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External Determinants of Learning Motivation among Vietnamese Pedagogical Students: Evidence from PLS-SEM

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Abstract

In the context of significant transformations in Vietnamese higher education (VHE) under the impact of digital transformation and educational reform, identifying the factors influencing learning motivation (LM) of Vietnamese Pedagogical Students (VPSs) is becoming increasingly urgent. Based on the integration of theoretical approaches and recent studies on LM, and considering the cultural and educational context of Vietnam, this study aims to examine the extent and differences in the influence of external factors on VPSs' LM. Four factors were proposed: (1) the role of lecturers, (2) institutional support, (3) infrastructure, technology, and learning resources, and (4) family and community encouragement. This study employed a quantitative survey design involving 587 students from two public teacher training universities in Vietnam. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The results indicate that all four factors have a positive impact on LM, with lecturer role showing the strongest influence (β = 0.429), followed by institutional support (β = 0.270), infrastructure and resources (β = 0.148), and family support (β = 0.091). These findings provide contextual evidence on how external conditions shape LM and offer policy implications for improving teacher education quality through strengthening pedagogy, digital capacity, and equitable access to learning resources.

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INTRODUCTION

Students' learning motivation (LM) is a dynamic combination of many factors (Betari et al., 2021; Nirmala et al., 2025; Widyastuti, 2025; Widarti et al., 2024), including external factors such as the role of faculty (Akram & Li, 2024; Kadiresan et al., 2021) support from the school and organizations through academic and financial aid mechanisms (Goldrick-Rab et al., 2016; Raboca & Cărbunărean, 2024), infrastructure, technology and learning resources (Cespón & Lage, 2022; Lu et al., 2023; UNESCO, 2024) and encouragement from family and community (Gao & Abad, 2023; Nguyen et al., 2021). For VPSs, LM is of particular importance because it is closely related to the professional development of pre-service teachers and their future responsibilities in the national education system (H. T. M. Nguyen, 2016; Hoang & Wyatt, 2021; Tran et al., 2023).

Empirical studies have confirmed the crucial role of instructors in shaping students' learning attitudes and academic achievement, even in challenging circumstances (Akram & Li, 2024; Bomia et al., 1997; Chu et al., 2021; Kadiresan et al., 2021; Nguyen & Tran, 2022; Phan & Nguyen, 2011; Pradhan et al., 2021; Whitehead, 1984; Yunus & Paimin, 2019;). Clarity regarding the teaching and pedagogical competence of instructors promotes student engagement and LM (Chu et al., 2021; Higgins et al., 2002; Kalaitzopoulou et al., 2023). Furthermore, faculty members who demonstrate

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enthusiasm, responsibility, and frequent interaction will facilitate psychological support, especially for students living far from home (Akram & Li, 2024). In digital learning contexts, instructor presence, responsiveness in discussions, and timely feedback remain essential in maintaining student engagement and motivation (Chu et al., 2021; Rahim, 2022).

The study carried out by Yunus & Paimin (2019) found that strong institutional support for both academic guidance and financial support plays an important role when it comes to improving the LM of students. They stated that this institutional support can help in either enhancing academic success or improving students' mental health. Academic counseling and guidance from advisory teams help reduce dropout rates and improve student academic performance (Kuh et al., 2006; Krause & Coates, 2008; Raboca & Cărbunărean, 2024; Tinto, 1994). Support in terms of administrative processes and responsive student services is particularly important for freshmen (Eisenberg et al., 2007). Financial support plays a crucial role in the context of low-income students, helping them overcome barriers to further their education (Goldrick-Rab et al., 2016).

In addition, the quality of educational infrastructure and learning resources directly influences students' LM by shaping their learning experience and access to knowledge (Dunn & Kennedy, 2019; Pradhan et al., 2021; Sen & Leong, 2020). The quality of facilities is positively correlated with learning (Do et al., 2016). Access to high-speed internet, LMS platforms, and digital content has transformed university learning worldwide (Dahlstrom et al., 2014; Rodríguez et al., 2020), increasing student engagement (Cespón & Lage, 2022; Camacho-Sánchez et al., 2024; Scholz et al., 2021). Technological support also promotes flexible, personalized learning, especially when integrated with asynchronous learning methods (Lu et al., 2023). Open access to academic databases, e-books, and scientific journals enhances autonomy and promotes self-directed learning (UNESCO, 2024).

Equally important, empirical evidence confirms that the family and social environment significantly influences LM (Do et al., 2023; Liu & Helwig, 2022). Even when learners live away from home, family support- emotional, financial, or psychological remains crucial (Gao & Abad, 2023; Grajcevci & Shala, 2017; Nguyen et al., 2021; Yunus & Paimin, 2019). However, excessive parental expectations can lead to stress and reduced motivation, especially in competitive systems (Wang, 2015). Peer support, collaboration, and a sense of belonging within communities also contribute to strengthening students' motivation and engagement (Putnam et al., 2003; Wentzel & Skinner, 2022).

