



Examining the factor structure of the teachers' sense of efficacy scale in the Vietnamese educational context

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ABSTRACT

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In recent years, research has focused on the factor structure of the Teacher Sense of Efficacy Scale (TSES), and the significant effects of teachers' self-efficacy on both teachers' outcomes (teachers' performance, enjoyment of teaching, and commitment to teach), and students' outcomes (student learning achievements, motivation, and own sense of efficacy). However, current literature shows that very limited research on the factor structure of the TSES for teachers has been conducted in the Vietnamese educational context. Thus, this study explored the factor structure of the 12-item TSES for a group of 395 in-service teachers from 24 high schools in Vietnam. Both exploratory factor analysis and confirmatory factor analysis were performed to explore the possible factor structure of the TSES and confirm the latent structural validity of the TSES model. The results of factorial analysis indicated that the three-factor structure of the original TSES, which included efficacy for instructional practices, efficacy for classroom management, and efficacy for student engagement, was appropriate for high school teachers in Vietnam. The reliability of each of the three subscales and the whole scale was satisfactory. The findings suggested that the application of TSES was suitable for Vietnamese in-service teachers to assess their self-efficacy. The study recommended that future studies should examine the factor structure of the TSES for a group of pre-service teachers in Vietnam to compare the experience levels of efficacy beliefs between pre-service and in-service teachers.

Contribution/Originality: The present study validated that the application of TSES conducted with high school teachers in Vietnam was suitable for Vietnamese in-service teachers in order to assess their self-efficacy. The results confirmed the three-factor structure of the TSES, including efficacy for instructional practices, efficacy for classroom management, and efficacy for student engagement in the Vietnamese educational context.

1. INTRODUCTION

In schools worldwide, teachers are required to have beliefs in their self-efficacy for various activities in the process of teaching (Cocca & Cocca, 2022; Duffin, French, & Patrick, 2012). Teachers' self-efficacy is considered as one of the most important aspects that constitutes teacher professionalism (Rizvi & Elliot, 2005) in their daily lives (Klassen et al., 2009; Tschannen-Moran & Hoy, 2001). In this respect, recent research has increasingly focused on teachers' self-efficacy, defined it as beliefs related to teachers' effectiveness for students' engagement, classroom management, and instructional strategies (Bandura, 1977; Cocca & Cocca, 2022; Hoy & Spero, 2005; Tsouloupas,

Carson, Matthews, Grawitch, & Barber, 2010). Recently, the Vietnamese government has considered ways to improve the quality of teaching staff. In the context of socio-economic development and the requirements of comprehensive renovation in education, the Vietnam has issued new standards and competencies for teaching staff of general education in order to comprehensively develop learners' qualities and capacities (Nguyen et al., 2022). Therefore, high school teachers are required to have both sufficient professional competence and efficacy. Teacher efficacy, the basis for evaluating the quality of teachers, needs to be assessed regularly to help teachers improve their capacity, thereby helping learners achieve better learning outcomes in their learning (Nguyen et al., 2022). It is crucial for teachers in Vietnam to feel capable of controlling their teaching activities in schools so that the proper training may be developed for their professional growth. However, there is not any available scale developed to measure teacher efficacy in the Vietnamese educational context. Although teachers' self-efficacy affected positively both teachers and students (Cocca & Cocca, 2022) no studies have been done to investigate the factor structure of teachers' self-efficacy in Vietnam. Therefore, this study investigates the factor structure of the TSES with a group of high school teachers to determine if the TSES may be a valid construct in the educational setting of Vietnam.

2. LITERATURE REVIEW

2.1. Teacher Self-Efficacy

Self-efficacy is viewed as “the belief in one’s capabilities to organize and execute the courses of action required to produce given attainment” (Bandura, 1977). In educational contexts, teachers’ self-efficacy refers to “teachers’ beliefs or convictions that influence how well students learn, even those who may be unmotivated” (Guskey & Passaro, 1994). Teachers’ efficacy can also be “a judgment of his or her capabilities to bring about desired outcomes of student engagement and learning” (Tschannen-Moran & Hoy, 2001). Generally, teachers’ self-efficacy indicates teachers’ beliefs in their capabilities to perform teaching activities to influence their students’ achievement (Cocca & Cocca, 2022; Htang, 2018; Skaalvik & Skaalvik, 2007, 2010; Thompson & Woodman, 2019).

