to an electronic questionnaire during late fall 2021. Participating in the study was voluntary, participants were well informed, and all of the respondents provided informed consent for participation. The study strictly followed EU General Data Protection Regulation (GDPR; 2016/679), national Data Protection Act (1050/2018), and national ethical principles of research with human participants (Kohonen et al., 2019).

Measures

In the present study, two measures were used: (1) the TEIP scale (Sharma et al., 2012), to investigate teacher educators' self-efficacy for readiness to teach in inclusive settings; and (2) the SACIE-R scale (Forlin et al., 2011), to investigate teacher educators' perceptions about inclusion.

The TEIP scale

The TEIP scale includes 18 items, and these are divided into three dimensions: (1) teaching efficacy to use inclusive instruction (e.g., "I can use a variety of assessment strategies—for example, portfolio assessment, modified tests, performance-based assessment, etc."), (2) efficacy in collaboration (e.g., "I am confident in informing others who know little about laws and policies relating to the inclusion of students with disabilities"), and (3) efficacy in managing behavior (e.g., "I am able to calm a student who is disruptive or noisy") (Sharma et al., 2012). Seventeen items were selected for the questionnaire in this context of teacher education. Participants responded to the subscales with a 9-point Likert-type scale for the items of teaching efficacy to use inclusive instruction and for the items of efficacy in collaboration (1 = not at all, 9 = a lot/very much), and for the items of efficacy in managing behavior (1 = strongly disagree, 9 = strongly agree). Savolainen and colleagues (2022) have also used a 9-point rating scale with the Finnish language.

The SACIE-R scale

The SACIE-R for HE includes 15 items, and these are divided into three subscales: (1) Attitudes (e.g., "Students who have difficulty expressing their thoughts verbally should be in regular classes"), (2) Concerns (e.g., "I am concerned that I do not have knowledge and skills required to teach students with disabilities"), and (3) Sentiments. However, Sentiments was excluded from this study at the analysis phase, as it has shown poor psychometric qualities, especially in the Finnish version (Savolainen et al., 2012; see also Savolainen et al., 2022). Participants responded to the items with a 4-point Likert-type scale, as in the study by Forlin et al. (2011), to eliminate a neutral midpoint response, and the range in this study (1 = strongly disagree, 2 = somewhat disagree, 3 = somewhat agree, 4 = strongly agree) was similar to that of the Finnish study by Savolainen et al. (2022).

Scale modifications

The TEIP and SACIE scales are originally written in English. A Finnish version of TEIP (Malinen et al., 2013a; Savolainen et al., 2012) is based on the original Sharma et al. (2012) measure. A Finnish version of SACIE-R has been previously used by, for example, Savolainen et al. (2022). Previous translations were used as a reference in creating versions for this study. However, as the context of this study was teacher education, the items needed to be adapted to fit the context. First, the translated items were adapted from a school context (e.g., "I am able to get children to follow classroom rules") to fit the context of teacher education (e.g., "I am able to get students to follow rules in my teaching group/course"). Second, the previous research was taken into account for using the scales (e.g., challenges with SACIE-R Sentiments scale). Third, the adapted items were checked by a group of academic professionals who all had a doctoral degree in the field of special education and were independent from the analysis of this research. Finally, all modifications were piloted among a group of

teacher educators who were involved in the projects, and the wording of the translated and modified items was clarified based on the responses and comments.