To explain these relationships, this study integrates three complementary theoretical perspectives: Self-Determination Theory (SDT), Expectancy-Value Theory (EVT), and the Technology Acceptance Model (TAM). SDT emphasizes the role of autonomy, competence, and relatedness in fostering motivation (Deci & Ryan, 1985). EVT suggests that LM is formed from expectations of success and the perceived value of the learning task. These factors can be enhanced through academic advising, career guidance, and especially financial support to reduce barriers to continuing education (Eisenberg et al., 2007; Goldrick-Rab et al., 2016; Kuh et al., 2006; Krause & Coates, 2008; Raboca & Cărbunărean, 2024; Tinto, 1994; Yunus & Paimin, 2019). TAM highlights how perceived usefulness and ease of use of technology influence engagement in digital learning environments (Davis, 1989; Dahlstrom et al., 2014; Lu et al., 2023; Rodríguez et al., 2020). By integrating these frameworks, this study provides a more comprehensive understanding of how external factors shape learning motivation.

Although the theoretical frameworks presented above have provided explanations for external factors influencing learners' LM, applying these models in isolation in research reveals several significant limitations. Meanwhile, research based on the integrated approach framework (Chen et al., 2023; Wang et al., 2024; Yue & Lu, 2022) is limited in number and lacks research evidence on this issue in relation to pedagogical practice. This shift is particularly relevant to Vietnam, where higher education is both influenced by Confucian tradition and is undergoing comprehensive reform (Le et al., 2019; Ngo & Tran, 2024; Van Dao & Hayden, 2019).

Previous research in Vietnam has primarily focused on internal factors such as learning attitudes, self-confidence, and personal aspirations (Ca et al., 2021; Do et al., 2016; Nga & Kiệt, 2016), with less attention given to external influences. The rapid digital transformation, accelerated by the COVID-19 pandemic, has highlighted the importance of learning environments, institutional support, and technological access in shaping student motivation (Ho et al., 2020; Phan et al., 2023).

However, most studies focus on students in fields such as economics and engineering, while research on teacher-training students remains limited (Hoang & Wyatt, 2021; Nguyen T. T. V., 2016; Tran et al., 2023).

Research on the LM of VPSs is also shaped by cultural, social, and educational conditions and contexts. Confucian values view education as a path to achieving social recognition and status advancement, thus reinforcing family expectations and achievement-oriented motivations (Blanco-Novoa et al., 2021; Grajcevci & Shala, 2017; Nguyen et al., 2021; Nguyen T. T. V., 2016; Truong et al., 2017). At the same time, educational reforms and resource disparities create inequalities in learning conditions. The COVID-19 pandemic has further transformed higher education systems and learning modalities, creating both opportunities and challenges for maintaining student motivation (Bao, 2020; Coman et al., 2020; Mali & Lim, 2021; Cobo-Rendón et al., 2022; Khan et al., 2025; UNESCO IESALC, 2020).

Based on these gaps, this study proposes a four-factor framework comprising faculty role, institutional support (including academic and financial mechanisms), infrastructure and technology, and family and community involvement to examine their influence on the learning motivation of VPSs. By employing an integrated SDT–EVT–TAM framework (Davis, 1989; Deci & Ryan, 1985; Eccles & Wigfield, 2002). This study contributes theoretically by offering a more comprehensive model of external influences on motivation and practically by providing empirical evidence to support policymakers and teacher-training institutions in designing strategies to enhance learning motivation among Vietnamese pre-service teachers.

METHOD

Research Design

This study employed a quantitative, cross-sectional survey design to examine the influence of external factors on LM of VPSs. The research model was grounded in the integration of SDT-EVT-TAM, aiming to explain how instructional, institutional, technological, and socio-cultural dimensions shape students' motivation in teacher education contexts. All constructs were conceptualized as reflective latent variables. The hypothesized relationships were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM), which is appropriate for predictive modeling and theory development in complex research frameworks (Radhi et al., 2025; Triyoga et al., 2025). Based on theoretical foundations and reflections within the cultural and educational context of Vietnam, we propose the following research model (see Fig.1)

