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Validation of the teaching style scale for primary school teachers: A Case study in Vietnam

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ABSTRACT

Teaching style reflects how teachers organize learning activities, interact with students, and enact instructions in the classroom. This study examines and validates the teaching style scale for primary school teachers based on Grasha's model in the Vietnamese educational context. Data were collected from 385 primary school teachers in Ho Chi Minh City through a questionnaire comprising 40 observed variables representing five teaching styles: Expert, Formal Authority, Personal Model, Facilitator, and Delegator. The scale was evaluated by using Cronbach's Alpha coefficient (all above 0.8), Confirmatory Factor Analysis (CFA), and Bootstrap analysis. The results show that after model refinement, 33 observed variables were retained and demonstrated acceptable reliability, convergent validity, and overall structural model fit. The results further indicate that primary school teachers tend to integrate multiple teaching styles within their instructional practice, with Facilitator and Delegator styles receiving the highest self-recorded ratings. The validated instrument may serve as valuable reference for academic research and professional development involving primary school teachers.

Keywords: teaching style, primary school teachers, scale validation, confirmatory factor analysis

INTRODUCTION

Improving educational quality remain a central objective of educational institutions worldwide, and teachers play a crucial role in shaping students' learning outcomes (Hattie, 2009, 2012). Previous studies have continuously demonstrated that teacher competence, professional readiness, and classroom organizational strategies are directly associated with students' academic achievement (Lynch et al., 2017), motivation, and engagement (Roksa et al., 2017).

Teaching style refers to the persistent way in which teachers act and interact in the classroom setting (Fischer & Fischer, 1979). Unlike a specific instructional method or pedagogical technique, teaching style denotes stable patterns in teachers' behaviors (Heimlich & Norland, 1994, 2002), beliefs, values, and classroom management practices (Conti, 1989, 2004), interactional approaches, models of information delivery (Darkenwald & Merriam, 1982), and strategic selection of learning activities (Carr, 1998; Cooper, 1999; Smith, 1982). Because teaching styles represent a latent psychological construct, its measurement requires evidence of reliability and validity in the target population in which it is applied (Jang et al., 2010). Related pedagogical constructs, including autonomy support, classroom structure, learner-centered relationships (Cornelius-White, 2007), and other teacher behaviors (Thoonen et al., 2011), have been linked to students' participation, motivation, and engagement (Huang & Zheng, 2022; Inayat & Ali, 2020; Jiang & Zhang, 2021; Sheikh & Mahmood, 2014). However, these constructs are conceptually distinct from Grasha's teaching style framework and cannot be utilized as valid evidence to establish the factorial validity of Grasha's scale.

Among the various conceptualizations of teaching style models, Grasha's model has gained considerable scholarly attention because it explicitly characterizes the different instructional roles assumed by teachers in the classroom. The theoretical model comprises five distinct styles: Expert, Formal Authority, Personal Model, Facilitator, and Delegator. Rather than relying on a single dominant style, teachers may combine or integrate these styles according to specific instructional goals, learner developmental characteristics, and situational classroom conditions (Grasha, 1994, 1996; Grasha & Riechmann, 1975; Grasha & Yangarber-Hicks, 2000). Nevertheless, it should not be assumed that these five theoretical dimensions function identically across different educational levels or socio-cultural settings.

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In primary education, school students generally require close instructional guidance, more explicit behavioral modeling, and a gradual, scaffolded transfer of learning responsibility. Consequently, Delegator-generated items may not carry the same operational meaning as they do in higher education contexts. Similarly, Expert and Formal Authority items may overlap more strongly because primary teachers are responsible for not only instruction but also classroom management. Furthermore, localized cultural expectations regarding pedagogical authority, participation, and autonomy in Vietnam may systematically affect item interpretation, factor loadings, and inter-dimensional relationships. These considerations highlight the need to validate the measurement scale within its specific educational demographic.

Although teaching-style models and scales have been used in numerous studies, the application of an established instrument to a novel context still requires rigorous empirical validation. Relevant adaptations and validations have been reported in Italy (Alivernini et al., 2012), Japan (Yoshida et al., 2014), the Turkish context (Üredi, 2006), and a collaborative quality-improvement settings (Ford et al., 2016). However, these studies do not establish whether Grasha's five dimensions remain distinct or retain their original structures meanings among Vietnamese primary school teachers. The primary research gap is therefore psychometric rather than merely geographical. Specifically, the scale's factor structure, reliability, convergent validity, and discriminant validity have not yet been examined and evaluated in this population.

Accordingly, this study investigates the psychometric properties of Grasha's Teaching Style Scale among primary school teachers in Ho Chi Minh City by addressing three following research questions (RQ):

RQ1. Does the hypothesized five-factor structure of Grasha's Teaching Style Scale fit the data collected from primary school teachers in Ho Chi Minh City?

RQ2. Does the scale demonstrate acceptable internal consistency, convergent validity, discriminant validity, and overall structure model fit in this sample?

RQ3. How are the five teaching styles represented in the participating teachers' self-reports?

THEORETICAL BASIS OF TEACHING STYLES

Literature Review

Studies on teaching styles often begin with the premise that how teachers organize classroom (Cooper, 2001; Schultz 1982), interact with students, and distribute control during the learning process can make a difference in students' learning experience (Patall et al., 2013). Using Grasha's model, Shaari et al. (2014) found that lecturers' teaching styles were significantly correlate with academic engagement, with Personal Model and Expert receiving higher evaluations than Delegator style**.** Roksa et al. (2017) did not directly employ the Grasha's framework, but their empirical findings revealed that clear and structured instruction teaching relates to freshman GPA via three mechanisms: perceived instructor interest, academic motivation, and learning engagement.

Another body of research focuses on the relationship between teaching styles and student motivation. Sheikh and Mahmood (2014) observed that distinct teaching style elicit varying levels of learner motivation. Examining Advanced Mathematic students, Huang and Zheng (2022) established that student-centered and eclectic teaching styles positively influence learning effectiveness through the mediation of learning motivation, whereas Inayat and Ali (2020) suggested that teacher-centered approaches may exert an adverse effect on professional knowledge acquisition. Additionally, Thoonen et al. (2011) showed that students' learning motivation is substantially conditioned by how effectively teachers anchor lessons in students' real-world experience and structure cooperative learning environments.