Data analysis

McDonald's omega (ω) was used to estimate the internal consistency reliabilities (Dunn, Baguley, & Brunsden, 2014; Hayes & Coutts, 2020; McDonald, 1999) of the TEIP and SACIE scales. Omega was chosen for the analysis as it represents the factorial model better than the more generally known Cronbach alpha (e.g., Dunn et al., 2014), and we considered $\omega > 0.80$ to indicate adequate internal consistency of the scale. With the confirmatory factor analysis (CFA), we investigated if the theoretical frameworks of teacher educators' self-efficacy for inclusive practices fit the data collected in Finland. Multiple CFA approaches were used for both TEIP and SACIE-R to find the best fitting model for our data: single-factor, three-factor, bi-factor, or second-order factor models. All factors were treated as correlated factors. Weighted least squares with mean and variance adjustments (WLSMV) estimators were used in the CFAs because the item-level data were considered as ordinal based on Likert-type ratings and existing non-normal distributions, which may violate the multivariate normal assumption of maximum likelihood (e.g., Flora & Curran, 2004). Li (2016) suggested that WLSMV provides correct and less biased results compared to other estimations, such as maximum likelihood (ML) or robust ML (MLR). With WLSMV, Mplus provides several goodness-of-fit indicators when estimating models: chi-square (χ^2), comparative fit index (CFI; Bentler, 1990), Tucker-Lewis index (TLI; Tucker & Lewis, 1973), the root mean square of approximation (RMSEA; Steiger & Lind, 1980), and the standardized root mean square residual (SRMR; Hu & Bentler, 1999). As the chi-square is considered to be overly sensitive for sample size, our interpretation of the results relied on CFI, TLI, RMSEA (with 90% confidence intervals [CIs]), and SRMR for evaluating the model fit. CFI or TLI should be above 0.95 for excellent model fit, and between 0.90 to 0.95 for a good model fit; values less than 0.05 are considered excellent, and values between 0.06 to 0.08 are considered as acceptable for RMSEA and SRMR (Brown, 2015; Hu & Bentler, 1999). Data were analyzed using Mplus 8.4 (Muthén & Muthén, 1998–2019).

Findings

Based on McDonald's omega (ω), the results of internal consistency indicated adequate reliability for all TEIP scales: Instruction (ω = .84), Collaboration (ω =.90), and Behavior (ω =.87). Thus, individual scales represent internal consistency with this data. However, to better understand the factorial structure, we tested four different factor models—unidimensional, three-factor, bifactor, and second-order factor—to find the best fit model for our data (Table 1).

Table 1
CFA models fit indices for TEIP

Models	CFI	TLI	RMSEA [90 % CI]	SRMR
Unidimensional model	0.857	0.837	.200 [.190; .210]	0.102
Three-factor model	0.969	0.963	.095 [.084; .106]	0.053
Bi-factorial model	Negative residual variances, no fit			
Second-order factorial model	0.969	0.963	.095 [.084; .106]	0.053

Note., CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square of approximation; CI, confidence intervals; SRMR, standardized root mean square residual.

First, the unidimensional model with 17 items indicated poor model fit (CFI = .857, TLI = .837, RMSEA = .200 [90 % CI: 0.190; 0.210], and SRMR = 0.102). Second, we tested the three-factor model with Instruction (6 items), Collaboration (5 items), and Behavior (6 items). The results indicated acceptable fit (CFI = .969, TLI = .963, RMSEA = .095 [90 % CI: 0.084; 0.106], and SRMR = 0.053) to the data, indicating that TEIP has a three-factor model. Third, we tested the bi-factor model, which included one general latent factor with 17 items and three latent factors (Instruction, Collaboration, Behavior). We were not able fit the data to the suggested bi-factor model due to negative residual variances, even with several modifications. Thus, this result indicated that TEIP does not have a general factor and individual latent factors that contribute to the same model. Fourth, we tested the second-order factor model with acceptable fit (CFI = .969, TLI = .963, RMSEA = .095 [90 % CI: 0.084; 0.106], and SRMR = 0.053).

