



Development and validation of Vietnam teachers' resilience scale instrument: A four-factor model

Ta Thi Nguyet Trang^a, Pham Chien Thang^{b,*}

^a Department of Economics and Management, TNU-International School, Viet Nam

^b Faculty of Journalism and Communication, TNU-University of Sciences, Viet Nam

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ABSTRACT

Existing studies on resilience measures tailored explicitly to teachers are relatively scarce, and the development of teacher resilience scales in developing Asian nations is lacking. To address this gap, we developed the Vietnam Teachers' Resilience Scale (VITRS), drawing on the Teachers' Resilience Scale (Daniilidou & Platsidou, 2018) and the Multidimensional Teachers' Resilience Scale (Mansfield & Wosnitza, 2015; Peixoto et al., 2020). The VITRS comprises 20 items across four dimensions (Social, Professional, Emotional, and Motivational resilience), demonstrating psychometric properties. The VITRS exhibits high reliability and validity and can serve as a significant assessment tool for high school and university teachers. This enables them to measure their resilience and prepare effectively to face and adapt to adversity. Despite these limitations, this study opens new avenues for future research.

1. Introduction

Teacher resilience is a multifaceted concept encompassing internal and external factors contributing to teachers' ability to navigate professional challenges [1,2]. According to Ostwald et al., teachers need resilience strategies "to successfully overcome personal vulnerabilities and environmental stressors" [3], p. 50. Castro et al. specify teacher resilience as "a series of specific strategies that teachers employ when they experience an adverse situation at school" [4], p. 263. In general, teacher resilience is referred to as teachers' capacity to preserve positive attributes in the face of various obstacles, pressures, and demands linked to their profession and challenges in their social, emotional, and motivational realms [2,5].

Many researchers contend that teacher resilience is crucial for several reasons. Day [6] found that outstanding teaching and learning in schools depend on teacher resilience, and Bobek [7] found that teacher resilience is essential for classroom effectiveness and retention. Ainsworth and Oldfield [8] believed that contextual effects are as essential as individual effects in determining a teacher's ability to thrive in the profession. Therefore, teacher resilience is important for teaching and learning, preventing burnout, and retaining teachers. Teachers frequently cite overwhelming workloads, increased pressure to meet goals, and stress associated with excessive bureaucracy as reasons for wanting to leave the education industry e.g., [8–11]. Currently, there are global issues regarding teacher recruitment and retention. Therefore, developing interventions aimed at increasing teachers' resilience and individual coping abilities within the profession remains an open research topic.

Some teacher-resilience scales have been developed in previous studies. The Teachers' Resilience Scale (TRS) was developed by

* Corresponding author.

E-mail address: thangpc@t nus.edu.vn (P.C. Thang).

Daniilidou and Platsidou [12] with four factors (Family Cohesion, Social Skills/Peer Support, Personal Strength, and Personal Style). The Multi-dimensional Teachers Resilience Scale (MTRS) was established by Mansfield and Wosnitza [13] and included 26 items with three dimensions (motivation/emotion, professional, and social). In another study by Peixoto et al. [14], the MTRS was confirmed by 13 items with four dimensions (professional, emotional, social, and motivational). Recently, the TRS and MTRS scales have become prevalent in many contexts. The development of a new scale is still in its early stages, and studies on teacher resilience in developing Asian countries are lacking.

When considering resilience within a global framework, there are significant variations in teachers' coping strategies across different cultures when facing similar obstacles [15], including heavy workload, emotional tension, work-life balance, and adaptation to new educational policies or reforms. Therefore, resilience scales must be adapted to contexts such as Africa and Asia. In the Southeast Asian context, several resilience scales have been developed for specific populations. For example, Kuo et al. [16] developed a resilience scale specifically for Southeast Asian immigrant women who divorced in Taiwan and found that personal competence, family identity, and social connections were the three factors for evaluating resilience. For other populations, Picco et al. [17] created a resilience scale for health professionals working at a psychiatric hospital in Singapore, revealing that the workplace is a key environment that affects the mental health and well-being of working adults. These studies provide valuable insights into resilience in the Southeast Asian context; however, there remains a gap in the literature regarding resilience scales tailored explicitly for teachers in Southeast Asia. To solve this problem, our study aimed to develop and assess a resilience scale for teachers in high schools and universities in Vietnam.