Grounded in self-determination theory, Jang et al. (2010) conceptualized autonomy support and classroom structure as distinct yet complementary instructional dimensions that synergistically foster student engagement. Similarly, Patall et al. (2013) investigated autonomy-supportive practices encompassing choice provision, rationale explanation, and sensitivity to learners' perspectives. Inayat and Ali (2020) confirmed that autonomy-supportive teaching style positively correlates with classroom engagement, curiosity, and exploratory behavior. In the context of English as a foreign language (EFL) instruction, Jiang and Zhang (2021) showed that instructors' teaching styles could systematically influence students' agentic engagement via learning goals. Crucially, these empirical inquires focus on autonomy-supportive or motivationally supportive pedagogical practices rather than direct operational measures of Grasha's five primary teacher roles.

In physical education contexts, empirical research underscores that teaching styles can significantly shape the classroom's motivational climate. Morgan et al. (2005) compared diverse instructional approaches, revealing that some specific styles foster higher level of mastery-oriented teaching behaviors. Likewise, Leo et al. (2020) linked supportive and leadership-related teaching practices to enhanced student engagement and participation motivation. Nevertheless, need-supportive teaching represent an interpersonal-motivational construct and must not be treated as a conceptual equivalent to Grasha's model (Yang & Dong, 2017).

A parallel line of inquiry addresses teaching styles in relation to learners' perceptual learning styles. Awla (2014) synthesized various perspective on the alignment versus the mismatch between learning styles and teaching styles, arguing that teachers should adopt a balanced pedagogical approach to respond to learner diversity effectively. Karataş and Yalın (2021) found that while academic achievement varied significantly across different teaching styles, no telling difference emerged between matched and unmatched learning–teaching style groups.

Recent studies have also expanded the focus on teaching styles to encompass broader educational outcomes beyond achievement and motivation. Gu et al. (2021) observed that the direct relationship between perceived teaching style and leaner creativity was not fully consistent. In vocational education in Hungary, Győri and Czakó (2020) established that student-centered mythologies exhibited a greater capacity to motivate disadvantaged students. More importantly, while such outcome-oriented

findings establish contextual relevance, they do not constitute validity evidence for a specific teaching-style instrument. Consequently, learner-centered instruction, autonomy support, need support, and classroom structure are conceptualized herein as adjacent constructs whose analytical value lies in their behavioral overlap with specific Grasha styles, rather than as interchangeable proof of validity for Grasha's instrument.

The literature most directly pertinent to the current investigation pertains to the development, cultural adaptation, and psychometric validation of teaching-style measures. Alivernini et al. (2012) evaluated a short form of the Problems in Schools questionnaire among 443 Italian primary teachers. Their analysis supported a two-factor model contrasting highly autonomy-supportive and highly controlling orientations, demonstrated metric invariance across teaching seniority groups, and yielded internal consistency coefficients ranging from 0.61 to 0.69. Because that ground was grounded in autonomy support and control rather than Grasha's five functional roles, it serves a methodological benchmark for cross-cultural validation rather than direct evidence for the current factor structure.

In a separate study, Yoshida et al. (2014) translated and back-translated Principles of Adult Learning Scale (PALS), refined items phrasing through pilot testing, and surveyed 1,111 Japanese nursing educators. Following the elimination of 14 negatively worded items, their final 30-item solution yielded a five-factor structure accounting for 45.3% of the total variance, with factor loadings ranging from 0.33 to 0.75 and Cronbach's alpha reaching 0.86 (0.87 for standardized items). Abós Catalán et al. (2018) contrasted CFA and ESEM for a four-factor Need-Supportive Teaching Style Scale, demonstrating that model choice and cross-loadings fundamentally influence structural conclusions. Because their scale was grounded in self-determination and achievement-goal frameworks, it is methodologically relevant but does not validate Grasha's inventory. Yoshida et al.'s instrument was similarly derived from PALS rather than Grasha's five-role framework and is cited here as a cross-cultural adaptation benchmark.

Regarding the Grasha specific model, extensive research has applied and adapted teaching styles across diverse educational settings. Üredi (2006) adapted Grasha's teaching style scale to Turkishm sampling 1,306 primary and lower secondary school teachers in Istanbul; the findings showed that perceptions of the teaching profession varied significantly across teaching style groups. Ford et al. (2016) adapted the terminology for a collaborative quality-improvement coaching context. Among a sample of 17 coaches, principal-components analysis identified five coaching styles and suggested removing Item 6 from both Facilitator and Delegator, illustrating how item semantics can shift outside the conventional classroom contexts; however, given the restricted sample size, their study offers contextual insights rather than robust confirmatory evidence. Additionally, Aktan (2012) examined associations between teaching style, academic achievement, self-regulation, and motivation rather than evaluating the scale's underlying measurement properties.

Across these studies, validation systematically entailed re-examining factor structure, reliability, content or construct validity (Alivernini et al., 2012), and, where applicable, measurement invariance when transferring an instrument across target population or functions (Ford et al., 2016; Yoshida at al, 2014). Hürriyetoğlu and Kılıçoğlu (2020) reduced an initial 44-item pool to 14 items, three factors in a sample of 605 teachers. Overall reliability was reported at 0.877, with subscale reliabilities of 0.816, 0.760, and 0.646; CFA yielded chi-square = 218.081, chi-square/df = 3.20, RMSEA = 0.06, CFI = 0.95, NNFI = 0.93, NFI = 0.97, GFI = 0.95, and RMR = 0.04. These benchmarks illustrate that preserving a scale label does not guarantee the stability of its underlying measurement structure, thereby establishing a baseline for evaluating item retention, factor intercorrelations, model fit, and invariance in the present study. Notably, the three factors identified by Hürriyetoğlu and Kılıçoğlu represented visual, auditory, and kinesthetic modalities, which are conceptually distinct from Grasha's five teaching roles.

In summary, prior research confirms that teaching style scales have been extensively developed, adapted, and validated in diverse educational contexts. However, whether the hypothesized five-factor structure is statistically supported and yield reliable, valid measurement among Vietnamese primary school teachers remains unexamined. This unresolved psychometric gap rather than mere geographical novelty alone, which defines the core objective of the present study.

Concept of Teaching Style

Teaching style is commonly conceptualized as the relatively enduring patterns behavioral characteristics that teachers display in organizing, managing, and executing instructional activities. Fischer and Fischer (1979) emphasized that teaching style must not be conflated with teaching methods. Instead, it denotes a constellation of behaviors and processes enacted throughout different stages of instruction (Batista et al., 2015), facilitating the learning process (Garcia, 1992). While teachers may dynamically switch between varied methods such as lecturing, discussion, or group work, their underlying teaching style remain remarkably consistent across contexts, even as instructional content changes (Carr, 1998), constituting a defining dimension of the pedagogical process (Smith, 1982). The style is fundamentally manifested in how teachers present information, organize content, structure learning tasks (Gregorc, 1979, 1989), and impart knowledge during classroom instruction (Brown, 2001).

