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Enhancing active teaching in Vietnam: Challenges and progress toward the 2018 education standards

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ABSTRACT

This study aims to assess the awareness, skills, and factors influencing the effectiveness of active teaching methods implemented by Vietnamese teachers to meet the requirements of the 2018 General Education Program. A survey was conducted with 1,291 secondary and high school teachers in the northern region of Vietnam. The collected data were analyzed to evaluate teachers' theoretical understanding, practical application and barriers to implementing active teaching methods. The results indicate that teachers possess a strong theoretical foundation in active teaching methods. Their practical application remains limited, particularly at the high school level among teachers with over 15 years of experience. Key barriers include exam pressure, insufficient teaching facilities, large class sizes, and disparities in student abilities. Younger teachers (<15 years of experience) tend to implement active teaching methods more effectively due to training aligned with the updated curriculum. It is crucial to increase teaching practice opportunities, improve classroom conditions and adjust the curriculum to alleviate pressure on learners to enhance the effectiveness of active teaching. This study provides valuable empirical data contributing to the development of strategies to improve education quality within the context of educational innovation in Vietnam.

Contribution/Originality: This research uniquely highlights the gap between theoretical understanding and the practical implementation of active teaching methods among Vietnamese teachers under the 2018 General Education Program Standards. It uncovers significant disparities across teacher demographics, curriculum levels, and classroom challenges, providing targeted recommendations to enhance teacher training, reduce exam pressures, and improve teaching infrastructure.

1. INTRODUCTION

1.1. Context and Theoretical Framework

Active learning approaches are rooted in constructivist theory, particularly Vygotsky's concept of the zone of proximal development which emphasizes knowledge construction through experience and interaction. This theoretical foundation informs instructional design, enabling teachers to develop activities suited to students' developmental levels—an area of global academic interest (Nguyen, 2024; Smyth & Henry, 1985; Wang & Feng, 2023). Since the late 20th century, education has shifted from traditional content-based instruction to competency-based education (CBE), a learner-centered model that prioritizes meaningful learning experiences over rote

memorization (Bonesso, Gerli, & Pizzi, 2015; Malhotra, Massoud, & Rajni, 2023; Wahyudin, 2018). Teachers' engagement with active learning is influenced by their attitudes and external expectations from colleagues, administrators, and students as well as their self-efficacy in adopting new pedagogical approaches.

Active learning presents challenges in implementation due to factors such as exam-oriented curricula, limited resources, and classroom management difficulties despite its benefits in enhancing student engagement and reducing boredom (Manakul, Somabut, & Tuamsuk, 2023; Sistermans, 2020; Slavin, 2002, 2020). Teachers integrate various instructional strategies such as experiments, simulations, modeling, and mind mapping to create structured and engaging learning experiences to address these challenges (IOP Conference Series: Materials Science and Engineering, 2022; Manakul et al., 2023).

In the 21st century, evolving educational paradigms necessitate the creation of learning environments that foster student engagement and competency development (Kurnia & Sunarno, 2022; Saputri, Wahyudi, Nurhayati, Nurussaniah, & Misbah, 2023). Research indicates that students demonstrate higher motivation and interest when active learning strategies are incorporated into lessons (Lukic et al., 2026).

1.2. Trends in Teaching Innovation and the Vietnamese Context

Vietnam, a developing country in Southeast Asia has experienced significant socioeconomic transformations, necessitating an alignment between workforce skills and industry demands (Mai Ngoc & Nguyen Phuc, 2023; Nguyen & Nguyen, 2019; Tran & Bui, 2024; Trang, 2019; Trinh Ngoc, 2017). Vietnam has undertaken comprehensive educational reforms in response to global educational trends, particularly the transition to competency-based education (CBE). Everett M. Rogers' theory of educational innovation provides a framework for analyzing the integration of new teaching methodologies within educational systems. Key factors influencing the adoption of active learning include the characteristics of the innovation, communication channels and the broader socio-cultural context (Shiels, 2018). These reforms align with Resolution No. 29/Nq-TW dated November 4 (2013) of the Communist Party of Vietnam which advocates for fundamental educational transformation to support industrialization, modernization, and global integration (Resolution No. 29/Nq-TW dated November 4, 2013).

Since 2014, the Vietnamese Ministry of Education and Training (MOET) has implemented teacher training programs aimed at fostering innovation in pedagogy and competency-based assessment. As part of this initiative, Official Letter No. 5555 was issued providing detailed professional guidelines that emphasize active learning strategies, assessment methodologies, and professional development through digital platforms (Official Dispatch No. 5555, 2014). Efforts to develop teacher training and professional development programs have focused on equipping educators with the skills necessary for implementing active teaching and learning methods in general schools (Tu & Hanh, 2017). The overarching goal of educational innovation is to enhance the quality of teaching, ensuring that students are active participants in their own learning, capable of adapting to real-life situations and addressing future challenges (Aliakbari & Valizadeh, 2023; Nichols, 2008).