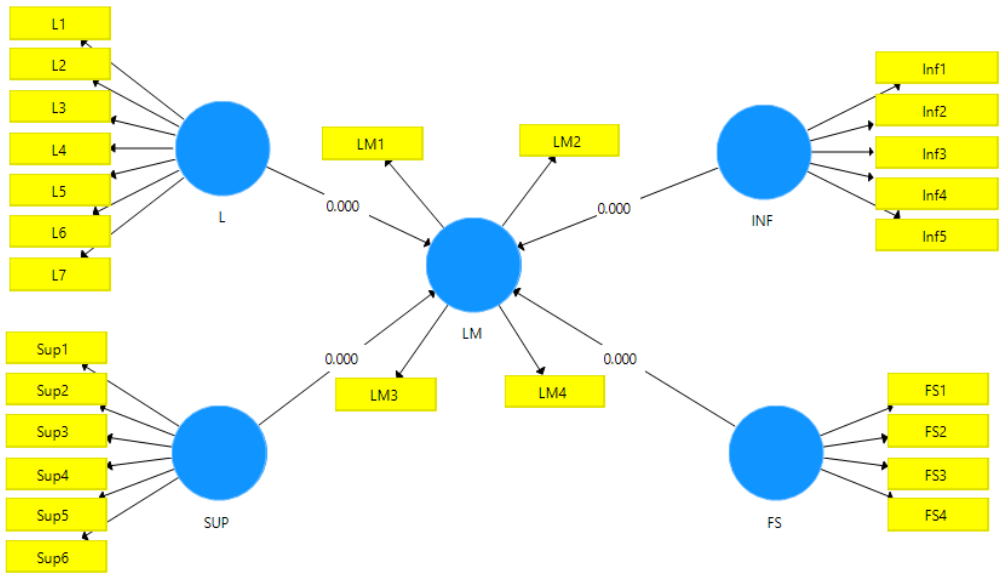

Figure 1. Proposed Research Model

Note: L = The roles of lecturers; INF = Infrastructure & Resources; SUP = Supports; FS = Family & Community; LM = Learning motivation.

Research Hypotheses

H1: Lecturers positively influence the LM of VPSs.
H2: Institutional supports positively influence the LM of VPSs.
H3: Infrastructure, technology, and learning resources positively influence the LM of VPSs.
H4: Family and community positively influence the LM of VPSs.

Participants

The study surveyed responses from a total of 587 students (Male=14.5%; Female=85.2%, others: 0.3%) of Hanoi National University of Education and Ho Chi Minh City National University of Education, Vietnam, using a convenience sampling method due to accessibility and institutional constraints, with the following characteristics of sample structure in terms of gender, major, and residential area (see Table 1). The gender distribution of the sample reflects the actual demographic characteristics of teacher education programs in Vietnam, where female students typically constitute the majority.

Table 1. Demographic Characteristics of The Sample (N=587)

	Items	Frequency	Percent
Gender	Male	85	14.5
	Female	500	85.2
	Others	2	0.3
Subject	Natural Science	166	28.3
	Social sciences and humanities	243	41.4
	Educational Science	128	21.8
	Other	50	8.5
Place of residence	Mountainous	73	12.4
	Rural	344	58.6
	Urban	170	29.0
Students' years at university	First-year student	42	7.2
	Second-year student	425	72.4
	Third-year student	46	7.8
	Final-year student	74	12.6
Total		**587**	**100**

Instrument Development

The instrument of measurement was constructed using a comprehensive review of previous studies on the issues of learning motivations and environmental factors in higher education. Existing scales that had been used before were adjusted for the context of Vietnam. There were five variables in the questionnaire, namely: The roles of the lecturers (L) – 7 questions; Supports (SUP) – 6 questions; Infrastructure & resources (INF) – 5 questions; Family and community supports (FS) – 5 questions; and Learning Motivation (LM) – 4 questions. All statements were rated on a 5-point Likert Scale, wherein 1 meant 'Strongly Disagree' while 5 indicated 'Strongly Agree'. To test for clarity and reliability, a pilot study was carried out using 85 VPSs. Minor changes were made before conducting the actual study.

Data Collection Procedure

Data were collected using an online survey using Google Forms. The participation in the survey was both voluntary and anonymous. The participants were made aware of the objectives of the survey and that it would be confidential before filling out the survey. Data screening was conducted to exclude incomplete and inconsistent surveys.

Data Analysis

The data analysis was done using SPSS 26.0 and SmartPLS 4.0 software. The process involved two steps. Firstly, descriptive statistics were used to analyze the characteristics of the sample.

Secondly, data screening was done to check for missing values, outliers, normality, and multicollinearity.

Second, the measurement scales were evaluated for reliability and validity (Suherman et al., 2025). Internal consistency was assessed using Cronbach's Alpha. Exploratory Factor Analysis (EFA) was performed to examine the underlying factor structure, with sampling adequacy verified through the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test.

Subsequently, PLS-SEM was applied to assess the measurement and structural models. Composite reliability (CR) and average variance extracted (AVE) were used to evaluate convergent validity, while discriminant validity was examined using the heterotrait–monotrait ratio (HTMT). Structural relationships were tested using bootstrapping with 5,000 resamples. Path coefficients, R^2, and effect sizes (f^2) were examined at a 0.05 significance level.