1.1. Literature review

1.1.1. Teacher resilience

According to Beltman [2], teacher resilience is a complex idea that can be viewed from various perspectives. These include the "person-focused", "process-focused", "context-focused", and "system-focused" perspectives. Mansfield et al. [18] argued that the process-focused viewpoint focuses on the dynamic interaction between teachers and their classroom environments. Teachers use various strategies to overcome challenges and maintain their well-being. The context-focused perspective highlights individual agency and resourcefulness in various situations [19]. The System-focused perspective acknowledges the intricate web of internal and external systems contributing to resilience. This perspective underlines the interconnectedness of various systems and their collective influence on resilience [20]. Wang et al. [21] reported that person-focused elements were perceived as the main barriers to teacher resilience by Chinese and Iranian teachers, while system, context, and process-focused elements were perceived as less harmful.

The Person-focused perspective considers an individual's intrinsic characteristics across four main dimensions: emotional, social, motivational, and professional. Each dimension uniquely contributes to teachers' resilience. For instance, the emotional dimension encapsulates a teacher's capacity for emotional regulation, maintaining a positive outlook, and using humor as a coping mechanism. Motivation, another aspect of the person-focused perspective, encompasses teachers' drives and perseverance. This includes patience, persistence, self-esteem, and self-confidence, which are essential for maintaining resilience in challenging situations. The profession-related dimension pertains to aspects directly related to the teaching profession, such as teachers' competence, instructional skills, and classroom management capabilities. Finally, the social dimension pertains to teachers' interpersonal skills. It focuses on how teachers engage with others and navigate their social environments, both within and outside the classroom. The social aspect of the person-focused perspective emphasizes an individual's ability to build and maintain relationships, which are crucial skills that underpin resilience [2].

According to Hoge et al. [22], there is minimal agreement on the conceptual definition of teacher resilience. Teacher resilience is a personal, internally driven, relative, dynamic, and developing attribute. A combination of protective factors and risk factors influences teacher resilience. Protective factors contribute to developing and maintaining resilience. In contrast, risk factors increase vulnerability to stress and adversity, such as altruistic motives, high self-efficacy, professional abilities and competencies, and personal characteristics, such as autonomy, conscientiousness, openness, and intrinsic motivation [23–25]. Supportive school environments, including emotional support, recognition of competence, and promotion of self-esteem by teachers, are protective factors that decrease teachers' vulnerability [24,26].

Conversely, risk factors that can undermine teacher resilience include experiencing negative feelings (such as tiredness, sadness, and anger), low self-efficacy or self-confidence, difficulty balancing professional and personal lives, lack of professional competencies and abilities, and personal hardship [27,28]. Socio-economic background, education, and exposure to disasters are risk factors that can affect teachers' resilience [29]. Burnout syndrome among teachers hinders the expression of resilience processes in school contexts [30]. Individual risk and protective variables interact dynamically to determine teacher resilience [6,7,10].

A complex interplay of personal and contextual factors shapes teacher resilience. Beltman [23] emphasized the role of institutional, professional, and interpersonal environments in shaping teachers' resilience. Mansfield [31] highlighted the evolving nature of resilience across teachers' careers, whereas Ainsworth and Oldfield [8] underscored the importance of contextual factors. Duckworth et al. [32] and Fleming et al. [33] identified perseverance, enthusiasm, and life satisfaction as the key predictors of teacher performance.

1.1.2. Measures of teachers' resilience

Several resilience scales have been developed specifically for teachers and are often drawn from existing resilience measures. Daniilidou and Platsidou [12] created a TRS that combined the most relevant subscales of the Connor-Davidson Resilience Scale (CD-RISC) [34] and Resilience Scale for Adults (RSA) [35]. TRS includes four factors: family cohesion, social skills, peer support,

personal strength, and personal style. Mansfield and Wosnitza [13] established that MTRS has three dimensions: motivation/emotion, professional, and social. Peixoto et al. [14] adapted and analyzed the psychometric properties of the MTRS using four factors: professional, emotional, social, and motivational. However, these scales may not be applicable to different educational levels or cultural regions. For instance, the TRS was primarily tailored to Greek teachers, the MTRS by Mansfield and Wosnitza [13] was developed for Australian teachers, and Peixoto et al. [14] further adapted the MTRS for Portuguese instructors. Further validation studies are needed to confirm its psychometric properties and multi-dimensional structure. Notably, a recent study by Daniilidou and Platsidou [36] aims to fill the existing gap in teacher-specific resilience measures. Their research developed the Teachers' Protective Factors of Resilience Scale (TPFRS); the TPFRS includes 29 items covering six key protective factors: "Values and beliefs, Emotional and behavioral competence, Physical well-being, In-school relationships, Out-of-school relationships, and the Legislative framework".

Teacher resilience emerges from the interaction between individual strengths and social work and life contexts. Understanding teacher resilience is crucial for identifying why some teachers thrive in adversity while others struggle [37–39]. However, resilience varies across cultural and contextual settings [15]. This highlights the need for resilience scales validated across diverse regions, particularly in non-Western cultures where resilience constructs are under-researched [15,40].