1.3. Implementing the 2018 General Education Program

The 2018 General Education Program was officially introduced both the general education framework and subject-specific curricula. It has been implemented nationwide since the 2020–2021 school year aiming to foster students' personal competencies and essential qualities (General Education Program - Comprehensive Program - Issued with Circular No. 32/2018/TT-BGDDT, 2018a). This program aims to form and develop students' qualities and capacities through educational content and activities including a number of subjects and activities that play a core role which are designed to help learners comprehensively develop their competencies and personal qualities (General Education Program - Comprehensive Program - Issued with Circular No. 32/2018/TT-BGDDT, 2018b). The program emphasizes active student participation by redefining teachers as facilitators promoting self-directed learning and encouraging students to apply knowledge to real-world contexts (General Education Program -

Comprehensive Program - Issued with Circular No. 32/2018/TT-BGDDT, 2018c). Educational policymakers and practitioners frequently highlight the innovation of teaching and assessment methods as a key factor in successfully implementing the competency-based approach (Hoang, 2023). Effective implementation of the 2018 curriculum necessitates modern pedagogical strategies, particularly experiential learning models (Le, Le, Nguyen, & Vu, 2023). To support this transition, the Ministry of Education and Training (MOET) continues to provide professional development programs that equip teachers with innovative instructional techniques (Ho Chi Minh City, 2020).

Additionally, scientific conferences and international collaborations serve as platforms for knowledge exchange on effective teaching methodologies. Achieving current educational goals requires actively promoting student engagement in teaching and learning through methods, techniques and forms of active teaching and learning, flexibly combined with traditional teaching approaches (Le et al., 2023; Lee, Chia, & Komar, 2022; Thi Thuy & Thi Hai Yen, 2024; Thuy, 2020). Despite these efforts, several challenges persist in implementing the 2018 General Education Program. Reforms emphasize innovation. Many teachers continue to rely on traditional teaching methods limiting the effectiveness of active learning approaches. Furthermore, teacher competency plays a crucial role in the success of these methods (Nguyen & Chen, 2024; Pham & Pham, 2021). Understanding students' learning styles enables teachers to tailor instruction, optimize student potential and address diverse classroom needs (Pham, Ha, Bui, & Cao, 2024). Additionally, differentiated instruction and hands-on activities enhance student engagement while serving as tools for identifying high-achieving learners (Cu Giac, Thi Phuong Lien, & Xuan Truong, 2020; Pham, 2019). The research questions are as follows:

RQ1: To what extent are teachers aware of active teaching methods?

RQ2: What factors affect teachers' implementation of active teaching methods?

2. LITERATURE REVIEW

2.1. Concepts and Perceptions of Active Learning

Active learning encompasses a range of strategies and activities designed to enhance learning outcomes by fostering student engagement. In this approach, teachers serve as organizers, facilitators, and assessors of learning, while students are expected to take an active self-directed role in the learning process (Thuy, 2020). As high school graduates are required to develop problem-solving skills to navigate an increasingly competitive global environment, teachers must carefully select appropriate teaching models and strategies to cultivate these abilities (Wardana, Sukestiyarno, Wardono, & Suyitno, 2024).

Active learning methods encourage students to actively participate in the classroom through various instructional techniques, including written assignments, games, quizzes, audience response systems, debates, and discussions. However, despite its benefits, the application of active learning remains limited in many professional education programs (Basdogan & Birdwell, 2023; Miller & Metz, 2014). A smart teaching approach is essential for transitioning classrooms from traditional learning environments to dynamic, student-centered spaces. This approach requires teachers to develop competencies in pedagogical strategies, technology integration, and classroom management. The key components of smart teaching include 1) Identifying expected student learning outcomes. 2) Managing and structuring course content. 3) Implementing effective teaching techniques and integrating technology, and 4) Organizing learning activities within a digital environment (General Education Program - Comprehensive Program - Issued with Circular No. 32/2018/TT-BGDDT, 2018a).

2.2. Characteristics of Active Teaching Methods

Active teaching methods shift the focus from passive knowledge acquisition to practical application. This transformation follows three core principles: i) Innovative Teaching Approaches: Moving from one-way knowledge transmission to interactive, student-centered learning, incorporating interdisciplinary topics and developing problem-solving skills. i) Learner Autonomy: Encouraging students to take initiative in their learning, develop self-

study habits, and cultivate creative and independent thinking. ii) Effective Resource Utilization: Integrating digital tools, self-developed teaching aids, and other instructional resources to enhance learning outcomes (General Education Program - Comprehensive Program - Issued with Circular No. 32/2018/TT-BGDDT, 2018a).

Teaching is both a science and an art requiring teachers to possess subject-matter expertise while implementing systematic, logical processes to deliver content effectively (Quang & Tri, 2021). Active teaching methods emphasize continuous learning, independent exploration, collaborative engagement and formative assessment compared to traditional approaches (Karamustafaoglu, 2009; Thai, 2010). In active teaching, teachers play a pivotal role in organizing and orienting activities, supporting and evaluating students' learning processes. Students are proactive and engaged participants acquiring knowledge, developing skills, and refining personal qualities. As students engage in learning activities, their abilities are developed, providing teachers with opportunities to assess the achievement of learning goals related to the development of students' competencies and qualities (Thuy, 2020). Teachers can address diverse student needs, improve teaching quality, and enhance students' ability to apply knowledge in real-world contexts by adopting student-centered active learning strategies (Ha Nam Khanh, 2016; Pham et al., 2024).

2.3. Effectiveness and Positive Impact of Active Learning Methods

The effectiveness of active learning methods can be enhanced through 1) Improving traditional teaching practices. 2) Incorporating diverse instructional strategies. 3) Applying problem-based and action-oriented teaching methods. 4) Utilizing situational teaching techniques. 5) Integrating digital and multimedia tools to support learning (General Education Program - Comprehensive Program - Issued with Circular No. 32/2018/TT-BGDDT, 2018a).