RESULTS AND DISCUSSION

Descriptive statistics of external factors and learning motivation of VPSs

Table 2 presents the descriptive statistics of external factors influencing the LM of VPSs. Overall, respondents reported relatively high perceptions of "*the roles of lecturers*" (M = 4.37, SD = 0.883), "*family and community engagement*" (M = 4.21, SD = 0.949), and "*the support of the training room, youth union and related departments*" (M = 4.17, SD = 0.929). *"Infrastructure, technology, and learning resources"* received comparatively lower evaluations (M = 3.83, SD = 1.019).

Among the lecturer-related items, L7 (learning rewards) and L5 (meaningful interaction) received the highest mean scores, indicating that motivational encouragement and teacher–student engagement are highly valued. Among the factors, the most highly rated is the semester planning within the supports (Sup2). Among the infrastructure factors, the interface of training software (Inf4) was rated highest, while internet availability (Inf2) was rated low with higher variations. Financial support from the family (FS2) and support from family and peers (FS3) have received very high ratings, implying that socio-cultural support is still an important motivator. These findings provide an initial overview before structural model testing.

Table 2. Feedback from VPSs about the Influence of External Factors on the LM

Code	Describe	SD	Mean	Rank
	The roles of lecturers			
L1	The lecturer clearly stated the objectives, teaching plan, and curriculum of the subject.	.879	4.40	4
L2	The tutor provides a variety of learning materials with specific instructions.	.911	4.27	6
L3	The tutor was friendly and enthusiastic, helping me feel comfortable and interested in the lesson.	.886	4.36	5
L4	The tutor's diverse teaching methods helped me have more motivation to study and complete assigned tasks.	.905	4.26	7
L5	I like teachers who regularly interact and share meaningful issues in studying and life.	.867	4.44	2
L6	The clear and timely feedback from teachers is very important to us because I feel that I receive attention.	.854	4.42	3
L7	We like the rewards that encourage active learning from the tutor.	.880	4.45	1
	Overall average	**0.883**	**4.37**	
	The support of the training room, youth union and related departments			
Sup1	The school regularly reports the situation, has financial support policies, and provides academic advice to students	.916	4.18	2
Sup2	The training department arranges clear plans and timetables for each semester	.888	4.26	1
Sup3	The political and student affairs department performs well in promoting, and rewarding students	.938	4.11	6

Code	Describe	SD	Mean	Rank
Sup4	The testing and accreditation center designs appropriate forms of course assessment	.926	4.16	3
Sup5	The student union, student association, and club have many activities to support students' learning	.945	4.12	5
Sup6	Keeping in touch with academic advisors helps us plan our studies better.	.966	4.15	4
	Overall average	**0.929**	**4.17**	
	Infrastructure, technology and learning resources			
Inf1	The school has facilities and infrastructure to ensure a comfortable learning space for us	.939	3.89	4
Inf2	Stable connection, students can access quickly, search for documents and study conveniently	1.257	3.30	5
Inf3	Diverse and rich learning resources including traditional and digital learning materials.	.930	4.00	2
Inf4	The training software interface is reasonably designed and easy to use.	.941	4.06	1
Inf5	The IT support and consulting team responds promptly when problems occur	1.028	3.91	3
	Overall average	**1.019**	**3.83**	
	Family and community engagement			
FS1	My parents often contact me to ask about my studies at school.	.969	4.15	3
FS2	My family provides timely financial support for my studies.	.908	4.34	1
FS3	My parents and friends encourage me whenever I have difficulties in studying.	.935	4.24	2
FS4	Participating in community activities helps me have more motivation to excel in my studies.	.987	4.11	4
	Overall average	**0.949**	**4.21**	

Source: Survey data and analysis on SPSS 26.0 software

Measurement model assessment

The measurement model was evaluated using established guidelines for reflective measurement models in PLS-SEM, including indicator reliability, internal consistency reliability, convergent validity, and discriminant validity.

Indicator reliability

Indicator reliability was examined through outer loadings. As shown in Table 3, all standardized loadings exceeded the recommended threshold of 0.70, ranging from 0.760 to 0.926. Most indicators demonstrated strong loadings above 0.85, indicating that the items share substantial variance with their respective latent constructs.

Inf2 had the lowest loading value at 0.760, but it is still greater than the minimum acceptable value of 0.708, which implies that it accounts for more than half of the variation in the latent variable. As all items satisfied the required standards, no item indicators were excluded from the analysis.