Despite continued interest in teacher resilience, developing new resilience measures has been scarce, particularly in the Southeast Asian context. This study aims to address this gap by developing the Vietnam Teachers' Resilience Scale (VITRS), which contributes to a broader understanding of teacher resilience in developing countries within the Southeast Asian region.

1.1.3. Development of the Vietnam teachers' resilience scale (VITRS)

The Vietnam Teachers' Resilience Scale (VITRS) was meticulously developed in a series of steps, beginning with an in-depth literature review of teacher resilience and its protective factors. This review facilitates an understanding of the crucial dimensions of teacher resilience and guides incorporating these dimensions into our scale.

The VITRS was created to capture the multifaceted nature of teacher resilience in the Vietnamese context. It draws insights from both process and context-focused perspectives on the role of context and coping mechanisms in resilience, complementing these with the four aspects of the person-focused perspective.

The current TRS and MTRS serve as valuable foundations for developing the VITRS. The MTRS [13,14] comprises 13 items, while the TRS [12] contains 25 items. The selection of items from these scales was based on their relevance to the Vietnamese educational environment, as established in our literature study. We thoroughly evaluated the relevance and adaptability of each item in a Vietnamese context.

The Vietnamese education system is profoundly shaped by the country's deep-rooted Confucian values, communist policies [41, 42], societal expectations, and government regulations [43]. As a testament to this influence, Vietnamese teachers are bound by governmental regulations, including the Education Law [44] and Higher Education Law [45].

Hence, in developing VITRS, we focused on dimensions that mirrored the unique intricacies of the Vietnamese educational context. Emphasizing professional, emotional, motivational, and social facets of resilience, VITRS underscores aspects that are more pertinent to the resilience of Vietnamese teachers than spiritual influences. This approach informed our selection of items from the TRS, such as "I am able to adapt to change" and "I am not easily discouraged by failure." Similarly, we incorporated items from the MTRS, such as "I feel I can be flexible when situations change at school" and "I feel I can balance my role as a teacher with other dimensions in my life." On the contrary, items with spiritual influences, such as "Sometimes fate or God can help me overcome my challenges" from the TRS were excluded.

A salient cultural trait in Vietnam is deep respect for authority and hierarchical structures, which is not adequately reflected in the TRS and MTRS items. Vietnamese teachers are often expected to defy school leaders and administrators, and they must adapt to new policies and societal expectations [46,47]. Reflecting this dynamic, the VITRS includes new items, such as "I can deal with whatever comes." These items encapsulate the professional resilience that Vietnamese teachers need to adapt and thrive amid ever-changing educational landscapes.

These items were translated into Vietnamese, edited for clarity, and back-translated into English to confirm consistency. Consequently, the VITRS, a 20-item scale measuring teacher resilience across Social, Professional, Emotional, and Motivational dimensions, emerged. This structure aligns with the MTRS, but incorporates the necessary modifications to suit the Vietnamese context.

To validate the VITRS, we consulted five educational psychology specialists and conducted focus group discussions with 20 teachers from a Vietnamese university and a high school. Their feedback informed us of the refinement of the scale items. The final VITRS was administered to a randomly selected sample of teachers in Hanoi, following approval from the Academic Committee at the University of Sciences, Thai Nguyen University, and Thai Nguyen, Vietnam, and informed consent was obtained from all participants.

2. Method

2.1. Data collection and participants

Participants were recruited from high schools and universities in Hanoi. The scale was administered to the Vietnamese population. A total of 755 high school and university teachers (339 university teachers and 416 high school teachers) completed the questionnaire. Determining the sample size in psychometric studies, especially those involving exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM), is a complex process. Researchers have traditionally suggested minimum sample sizes of 100–500 or ratios of participants (N) to variables (p) of 5:1 [48]; accordingly, our sample size was 755, which is well within the recommended range for psychometric studies. We collected data over two months, from October 2022 to November 2022.

2.2. Instrument

The final VITRS was developed using 20 items based on four dimensions: social (S), professional (P), emotional (E), and motivational (M). This is a 5-point Likert-type scale (1 = absolutely disagree to 5 = absolutely agree), consisting of only positive items (see Appendix 1). Examples of items in each dimension of the VITRS include Social (five items); for example, "I can discuss difficult issues at work with my colleagues." Professional (five items), for example, "I can deal with whatever comes." Emotional (five items): "When I feel stressed at work, I can quickly calm down." Motivational (five items), for example, "Overcoming the difficulties encountered will help me be more successful at work."