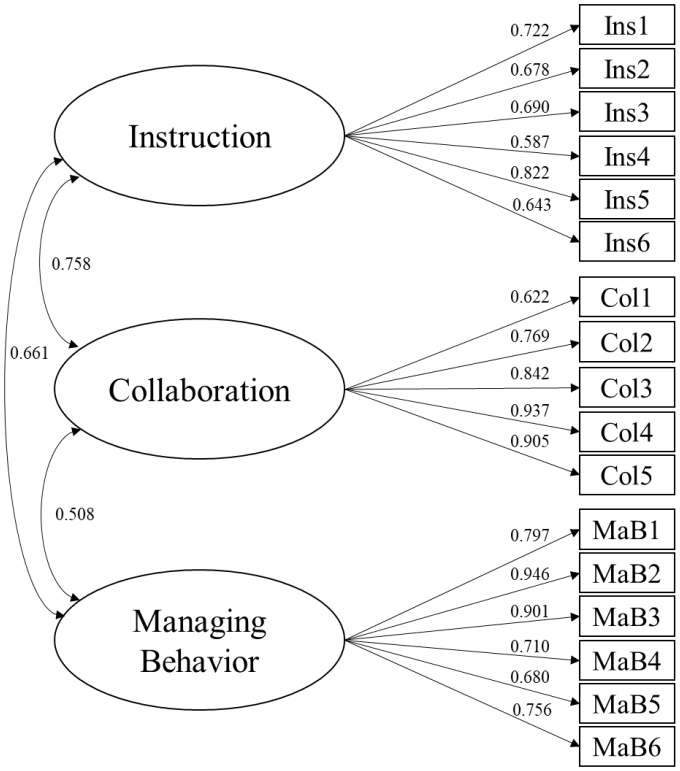

Figure 1. Three-factor model of TEIP

These results demonstrate that TEIP may possess a three-factor structure and a second-order factor structure based on the three individual latent factors. The factor loadings were not different for the second-order factor model, and the coefficients were almost perfect for Instruction, and slightly lower for Collaboration and Behavior (Table 2). Additionally, the CFA models of TEIP are presented in Figures 1 and 2.

Table 2.
Factor loadings of three-factor model and second-order model for TEIP

Items / second-order factors	Three-factor model			Second-order model
	F1	F2	F3	Second-order
Instruction1	0.722			
Instruction2	0.678			
Instruction3	0.690			
Instruction4	0.587			
Instruction5	0.822			
Instruction6	0.643			
Collaboration1		0.622		
Collaboration2		0.769		
Collaboration3		0.842		
Collaboration4		0.937		
Collaboration5		0.905		
Managing Behavior1			0.797	
Managing Behavior2			0.946	
Managing Behavior3			0.901	
Managing Behavior4			0.710	
Managing Behavior5			0.680	
Managing Behavior6			0.756	
Efficacy for instruction				0.993
Efficacy for collaboration				0.763
Efficacy for managing behavior				0.665

Note., all loadings were significant at $p<0.001$.