Table 3. Outer Loadings of Measurement Items

	FS	INF	L	LM	SUP
FS1	0.867				
FS2	0.848				
FS3	0.907				
FS4	0.846				
Inf1		0.887			

	FS	INF	L	LM	SUP
Inf2		0.760			
Inf3		0.922			
Inf4		0.905			
Inf5		0.904			
L1			0.905		
L2			0.899		
L3			0.913		
L4			0.891		
L5			0.911		
L6			0.897		
L7			0.893		
LM1				0.875	
LM2				0.897	
LM3				0.926	
LM4				0.871	
Sup1					0.900
Sup2					0.895
Sup3					0.918
Sup4					0.924
Sup5					0.900
Sup6					0.859

Note: L = The roles of lecturers; INF = Infrastructure & Resources; SUP = Supports; FS = Family & Community; LM = Learning motivation.

Internal consistency, reliability, and Convergent validity

The internal consistency of the scales was evaluated through Cronbach's Alpha, rho_A, and Composite Reliability (CR). The values for Cronbach's Alpha were between 0.890 (FS) and 0.962 (L), surpassing the acceptable value of 0.70. Values of composite reliability also ranged between 0.924 and 0.968, reinforcing the internal consistency of all the constructs tested. While some constructs, such as L and SUP, presented composite reliability values greater than 0.95, which could signify redundancy of items, according to content analysis of the items, these items are measuring complementary aspects of the constructs, not redundancy.

Table 4. Construct Reliability and Convergent Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
FS	0.890	0.896	0.924	0.752
INF	0.925	0.944	0.943	0.770
L	0.962	0.962	0.968	0.813
LM	0.915	0.916	0.940	0.796
SUP	0.953	0.953	0.962	0.809

The AVE for all constructs varied from 0.752 (FS) to 0.813 (L), which is significantly higher than the minimum required level of 0.50. It is evident from this that the respective construct accounts for over 75 percent of the variance among the indicators of that construct. The high AVE also confirms that the indicators converge well with the respective constructs.

Discriminant validity

For the assessment of discriminant validity, the HTMT measure was used, as it has been argued to be a more robust criterion compared to the traditional Fornell–Larcker approach. Referring to Table 5, it is worth noting that HTMT measures did not exceed the stringent standard of 0.85 for almost all of them. The highest values of HTMT are recorded for: Lecturers' Roles (L) vs. Supports (SUP): 0.854; Supports (SUP) vs. Learning Motivation (LM): 0.814; Lecturers' Roles (L) vs. Learning Motivation (LM): 0.821.

The threshold of the HTMT measure between L and SUP (0.854) just marginally exceeded the stringent threshold of 0.85, but still did not exceed the relatively generous threshold of 0.90, widely accepted in the social sciences. Thus, the results can be explained by the fact that the two constructs under study represent the concept of the influence of the institution (lecturers' roles and supports), while the learning motivation construct, although referring to the same institution, reflects students' individual perception of its activities. Therefore, the results of discriminant validity analysis can be interpreted as acceptable; however, their interpretation should be made with caution.

Table 5. Heterotrait - Monotrait Ratio matrix

	FS	INF	L	LM	SUP
FS					
INF	0.278				
L	0.300	0.689			
LM	0.364	0.716	0.821		
SUP	0.330	0.818	0.854	0.814	

Given that there is adequate reliability of indicators, internal consistency, convergent validity, and discriminant validity of the constructs under consideration, then it means that the measurement model has excellent psychometrics. All the constructs under study have surpassed the minimum thresholds in accordance with the PLS-SEM criteria.

Structural model assessment

The structural model was analyzed to test the predictive effect of the external variables on LM among VPSs. Figure 2 shows the structural model with standardized regression weights and the R^2 of the dependent variable LM. According to the results, roles have the greatest effect on LM, then comes supports, followed by infrastructures & resources, and lastly family & community. An R^2 value of 0.666 denotes a great power of the model. See statistical outputs in Tables 7–10.