The results of some previous research show that teacher efficacy positively related to teachers’ performance, enjoyment of teaching, and commitment to teach (Betoret, 2006; Cantrell et al., 2014; Heneman, Kimball, & Milanowski, 2006; Hoy & Spero, 2005; Hoy, Davis, & Pape, 2006; Klassen et al., 2009; Klassen & Chiu, 2010; Lumpe, Czerniak, Haney, & Belyukova, 2012; Schwarzer & Hallum, 2008; Skaalvik & Skaalvik, 2010; Woolfolk-Hoy, Hoy, & Davis, 2009). Teacher efficacy was also reported to correlate with positive students’ outcomes (e.g., student learning achievements, motivation, and own sense of efficacy) (Cocca & Cocca, 2022; Guo, Piasta, Justice, & Kaderavek, 2010; Zee & Koomen, 2016).

2.2. Teachers’ Sense of Efficacy Scales

Since the emergence of the social learning theory of Rotter (1966) and the social cognitive theory of Bandura (1977) researchers have striven to develop scales (e.g., The two-item RAND measure, Armor et al. (1976) Teacher locus of control, Rose and Medway (1981) Teacher efficacy scale, Gibson and Dembo (1984) Bandura’s teacher self-efficacy, Bandura (1997) to measure teachers’ self-efficacy. However, Tschannen-Moran and Hoy (2001) pointed out the existing instruments had the conceptual and methodological shortcomings. Therefore, they developed, based on suggestions of Bandura (1997) and Tschannen-Moran, Woolfolk, and Hoy (1998), a new kind of teachers’ sense of efficacy scales (TSES). The TSES is an integrated model of self-efficacy that embraces perceptions of efficacy beliefs about frequent behaviors and tasks of teachers in schools. The TSES comprised both the 24-item version and the 12-item version, which measured three dimensions of teachers’ self-efficacy: efficacy for instructional strategies (IS), efficacy for classroom management (CM), and efficacy for student engagement (SE).

Tschannen-Moran and Hoy (2001) believed that the three dimensions of the TSES represented the necessary requirements for an effective teacher. Teachers' effectiveness for student engagement is their ability to help students value learning, inspire, motivate, and encourage students to believe that they may learn well (Tschannen-

Moran & Hoy, 2001). Teachers' effectiveness for instructional strategies is their ability to ask questions that engage students, implement different types of assessment strategies, teaching strategies and provide alternative clarifications when students are confused (Tschannen-Moran & Hoy, 2001). Teachers' effectiveness for classroom management is their ability to control disruptive behavior, establish effective classroom management systems, and require students to follow classroom rules (Tschannen-Moran & Hoy, 2001). In recent years, the TSES has become one of the most predominant tools to measure teachers' self-efficacy (e.g., (Hoy & Spero, 2005; Klassen et al., 2009; Knoublauch & Hoy, 2008; Poulou, 2007; Tsigilis, Koustelios, & Grammatikopoulos, 2010; Valls, Bonvin, & Benoit, 2020; Yilmaz, 2011)). However, to our knowledge, no study on the factor structure of the TSES has been done in Vietnam prior to this study.