Heimlich and Norland (2002) conceptualized teaching style as the alignment between teachers' pedagogical beliefs and their observed instructional behaviors. Similarly, Wright (1987) defined teaching style as a composite of strategies, techniques, motivations, personality traits, and levels of control exercised by the teachers. It reflected not only visible classroom practices but also underlying teachers perceptions regarding learners, learning content, and the in structural environment (Darkenwald & Merriam, 1982), as well as the subjective definition of their professional role. In addition, teaching style is inextricably associated with teachers' personal needs, professional goals (Gayle, 1994), and overarching instructional purposes, shaped by their personal, social, and cultural experiences (Whittington & Raven, 1995).

Conti (1989, 2004) further reinforced that teaching style is distinct from specific instructional techniques or tactics. Teaching style influences how teachers organize classroom activities, interact with learners, and select learning experiences (Cooper, 1999, 2001). Peacock (2001) characterized teaching style as a teacher's natural, habitual, and preferred mode of instruction, whereas Schultz (1982) defined it as a relatively stable behavioral pattern in instructional practice. Bennett (1979) highlighted teaching

style through observable instructional and interpersonal behavior while Hilligoss (1992) emphasized dimensions of teachers' care, support, and relational connection with students. Complementarily, Hyman and Rosoff (1984) posited that teaching style is identifiable not only through instructional behavior, but also through deliberate pedagogical omissions during instruction.

Synthesizing these theoretical perspectives, teaching style in the present study is defined as the characteristic pattern of teachers' behaviors, beliefs, and interactions that teacher exhibit when organizing the teaching–learning process. It encompasses the ways teachers transmit knowledge, manage learning tasks, guide classroom activities and interactions, support learners, allocate learning responsibilities between teachers and students, and deploy instructional methods and modalities.

Teaching Styles

Grasha (1994, 1996, 2002) conceptualized teaching style as a multidimensional pattern of needs, beliefs, and behaviors displayed when delivering content, interacting with students, managing learning tasks, supervising learning activities, and mentoring learners. This theoretical framework consists of five styles: Expert, Formal Authority, Personal Model, Facilitator, and Delegator. These five teaching styles have also been broadly recognized across empirical studies, such as Huang and Zheng (2022), Efilti and Çoklar (2013), Abelson (1973), Lowman (1990), Mann et al. (1970), and Reinsmith (1992), and consistently linked to student academic performance (Ahmed et al., 2020; Chetty et al., 2019).

The Expert style: defined by an emphasis on content mastery, academic competence, and thorough students' preparation (Grasha, 1994, 1996, 2002). Teachers adopting this style focus on transmitting authoritative information, challenge student intellect, and maintaining their stature as domain experts, while beneficial for content depth, over-reliance on this style can inhibit interactive rapport with learners (Karataş & Yalın, 2021). Within primary education, this dimension is operationalized not as an overt display of complex scholarly expertise, but to rather as the delivery of accurate, age-appropriate explanations that provide a secure cognitive foundation.

The Formal Authority: characterized by the teacher's establishment of structured rules, standards and learning expectations (Grasha, 1994, 1996, 2002). Teachers embodying this style focus heavily on learning objectives, correct procedures, and normative classroom standards (Abelson, 1973; Lowman, 1990; Mann et al., 1970; Reinsmith, 1992). While effective for maintaining classroom order and providing structural clarity (Hersey & Blanchard, 1992), an overemphasis on authority may include perceived rigidity, constraining teacher-student interaction flexibility (Karataş & Yalın, 2021) and potentially suppressing student engagement (Shaari et al., 2014) and academic achievement (Ahmed et al., 2020; Chetty et al., 2019). Although Formal Authority share behavioral features with direct instruction of classroom structure, Grasha's construct specifically targets the rule setting and expectations, and should not be equated with controlling teaching. For young students, clear routines and expectations may function as developmentally supportive scaffolding rather than rigid control.

The Personal Model style: reflected in instruction via explicit demonstration and modeling (Grasha, 1994, 1996, 2002). Teachers adopting this style do not merely deliver content; they also demonstrate ways of thinking (Karataş & Yalın, 2021), problem-solving, task performance, experience sharing for student imitation (Grasha & Yangarber-Hicks, 2000). This style is particularly effective in establishing academic and professional benchmarks, especially when learners require concrete examples of how knowledge can be applied in practice (Ahmed et al., 2020; Üredi, 2006). It has also been positively linked to learners' academic achievement (Chetty et al., 2019) coaching context and skill development (Ford et al., 2016). Concrete modeling is highly salient in primary classrooms, where young students often benefit immensely from observing modeled reasoning process prior to independent execution attempt.

The Facilitator style: emphasizes the teacher's role in guiding, encouraging, and creating conditions for learners to participate in the learning process. Teachers using this style often utilize questioning, suggestive problem-solving, active listening, and self-directed skill scaffolding (Grasha, 1994, 1996, 2002). While overlapping behaviorally with learner-centered strategies or autonomy-supportive practices, Facilitator style represents a distinct role within Grasha's five-style taxonomy. In primary education, facilitation relies on scaffolded questioning and guided participation rather than the complete removal of teacher guidance. Üredi (2006) found that this style was associated with heightened professional efficacy compared to other teaching styles. Student engagement is optimized when facilitation combines autonomy support with clear structured parameters (Jang et al., 2010), helping learners recognize task values (Patall et al., 2013). Shaari et al. (2014) indicated that teachers may prefer the facilitator role in the teaching process, while Ahmed et al. (2020) noted that learners take greater responsibility in completing learning tasks under this style. However, the effects of the Facilitator style may vary depending on the context, subject domain, and students' readiness (Sheikh & Mahmood, 2014), as well as the extent to which learners are prepared to take responsibility for their own learning (Ford et al., 2016). The studies on autonomy support and classroom structure are therefore used to clarify potentially overlapping behaviors, not to establish the factor validity of the Facilitator subscale.