2.3. Data analysis

The data were analyzed using IBM SPSS Statistics 28.0 and IBM AMOS 28.0. Statistical significance was set at $p < 0.05$. We checked the reliability, validity, and stability of the VITRS. We assessed the internal consistency of the VITRS by obtaining inter-item and item-total correlations and Cronbach's alphas. We performed exploratory factor analysis (EFA) using principal component analysis as the extraction method to identify the underlying structure of our dataset. This method is commonly used in scale development and is appropriate for this study [49,50]. We chose varimax rotation because it simplifies the factor structure and makes it easier to interpret by maximizing the variance of the squared loadings of a factor on all variables in a factor matrix [51]. This helped us identify the variables loaded onto which factor aided in the development of VITRS.

In Confirmatory factor analysis (CFA), the model fit of the single-and multigroup CFAs was evaluated using the comparative fit index (CFI), Tucker–Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). For CFI and TLI, Values ≥ 0.90 for these indices, are treated as indicative of an acceptable fitting model [52,53]. RMSEA values smaller than 0.08 suggests a good model fit, and SRMR values up to 0.05 indicate a good-fitting model [54–56]. In our study, we tested both first- and second-order factor models. The first-order model assumes that each observed variable (item) is directly influenced by a single latent factor (the dimension of resilience); The second-order model, on the other hand, assumes that the observed variables are influenced by first-order factors, which are in turn influenced by a higher-order (second-order) factor (overall resilience) [57, p. 323]. We adopted the AVE method to test discriminant validity.

We tested the scale's stability using measurement invariance testing to compute the invariance between the two subject groups (high school and university teachers). We used multi-group configural, metric, scalar, and partial invariance tests [57,58]. To test the difference between high school and university teachers' resilience levels, we used multivariate analysis of variance (MANOVA) and effect size (Cohen's d) test [59–61].

3. Results

3.1. Exploratory factor analysis

The mean scores for all items ranged from 4.67 to 4.79, indicating that the responses were generally high on the scale. The standard

Table 1
The factor loadings of VITRS, item-total correlation and Mean (M), standard deviation (SD).

Items	Mean (SD)	Corrected Item - Total Correlation	Factor 1 (Social)	Factor 2 (Professional)	Factor 3 (Emotional)	Factor 4 (Motivational)
S1	4.79 (0.481)	0.827	0.843			
S4	4.73 (0.592)	0.830	0.824			
S5	4.74 (0.571)	0.853	0.823			
S2	4.76 (0.540)	0.812	0.808			
S3	4.75 (0.549)	0.787	0.777			
P2	4.77 (0.536)	0.803		0.808		
P4	4.76 (0.549)	0.815		0.807		
P5	4.79 (0.514)	0.778		0.804		
P3	4.78 (0.529)	0.826		0.803		
P1	4.77 (0.534)	0.766		0.802		
E5	4.69 (0.597)	0.801			0.837	
E3	4.71 (0.586)	0.813			0.833	
E4	4.67 (0.624)	0.759			0.803	
E2	4.70 (0.597)	0.739			0.797	
E1	4.69 (0.631)	0.757			0.791	
M4	4.78 (0.514)	0.814				0.807
M1	4.76 (0.533)	0.791				0.807
M3	4.77 (0.536)	0.825				0.803
M5	4.78 (0.518)	0.778				0.779
M2	4.75 (0.579)	0.748				0.753
Cronbach's Alpha			0.932	0.922	0.910	0.918
Variance (%)			19.554	19.122	18.950	18.694
			Total variance (%):76.320			

deviations, which measure the dispersion of the responses, ranged from 0.481 to 0.631, suggesting a relatively small spread of responses around the mean. The corrected item-total correlation values, which measured the correlation between each item and the total score of the other items, ranged from 0.739 to 0.853 (Table 1). These high values indicate that each item correlated well with the overall scale, suggesting good internal consistency. Construct reliability was assessed using Cronbach’s alpha for the social ($\alpha = 0.932$), professional ($\alpha = 0.922$), emotional ($\alpha = 0.910$), and motivational scales ($\alpha = 0.918$). The reliability results showed that the Cronbach’s alpha values of the scales were above 0.9, indicating that these scales have internal consistency reliability [61,62].

In our study, the KMO and Bartlett tests were the initial statistical tests used to determine whether the data were appropriate for exploratory factor analysis. The results were as follows: KMO = 0.938; Bartlett test: $\chi^2 = 12081.891$, $df = 190$ ($p = 0.000$); A KMO value greater than 0.90 is optimal [63]; and the results indicate that the null hypothesis must be rejected [64]; the data are suitable for factor analysis.