2.3. Testing the Psychometric Properties of the TSES

In recent years, many studies have been carried out to examine the psychometric properties of TSES (Bilali, 2015; Htang, 2018; Pfitzner-Eden, Thiel, & Horsley, 2014; Ruan et al., 2015; Valls et al., 2020; Zai & Munshi, 2016; Zai & Soomro, 2015). For instance, Pfitzner-Eden et al. (2014) developed a version of the 12-variable TSES scale from the 24-variable TSES version based on data collected from 851 school teachers, divided into 3 sample groups from Germany and New Zealand. The multi-group CFA analysis results showed that the three-factor solution was identical for all three sample groups. The findings showed that this scale allowed three-way assessment of teacher effectiveness ($\chi^2 = 229.64$, $df = 153$, $\chi^2/df = 1.50$, $CFI = 0.97$, SCF (scaling correction factor) = 1.39, $RMSEA = 0.04$). The reliability coefficient was found to be satisfactory for each factor of the TSES scale and for each sample group (IS [$\alpha = 0.68 / 0.73/0.81$]), CM ($\alpha = 0.91 / 0.93 / 0.94$]), SE ($\alpha = 0.80/0.76/0.86$]).

Bilali (2015) explores the validity and reliability of the 12-variable TSES scale on a dataset collected from 92 pre-service teachers in Albania. The results show that the 12-variable version has a high reliability coefficient of $\alpha = 0.94$ (before practice) and $\alpha = 0.96$ (after practice). Factor analysis of 12 variables showed that a single factor had an eigenvalue of 7.10, explaining 59% of the total variance extracted. This result is compatible with previous studies when confirming the suitability of the one-factor solution of the 12-variable TSES scale (Al-Mehrzi et al., 2011; Cheung, 2006; Fives & Buehl, 2009; Tschannen-Moran & Hoy, 2001).

Ruan et al. (2015) researched a dataset of 489 teachers in China, Korea and Japan to confirm whether the structure of the 12-variable TSES scale is reliable and appropriate to measure teacher effectiveness. The CFA analyses show that the fit indicators of the 12-variable TSES version of the scale model for all three country groups are acceptable ($\chi^2 = 96.61$, $df = 51$, $TLI = 0.93$, $CFI = 0.91$, $RMSEA = 0.08$ [China]; ($\chi^2 = 103.04$, $df = 51$, $TLI = 0.94$, $CFI = 0.95$, $RMSEA = 0.07$ [Korea]; ($\chi^2 = 94.25$, $df = 51$, $TLI = 0.94$, $CFI = 0.96$), $RMSEA = 0.07$ [Japan]). The researchers proposed an 11-variable (three-factor) model where one observed variable was excluded from the 12-variable version and examined an additional 11 modified observed variables for the three country groups. The results suggest that this scale can be used in cross-cultural studies on teacher effectiveness in East Asian contexts.

Zai and Soomro (2015) explored the 12-variable TSES scale based on data collected from 210 teachers in the educational context in Pakistan. The CFA analysis showed that the one-factor solution model was not suitable ($\chi^2(49) = 168.25$, $p < 0.001$; AIC (Akaike Information Criterion) = 70.25; $CFI = 0.88$; $GFI = 0.88$; $SRMR$ (Standardized Root Mean Square Residual) = 0.06; $RMSEA = 0.10$), while the three-factor solution model was appropriate ($\chi^2(49) = 153.93$, $p < 0.001$; $AIC = 55.93$; $CFI = 0.90$; $GFI = 0.90$; $SRMR = 0.12$; $RMSEA = 0.10$). The internal consistency of the three factors ES, IS and CM has the reliability coefficients of 0.80, 0.76 and 0.80, respectively. The 12-variable TSES scale had an internal consistency of 0.89.

Zai and Munshi (2016) investigated the latent structure of the 12-item TSES scale based on a dataset collected from 423 pre and 549 in-service teachers in Pakistan. The results of the CFA rejected the one-factor model, and confirmed that the three-factor model was more suitable for both pre and in-service teachers. The fit indices of the

three-factor model of the 12-variable version is accepted ($\chi^2(51) = 119.95$; $p < 0.001$; NFI (Normed Fit Index) = 0.94; NNFI (Non-Normed Fit Index) = 0.95; CFI = 0.96; GFI = 0.97; AGFI = 0.95; SRMR = 0.03; RMSEA = 0.05). The three-factor reliability coefficient of the 12-variable version is 0.70 for SE, 0.73 for IS and 0.70 for CM, respectively.