The use of multimedia and audio-visual aids significantly boosts student motivation and engagement leading to improved learning outcomes (Iqbal & Sami, 2020). The lesson study approach enables teachers to refine strategies and enhance teaching effectiveness (Centeno et al., 2020). Additionally, project-based learning, inquiry-based learning, and experiential learning have proven particularly effective in STEM education, fostering deeper engagement and practical application of knowledge (Wanner & Palmer, 2018). Research in Vietnam has similarly emphasized the role of these methods in developing students' competencies and problem-solving skills (Vu, Nguyen, Pham, Phuong, & Bui, 2024).

2.4. Degree of Implementation of Active Teaching Methods in Vietnam

Vietnamese teachers employ various active teaching strategies, including project-based learning, brainstorming, problem-based teaching, and flipped classroom models. However, the effectiveness of implementation varies as many teachers continue to rely on traditional teaching approaches (Vu et al., 2024). Studies indicate that integrating digital tools, innovative teaching media, and interdisciplinary learning strategies can significantly enhance student engagement and performance (Delić-Zimić & Gadžo, 2018).

There remain gaps in research and practical application of active learning methods in Vietnam despite ongoing educational reforms. Current studies primarily focus on policy frameworks and implementation guidelines rather than providing an in-depth analysis of teachers' instructional strategies, challenges, and real-world experiences in implementing these reforms. Addressing this gap requires empirical research on teaching methodologies, challenges and best practices within Vietnamese classrooms (Vu et al., 2024). The successful implementation of active teaching methods depends on i) continuous teacher training and professional development. ii) A supportive institutional framework. iii) A culture that fosters innovation and adaptability in education. Ensuring these conditions will facilitate a more effective and sustainable transition toward active learning environments in Vietnam.

For example, when teaching strategies fail to incorporate active and differentiated learning approaches, particularly in subjects such as math, science, literature, biology, fine arts, and music, students' motivation may

decrease. This limits the development of their personal and professional skills (Duluţă, Mocanu, Saru, Pietraru, & Crăciunescu, 2019). Transitioning from experiential learning methods inspired by the performing arts to digital approaches, such as click-based feedback systems using the Mentimeter application has demonstrated the effectiveness of the 4MAT teaching method compared to traditional teaching methods in mathematics (Stanciu, 2020). From the perspective of mathematics teachers, games are not only considered teaching tools but also as structures that integrate various tools and methods, enhancing student engagement and learning outcomes (Uğurel & Morali, 2010). For immediate learning, the textbook method is more effective while the laboratory method supports lifelong learning (Wiley, 1918). Narrative analysis has also been shown to effectively assess an individual's motivational tendencies and readiness for self-development (Kalenychenko & Kalenychenko, 2024). Active teaching methods, such as project-based learning, scientific research-based learning, problem-based learning, and experiential learning are highly correlated with STEM-oriented teaching. When appropriately applied, these methods significantly enhance the organization and effectiveness of STEM lessons, particularly in biology (Nguyen, Lang, Luu, & Nguyen, 2022). In fine Arts education, incorporating creative design improves teaching outcomes (Davydova, 2019) while the body rhythm teaching method offers notable advantages in enhancing the quality of music and dance education (Chen & Liu, 2023; Wu & Liu, 2013). The use of active teaching aids remains inconsistent despite these advances. Many teachers still rely on traditional methods which are increasingly unsuitable for the demands of modern curriculum innovation and the evolving needs of teachers and students. Additionally, transitioning from one learning environment to another, such as moving from high school to university poses significant challenges for students (Duluţă et al., 2019; İnam, Uğurel, & Boz Yaman, 2018; Üstün & Savaş, 2010).

3. METHODOLOGY

3.1. Theory Framework

3.1.1. Research Type

This study employs a descriptive and quantitative correlation design to investigate the current state and factors influencing the implementation of active teaching methods by some teachers in the Northern region of Vietnam including the Northwest (Dien Bien, Lai Chau, Son La, Hoa Binh, Lao Cai and Yen Bai), Northeast (Ha Giang, Cao Bang, Bac Kan, Lang Son, Tuyen Quang, Thai Nguyen, Phu Tho, Quang Ninh and Bac Giang) and Red River Delta (Hanoi city, Hai Phong city, Bac Ninh, Ha Nam, Hai Duong, Hung Yen, Nam Dinh, Ninh Binh, Thai Binh and Vinh Phuc).

3.1.2. Research Method

The study utilizes a survey-based approach grounded in Everett M. Rogers' theory of educational innovation (Sahin, 2011). Data were collected through online questionnaires designed to explore the current state, readiness, and factors impacting the ability of Vietnamese teachers to implement active teaching methods in alignment with the 2018 General Education Program.

3.2. Participants

3.2.1. Sampling Procedure

The study employed a random sampling technique to select 1,291 junior high and high school teachers from the Northern region of Vietnam, ensuring a diverse range of teaching experience (from less than 5 years to over 20 years). Of the sample, 46.6% were junior high school teachers, and 53.4% were high school teachers. Regarding gender distribution, 23.8% of the participants were male teachers, and 76.2% were female teachers. The sample was further categorized based on teachers' years of experience: 9.3% had less than 5 years of experience, 5.8% had 5 to

10 years, 21.8% had 10 to 15 years, 27.4% had 15 to 20 years, and 35.6% had over 20 years of experience. Table 1 presents the distribution of survey participants based on their characteristics including gender and class type.

Table 1. Distribution of survey participants by characteristics.