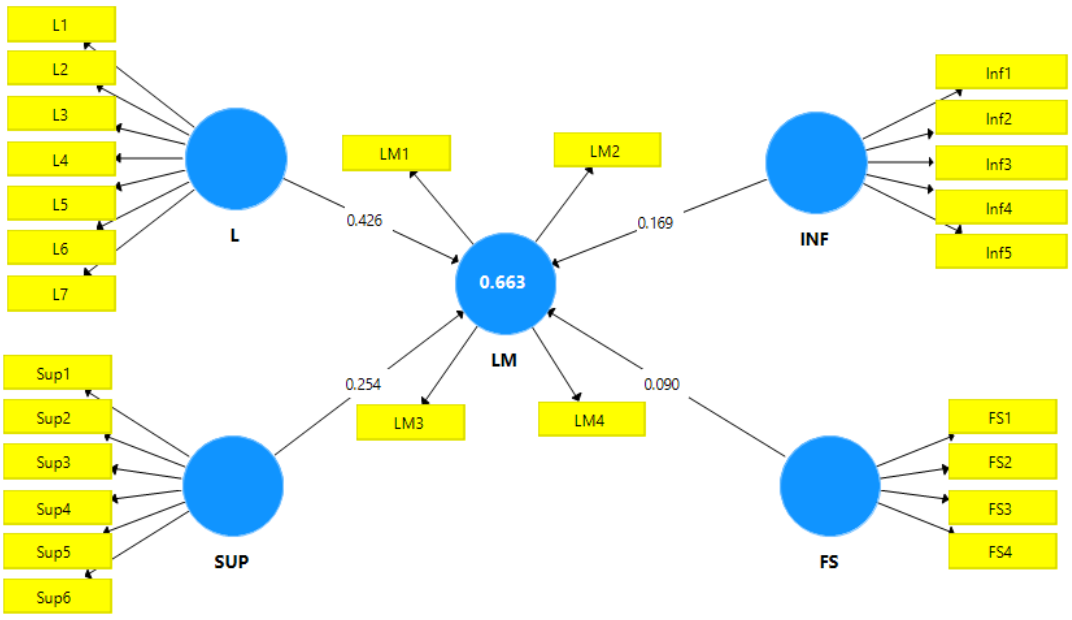

Figure 2. Structural Model Results with Standardized Path Coefficients and R^2 Values

Collinearity assessment

According to Table 7, multicollinearity was evaluated based on the Variance Inflation Factor (VIF) values. The VIF factors are between 2.051 and 4.974 and are all lower than 5, indicating that there is no multicollinearity issue in the regression model.

While many factors related to L and SUP have rather high VIF values, including L5 (4.974), L3 (4.812), and Sup4 (4.870), they are still within tolerable ranges. Consequently, the estimates for structural parameters should be reliable since there is no sign of multicollinearity issues.

Table 7. Variance Inflation Factor (VIF) Values

Item	VIF	Item	VIF
FS1	2.283	L5	4.974
FS2	2.287	L6	4.195
FS3	3.023	L7	4.135
FS4	2.195	LM1	2.680
Inf1	3.103	LM2	3.060
Inf2	2.051	LM3	3.898
Inf3	4.095	LM4	2.430
Inf4	3.755	Sup1	3.843
Inf5	3.557	Sup2	3.784
L1	4.189	Sup3	4.435
L2	4.681	Sup4	4.870
L3	4.812	Sup5	3.887
L4	4.222	Sup6	2.891

Path coefficient significance

As shown in Table 8, all proposed associations have positive and significant effects at the 0.01 significance level. The lecturer's role (L) has the most considerable influence on learning motivation (LM), with $\beta = 0.426$, $t = 8.357$, and p-value < 0.001. Institutional support (SUP) also significantly predicts LM ($\beta = 0.254$, $t = 4.387$, $p < 0.001$), followed by infrastructure and learning resources (INF) ($\beta = 0.169$, $t = 4.052$, $p < 0.001$). Family and community support (FS) exhibits the lowest but statistically significant impact ($\beta = 0.090$, $t = 3.398$, $p = 0.001$).

All values of t are greater than the critical value of 1.96, thus implying that the results are statistically significant at 95% confidence levels. The high similarity between the estimates from the original sample data and bootstrap means supports this finding.

Table 8. Path Coefficients and Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
FS -> LM	0.090	0.091	0.027	3.398	0.001
INF -> LM	0.169	0.169	0.042	4.052	0.000
L -> LM	0.426	0.423	0.051	8.357	0.000
SUP -> LM	0.254	0.256	0.058	4.387	0.000

Coefficient of determination (R^2) and effect size (f^2)

According to Table 9, the coefficient of determination R^2 is 0.666, and the adjusted R^2 is 0.663. This means that 66.6% of the variance in learning motivation can be predicted from L, SUP, INF, and FS. A coefficient of determination at such a high percentage is regarded as very significant in the field of education and behavior studies.

Table 9. Coefficient of Determination

	R Square	R Square Adjusted
LM	0.666	0.663

The effect size results reported in Table 10 indicate that lecturers' roles have a medium effect on LM ($f^2 = 0.178$). In contrast, institutional support ($f^2 = 0.044$), infrastructure ($f^2 = 0.033$), and family support ($f^2 = 0.022$) demonstrate small effect sizes. These findings suggest that while multiple contextual factors significantly influence learning motivation, lecturers' roles represent

the dominant predictor within the model, whereas the remaining constructs function as complementary contributors.

Table 10. Effect Size (f^2)

	FS	INF	L	LM	SUP
FS				0.022	
INF				0.033	
L				0.178	
LM					
SUP				0.044	

In summary, the structure model fulfills all the required evaluation criteria in that it has good collinearity values (see Table 7), path coefficients that are statistically significant (see Table 8), sufficient explanatory power (see Table 9), and consistent effect sizes theoretically (see Table 10). All these features make the model valid and predictive of LM amongst VPSs.