Htang (2018) explores the psychometric property of the 12-variable TSES version based on the structural equation model of the dataset obtained from 101 teachers of three different educational levels (public high school, pedagogical colleges and universities) in Myanmar. The results suggested a three-factor structure, explaining 56.35 total variance extracted and eigenvalues greater than 1. All the loaded variables corresponded to each of its own original factors. The appropriate indices for the three-factor model met the requirements ($\chi^2(51) = 69.20$, $p = 0.06$, $\chi^2/df = 1.35$, CFI = 0.96, NFI = 0.88, RMSEA = 0.06, IFI = 0.96, GFI = 0.89, SRMR = 0.05). The results showed that the reliability coefficient of the total scale was 0.88, and the reliability coefficients of the three components were also satisfactory, 0.78 for IS, 0.86 for CM and 0.83 for SE, respectively.

Valls et al. (2020) explored the psychometric properties of the 12-variable version of the TSES scale based on a dataset collected from 283 primary and secondary school teachers in France. The results of the CFA confirmed that the three-factor structure of the scale and the psychometric properties were satisfactory. The results showed that the fit indices of the three-factor model were relatively good ($\chi^2 = 185.28$), $df = 51$, $\chi^2 / df = 3.36$, GFI = 0.90, CFI = 0.90, TLI = 0.87, ECVI (Expected Cross Validation Index) = 0.85, AIC = 239.28, RMSEA = 0.06). The findings of the above studies are supported by previous studies (Cheung, 2006; Duffin et al., 2012; Fives & Buehl, 2009; Klassen et al., 2009; Tsui & Kennedy, 2009) which determined that the TSES has a three-component structure.

2.4. The Present Study

Over the years, concerns have been raised on whether teacher efficacy can be considered a unidimensional or a multidimensional construct (Cocca & Cocca, 2022; Denzine, Cooney, & McKenzie, 2005; Duffin et al., 2012; Htang, 2018; Klassen, Tze, Betts, & Gordon, 2011; Tschannen-Moran & Hoy, 2001; Wheatley, 2005). In practice, instruction is so complex that tools for measuring teachers' self-efficacy should capture this multi-faceted concept (Bandura, 1997; Klassen et al., 2011; Nie, Lau, & Liau, 2012). The TSES (Tschannen-Moran & Hoy, 2001) is a promising instrument that describes the concept of teachers' self-efficacy (Henson, 2002) because it shows a stable factor structure of assessing various teaching activities. Previous studies provided some insights into the factor structure of the TSES through the exploratory factor analysis (EFA) (Tsigilis et al., 2010). However, the basic structure of a scale should not be based solely on EFA (Anderson & Gerbing, 1988) but should warrant more rigorous statistical methods (e.g., the confirmatory factor analysis [CFA]). CFA allows investigators to define a detailed and specific model in advance, in which measurement error can be examined, prior to test the model's fit with the dataset. Moreover, since the TSES was designed and examined in North America, its generalizability to other cultures remains an empirical question (Tsigilis et al., 2010). Therefore, this study investigates the factor structure of the 12-item TSES version through CFA in the educational setting in Vietnam to provide corroborating evidence of the multicultural value of this scale.

3. RESEARCH METHODS

3.1. Participants

A total of 395 Vietnamese in-service teachers (211 females [53.40%] and 184 males [46.60%]) from nine high schools (Grades 10-12) took part in this study. The average in years of teaching experience for the teachers was 6.68 (SD = 2.45) and the average age of the teachers was 34.12 years (SD [Standard Deviation] = 6.71). The average age for female teachers was 31.72 years (SD = 6.07), while the average age for male teachers was 34.77 years (SD = 7.63). The original sample group was randomly distributed into two sub-groups. The first sub-group, comprised of 195 participants (105 females and 90 males), was used to perform the EFA, while the second sub-

group, made up of 192 participants (108 females and 84 males), was used to perform the CFA (MacCallum, Roznowski, Mar, & Reith, 1994). The participants were in charge of a variety of subjects (literature, mathematics, English, history, chemistry, physics, and biology). All the volunteer-participants completed the survey questionnaires. The response rate for the questionnaires was over 87%. All responses collected from the TSES surveys were anonymous and confidential.