Features	Percentage (%)
Seniority	
Less than 5 years	9.3
5 to 10 years	5.8
10 to 15 years	21.8
15 to 20 years	27.4
Over 20 years	35.6
Gender	
Male	23.8
Female	76.2
Grade currently taught	
Middle school	46.6
High school	53.4

The distribution of survey participants by characteristics is presented in Figure 1.

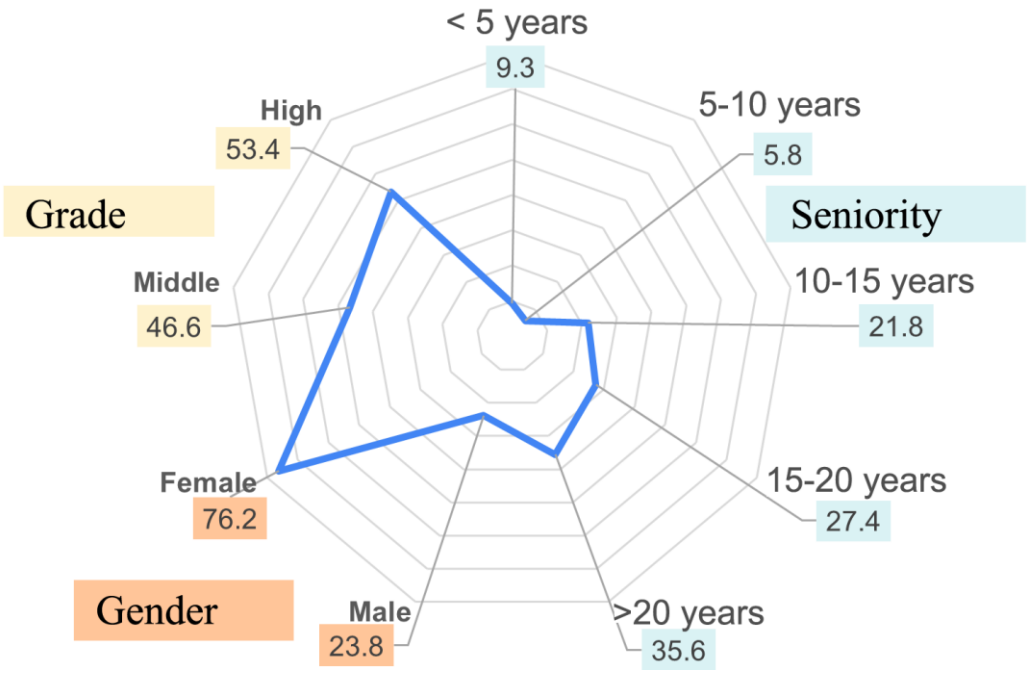

Figure 1. Radar chart of survey participants' distribution by characteristics.

3.2.2. Participant Characteristics

The participants included secondary and high school teachers of various ages and genders from diverse geographical areas, including cities, towns, rural regions, and mountainous areas in the northern region of Vietnam. This diversity provided a comprehensive perspective on the contextual factors influencing the current state and challenges in implementing active learning methods.

3.3. Data Collection and Analysis

3.3.1. Collection Tools

Data were collected through a survey questionnaire which comprised sections on participants' personal and professional backgrounds, along with items assessing the current state and influencing factors of teachers' use of active learning methods. A 5-point Likert scale ranging from strongly disagree to strongly agree was utilized.

3.3.2. Data Collection Process

The questionnaires were implemented online through email and platforms like Google Forms. For teachers with limited internet access, printed copies were distributed and collected in person. The data collection process took place from May to December 2024.

3.3.3. Survey Design and Analysis

The survey comprised 127 questions divided into seven categories. Data analysis was conducted using Exploratory Factor Analysis (EFA) in SPSS while factor correlations were examined with Smart PLS. Initial findings were summarized and categorized based on variables such as educational level and years of experience.

Table 2. Overview of survey results.

Descriptive statistics	Medium	By seniority		By level of education	
	(N=1290)	< 15 years	> 15 years	Middle school	High school
		(N=476)	(N=814)	(N=601)	(N=689)
A. Teachers' understanding of the teaching method					
Mean	4.420	4.340	4.470	4.480	4.380
Std. Deviation	0.514	0.487	0.524	0.519	0.506
B. Teachers' awareness of the teaching method					
Mean	4.540	4.590	4.520	4.560	4.530
Std. Deviation	0.527	0.526	0.526	0.523	0.531
C. Characteristics of the teaching method					
Mean	4.211	4.270	4.176	4.214	4.208
Std. Deviation	0.458	0.463	0.452	0.474	0.444
D. Level of use of the teaching method					
Mean	3.230	3.263	3.211	3.278	3.189
Std. Deviation	0.898	0.914	0.889	0.904	0.891
E. Level of effectiveness of the teaching method					
Mean	3.490	3.583	3.436	3.512	3.471
Std. Deviation	0.749	0.725	0.757	0.793	0.708
F. Level of implementation of the teaching method					
Mean	4.610	4.6	4.613	4.638	4.585
Std. Deviation	0.473	0.476	0.472	0.474	0.472
G. Effective matching of the teaching method					
Mean	4.332	4.34	4.328	4.356	4.311
Std. Deviation	0.491	0.484	0.494	0.503	0.479

4. FINDINGS

4.1. Overview

The survey results indicate that teachers have a solid understanding of active teaching methods and techniques (A) with an average score of 4.42/5. They also demonstrate a good understanding of the importance of using these methods (B) with an average score of 4.54/5 as well as the characteristics of the methods (C) with an average score of 4.21/5. However, the level of application (D) and effectiveness (E) received lower average scores at 3.23/5 and 3.49/5, respectively. This suggests that teachers possess a strong theoretical understanding of active teaching methods. Practical implementation remains challenging.