The Delegator style: reflected in the teacher's tendency to foster learners greater autonomy and independent execution. Learners are encouraged to complete tasks independently, make decisions, and work either individually or in groups, while the teacher serves as a consultant and provides support when needed (Grasha, 1994, 1996, 2002). This style is suitable for activities that require self-learning, problem-solving, and responsibility for learning outcomes (Üredi, 2006). However, delegating responsibility to students should be accompanied by clear learning structure (Jang et al., 2010), so that students can internalize the value of learning (Alivernini et al., 2012). Sheikh and Mahmood (2014) found that this style generated the highest level of student motivation, fostering students active participation, the development of autonomous thinking, and opportunities for learners to work independently on learning plans or tasks (Ahmed et al., 2020). It has also been linked to students' academic achievement (Chetty et al., 2019), particularly when applied in appropriate contexts (Ford et al., 2016). Within Grasha's construct, Delegator specifically demotes the transfer of tasks and decision-making responsibility. In primary education, delegation must be understood as a gradual scaffolded release of limited responsibility, distinct from higher education expectations of full autonomy.

Teachers rarely apply a single, fixed teaching style but rather, multiple styles co-exist and are dynamically blended based on pedagogical goals, students' characteristics, subject content, and classroom contextual demands. Primary school teachers, in particular, must fluidly coordinate these diverse roles within the same teaching process, acting simultaneously as knowledge providers, rule architects, cognitive models, learning facilitators, and the person who gradually gives students more responsibility for learning. These nuanced distinctions provide the contextual groundwork for empirical analysis, determining whether items assessing expertise, authority, modeling, facilitation, and delegation preserve their intended measurement when administered to primary school teachers in Vietnam.

RESEARCH METHODOLOGY

Research Context and Participants

The study was conducted in 13 primary schools in Ho Chi Minh City, one of Vietnam's major educational center with a well-developed primary education system with a large teaching staff, and a regular intensive involvement in educational reforms and innovative teaching initiatives. A total of 385 primary teachers participated in the study. The sample represented a diverse cross-section of primary school teachers in terms of age, educational level, and professional teaching experience. Ho Chi Minh City was selected as a research setting because of its active implementation of educational innovation, technology-enhanced instruction, and contemporary teaching approaches. Furthermore, variations in socio-economic conditions, school characteristics, and student demographics across different districts contributed to the diversity of the research sample.

Instrument and Data Collection

Research data were collected using a questionnaire based on Grasha's Teaching Style Model (1994, 1996, 2002). The instrument consisted of 40 observed variables representing five teaching styles: Expert, Formal Authority, Personal Model, Facilitator, and Delegator. All items were measured on a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). Participants were asked to indicate the extent to which each statement reflected their instructional practice.

A non-probability convenience sampling approach was employed for data gathering. Participating primary schools were selected based on organizational accessibility and formal institutional consent. Within the participating institutions, questionnaires were administered to actively practicing teachers on a voluntary basis, ensuring informed participation and data integrity.

Before conducting the official survey, the questionnaire was reviewed for content and language to ensure clarity, comprehensibility, and suitability for the primary school context. Following data collection, reliability was assessed using Cronbach's Alpha and the measurement structure of the instrument was evaluated through Confirmatory Factor Analysis (CFA) to determine the adequacy of the teaching style measurement model for primary school teachers in Vietnam.

Survey Sample

The survey sample size was determined using two complementary considerations.

First, the sample size was estimated using Yamane's formula (1967) for a known population. Based on the population of 1,126 teachers within the defined sampling frame**,** the required sample size was 296 as below:

$$\mathrm{n} = \frac{N}{1 + N * e\text{^}2}$$

Second, the sample adequacy was determined using the item-to-response ratio recommended by Hair et al. (2009, p. 100) who suggested a minimum sample size should be 50 and preferably 100 or more. Given the 40 observed variables included in the instrument, the recommended minimum sample size was 200 respondents (n = 40 * 5 = 200).

Hair et al. (2021) discuss the ten-times rule within the context of partial least squares structural equation modeling (PLS-SEM). Because the present study employed covariance-based CFA in AMOS, this guideline was not used to determine the sample size.

Based on the population calculation (n = 296) and the item-to-case ratio (n = 200), the final sample of 385 teachers exceeded the minimum requirement, thus indicating adequate sample size for the intended analyses.

Translation and Cross-Cultural Adaptation

The Vietnamese version of Grasha's Teaching Style Scale was adapted following the cross-cultural adaptation guidance of Beaton et al. (2000). After permission to use the 40-item instrument had been obtained, two independent forward translations were reconciled, followed by two independent back-translations and comparison with the source version. A five-member expert panel reviewed theoretical relevance, semantic equivalence, clarity, and cultural suitability, with wording refined where necessary without changing the intended constructs. Cognitive interviews with 10 primary school teachers and a pilot study with 68 teachers from schools outside the main sample were then conducted. All 40 items were retained for the main survey; the subsequent removal of seven items resulted from CFA-based model refinement rather than the translation or pilot stages.

Ethical Considerations

Ethical approval for this study was granted by the Research Ethics Committee for Social Sciences and Humanities of Ho Chi Minh City University of Education (Certificate No. ECSH-2025-014, dated September 10, 2025). Formal permission was obtained

Table 1. Results of the reliability assessment using Cronbach's alpha

Latent variable	Item Code	Cronbach's Alpha coefficients	N of Items	Corrected Item-Total Correlation
Expert Style	ES	0.848	8	All values ≥ 0.5
Formal Authority Style	Fa	0.810	8	All values ≥ 0.3
Personal Model Style	PmS	0.871	8	All values ≥ 0.4
Facilitator Style	FS	0.919	8	All values ≥ 0.6
Delegator Style	DS	0.812	8	All values ≥ 0.4

Table 2. Description of the research model

Latent variable	Item Code	Type	Level	Description
Expert Style	ES	Reflective	1	Operationalized through 8 observed variables ES1 -> ES8
Formal Authority Style	Fa	Reflective	1	Operationalized through 8 observed variables Fa1 -> Fa8
Personal Model Style	PmS	Reflective	1	Operationalized through 8 observed variables PmS1 -> PmS8
Facilitator Style	FS	Reflective	1	Operationalized through 8 observed variables FS1 -> FS8
Delegator Style	DS	Reflective	1	Operationalized through 8 observed variables DS1 -> DS8

from the participating schools, and the questionnaire was administered to teachers who agreed to participate voluntarily. Data collection was conducted in accordance with the approved research protocol.

Data Analysis

Data analysis was conducted using SPSS to assess reliability, including Cronbach's Alpha, and to conduct descriptive statistics, including mean and standard deviation. The lowest score was 1 and the highest score was 5. The interval used to interpret the mean scores was calculated as follows: (Max - Min): 5 = (5 - 1): 5 = 0.8.