The eigenvalues of the four factors were greater than 1. The scree plot and parallel analysis enabled us to maintain a four-factor model that explained 76.320 % of the total variance. The variance percentages for each factor ranged from 18.694 % to 19.554 %, suggesting that the four factors together explained a substantial proportion of the total variance in the data [65,66]. Next, a Varimax rotation-based exploratory factor analysis was performed to determine the correlations between the observed variables and underlying factors, and the results indicated that the range of rotated factor values between 0.753 and 0.843 was acceptable [53,67] (Table 1).

3.2. Confirmatory factor analysis

We tested two models to explore the hierarchical structure of the resilience construct on this scale. The first-order CFA model fit results in Table 2 show that the current four-factor model showed a good fit for the data; RMSEA = 0.057, SRMR = 0.0251, CFI and TLI greater than 0.95, indicating a good model fit. A strong correlation existed between the four factors in the first-order factor model (Table 3). The correlation pattern showed that second-order factors could explain the association between these factors.

The second-order CFA model fit results showed TLI = 0.961, CFI = 0.966, RMSEA = 0.057, and SRMR = 0.0252, suggesting a good fit. The chi-square difference test [68] was used to determine whether applying a second-order factor model resulted in a statistically significant reduction in fit compared with the first-order model. The P-Value was 0.966, which was not statistically significant (Table 2). To test whether adding a second-order factor significantly improved the model fit, we retained the null hypothesis that the second-order model did not fit considerably worse than the first-order model. This approach allowed us to examine whether a higher-order resilience factor could explain the dimensions of resilience in our scale [68]. This result supports the viability of the second-order factor model (Fig. 1).

3.3. Validity of the scale

The validity test results in Table 3 show that the AVE of the four factors is greater than 0.5, the CR is greater than AVE, and the concurrent validity indices imply no validity problems. In addition, discriminant validity indices revealed good validity for all four factors; all AVEs were greater than MSVs, and the square roots of AVEs were greater than the Pearson product-moment correlation coefficient for each construct [69,70].

3.4. Stability of the scale

Test for configural invariance. In this step, we constrained the basic factor model to equality across groups. Nevertheless, no equality constraints are imposed on the estimated model parameters. This model serves as a baseline against which the metric invariance model is compared to determine whether there is evidence of noninvariant factor loadings. Our study showed that the model fits reasonably well and provides proof of configural invariance (CFI = 0.930, TLI = 0.918, RMSA = 0.059).

We first assume that configural invariance holds and then impose equality restrictions on factor loadings to test for metric invariance. If the current model represents a significant decrease in fit relative to the configural model, there would be evidence of non-invariance in factor loadings. The chi-square difference test results showed a statistically significant reduction in fit owing to the addition of equality constraints ($p < 0.001$). However, $\Delta CFI < 0.01$, and $\Delta Mc NCI < 0.02$, suggesting that the decrease in fit was not substantial [71,72]. These results indicate evidence of metric invariance in VITRS [58,72].

Operating under the assumption that metric invariance holds, we tested for scalar invariance. This is a test of whether the item intercepts are invariant across groups. The results of the chi-square difference test indicated a non-significant ($p = 0.082$, $\Delta CFI = 0.000$, $\Delta Mc NCI = 0.003$) decrease in fit due to adding equality constraints. Consequently, we can conclude that there is evidence of metric invariance. However, to ensure this, we tested partial scalar invariance. We explored the possible sources of the non-invariant loadings and relaxed the equality constraints on the factor loadings that should be freely estimated in each group, producing a partial-invariance model [73], p. 76.

Table 2
Model fit of first order and second order confirmatory factor analysis.

Model	Chi-square	df	CFI	TLI	RMSA	SRMR	Δ Chi-square	Δ df	sig.
First order CFA	571.937	164	0.966	0.961	0.057	0.0251	–	–	–
Second order CFA	572.007	166	0.966	0.961	0.057	0.0252	0.07	2	0.966

Table 3
Model validity measures.

	CR	AVE	MSV	MaxR(H)	P	S	M	E
P	0.922	0.703	0.359	0.925	0.839			
S	0.932	0.736	0.368	0.936	0.568***	0.858		
M	0.918	0.697	0.368	0.923	0.599***	0.606***	0.835	
E	0.910	0.673	0.261	0.915	0.488***	0.490***	0.511***	0.820

Significance of Correlations: *** $p < 0.001$.