The analysis results in Table 3 show no significant differences in the average scores for factors B, C, D, E, and G between secondary and high school teachers. In other words, teachers in both groups share a good understanding of the importance of these methods (B) and their characteristics (C), but their level of application (D) and effectiveness (E) remain sub-optimal.

Noticeably, the results reveal that the junior high school group has a better understanding of active teaching methods and techniques (A) and implements them (F) more effectively than the high school group. This difference is statistically significant at a 95% confidence level.

Table 3. Independent t-test results between junior high school and high school groups.

Items		Levene's test for equality of variances		t-test for equality of means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference
A	Assumed	13.742	0.000	3.343	1288	0.001	0.096	0.029
	Not assumed			3.337	1254.914	0.001*	0.096	0.029
B	Assumed	1.562	0.212	1.152	1288	0.250	0.034	0.029
	Not assumed			1.153	1269.095	0.249	0.034	0.029
C	Assumed	3.083	0.079	0.256	1288	0.798	0.007	0.026
	Not assumed			0.255	1259.266	0.799	0.007	0.026
D	Assumed	0.002	0.961	1.775	1288	0.076	0.089	0.050
	Not assumed			1.773	1268.158	0.076	0.089	0.050
E	Assumed	6.284	0.012	0.994	1288	0.320	0.042	0.042
	Not assumed			0.987	1213.185	0.324	0.042	0.042
F	Assumed	1.381	0.240	1.998	1288	0.046*	0.053	0.026
	Not assumed			1.998	1262.834	0.046	0.053	0.026
G	Assumed	1.102	0.294	1.637	1288	0.102	0.045	0.027
	Not assumed			1.632	1245.826	0.103	0.045	0.027

Note: * A statistically significant difference at the 95% confidence level.

The analysis results in Table 4 reveal significant differences between younger teachers and more experienced teachers. Experienced teachers demonstrate a stronger understanding of active teaching methods (A) compared to younger teachers. However, younger teachers exhibit better awareness of the skills required to use the methods (B), the characteristics of the methods (C), and the effectiveness of the methods (E).

With a confidence level of 95%, factors with sig. (2-tailed) < 0.05 indicate statistically significant differences between the mean scores of the groups for factors A, B, C, and E.

Table 4. Independent t-test results between groups with < 15 years and > 15 years of experience.

Items		Levene's test for equality of variances		t-test for equality of means				
		F	Sig.	t	Df	Sig. (2-tailed)	Mean difference	Std. error difference
A	Assumed	44.661	0.000	-4.544	1288	0.000	-0.134	0.029
	Not assumed			-4.630	1052.443	0.000*	-0.134	0.029
B	Assumed	3.224	0.073	2.380	1288	0.017*	0.072	0.030
	Not assumed			2.381	995.330	0.017	0.072	0.030
C	Assumed	13.000	0.000	3.577	1288	0.000	0.094	0.026
	Not assumed			3.555	975.244	0.000*	0.094	0.026
D	Assumed	0.055	0.815	0.992	1288	0.322	0.051	0.052
	Not assumed			0.984	971.897	0.325	0.051	0.052
E	Assumed	1.339	0.247	3.430	1288	0.001*	0.148	0.043
	Not assumed			3.469	1029.071	0.001	0.148	0.043
F	Assumed	0.758	0.384	-0.348	1288	0.728	-0.010	0.027
	Not assumed			-0.347	987.757	0.729	-0.010	0.027
G	Assumed	0.003	0.954	0.412	1288	0.681	0.012	0.028
	Not assumed			0.414	1010.677	0.679	0.012	0.028

Note: * A statistically significant difference at the 95% confidence level.

4.2. Analysis of the Measurement Model (Outer Model)

4.2.1. Quality of Observed Variables

According to the correlation model of observed variables shown in Figure 2, Hair, Hult, Ringle, and Sarstedt (2016) stated that the outer loading factor must be greater than or equal to 0.708 for an observed variable to be

considered of high quality. Since 0.7082=0.50.708^2 = 0.50.7082=0.5, this indicates that the latent variable explains at least 50% of the variation in the observed variable.

The assessment of the quality of observed variables (indicator reliability) revealed that several variables in Group D (D1, D2, D3, D4, D5, D7, D9, D10, D11, D12, D13, D14, D15, D18, D20, D21, D22, D23, D24, D26, D27) and Group E (E1, E2, E3, E4, E5, E7, E9, E10, E11, E12, E13, E14, E15, E18, E21, E22, E23, E24, E26, E27) had outer loading factors below 0.7. Consequently, these variables were excluded from the calculations.

The eliminated variables are also not included in the overall analysis results presented in Section 1.