3.2. Instruments

3.2.1. The TSES

The 12-item version of the TSES (Tschannen-Moran & Hoy, 2001) was utilized to gather data from the participants. All 395 teachers received the Vietnamese TSES and completed the survey questionnaire. The scale included 12 observed items measuring three components of teaching effectiveness: CM (e.g., “How much can you do to get children to follow classroom rules?”), SE (e.g., “How much can you do to help your students value learning?”), IS (e.g., “To what extent can you use a variety of assessment strategies?”). Each component scale consisted of 4 observed items and participants responded on a five-point Likert scale, from 1 (never) to 5 (very often).

3.2.2. The Teacher Stress Inventory (TSI)

The six-item TSI (Boyle, Borg, Falzon, & Baglioni Jr, 1995) and one item (Gates, 2007) independently were utilized to measure two sub-scales, including the workload stress (WS) and classroom stress (CS). The WS consisted of four items (e.g., “How great a source of stress is having too much work to do?”) and CS included three items (e.g., “How great a source of stress is having noisy students?”). Participants responded on a 5-point Likert scale, ranging from 1 (No stress) to 5 (Extreme stress).

The Alpha value of the TSI was 0.81. The internal consistency reliability was 0.81. The results of EFA suggested a two-factor model and explained 53.37% of the total extracted variance. The coefficients of the factor loadings for two factors ranged from 0.52 to 0.88. The results of CFA confirmed the two-factor model and the model's indices were appropriate ($\chi^2 = 26.10$, $df = 13$, $p = 0.016$, $TLI = 0.95$, $CFI = 0.97$; $RMSEA = 0.07$).

3.2.3. Data Analyses

The present study aimed to validate the TSES conducted with high school teachers in Vietnam. Thus, both EFA and CFA were performed to explore the possible factor structure of the TSES and confirm the latent structural validity of the TSES model. The values of Kaiser-Meyer-Olkin Measure (KMO), Bartlett's test, factor loadings, and Eigenvalue were calculated. The standardized estimates, residual moments, and modification indices were evaluated. The model's fit indices: Chi square/degrees of freedom ratio (χ^2/df) ratio, Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) were inspected. The Cronbach's alpha coefficients of the instruments, and their sub-scales were calculated. The alpha-level was fixed at $p < 0.01$.

4. RESULTS

The results of EFA analysis showed that the factor analysis was suitable as the KMO value = 0.86 and the testing of Bartlett, $\chi^2_{(66)} = 1032.78$ ($p < 0.000$). The principal-axis extraction with varimax rotation indicated a three-factor dimension of the TSES (eigenvalues > 1), accounting for 56.38% of the total extracted variance. All observed items of the TSES converged on each of the initial component factors, respectively. However, the item number 8 under the efficacy of classroom management subscale was removed because it had low communalities and loadings (< 0.50).

Table 1. EFA for the TSES.

Items		Factor loading			Factors
		IS	SE	CM	
9.	Use a variety of assessment strategies? (Is2)	0.89			IS
12.	Implement alternative teaching strategies in your classroom? (Is4)	0.80			
10.	Provide an alternative explanation or example when students are confused? (Is3)	0.71			
5.	Craft good questions for your students? (Is1)	0.67			
4.	Help your students value learning? (Se2)		0.85		SE
7.	Get students to believe they can do well in school work? (Se3)		0.84		
2.	Motivate students who show low interest in school work? (Se1)		0.72		
11.	Assist families in helping their children do well in school? (Se4)		0.63		
6.	Get children to follow classroom rules? (Cm3)			0.85	CM
3.	Calm a student who is disruptive or noisy? (Cm2)			0.72	
1.	Control disruptive behavior in the classroom? (Cm1)			0.50	
Eigenvalue		4.67	1.97	1.06	
Cum %		38.80	53.17	59.25	

Note: Factor loadings < 0.50 were omitted.
 EFA = Exploratory factor analysis, TSES = Teachers' sense of efficacy, IS = Efficacy for instructional strategies, SE = Efficacy for student engagement, CM = Efficacy for classroom management.