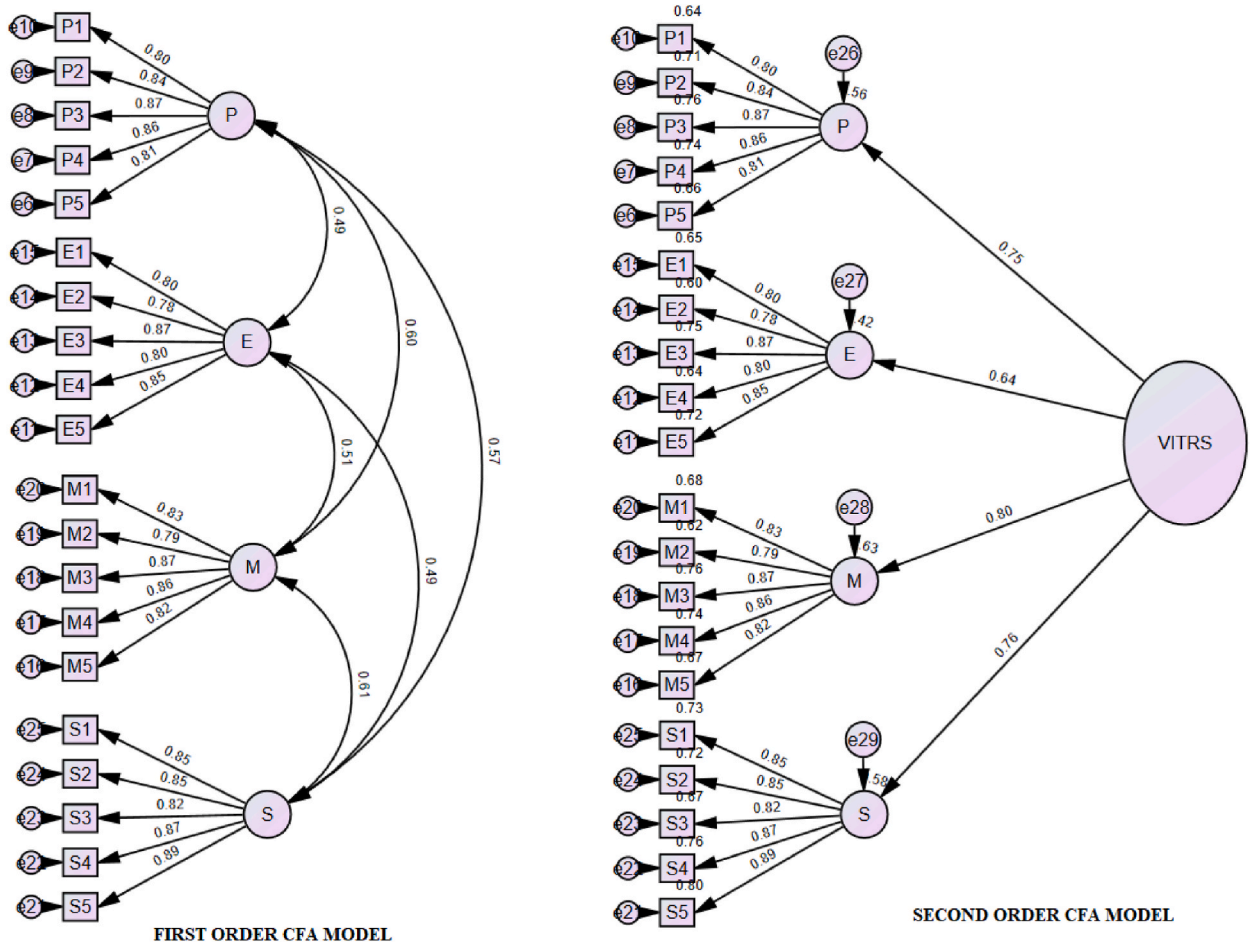


Fig. 1. First-order and Second order CFA model.

The intercepts for items 5 (P5) and 11 (M1) were removed from the equality constraint in the final partial invariance model. We compared this partial invariance model to the metric invariance model after determining the two intercepts that caused them to differ. The chi-squared difference test was not statistically significant ($p = 0.797$). ΔCFI and $\Delta Mc NCI$ were 0.001, indicating that the partial invariance model was not substantially different from the metric invariance model. The results in Table 4 indicate that the VITRS structures of the two samples were identical. These results confirm the stability of the scale.

3.5. Multivariate analysis of variance

There was a statistically significant difference in resilience performance between teachers at different levels (university and high school teachers) ($F(4, 753) = 9.875, p < 0.001, Wilk's \Lambda = 0.950$). The MANOVA test results showed that the difference between teachers at different levels was statistically significant for social ($F(1, 753) = 8.952; p = 0.003; \text{partial } \eta^2 = 0.012$), professional ($F(1, 753) = 6.398; p = 0.012; \text{partial } \eta^2 = 0.008$), emotional ($F(1, 753) = 39.120; p < 0.001; \text{partial } \eta^2 = 0.049$), and motivational ($F(1, 753) = 6.079; p = 0.014; \text{partial } \eta^2 = 0.008$) (Table 5).