The interpretation levels were classified as follows (Pimentel, 2010; Nyutu et al., 2021): Level 5: Mean = 4.21–5.00: Totally agree; Level 4: Mean = 3.41–4.20: Somewhat agree; Level 3: Mean = 2.61–3.40: Neither agree nor disagree; Level 2: Mean = 1.81–2.60: Somewhat disagree; Level 1: Mean < 1.81: Totally disagree.

Covariance-based CFA was used to evaluate the quality of the measurement model; no separate structural model was estimated.

Scale Quality Assessment

The reliability of the scale was assessed using Cronbach's Alpha. Observed variables were considered acceptable when their Corrected Item–Total Correlations were equal at least 0.30 (Nunnally & Bernstein, 1994). Cronbach's Alpha values of 0.80 or higher were interpreted as indicating very good reliability, values between 0.70 to nearly 0.80 as good reliability and values above 0.60 as acceptable reliability (Hoang & Chu, 2008). The results of the reliability test are presented in **Table 1**.

The results presented in **Table 1** show that all observed variables achieved acceptable corrected item–total correlations (≥ 0.30). In addition, all Cronbach's Alpha coefficients were above 0.80, indicating that the scales met the reliability requirements and demonstrated good to very good reliability.

Assessment of the Measurement Model Using Covariance-Based SEM

Measurement Model: Based on the results of the reliability assessment using Cronbach's Alpha, all observed variables showed a tendency to be highly correlated with one another and demonstrated satisfactory convergence on their corresponding latent constructs, as described in **Table 2**.

To confirm the suitability of the Teaching Style Scale, which consists of five factors and 40 observed variables, based on the theoretical framework of the study, Confirmatory Factor Analysis (CFA) was conducted using AMOS (v. 18).

In addition to the overall fit indices, a non-parametric bootstrap was used to examine the stability of parameter estimates under repeated resampling. The principle of Bootstrap is to generate multiple new samples by randomly resampling with replacement from the original dataset. Each Bootstrap sample has the same size as the original sample, but may contain repeated observations. For each generated sample, the parameters of interest are estimated and recorded. In this study, the simulation process was set at N = 1,000 random resampling iterations with a 95% confidence interval (Bollen & Stine, 1992; Efron, 1979; Efron & Tibshirani, 1994).

RESULTS

Validation of the Teaching Style Scale for Primary School Teachers

Confirmatory Factor Analysis (CFA)

The initial CFA results indicated that the hypothesized five-factor model did not achieve satisfactory overall fit. Specifically, the Chi-square/df (CMIN/DF) index was 3.412 (exceeding the standard threshold < 3.0), the TLI index was 0.788, and the CFI index reached 0.802 (both below the commonly used 0.90 criterion). Although the RMSEA index was 0.079 (within the acceptable threshold < 0.08), the overall fit statistics suggested that model refinement was necessary (**Table 3**).

Table 3. Results of the bootstrap analysis

Parameter	Estimate		Lower		Upper	P
ES1	<---	Expert Style	0.719	0.635	0.792	0.002
ES2	<---	Expert Style	0.770	0.699	0.828	0.002
ES3	<---	Expert Style	0.673	0.550	0.757	0.002
ES4	<---	Expert Style	0.751	0.678	0.810	0.002
ES6	<---	Expert Style	0.536	0.419	0.626	0.002
ES7	<---	Expert Style	0.641	0.543	0.719	0.002
Fa1	<---	Formal Authority Style	0.455	0.343	0.549	0.002
Fa4	<---	Formal Authority Style	0.771	0.707	0.827	0.002
Fa5	<---	Formal Authority Style	0.759	0.689	0.820	0.002
Fa6	<---	Formal Authority Style	0.721	0.628	0.797	0.002
Fa7	<---	Formal Authority Style	0.650	0.558	0.735	0.002
Fa8	<---	Formal Authority Style	0.699	0.608	0.778	0.002
PmS1	<---	Personal Model Style	0.576	0.479	0.658	0.002
PmS2	<---	Personal Model Style	0.757	0.691	0.816	0.002
PmS3	<---	Personal Model Style	0.675	0.582	0.749	0.002
PmS4	<---	Personal Model Style	0.674	0.577	0.758	0.002
PmS5	<---	Personal Model Style	0.796	0.742	0.844	0.002
PmS6	<---	Personal Model Style	0.780	0.712	0.841	0.002
PmS7	<---	Personal Model Style	0.451	0.332	0.552	0.002
PmS8	<---	Personal Model Style	0.723	0.645	0.790	0.002
FS1	<---	Facilitator Style	0.819	0.758	0.866	0.002
FS2	<---	Facilitator Style	0.774	0.703	0.835	0.002
FS3	<---	Facilitator Style	0.785	0.717	0.840	0.002
FS4	<---	Facilitator Style	0.752	0.670	0.816	0.002
FS5	<---	Facilitator Style	0.833	0.781	0.877	0.002
FS6	<---	Facilitator Style	0.665	0.576	0.743	0.002
FS7	<---	Facilitator Style	0.707	0.620	0.777	0.002
FS8	<---	Facilitator Style	0.795	0.731	0.847	0.002
DS2	<---	Delegator Style	0.830	0.779	0.872	0.002
DS3	<---	Delegator Style	0.669	0.573	0.741	0.002
DS4	<---	Delegator Style	0.757	0.675	0.825	0.002
DS5	<---	Delegator Style	0.675	0.580	0.753	0.002
DS8	<---	Delegator Style	0.658	0.564	0.738	0.002

Model Refinement and Removal of Low-Loading Items

To improve the model fit**,** standardized loadings were examined. Items with loading below 0.50 were reviewed and removed sequentially, beginning with the lowest-loading indicators. Seven observed variables failed to meet the factor loading criterion were excluded from the model, including:

- Fa2 and Fa3 (belonging to the Formal Authority Style factor)
- ES5 and ES8 (belonging to the Expert Style factor)
- DS1, DS6, and DS7 (belonging to the Delegator Style factor)

After the seven items were removed, the model contained 33 observed variables and retained five labeled factors.

After refinement, the CFA was re-estimated and the reported fit indices improved to levels commonly regarded as acceptable:

- CMIN/DF = 2.393, which was lower than the value for the initial model.
- RMSEA = 0.060, indicating acceptable approximate fit.
- TLI = 0.901 and CFI = 0.909, both marginally above 0.90.