Using the remaining 11 observed items, the principal-axis factor analysis method with varimax rotation confirmed the same three-factor structure of the TSES with eigenvalues greater than 1, with a model coefficient higher than 0.45. These three factors explained 59.25% of the total extracted variance. The factor 1, IS, included 4 observed variables with loading coefficients from 0.67 to 0.89. The factor 2, SE, consisted of 4 observed variables with loading coefficients from 0.63 to 0.84. The factor 3, CM, comprised 3 observed variables with loading coefficients from 0.50 to 0.85. The results of the EFA are reported in Table 1.

Using these 11 observed variables, results of the first CFA showed that the model was not suitable for the one-factor structure because all the indices were below the accepted levels ($\chi^2 = 463.70$, $df = 44$, $\chi^2/df = 10.53$, $p = 0.000$, $TLI = 0.56$, $CFI = 0.65$, and $RMSEA = 0.22$). The results of the second CFA confirmed the same three-factor solution found in the EFA, which indicated that the appropriateness of the three-factor model for the short-form (11 items) TSES. The model's indices were suitable ($\chi^2 = 77.40$, $df = 41$, $\chi^2/df = 1.88$, $p = 0.001$, $TLI = 0.96$, $CFI = 0.97$, and $RMSEA = 0.06$). The factor loading coefficients of the three factors ranged from 0.64 to 0.90 (standardized estimates). Figure 1 reports the fit model of the TSES.

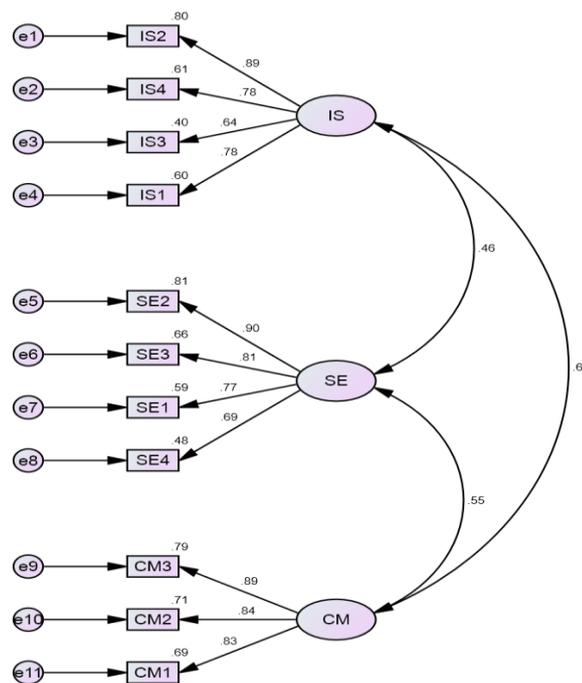


Figure 1. The fit model of the TSES.

Table 2. Means, standard deviations, Cronbach's alpha (α) and Inter-factor correlations.

Factors	No. of items	M	SD	α	TSES	CM	IS	SE	CS	WS
TSES	11	3.35	0.75	0.86	-					
IS	4	3.70	0.93	0.85	0.78**	-				
SE	4	3.03	0.98	0.84	0.77**	0.31**	-			
CM	3	3.33	0.99	0.77	0.80**	0.52**	0.44**	-		
CS	3	4.06	0.64	0.82	0.54**	0.68**	0.17*	0.45**	-	
WS	4	3.65	0.68	0.76	0.59**	0.35**	0.41**	0.65**	0.32**	-

Note: N = 395, *p < 0.05, and **p < 0.01.