Regional differences

A one-way ANOVA was performed to assess whether regional differences exist in perceptions of external factors that may influence students' motivation to learn. From Table 11, it is clear that all three groups had mean scores above 3.84 but below 4.40. Nevertheless, there were no statistically significant differences for any variables, such as lecturers (F=0.694, p=.500), institutional assistance (F=0.874, p=.418), infrastructure (F=2.593, p=.076), family and community support (F=0.604, p=.547), and general learning motivation (F=0.283, p=.754). It seems that there are no significant differences in the perceptions of external influences in relation to learning motivation among urban, rural, and mountainous groups.

Table 11. Comparison of the Impact of External Factors on the LM of VPSs by Region

Factor	Region	Mean	SD	F	Sig. (p)
L	Urban	4.33	0.85	0.694	.500
	Rural	4.40	0.78		
	Mountainous	4.33	0.75		
Sup	Urban	4.10	0.91	0.874	.418
	Rural	4.20	0.80		
	Mountainous	4.16	0.81		
Inf	Urban	3.84	0.96	2.593	.076
	Rural	4.03	0.83		
	Mountainous	3.97	0.83		
FS	Urban	4.26	0.69	0.604	.547
	Rural	4.19	0.82		
	Mountainous	4.25	0.74		
LM	Urban	4.18	0.89	0.283	.754
	Rural	4.23	0.83		
	Mountainous	4.17	0.83		

Academic year differences

Similarly, a one-way ANOVA was performed to examine differences across academic years. As presented in Table 12, mean scores remained consistently high across first-year to final-year students (3.91–4.50). No statistically significant differences were observed for lecturers (F = 1.082, p = .425), supports (F = 0.937, p = .357), infrastructure (F = 1.964, p = .120), family support (F = 0.775, p = .510), or overall LM (F = 0.890, p = .447). These findings suggest that students' perceptions remain relatively stable throughout their academic progression.

Table 12. Comparison of the Impact of External Factors on the LM of VPSs by Academic Year

Factor	First-year	Second-year	Third-year	Final-year	F	Sig. (p)
L	4.44	4.35	4.50	4.40	1.082	0.425
Sup	4.37	4.15	4.24	4.12	0.937	0.357
Inf	4.29	3.91	4.16	4.01	1.964	0.120
FS	4.21	4.15	4.24	4.12	0.775	0.510
LM	4.43	4.16	4.38	4.29	0.890	0.447

Discussion

The present study has analyzed the effect of external factors on LM in the case of VPS students. This research provides empirical evidence that all the proposed variables have a positive and significant effect on LM (Chen et al., 2023; Wang et al., 2024). However, among the four variables, the variable of lecturer's involvement shows the highest correlation with LM, followed by support from infrastructure and resources, and family and community encouragement.

Lecturers emerge as the most significant predictor of LM. This finding reinforces the extensive body of literature emphasizing the importance of instructor–student interaction, feedback quality, and motivational support (Akram & Li, 2024; Higgins et al., 2002; Kadiresan et al., 2021; Kalaitzopoulou et al., 2023; Phan & Nguyen, 2011). In line with previous studies, students in Vietnamese educational establishments hold interaction and motivational assistance from their lecturers in high regard. Positive feedback and engagement seem to serve as the crucial means by which lecturers promote competence beliefs and continuous academic efforts among the learners (Bomia et al., 1997). Based on theoretical grounds, one possible interpretation of this study's findings is that the SDT can provide a framework in which the interaction between the lecturers and students, along with feedback, serves as an essential component in the satisfaction of students' needs for competence and relatedness (Deci & Ryan, 1985). In Vietnam and similar Eastern Asian settings, the teacher is considered to be an authority figure both morally and intellectually, as illustrated by the saying "nhất tự vi sư, bán tự vi sư" (Truong et al., 2017). These findings indicate that relational and pedagogical dimensions of teaching remain central to sustaining student motivation.

Stability through institutional support: Institutional support showed the second-highest impact on LM, revealing the importance of well-defined academic institutions in motivating learners. Research shows that Vietnamese learners tend to appreciate institutional arrangements, advice from faculty members, and financial assistance schemes (Khan et al., 2015; Phan et al., 2023). When students view their institution as being well-structured, open, and supportive, they become more inclined to feel academically secure and goal-committed. This finding can also be attributed to the Expectancy–Value Theory (EVT), where the role of the institution could increase students' expectancy for achievement and task value because it eliminates academic and monetary obstacles.