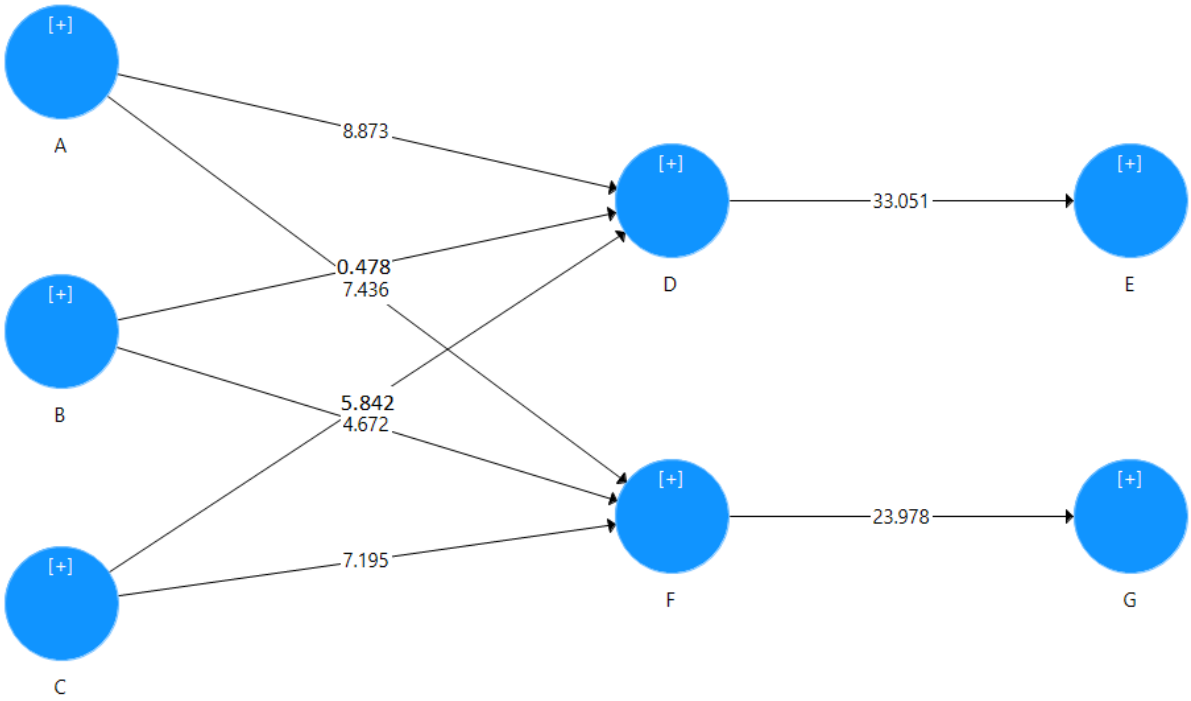

Figure 2. Correlation model between factors.

Details of the quality of variables are shown in Table 5. Variables with loading coefficients below 0.7 will be eliminated.

Table 5. Quality of observed variables.

Items	C	D	E	F	G
C.1	0.745				
C.10	0.859				
C.11	0.791				
C.12	0.777				
C.13	0.856				
C.14	0.860				
C.15	0.875				
C.16	0.874				
C.17	0.858				
C.18	0.832				
C.19	0.788				
C.2	0.807				
C.20	0.835				
C.21	0.852				
C.22	0.837				
C.23	0.857				
C.24	0.844				
C.25	0.842				
C.3	0.817				

Items	C	D	E	F	G
C.4	0.815				
C.5	0.825				
C.6	0.813				
C.7	0.858				
C.8	0.800				
C.9	0.825				
D.1		0.593			
D.10		0.532			
D.11		0.523			
D.12		0.467			
D.13		0.352			
D.14		0.311			
D.15		0.609			
D.16		0.753			
D.17		0.712			
D.18		0.522			
D.19		0.758			
D.2		0.601			
D.20		0.667			
D.21		0.550			
D.22		0.687			
D.23		0.542			
D.24		0.413			
D.25		0.716			
D.26		0.546			
D.27		0.596			
D.28		0.766			
D.29		0.797			
D.3		0.226			
D.30		0.781			
D.31		0.698			
D.4		0.384			
D.5		0.613			
D.6		0.739			
D.7		0.609			
D.8		0.745			
D.9		0.418			
E.1			0.665		
E.10			0.634		
E.11			0.597		
E.12			0.578		
E.13			0.476		
E.14			0.461		
E.15			0.671		
E.16			0.800		
E.17			0.737		
E.18			0.548		
E.19			0.802		
E.2			0.652		
E.20			0.743		
E.21			0.640		
E.22			0.750		
E.23			0.638		
E.24			0.604		

Items	C	D	E	F	G
E.25			0.790		
E.26			0.686		
E.27			0.703		
E.28			0.784		
E.29			0.816		
E.3			0.417		
E.30			0.808		
E.31			0.743		
E.4			0.552		
E.5			0.706		
E.6			0.768		
E.7			0.664		
E.8			0.765		
E.9			0.551		
F.1				0.763	
F.10				0.828	
F.11				0.840	
F.12				0.824	
F.13				0.845	
F.14				0.826	
F.15				0.802	
F.16				0.806	
F.17				0.803	
F.18				0.777	
F.19				0.767	
F.2				0.769	
F.3				0.809	
F.4				0.740	
F.5				0.824	
F.6				0.778	
F.7				0.802	
F.8				0.812	
F.9				0.830	
G.1					0.797
G.10					0.856
G.11					0.867
G.12					0.846
G.13					0.859
G.14					0.863
G.15					0.833
G.16					0.831
G.17					0.832
G.18					0.823
G.19					0.830
G.2					0.818
G.3					0.820
G.4					0.794
G.5					0.820
G.6					0.818
G.7					0.845
G.8					0.843
G.9					0.849

4.2.2. Reliability and Convergence of the Scale

After removing variables that did not meet quality standards, the model was further tested for reliability and convergence. According to Hair et al. (2016) the reliability threshold (CR) should be 0.7 or higher. Hock and Ringle (2010) recommend that the Average Variance Extracted (AVE) should be 0.5 or higher to ensure scale convergence.