The final model retained Fa1 (= 0.455) and PmS7 (= 0.451), both demonstrated factor loading s slightly below 0.50. However, their bootstrap confidence intervals excluded zero, and composite reliability values of the corresponding factors remained above the recommended threshold of 0.80. Consequently, these items were retained for subsequent analysis although their performance warrants further examination in future studies. These results suggest that the revised measurement model achieved an acceptable level of measurement validity.

Bootstrap Analysis

The Bootstrap test results show that the P-value of all standardized regression weights between the 5 teaching style factors and 33 observed variables is 0.002 ($p < 0.01$), which is less than the significance level of 0.05. At the same time, the 95% confidence interval of the regression weights (between the Lower and Upper values) for all variables is completely positive and contains no zeros. These results indicate that the retained loadings were statistically different from zero under bootstrap resampling. They do not establish external generalizability or compensate for using the same sample to refine and re-estimate the model.

The results of the composite reliability and convergent validity analysis of the Teaching Style scale show that (**Table 4**):

Table 4. Results of the measurement model assessment

STT	Latent variable	Number of Remaining Items	Composite Reliability (CR) (Criterion > 0.70)	Average Variance Extracted (AVE) (Criterion > 0.50)	Conclusion
1	Expert Style	6	0.840	0.471	Provisional (High CR; AVE < 0.50)
2	Formal Authority Style	6	0.837	0.468	Provisional (High CR; AVE < 0.50)
3	Personal Model Style	8	0.875	0.473	Provisional (High CR; AVE < 0.50)
4	Facilitator Style	8	0.920	0.590	Excellent
5	Delegator Style	5	0.843	0.520	Excellent

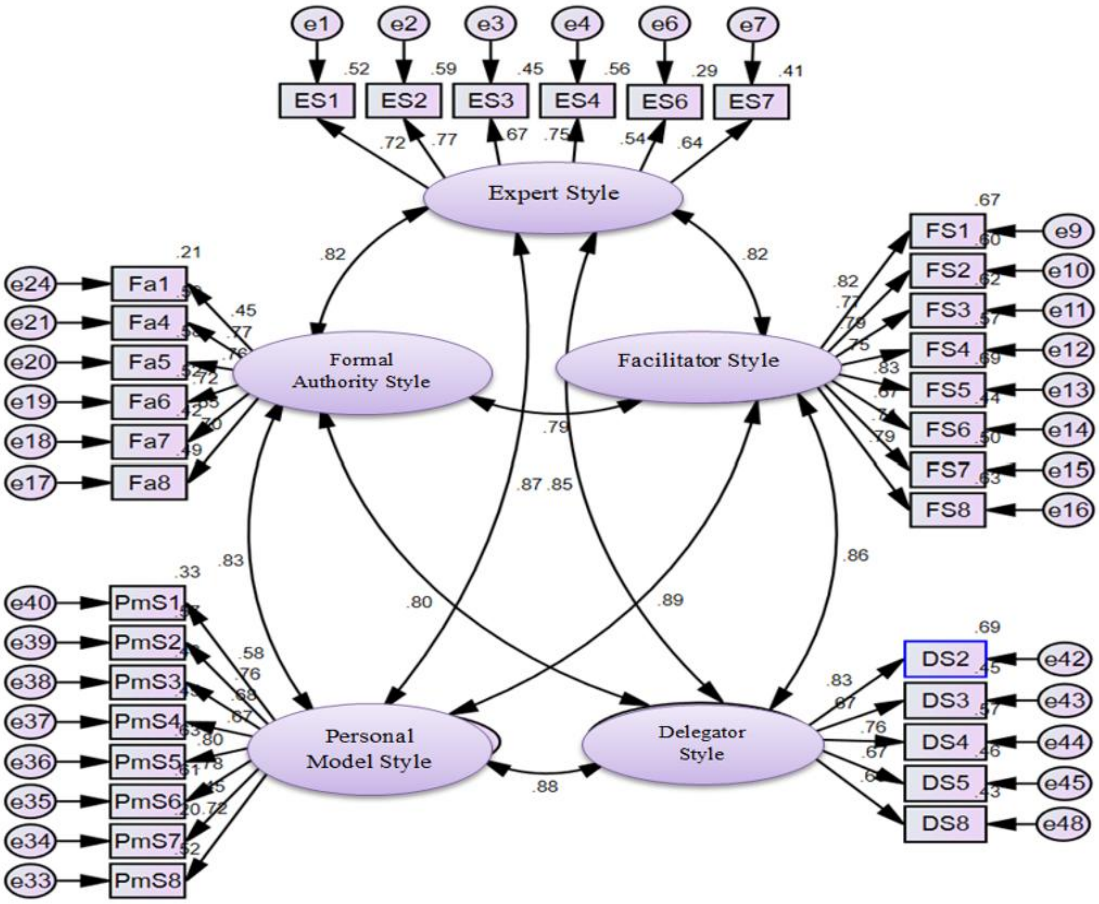


Figure 1. Measurement model of the teaching style scale (Source: Authors' own elaboration)

Composite reliability ranged from 0.837 to 0.920 and exceeded the 0.70 criterion for all five factors, supporting their internal consistency.

Regarding convergent validity (AVE), the Facilitator Style (AVE = 0.590) and Delegator Style (AVE = 0.520) factors both reached the optimal standard (> 0.50). However, 3 factors: Expert Style (AVE = 0.471), Formal Authority Style (AVE = 0.468), and Personal Model Style (AVE = 0.473) had AVE scores slightly lower than the 0.50 threshold. When AVE is below 0.50 but composite reliability remains adequate, convergent validity may be considered provisionally acceptable (Fornell & Larcker, 1981); nevertheless, the sub- 0.50 AVE values for Expert, Formal Authority, and Personal Model warrant caution and should not be described as full evidence of convergence.

The 33-item model showed acceptable overall fit and composite reliability, but evidence for convergent validity was mixed and discriminant validity was not established.

Discriminant validity was assessed using the Fornell–Larcker criterion. The square roots of AVE were 0.686 for Expert, 0.684 for Formal Authority, 0.688 for Personal Model, 0.768 for Facilitator, and 0.721 for Delegator, whereas the inter-factor correlations shown in **Figure 1** ranged from 0.79 to 0.89. Because the correlations exceeded the corresponding square roots of AVE, discriminant validity was not supported. The five dimensions should therefore not be interpreted as fully distinct in this sample.

Teaching Styles of Primary School Teachers

Descriptive statistics show that the means score of all five teaching styles exceeded 3.41, suggesting that participants generally agreed with the statements describing the five teaching styles detention (**Table 5**).