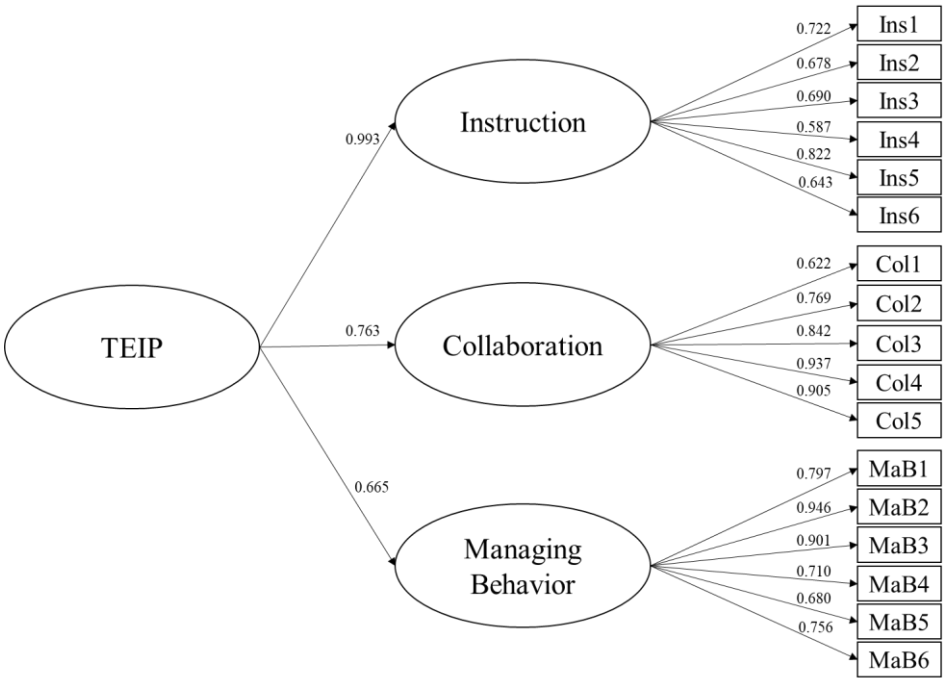

Figure 2. Second-order model of TEIP

Similarly, the reliability of SACIE-R was with McDonald's ω. Results indicated two factors with good reliabilities: Concerns (ω = .83) and Attitudes (ω = .85). We tested three different factor models (unidimensional model, two-factor model, and bi-factor model) to find the best-fit model for our data (Table 3). For SACIE-R, we could not fit the second-order factor models, as it cannot be identified without at least three first-order factors (Brown, 2015). First, the unidimensional model with 10 items indicated a poor model fit (CFI = .859, TLI = .818, RMSEA = .201 [90 % CI: 0.183; 0.220], and SRMR = 0.111). Second, we tested the two-factor model with Concerns (5 items) and Attitudes (5 items). The results indicated acceptable fit (CFI = .987, TLI = .983, RMSEA = .061 [90 % CI: 0.037; 0.084], and SRMR = 0.038), supporting the notion that SACIE-R has a two-factor model. Third, we tested the bi-factor model, which included one general latent factor with 10 items, and two latent factors (Concerns and Attitudes). Similarly, as with the TEIP, we could not fit the data to the suggested bi-factor model due to negative residual variances, even with several modifications.

Table 3.
Model fit indices of different models of SACIE-R

Models	CFI	TLI	RMSEA [90 % CI]	SRMR
Unidimensional model	.859	.818	.201 [0.183; 0.220]	.111
Two-factor model	.987	.983	.061 [.037; 0.084]	.038
Bi-factorial model[1]	Negative residual variances, no fit			

Note., CFI, comparative fit index; TLI, Tucker-Lewis index; RMSEA, root mean square of approximation; CI, confidence intervals; SRMR, standardized root mean square residual.

Based on goodness-of-fit indices, results indicate SACIE-R possesses a two-factor structure (Table 4). Additionally, the CFA model of SACIE-R is presented in figures 3.

Table 4.
Factor loadings of two-factor model for SACIE-R

Items / second-order factors	Two-factor model	
	F1	F2
Concerns1	0.861	
Concerns2	0.517	
Concerns3	0.848	
Concerns4	0.683	
Concerns5	0.829	
Attitudes1		0.814
Attitudes2		0.759
Attitudes3		0.871
Attitudes4		0.842
Attitudes5		0.654

Note: all loadings were significant at $p<0.001$.

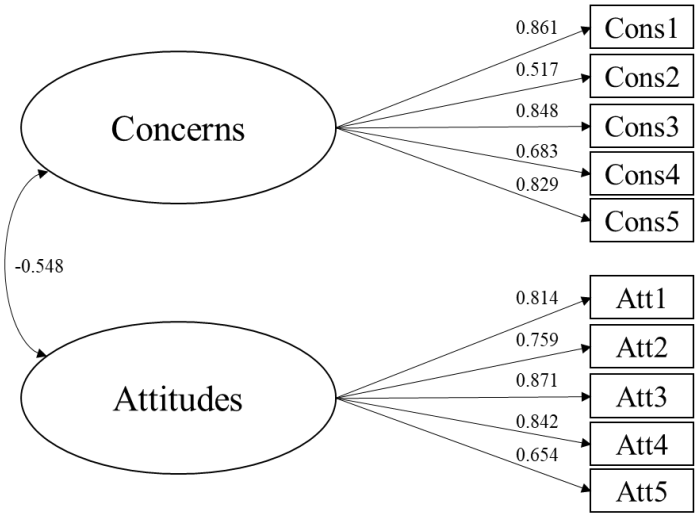

Figure 3 *Two-factor model of SACIE-R*

Discussion

This study assessed the reliability and factorial validity of two scales—the TEIP and the SACIE-R—with Finnish higher education (HE) teacher educators. Internal consistency for TEIP and its Instruction, Collaboration, and Behavior subscales and SACIE-R and its Concerns and Attitudes subscales were found to be adequate. To better understand the factorial structure with the Finnish teacher educators, the study tested four different factor models for TEIP—unidimensional, three-factor, bifactor, and second-order factor—and three for SACIE-R—unidimensional, two-factor, and bifactor. From the results, both a three-factor model and a second-order factor model with three individual latent factors with Instruction, Collaboration, and Behavior fit the data. Based on goodness-of-fit indices, we concluded that SACIE-R possesses a two-factor structure with Concerns and Attitudes.