The results in Table 6 confirm that the scale meets the criteria for both reliability and convergence.

Table 6. Reliability and convergence of the scale.

Item	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
C	0.981	0.982	0.982	0.689
D	0.941	0.943	0.950	0.655
E	0.955	0.957	0.961	0.690
F	0.969	0.970	0.972	0.645
G	0.976	0.976	0.977	0.696

The discriminant validity of the scale is presented in Table 7. Traditionally, discriminant validity has been assessed using the square root of the AVE index as proposed by Fornell and Larcker (1981). However, this method has certain limitations and a more accurate approach is recommended.

Henseler, Ringle, and Sarstedt (2015) conducted simulation studies and demonstrated that discriminant validity is better evaluated using the HTMT (Heterotrait-Monotrait) index. According to Garson (2016), discrimination between two latent variables is ensured when the HTMT index is less than 1. Henseler et al. (2015) further suggested that a value below 0.9 guarantees discriminant validity. Clark and Watson (1995) and Kline (2015) proposed a stricter threshold of 0.85.

The results in Table 7 confirm that the observed variables in the scale meet the criteria for discriminant validity.

Table 7. Discriminant validity of the HTMT scale.

Items	A	B	C	D	E	F
B	0.236					
C	0.236	0.498				
D	0.242	0.109	0.190			
E	0.167	0.197	0.275	0.729		
F	0.276	0.280	0.308	0.142	0.208	
G	0.233	0.346	0.409	0.162	0.293	0.609

4.3. Analysis of the Structural Model (Inner Model)

4.3.1. Impact Relationship

The impact relationships between the factors are summarized in Table 8. At a 95% confidence level, all research factors exhibit significant relationships, except for teachers' perception of the importance of method-use skills (B) in relation to the level of use and effectiveness of the methods (D).

Table 8. Impact relationship.

Impact	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
A -> D	0.204	0.204	0.027	7.431	0.000
B -> D	-0.014	-0.016	0.032	0.439	0.660
C -> D	0.142	0.144	0.032	4.419	0.000
A -> F	0.196	0.195	0.029	6.877	0.000
B -> F	0.137	0.137	0.030	4.504	0.000
C -> F	0.188	0.191	0.034	5.526	0.000
D -> E	0.692	0.692	0.017	39.986	0.000
F -> G	0.593	0.592	0.024	24.399	0.000

4.3.2. Level of Influencing Factors

The results in Table 9 evaluate the extent to which the research factors explain variations in student satisfaction. Teachers' awareness of the characteristics of the method (D) is the primary factor accounting for 47.9% of the variation in the effectiveness of the method (E). Similarly, the level of implementation of the method (F) is a major factor explaining 35.1% of the variation in the effectiveness of skills (G).

The f-square index indicates the strength of the influence of independent variables. According to the thresholds proposed by Cohen (1998) f-square value of less than 0.02 represents a very small effect while a value greater than 0.35 indicates a large effect. The results in Table 9 show teachers' theoretical awareness of the method A. Understanding of the method. B. Awareness of the importance of using the method. C. Understanding the characteristics of the method has minimal influence on the level of use (D and F) and the effectiveness of the method (E and G).

Table 9. Explanation level of influencing factors.

Impact	Loading factor			F-square	R-square
	Direct effect	Indirect effect	Total effect		
A->D	0.204		0.204	0.042	0.070
C->D	0.142		0.142	0.016	
A->E		0.141	0.141		0.479
C->E		0.098	0.098		
D->E	0.692		0.692	0.920	
A->F	0.196		0.196	0.042	0.146
B->F	0.137		0.137	0.016	
C->F	0.188		0.188	0.031	
A->G		0.116	0.116		0.351
B->G		0.081	0.081		
C->G		0.112	0.112		
F->G	0.593		0.593	0.542	

The findings in Table 9 indicate that theoretical factors (A, B and C) are not the primary determinants of the effectiveness of active teaching methods (E and G). Instead, the regular application of practical methods (D and F) plays a more significant role. This result aligns with active teaching which emphasizes learner initiative and engagement. Regular use of active teaching methods contributes significantly to achieving favorable outcomes.

A detailed evaluation of each factor in Tables 2 and 3 show that in the group of factors A and F, junior high school teachers scored higher on average compared to high school teachers. This difference is statistically significant. This suggests that the creative learning environment at the junior high school level is more conducive to active teaching than that at the high school level.

Regarding teaching experience, teachers with more than 15 years of seniority had a higher average score than those with less than 15 years of seniority in the factor of understanding methods (A). However, for factors B, C, and E, the group with more than 15 years of experience also achieved better results. This can be attributed to the education sector's dynamics where senior teachers tend to have a stronger theoretical foundation and a well-established repertoire of teaching methods. On the other hand, younger teachers excel in the practical implementation of these methods.

The study highlights a potential approach to improving the effectiveness of active teaching methods by combining the experience of senior teachers with the technical and innovative approaches of younger teachers.

5. DISCUSSION

The study's findings indicate that Vietnamese teachers possess a strong theoretical understanding of active teaching methods as reflected in their high mean scores for theoretical awareness (A: 4.42/5), recognition of the importance of these methods (B: 4.54/5) and comprehension of their characteristics (C: 4.21/5). These results

suggest that teacher training and professional development programs have effectively enhanced teachers' theoretical knowledge and awareness of active teaching strategies (Ha, Khanh, Ngo, & Tien, 2023).