Table 5. Descriptive results of primary school teachers' teaching styles

Latent variable	Mean	Std. Deviation
Expert Style		
I believe that mastering fundamental knowledge (e.g., terms, concepts, facts, and principles) is one of the most important goals students should achieve in the learning process.	3.94	0.911
I place great importance on sharing my knowledge and professional experience with students during instruction.	4.14	0.831
I consider my explanations and interpretations of lesson content to be important for students' understanding of the subject matter.	3.88	0.906
I want students to leave my classroom with a strong foundation of knowledge and skills that will enable them to meet learning expectations and apply what they have learned in everyday life.	4.26	0.750
I often draw upon my own knowledge and experience when addressing students' differing views about lesson content.	3.61	1.060
Students see me as a source of knowledge who can help them understand issues related to the subject area.	3.82	0.934
Total: N=385	3.94	0.899
Formal Authority Style		
I set high standards for students throughout the learning process.	3.44	1.134
I clearly define what students are expected to learn and how they are expected to learn in my class.	4.23	0.722
I provide clear instructions on how assignments and homework should be completed.	4.04	0.838
I establish very specific goals that I expect students to achieve.	4.06	0.771
I clearly communicate my expectations to students from the first class meeting.	3.98	0.867
My standards and expectations help students develop the discipline necessary for learning.	3.99	0.805
Total: N=385	3.96	0.856
Personal Model Style		
What I say and do is intended to provide a model that helps students gain a more accurate understanding of the lesson content.	3.70	1.134
I encourage students to perform beyond the examples or demonstrations that I provide.	4.25	1.401
I often show students what to do and how to do it in order to help them learn more effectively.	4.02	1.184
I frequently use examples from my own experience to clarify lesson content	4.05	0.722
I often demonstrate different approaches that students can use to accomplish learning tasks.	4.19	0.838
I regularly provide feedback on students' learning activities and performance.	4.12	0.771
I clearly communicate my expectations to students from the first class meeting.	3.60	0.867
Students see me as a coach who works with them to correct mistakes in their thinking and behavior.	4.00	0.805
Total: N=385	3.99	0.965
Facilitator Style		
I use teaching methods that accommodate students' different learning styles.	4.30	0.754
I spend time advising students on how to improve their performance in individual or group learning tasks.	4.21	0.741
I frequently use small-group discussions to help students develop critical thinking skills.	4.27	0.755
When students work on learning tasks, I usually guide them by asking questions, suggesting solutions, and proposing alternative approaches.	4.15	0.758
The learning activities I design encourage students to take initiative and assume responsibility for their own learning.	4.23	0.772
I encourage students to provide suggestions regarding what will be learned and how instruction will be conducted in the classroom.	3.95	0.845
I allow students to choose activities that best help them achieve the learning objectives.	4.03	0.802
I provide students with individualized support and encouragement to help them learn more effectively in class.	4.14	0.804
Total: N=385	4.16	0.779
Delegator Style		
I often organize activities that encourage students to develop their own ideas related to the lesson content.	4.26	0.764
Students are able to design and carry out learning activities based on their own learning experiences.	4.04	0.796
I place great importance on developing students' independent thinking and self-directed learning skills during lessons.	4.15	0.812
Students are often given responsibility for presenting certain parts of the lesson in class.	3.97	0.822
In the classroom, I serve as a resource person whom students can turn to whenever they need assistance.	4.01	0.860
Total: N=385	4.09	0.811

Among the five dimensions, the Facilitator Style had the highest mean score (M = 4.16, SD = 0.779). This result indicates that primary school teachers tended to frequently engage in guiding, supporting, and facilitating activities that encourage students to participate actively in the learning process. Within this group, the statement with the highest mean score was "I use teaching methods that are appropriate to the different learning styles of students" (M = 4.30, SD = 0.754), followed by "I frequently use small group discussions to help students develop critical thinking skills" (M = 4.27, SD = 0.755). This suggests that teachers prioritized meeting the students' diverse learning needs and encourage the latter's active participation in the classroom.

The Delegator Style had a mean score of 4.09 (SD = 0.811) as the second level. Participants reported relatively high level of agreement with the statement related to encouraging students to develop their own ideas (Mean = 4.26; SD = 0.764), and promoting students' thinking self-directed learning skills (Mean = 4.15; SD = 0.812), and facilitating students' greater participation and responsibility in learning activities. This reflects a trend toward increasing student autonomy and self-study abilities in the teaching process.

The Personal Model Style yielded a mean score of 3.99 (SD = 0.965). Participants frequently used real-world examples, personal experiences, and model activities to support student learning. The statement with the highest average score in this dimension

was, “I encourage students to perform beyond the examples or demonstrations that I provide” (M = 4.25; SD = 1.401). The results show that teachers not only transmit knowledge but also play a guiding and modeling role for students in the learning process.

The Formal Authority Style achieved a mean score of 3.96 (SD = 0.856). Participants tended to set clear objectives, standards, and expectations for students. Within this group, the statement “I usually define what and how students are expected to learn in the classroom” had the highest mean score (M = 4.23; SD = 0.722). This indicates that teachers still value maintaining structure, direction, and discipline in the teaching process.

The Expert style showed the lowest mean score of 3.94 (SD = 0.899) among the five dimensions, although it remained within the agreement range. Teachers highly attached significant importance to helping students develop a strong foundation of knowledge and skills (M = 4.26, SD = 0.750) and sharing their knowledge and experience during instruction (M = 4.14, SD = 0.831). These findings indicate that subject expertise continues to play an important role in teaching practice.

Overall, the results suggest that participants reported using multiple teaching styles rather than relying predominantly on a single instructional approach. However, Facilitator and Delegator styles received the highest mean scores among the dimensions, suggesting that participants viewed their practice as relatively oriented toward support, participation, and age-appropriate responsibility.

DISCUSSION

The present study examined the psychometric properties of Grasha’s Teaching Style Scale among primary school teachers in Ho Chi Minh City**.** Although the initial model did not achieve the desired level of suitability, the confirmatory factor analysis helped eliminate seven observed variables with low explanatory power, thus forming a model consisting of 33 observed variables belonging to five theoretical factors. The improved fit indices showed that a model with five labeled factors could be estimated in the sample, but the high factor correlations prevented the dimensions from being interpreted as clearly distinct**.** These results are consistent with adaptation and scale validation studies in other contexts such as those in Türkiye (Üredi, 2006), Italy (Alivernini et al., 2012), and Japan (Yoshida et al., 2014), showing that applying a measurement tool to a new context often requires certain adjustments but can still preserve the core theoretical structure.