Similar to the present study with HE teacher educators, previous studies of school teachers in other educational contexts have shown that TEIP has adequate internal consistency, indicating that the items on the scale are measuring the same construct consistently (e.g., Alnahdi, 2019; Chao et al., 2016; Malinen et al, 2013a; Sharma et al., 2012). However, studies investigating the factorial validity of TEIP have yielded more inconsistent results. While some studies found that the factor structure of TEIP is adequate or excellent (Malinen et al., 2012, 2013b; Malinen & Savolainen, 2016; Yada et al., 2021), others reported poor fit indices (Alnahdi, 2019; Chao et al., 2016; Emam & Al-Mahdy, 2019), with misfitting items or fluctuations from unidimensional to three-factorial models (Alnahdi, 2019; Malinen et al., 2012, 2013a, 2013b). Moreover, the TEIP scale has primarily been investigated using unifactorial or three-factorial models (Selenius & Ginner Hau, 2023). However, Yada et al. (2021) suggested the possibility of a higher-order factorial structure of teacher self-efficacy for inclusion. The results of this study confirmed the existence of both three-factor and second-order factorial models with the HE teacher educators' data. Here, the results indicated that an appropriate structure for investigating individually all three factors (i.e., Instruction, Collaboration, and Behavior) of TEIP may be conducted in the future. However, the results also indicate a more general teachers' self-efficacy second-order factor for inclusion among teacher educators.

With SACIE-R, only the two-factor model was found. Thus, a more well-known structure of Concerns and Attitudes seems to exist with HE teacher educators' data. This study was able to identify similar, adequate internal consistencies for SACIE-R Attitudes and Concerns subscales, as in previous studies on school teachers (e.g., Forlin et al., 2011; Mateu et al., 2020; Vogiatzi et al., 2023). However, the number of SACIE-R factors have posed additional questions to the research community. Savolainen et al. (2012) replicated the Attitudes and Concerns factors in SACIE-R but found that the Sentiments factor was more problematic. Moreover, Vogiatzi et al. (2023) found that the two-factor model of SACIE-R with Attitudes and Concerns was psychometrically sound. This was also in line with the present study, where we concluded that SACIE-R possesses a two-factor structure with Concerns and Attitudes.

TEIP and SACIE-R are important and psychometrically sound research instruments for inclusive education among teachers in general. Our study, however, extended the understanding with Finnish teacher educators in particular. The results revealed that TEIP may be used as a more general self-efficacy beliefs measure, or a more specific measure of Instruction, Collaboration, and Behavior related to self-efficacy beliefs of inclusion, similar to SACIE-R Attitudes and Concerns. Generally, teacher self-efficacy beliefs are important in promoting inclusive practices in education (Ahmmed et al., 2014; Sokal & Sharma, 2014; Sharma et al., 2015; Wray et al., 2022). Teachers with high self-efficacy beliefs are more likely to set higher educational goals for themselves and their students, adjust their teaching for diverse students, and use varying teaching approaches to improve their students' thinking, motivation, and engagement (Dixon et al., 2014). This is particularly important in teacher education programs for advancing inclusive practices in teacher training and creating in-depth understanding among future teachers about inclusion. Moreover, teachers with higher self-efficacy are more willing to support

students with learning difficulties (Ashton & Webb, 1986), an important factor in teacher education both now and in the future. Societal support of student teachers' self-efficacy beliefs is vital to achieve inclusive education. However, this requires insight into how teacher education programs can encourage an understanding of students' individual characteristics and learning capabilities, difficulties, and backgrounds, all in the same physical and digital learning environments and communities (Ainscow et al., 2004; EADSNE, 2011). Additionally, since teacher educators are responsible for instructing all future educators—from class teachers to subject teachers—they significantly contribute positive attitudes toward inclusive education in HE. Generally, with TEIP, self-efficacy can be measured with one latent second-order factor for teacher educators in teacher education programs. However, if a more in-depth perspective on how to investigate teacher educators' understanding of instruction, collaboration, and behavior in inclusive HE practices is needed, TEIP may provide possibilities. In this sense, teacher educators' instructional abilities to support inclusion in teaching (Darling-Hammond, 2006); success and behavior, including their own behavior and leadership (Ahsan et al., 2012; Tschannen-Moran & Woolfolk-Hoy, 2001); and collaboration with various stakeholders (Loreman et al., 2013) may be better understood. Such insights may also be used to support teacher educators' dispositions for inclusion.