The results also show that mean scores for Professional and Motivational factors were statistically significantly different between

Table 4
Measurement invariance test of the VITRS.

Model	1	2	3	4
Model description	Configural invariance (baseline)	Metric invariance	Scalar invariance	Partial invariance
Chi-square	1201.97	1257.033	1281.354	1266.537
df	328	344	360	358
CFI	0.930	0.926	0.926	0.927
Mc NCI	0.5601	0.5458	0.5428	0.5475
TLI	0.918	0.919	0.922	0.922
RMSA	0.059	0.059	0.058	0.058
Δ Chi-square	–	55.063	24.321	9.504
Δ df	–	16	16	14
sig.	–	0.000	0.082	0.797
Δ CFI	–	0.004	0.000	0.001
Δ Mc NCI	–	0.014	0.003	0.001

university and high school teachers, with a small effect (Cohen's $d < 0.2$, $p < 0.05$). The mean social and emotional scores of universities and high school teachers differed significantly, ranging from a small to a medium effect ($0.2 < \text{Cohen's } d < 0.5$, $p < 0.05$). In addition, university teachers had a higher mean across all scales than did high school teachers.

4. Discussion

Teachers worldwide, including those in Vietnam, face numerous psychological challenges and stressful conditions [4,74,75]. Resilience is a critical psychological attribute that helps teachers overcome these challenges and enhances their mental health. Although several scales, such as the Resilience Scales (RS) [76], RSA [35], CD-RISC [34], and Brief Resilient Coping Scale (BRCS) [49], have been proposed to measure resilience in different populations, few have directly addressed teacher resilience [12–14]. Moreover, resilience scales for teachers in Southeast Asia are lacking. We developed the Vietnamese Teachers' Resilience Scale (VITRS) to address this gap.

Emerging nations such as Vietnam present unique challenges in education [43,46], making the development of VITRS pertinent in an important addition to the field of educational psychology. Drawing from Beltman [2], VITRS is rooted in a theoretical foundation that encapsulates four pivotal dimensions of teacher resilience: social, professional, emotional, and motivational. These dimensions echo the person-focused approach to teacher resilience but are nuanced to resonate with Vietnam's distinct cultural and educational fabric. As an innovation, the VITRS amalgamates components from established scales, such as the TRS [12] and MTRS [13,14], but with an emphasis on the unique challenges and experiences intrinsic to Vietnamese educators. Our validation processes show that the VITRS not only aligns well with the intricacies of the Vietnamese context but also exhibits robust internal consistency, dependability, and model fit, demonstrating its psychometric robustness. Strong relationships were found in the second-order factor model between the four dimensions of the VITRS, indicating that teachers with higher levels of resilience tend to have higher levels of social, professional, emotional, and motivational resilience [68].

The VITRS offers a distinctive contribution to resilience literature by providing a culturally and contextually specific measure for Vietnamese teachers. The existing scales from which we selected items from the TRS and MTRS robust measures of teacher resilience were developed in different cultural and educational contexts, such as Australian teachers [13], Greek primary and secondary school teachers [12], Germany, Ireland, and Malta teachers [77], and Portuguese Teachers [14]. However, they may not fully capture the unique challenges and resilience factors experienced by Vietnamese teachers. For instance, the education system in Vietnam is shaped by unique cultural values, societal expectations, and governmental policies [41,42], which may not be adequately reflected in TRS and MTRS. This aligns with the broader academic consensus that underscores the need for contextually relevant scales, especially in non-Western settings [15,40]. Therefore, VITRS has specificity in selecting items from the TRS and the MTRS that directly correspond to the sociocultural and educational challenges educators face in Vietnam.

Furthermore, new items were developed to encapsulate the unique resilience skills pertinent to the Vietnamese teaching context. VITRS's validation with Vietnamese teachers and educational psychology experts ensured its cultural aptness and reliability. Although it shares some elements with the existing scales, VITRS's unique focus on the Vietnamese context makes it a valuable addition to resilience measures. This sets a precedent for future context-specific resilience research.

According to several earlier studies, there are differences between teachers at different grade levels in terms of resilience, but they were inconclusive [78–80], and the VITRS evaluated instructors' resilience skills at various levels. Our findings indicate that university

Table 5
The difference in resilience performance of University and Highschool teachers.