The item deletion pattern exhibited non-uniform distribution across the measured dimensions: two items from Expert, two from Formal Authority, and three from Delegator were removed, whereas all items pertaining to Personal Model and Facilitator were retained. This disparity suggests that constructs centered on concrete modeling and guided participation were operationalized and interpreted with greater conceptual consistency within this primary-education sample. Conversely, items tapping into expertise, formal authority, and delegated responsibility appeared more susceptible to contextual influences, such as local role expectations and pupils’ developmental readiness. Given that these item reductions were executed post hoc within the same sample, this interpretation must be regarded as tentative and subject to cross-validation.

The Bootstrap analysis further supported the stability of the retained measurement parameters. All retained loadings remained statistically significant across bootstrap samples, and their confidence intervals excluded zero. These findings strengthen confidence in the stability of the revised measurement model within the present dataset. Nevertheless, bootstrap resampling does not replace independent validation and should be interpreted as evidence of generalizability beyond the current sample.

Regarding convergent validity, Expert, Formal Authority, and Personal Model had AVE values below 0.50, although their composite reliability estimates exceeded the recommended level. Under the Fornell and Larcker (1981) guidance, adequate composite reliability provides some support when AVE is below 0.50, but it does not remove the weakness indicated by the AVE values. These findings provide partial support for convergence but do not remove the need for caution, particularly because the factors also showed high intercorrelations.

A more notable finding concerns the lack of discriminant validity among the five dimensions. Inter-factor correlations ranged from 0.79 to 0.89 suggest substantial overlap among the five roles. In primary classrooms, one teacher may use multiple instructional functions, including presenting lesson content, establishing classroom routines, demonstrating learning strategies, guiding participation, and gradually transfer responsibility to students. Such role integration may account for part of the overlap; nevertheless, the lack of discriminant validity means that the five dimensions should not be presented as empirically distinct without further evidence.

The descriptive statistical findings show that primary school teachers do not rely entirely on a single teaching style but tended to combine several different teaching styles in the classroom. This pattern is consistent with Grasha's (1994, 1996) view that teaching styles can coexist and be combined flexibly depending on teaching objectives, learner characteristics, and classroom conditions. In the primary school environment, teachers must simultaneously impart foundational knowledge, manage the classroom, support students, and form initial learning habits. Therefore, combining multiple styles is a practical requirement rather than a personal sole choice by the teacher.

A noteworthy descriptive finding is that the Facilitator Style had the highest mean score among the five teaching styles. This finding suggests that primary school teachers perceived themselves as frequently engaging in practices intended to facilitate students’ participation, guidance and active involvement in learning. The pattern is behaviorally consistent with evidence on autonomy support and structured participation (Jang et al., 2010; Patall et al., 2013), but those constructs are theoretically distinct from Grasha’s Facilitator role and do not validate that factor (Inayat & Ali, 2020). The self-reported pattern may be consistent with a preference for supportive practice, but it cannot by itself establish a broader shift in classroom behavior.

The Delegator Style ranked second in terms of its level of manifestation. Participants reported encouraging students to develop independent thinking skills, contribute their own ideas, assume age-appropriate learning responsibility and demonstrate active participation in classroom activities **a**lthough primary school students do not yet have the same high level of self-direction as secondary school or university students do. This is consistent with Sheikh and Mahmood's (2014) observation of the positive role of the Delegator Style in learning motivation. For this age group, the score is best interpreted as teachers' reported use of scaffolded opportunities for responsibility rather than as evidence that students independently plan or manage learning to the degree expected in higher education.

It is important to note that both Facilitator and Delegator dimensions were assessed through teachers' self-reports. Because contemporary educational disclosure increasingly emphasizes learner-centered teaching, socially desirable responding may have influenced participants' rating. Consequently, the reported mean should be interpreted as perception of practice rather than direct evidence of classroom behavior. Further studies incorporating classroom observations, students evaluation, or other independent sources of evidence would provide a more comprehensive assessment of teaching styles in practice.

Meanwhile, the comparatively lower ratings obtained for the Expert Style and Formal Authority styles should be interpreted as indicating that content knowledge or classroom structure have become less important. Rather, the finding may reflect a shift in how teachers perceive their professional role. Subject expertise and classroom management remain important components of effective teaching; however; they may appear to be integrated with supportive, participatory and responsibility-oriented practices rather than functioning as dominant instructional approaches. This interpretation aligns with broader developments in contemporary educational practice that emphasize balance guidance with student participation.

CONCLUSION

This study evaluated and refined the psychometric properties of Grasha's Teaching Style Scale among primary school teachers in Ho Chi Minh City. Following a model refinement, a 33-item, five factor solution demonstrated overall model fit and satisfactory composite reliability. However, evidence for convergent validity was mixed and discriminant validity was not supported, indicating substantial overlap among five teaching-style dimensions These findings provide preliminary support the use of the revised instrument in similar research context while also highlighting the need for further validation. CFA and bootstrap results provide provisional evidence for research use in comparable samples, but independent cross-validation remains necessary.

The results also show that primary school teachers tend to combine multiple teaching styles in their teaching process instead of using only a single instructional role. Among these dimensions, the Facilitator Style and Delegator Style received the highest self-report ratings, suggesting an emphasis on supporting student participation, guidance, and age-appropriate responsibility within the teaching process. Because these findings were based on self-report data, they should be interpreted as teachers' perception of their instructional practice rather than direct evidence of classroom behavior.

From a theoretical perspective, the study contributes preliminary evidence regarding applicability of Grasha's teaching-style framework in a Vietnamese urban primary education context. From a practical perspective, the revised scale may serve as a useful instrument for exploratory research and professional development activities involving comparable teacher population. However, the instrument should not yet be regarded as a standardized national measure or used as the sole basis for high-stakes decision concerning teacher evaluation or professional placement, or for other high-stakes decisions.

In addition to the achievements, the study still has some limitations to be acknowledged. The data were collected from primary schools in Ho Chi Minh City, so they do not fully reflect or represent the characteristics of primary school teachers in other localities. Future studies should cross-validate the 33-item model in independent samples from multiple regions; assess test-retest reliability, criterion-related validity, and measurement invariance across demographic and professional groups; and examine associations with classroom observations, student reports, and student outcomes. Replication should also determine whether the five factors remain distinguishable and whether the two marginally loading items should be retained. The same sample was used to test the initial model, remove items, and re-estimate the revised model, which may capitalize on chance and does not constitute independent confirmation. The exclusive reliance on self-report also limits conclusions about actual classroom practice.

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