Although self-efficacy is an important factor in promoting inclusive education, so too are attitudes toward inclusion: positive attitudes are vital, and negative ones may pose major obstacles (Evans & Lunt, 2002). According to Ajzen's (1991) TPB, attitudes are an important factor for teacher behavior, including inclusion in teaching (Avramidis & Norwich, 2002; Yada et al., 2022). However, studies of attitudes and inclusion have yielded varying results. For example, older teachers have less positive attitudes toward inclusion than younger teachers (Ahmmed et al., 2014), similar to more experienced in-service teachers vis-à-vis more novice pre-service teachers (Avramidis et al., 2000). Notably, training for inclusive or special education does seem to improve teachers' positive attitudes (Varcoe & Boyle, 2014). In addition to self-efficacy and attitudes, concerns for inclusive education should not be neglected. This is important for teachers at various levels of education, particularly among teacher educators, and concerns can be reflected via TPB. Concerns for inclusion may be related to low confidence levels in teaching students with special education needs as well as to a lack of resources and time (Takala et al., 2022; Wray et al., 2022), thus reducing the sense of perceived behavioral control. Moreover, having a better understanding of, and more positive attitudes towards inclusion does not directly equate to less concerns for inclusive education among teachers (Song et al., 2019). As such, teacher education may significantly diminish concerns by addressing them in teacher training (Sharma et al., 2008; Sokal & Sharma, 2014).

Training aimed at promoting inclusive or special educational practices can have a positive impact on an individual's self-efficacy for inclusion (Sokal & Sharma, 2014; Sharma et al., 2015). However, it is essential to note that inclusion is not solely the responsibility of special education, special education teachers, or special education teacher educators. Instead, it is the responsibility at all educational levels, of teachers, and teacher educators, including those in early childhood, comprehensive, secondary, tertiary (including teacher training), and lifelong learning. All teacher educators are required to be facilitators of inclusive education in their teaching and training for current and future teachers. This presents a significant challenge for the field of teacher training, as pre-service teachers are often deemed unprepared for inclusive classrooms (Crispel & Kasperski, 2019; Florian & Camedda, 2020). Moreover, in-service teachers may have concerns about inclusive education, even though their attitudes towards disabilities are positive and neutral towards inclusion (Yada & Savolainen, 2017). In addition to these challenges, further research into teacher educators' inclusive education perspectives is greatly warranted, employing psychometrically sound research instruments.

Limitations and Future Research

There are limitations to this study. First, the sample used was a convenience sample from only one country, although we could gather data from all teacher education institutions in Finland. Future research should consider exploring the validity and reliability of these scales in different contexts and with more specific populations, using randomized samples to enhance inclusive education practices. Second, while we used a strong quantitative research method with the sample, we did not follow the original structure of the SACIE-R, which may limit the results of this study. Third, the use of participants' self-ratings may be a limitation, due to potential reporting biases, such as a tendency to respond in a socially desirable way. Therefore, future research should also include qualitative data and observations to complement the results. Fourth, while the items in the questionnaire were adapted to fit the context of teacher education and were piloted among a group of academic professionals, the translations were based on measures used in previous studies, rather than focus on exclusive items for teacher educators. Finally, while this study investigated the psychometric properties of TEIP and SACIE-R and found them to be adequate, further research is needed to gain a more in-depth understanding of the self-efficacy of teacher educators' inclusion practices, and the structures that influence them.

Implications

The implementation of, and training for, inclusive education require a greater understanding of inclusive education and the personal disposition of teacher educators at all levels of the education system, from early childhood education to HE. This demands more research-grounded actions, requiring psychometrically sound instruments. The TEIP and SACIE-R scales can help teacher educators to assess their self-efficacy beliefs, attitudes, and concerns toward inclusive education, which, in turn, can contribute to improving inclusive practices in teacher education and more broadly in HE. The identification of the three-factor and two-factor structures of TEIP and SACIE-R, respectively, can help researchers and educators better understand the underlying constructs of these scales. This study also highlights the importance of testing multiple factor models to identify the best fit model for the data. Our results will be useful for teacher education programs, policymakers, and educators who aim to develop more inclusive practices in HE. Our research findings provide insights into the preparedness of teacher educators in response to the diverse needs of learners that enter HE and teacher education program contexts. Moreover, the findings may also help to identify areas where more training and support are needed to improve the competencies in delivering inclusive education in Finland.

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