Younger teachers have greater flexibility, creativity, and adaptability. They excel in integrating technology, leveraging modern educational resources and fostering strong student engagement. These elements enable them to select and apply active teaching methods, catering to diverse learning needs. In addition, university training programs especially those affiliated with high-quality, key, and international institutions provide comprehensive instruction in innovative teaching methodologies.

A comparative analysis of middle and high school teachers reveals that middle school teachers express a higher awareness and understanding of active teaching methods (A) than the other subject. This discrepancy may stem from curricular differences. Middle school curricula emphasize foundational cognitive skills while high school instruction is more exam-oriented often preventing the opportunity of applying active teaching strategies.

Furthermore, experienced teachers (>15 years) demonstrate a stronger grasp of the theoretical foundations of active teaching methods (A) compared to their less experienced peers (<15 years). However, this deep theoretical knowledge is often attached with a preference for traditional instructional approaches making it more challenging for older teachers to utilize active learning techniques in their teaching practices.

5.1. Challenges and Recommendations for the Implementation of Active Teaching Methods

The practical application of active teaching methods remains limited despite possessing strong theoretical knowledge. The study recorded low mean scores in implementation (D: 3.23/5) and effectiveness (E: 3.49/5) highlighting difficulties in translating theoretical understanding into classroom practice. Several key barriers contribute to this gap: *1) Curriculum Pressure*: High school teachers face demanding curricula with subject-intensive content and the pressure of national examinations. The strong emphasis on exam results often leads to a preference for teacher-centered methods that prioritize knowledge transmission over interactive, student-centered approaches (Kim, 2023; Seon & Oh, 2013). *2) Insufficient Facilities and Technology*: Many schools lack the necessary infrastructure, instructional materials, and technological resources required for effective implementation of active teaching strategies. Poor classroom conditions significantly hinder the adoption of interactive pedagogies. *3) Classroom Constraints*: Large class sizes and diverse student learning abilities present logistical challenges in applying active teaching strategies effectively. While younger teachers demonstrate higher levels of methodological skills (B), understanding of methodological characteristics (C) and effectiveness (E) compared to their senior colleagues, their ability to implement these methods is often restricted by systemic challenges.

5.2. Recommendations for Enhancing Active Teaching Practices

The following measures are proposed to bridge the gap between theoretical knowledge and practical application: *1) Enhancing Teacher Training and Professional Development*: Strengthen professional development programs with a focus on the practical application of active teaching methods. Special attention should be given to training middle school teachers and experienced teachers , equipping them with strategies to integrate active learning techniques into their classrooms. *2) Improving Teaching Conditions* : Allocate resources to enhance school facilities, provide access to technological tools, and ensure the availability of modern instructional materials. These improvements will support the implementation of interactive and student-centered learning environments. *3) Reducing Exam Pressure*: The Ministry of Education should consider revising curricula and assessment methods to alleviate exam-related stress. Reforms should shift the focus from rote memorization to skill development and interactive learning approaches (Kim, 2023; Zeleke & Kibret, 2022). *4) Conducting Further Research*: Comprehensive studies should be conducted to examine additional factors influencing the implementation of active teaching methods, such as class size, socioeconomic conditions, and regional cultural differences. Gathering student

perspectives on the effectiveness and engagement of active teaching strategies will provide valuable insights into their impact on learning outcomes.

Vietnamese teachers can transition from theoretical awareness to effective practical application, fostering more interactive and student-centered learning environments by addressing these challenges and implementing these recommendations.

6. CONCLUSION

This study assessed teachers' awareness, skills, and effectiveness in implementing active teaching methods, examined influencing factors and proposed strategies for development. It identified key challenges and solutions related to the application of active teaching methods in Vietnam's education system. Findings indicate that teachers generally hold positive and consistent views on the theory and significance of active teaching methods, reflecting the impact of training programs in raising awareness. However, a significant gap exists between theoretical understanding and practical application, particularly among high school teachers and those with over 15 years of experience. Key obstacles include exam-driven curricula, limited resources, and large class sizes with diverse student abilities. These factors contribute to moderate implementation and effectiveness, especially in activities requiring high interaction or extensive resource support.

Younger teachers (with less than 15 years of experience) illustrate stronger adoption of active teaching methods, taking advantage of modern training programs and a greater readiness for innovative pedagogical techniques. This trend highlights a promising shift in instructional approaches among current educational reforms.

Based on these findings, the study emphasizes a multi-faceted approach to improve active teaching methods: 1) Strengthen Professional Development: Focus on practical skills and equip teachers with tools to adapt modern educational theories and active teaching methods to diverse school contexts. Digital transformation training should provide a holistic perspective for educators across Vietnam. 2) Enhance Teaching Conditions: Invest in facilities, technology, and teaching materials to reduce practical challenges faced by teachers. 3) Revise Curriculum: The Ministry of Education should reduce exam pressure, particularly at the high school level, to facilitate effective implementation of active teaching methods. Additionally, the study recommends student feedback surveys and analyses of regional, cultural, and socio-economic factors to promote a more comprehensive understanding of active teaching methods in Vietnam.

In a nutshell, this study brings valuable insights to the relationship between teachers' awareness, practice, and effectiveness in implementing active teaching methods. Its recommendations aim to develop educational quality, drive innovation in pedagogy, and align teaching practices with the objectives of Vietnam's new general education program.

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