M = Mean, SD = Standard deviation, α = Cronbach's alpha, TSES = Teachers' sense of efficacy, CM = Efficacy for classroom management, IS = Efficacy for instructional strategies, SE = Efficacy for student engagement, CS = Classroom stress, WS = Workload stress

The results of descriptive and inferential analyses are shown in Table 2. Means of the three subscales ranged from 3.03 to 3.70. The values of internal consistency reliability of the three subscales were satisfactory ($\alpha = 0.86$ for the overall TSES, 0.85 for IS, 0.84 for SE and 0.77 for CM ($p < 0.01$)). The TSES (general) had significant correlations ($p < 0.001$) with the three factors (task-specific) of the CM ($r = 0.80$), IS ($r = 0.78$) and SE ($r = 0.77$). The convergent validity of the TSES was satisfactory and the three components of the scale are moderately and positively correlated with one another, ranging from 0.31 to 0.52.

The general teacher efficacy was positively related with teachers' classroom stress (0.54, $p < 0.01$) and workload stress (0.59, $p < 0.01$). Moderate positive associations were found between the three subscales of efficacy and the two subscales of job stress. More specifically, classroom and workload stress subscales correlated with the CM (0.68 and 0.37, $p < 0.05$), with IS (0.17, $p < 0.05$ and 0.41, $p < 0.01$), and with SE (0.45 and 0.32, $p < 0.01$). The correlations among three subscales of task-specific teacher efficacy were slightly higher than correlations with teachers' job stress. The general TSES and its subscales had predictive validity.

5. DISCUSSION

This study was done to investigate the factor structure of the TSES in the setting of high school education in Vietnam. The results of EFA suggested a three-factor structure of the TSES: efficacy for CM, efficacy for IS, and efficacy for SE. A further examination of each observed item showed that the 11 observed items converged around the same 3 factors as found by the study of Tschannen-Moran and Hoy (2001). This results represent the structural equivalence of the TSES in the context of Vietnamese high schools. Although the research results showed a stable structure of the 12-item of the TSES version, the analysis indicated that one observed item had a low factor loading coefficient and its correlation value with all other items was low (< 0.40). Specifically, item 8 (*"How well can you establish a classroom management system with each group of students?"*) did not fit well under the subscale efficacy for classroom management. The low loadings of this item in this subscale have been empirically verified in EFA (e.g., (Cocca & Cocca, 2022; Duffin et al., 2012; Fives & Buehl, 2009; Tschannen-Moran & Hoy, 2001; Wolters & Daugherty, 2007)). This item refers to a system of classroom management established by classroom teachers working with groups of students. In the educational environment of Vietnam, it is not possible to group students to teach in a different way because the class size is too large (Htang, 2018). Similar results were obtained by Ruan et al. (2015) who indicated that the school setting in Asian countries, where teaching methods following the "one-size-fits-all" model and grouping pupils for teaching "is not a common practice".

Moreover, item 8 highlights "a student-centered approach of teaching". In practice, teachers in Vietnam often adopt teacher-centered teaching methods (The Organization for Economic Cooperation and Development (OECD), 2019). As a result, students have less freedom and autonomy to actively take part in the learning process (The Organization for Economic Cooperation and Development (OECD), 2019). In the educational context in Asian countries, including Vietnam, the passive interaction between teachers and students through lecture-based instruction remains popular due to culture and large class sizes (Galton, Lai, & Chan, 2019; Hang & Van, 2020; Harman & Bich, 2010; Phuong-Mai, Terlouw, Pilot, & Elliott, 2009; Tran & Lewis, 2012; Tran, Nguyen, Van De,

Soryaly, & Doan, 2019). This information supports the results of Tran. (2019) who reported that teachers in Vietnam often apply traditional methods of teaching based on reproduction of knowledge (The Organization for Economic Cooperation and Development (OECD), 2019). Therefore, the reason why observed item 8 does not fit the model is understandable. Finally, a three-factor structure with 11 observed items was selected based on the TSES version of 12 observed items. CFA was done further to check the fit of the model. CFA confirmed the three-factor structure of the TSES for in-service teachers. Although the TSES has fewer observed items than the original version, it is still valid and reliable, after removing one observation item.