VITRS factors	Mean Difference	SE	t	Cohen's d	P _{Tukey}
Social	0.106	0.035	2.992	0.219	0.003
Professional	0.086	0.034	2.529	0.185	0.012
Emotional	0.233	0.037	6.255	0.458	<0.001
Motivational	0.084	0.034	2.465	0.181	0.014

teachers had higher resilience than high school teachers, scoring higher on all dimensions of resilience. One possible explanation is that university teachers in Vietnam exercise greater autonomy regarding pedagogical choices and curriculum development, which might foster self-control and resilience when facing difficulties. University teachers often engage in research activities, which may enhance their resilience and problem-solving skills [44]. Additionally, because university students are older and more independent, their interactions with them could be less emotionally exhausting than those of high school students. This may make university teachers more resilient. This finding is noteworthy given the different regulatory settings and expectations at different educational levels [81,82].

As a tool, the VITRS holds immense potential for gauging teachers' resilience in Vietnam. Beyond merely assessing resilience, it could serve as a beacon, identify educators at risk of burnout, and facilitate timely intervention. In tandem with prior literature [4,19,23], VITRS could be pivotal in correlational studies exploring the nexus between teacher resilience and variables such as job satisfaction, teaching efficacy, and student outcomes. Future iterations of VITRS could delve deeper, integrate additional resilience dimensions germane to the Vietnamese context, and extend its validation to diverse teacher cohorts.

This study has some limitations. First, the sample was limited to instructors in Hanoi, which could determine the applicability of the findings to teachers in other regions. Second, VITRS is a self-reported measure that might be subject to response bias, and future studies may supplement the self-reported data. Future studies may include additional techniques for evaluating teacher resilience, such as observations or interviews. Third, the measurement invariance test showed that while the VITRS's reliability, validity, and stability are adequate, stability still needs to be improved. Fourth, this study did not use a test-retest methodology. Researchers can assess the consistency of the VITRS in future investigations by performing the same test again on the same sample at different times. Additionally, VITRS has only been developed with four basic factors (professional, emotional, social, and motivational). When we conducted the research, some factors were not evaluated and considered appropriate for the Vietnamese context, such as spiritual influencing or legislative framework factors [36]. Future studies can expand the measurement scale and re-evaluate these factors accordingly.

5. Conclusions

This study significantly advances the theoretical and practical understanding of teacher resilience in Vietnam and the Southeast Asian region. The development of the VITRS, which introduces a culturally appropriate and context-specific measure, theoretically adds to the body of knowledge already known about teacher resilience. It contributes to the worldwide conversation on teacher resilience, which has been heavily affected by Western perspectives, by offering a nuanced understanding of resilience among teachers in developing Southeast Asian nations.

Practically, VITRS serves as a valuable tool for educational stakeholders in Vietnam and other Southeast Asian countries with similar cultural and educational contexts. This allows for the assessment of teacher resilience, which can inform targeted interventions to enhance teachers' resilience, and ultimately improve their well-being and effectiveness. This scale can also be used in policymaking and teacher-training programs to foster resilience among teachers, thereby enhancing the overall quality of education.

Furthermore, the findings of this study highlight the importance of considering cultural and contextual factors when studying and fostering resilience, reinforcing the need for more localized and culturally sensitive approaches in resilience research and practice. Therefore, this study fills a research gap and provides practical insights that can guide efforts to support teachers' resilience in Southeast Asia.

Declarations of ethic statement

This study was reviewed and approved by the Science and Training Committee, TNU-University of Sciences, Thai Nguyen, Vietnam. All participants provided informed consent to participate in the study.

CRedit authorship contribution statement

Ta Thi Nguyet Trang: Writing – review & editing, Writing – original draft, Conceptualization. **Pham Chien Thang:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2023.e22730>.

Appendix

Appendix 1

VITRS item

Items	Description
Professional	
P1	I can deal with whatever comes.
P2	I can achieve the goals of my work.
P3	I can be able to adapt to change.
P4	When work stresses me out, I don't give up and deal with it.
P5	I choose to deal with stress to strengthen myself mentally.
Emotional	
E1	When I feel stressed at work, I can quickly calm down.
E2	When I have a problem at school, I usually think twice before dealing with it.
E3	I can come up with many solutions to solve the problem encountered.
E4	I don't feel confused when I get in trouble.
E5	I do not feel uncomfortable with the problems encountered at work.
Motivational	
M1	Overcoming the difficulties encountered will help me be more successful at work.
M2	I think the problem at work is just the challenge.
M3	I like challenges at work.
M4	I try different methods of problem-solving at work to train myself.
M5	Confronting difficulties is one of my personal development goals.
Social	
S1	I can discuss difficult issues at work with my colleagues.
S2	The bonds between me and my colleagues are strong.
S3	Meeting new colleagues or new students is not difficult for me.
S4	I can build new friendships with others.
S5	I get support from friends/colleagues.

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