The fit indices of the one-factor solution were not suitable, while the three-factor solution did fit the model well. Following analysis, the appropriate index values showed that the 11-observed item model provided a well-suited data model for a group of teachers in Vietnam. The three-factor dimension of the TSES was consistent with some empirical studies done in different countries (Klassen et al., 2009; Nie et al., 2012; Ruan et al., 2015; Tschannen-Moran & Hoy, 2001) which indicated the three factors of the TSES for in-service teachers. This study responded to the urgent call to further confirm the factor structure of the TSES in different educational settings (Cocca & Cocca, 2022; Tschannen-Moran & Hoy, 2001).

The findings of this study supported results of previous studies, which were carried out to confirm the validity of the TSES towards its application in different cultural contexts (Klassen et al., 2009; Nie et al., 2012; Ruan et al., 2015). Klassen et al. (2009) examined the validity of the TSES in five countries, including Canada, Cyprus, the United States, South Korea and Singapore, and indicated a three-factor dimension of the TSES. Another study by Ruan et al. (2015) confirmed the validity and reliability of the TSES in China, Korea and Japan, and recommended using the TSES for teachers across the three Asian countries. Nie et al. (2012) modified the TSES and further tested its validity and reliability, and suggested using the TSES for teachers in Singapore. This result was in line with Bandura (1997) view that self-efficacy is a common concept that could be consistently valid across different cultures. Ruan et al. (2015) pointed out that cultural influences cannot be ignored in the study of teachers' self-efficacy. Furthermore, it is essential that teacher effectiveness can be studied through a broader perspective in a multicultural setting. In addition, an inspection of the predictive, convergent and discriminant values, and the values of the correlation coefficients between the scales and the component scales showed that the TSES had predictive, convergent and discriminant validity. The moderate relationships between the three factors of the TSES confirmed a three-dimensional model for in-service teachers. The discriminant validity of the general TSES was also suitable and subscales of the TSES presented higher correlation coefficients with the job stress. Thus, our results suggested that both general teacher efficacy and task-specific teacher efficacy should be used to predict teacher outcomes (e.g., job satisfaction, commitment, job stress).

6. CONCLUSION

The short-form version of the TSES scale presents a three-factor structure similar to the original version and exhibits acceptable psychometric properties. This study validates the three-factor model of the TSES scale, including its effectiveness on student engagement, teaching strategies, and classroom management. This adds value to enhancing the appropriateness of using the TSES scale to measure teacher effectiveness in Vietnam, and allows cross-cultural comparisons to broaden generalizability, universality, and compatibility of teachers' self-efficacy among different cultures. Although "the concept of teacher efficacy might be culturally oriented and thus may be carefully specified and examined" (Lin & Gorrell, 2001) Vietnamese teachers' self-efficacy may be culturally independent in this study (Tsigilis et al., 2010).

7. LIMITATIONS

Despite all the findings of this study, there are some limitations. Firstly, Schunk and Pajares (2009) suggested that cultural and contextual characteristics might significantly influence teacher efficacy. In different cultural

contexts, some studies indicated that the TSES is reliable although cultural constancy may not always be universally confirmed (Klassen et al., 2009; Tsigilis et al., 2010). Therefore, future studies should be able to control statistically external factors, such as environmental or social conditions, as they may directly or indirectly influence teachers' perception of their efficacy. Secondly, the present study indicated only the appropriateness of the three-factor model of the TSES for a group of in-service teachers. Further research should investigate the validity of the TSES scale for a group of pre-service teachers in Vietnam to compare the experience levels of efficacy beliefs between pre-service and in-service teachers. Thirdly, the sampling procedure was carried out according to the non-probability method. In future, random samples with the probability technique should be used to increase the generalizability of the research results. Finally, even if the TSES was used to measure general constructs of effective teachers, these general constructs may be more subject-specific (Bandura, 1993). For instance, teachers may be more effective teaching a specific subject and this would contribute positively to the students' learning outcomes. Therefore, future research should use TSES for teaching in specific subjects.

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