The influence of infrastructure, technologies, and resources on learning motivation was observed to be relatively low compared to other factors, seemingly contrary to policy expectations in terms of national digital transformation in education. It has become clear that the use of technology to facilitate learning motivation in higher education is one of the major global trends(Dunn & Kennedy, 2019; Pradhan et al., 2021; Sen & Leong, 2020;). From the perspective of TAM theory, infrastructure and digital tools might be seen as facilitating conditions that affect perceived usefulness and perceived ease of use (Davis, 1989) and, hence, indirectly motivate learners' behavior rather than being direct motivators. In response to the pandemic outbreak, Vietnamese higher educational organizations have quickly embraced digital-based teaching and learning processes (Cespón & Lage, 2022). Nevertheless, the limited impact noted in this study may be due to structural limitations (Khan et al., 2015). These findings suggest that technology alone is insufficient to drive motivation unless it is meaningfully integrated with pedagogical practices (Camacho-Sánchez et al., 2024)

Encouragement within the family and community showed the least structural impact despite positive views among the students regarding familial support (Blanco-Novoa et al., 2021). This could be explained by the fact that there seems to be a development of a phase in emerging

adulthood where university students are less likely to depend on family for motivation to study daily. Although family support is still an important variable in the background, the learning environment seems to play a more significant role. This finding does not negate the significance of family support; it only indicates that at this stage in life, the influence of motivation would come from other sources.

The absence of significant differences across regions and academic years represents an important finding. This stability may be attributed to the relatively homogeneous educational culture in Vietnam, where shared values such as respect for lecturers, discipline, and collective academic goals are deeply embedded. Such cultural consistency may reduce variability in how external factors influence motivation (Nguyen et al., 2021). In addition, centralized governance, standardized curricula, and national-level policies may contribute to similar learning conditions across institutions. These findings suggest that motivational patterns among VPSs operate within a structurally and culturally consistent system.

In addition to the above empirical explanations, the research also holds important theoretical and policy implications for future development. This research adds insight to the existing literature on LM in TE through the identification of the relatively heavier influence of external variables. According to the results obtained, it seems as though the motivation of VPSs is mainly determined by the relations and institutions, especially the role of lecturers and the institution, but not the physical aspect, like infrastructure and family background. Such results imply a combined SDT-EVT-TAM approach wherein the motivational process is seen as the interrelation between psychological needs, expectancy-value theory, and usefulness perception (Davis, 1989; Deci & Ryan, 1985; Eccles & Wigfield, 2002). The hierarchical effects uncovered from the model add to the body of knowledge on motivation theory by showing how different external variables exert varying degrees of influence in centrally controlled higher education institutions. Through the use of Vietnam as a case study, the paper adds to the previous literature on the topic, considering its culture and context.

The results have several policy implications. Firstly, there is a need to emphasize the lecturers' ability to conduct themselves in a pedagogically sound manner. Programmes that will involve the enhancement of feedback skills, student engagement tactics, as well as diversification of instruction are expected to have significant motivational consequences (Chu et al., 2021; Rahim, 2022). Improving the relationship elements of pedagogy might be significantly more influential than merely increasing access to technology. Secondly, it is necessary to maintain open academic procedures, effective advice systems, and consistent financial support. Institutional reliability seems to act as a buffer that enhances the students' academic security and commitment towards their course. In professional courses such as teacher training, consistent administrative processes may increase the students' commitment towards their careers. Thirdly, although investment in ICT will be essential for meeting national transformation requirements, ICT investment ought to form part of the pedagogical change process and not as an alternative approach. Technology works best when it forms part of a systematic design process together with the lecturer’s competency. Fourthly, the lack of any form of demographic difference implies that systemic solutions can be generalized without the need for extensive regionalization. Similar patterns of motivational behavior among all groups indicate a possibility of a unified approach at the national level to boost motivation among teacher educators.

LIMITATIONS

It is important to point out several limitations that need to be considered when analyzing the findings obtained. First, the cross-sectional nature of the research prevents drawing any causal conclusions, and thus, the results obtained should be interpreted only in terms of association. Longitudinal research design could be considered as one of the means to overcome this problem in future work. Second, the use of self-reporting measures in the current research may have led to CMB as well as social desirability effects. Although the anonymity of participants was ensured in the current research, statistical analysis of CMB was not performed. Thus, this limitation should be addressed in future studies in order to ensure higher validity of the findings. Third, the gender composition of the sample used is somewhat skewed, with females representing the majority of

participants. Even though this represents a natural situation within Vietnam's teacher education programs, it introduces some potential gender bias. Finally, only external factors were considered in the current study.

CONCLUSION

Sustaining LM in the backdrop of the ongoing digital transformation and modernization of education is fraught with many difficulties for TEIs in Vietnam. This research study empirically shows that external contextual factors have a substantial effect on the development of LM among VPSs. Out of the four factors analyzed, the most influential was the lecturers' roles, while the least important factor was that of infrastructure and learning resources. The lack of statistical differences between the regions and the academic year also suggests that there is a fairly stable motivational framework within the national TEI system. The present study makes a contribution to existing knowledge in light of a theoretical foundation that encompasses SDT, EVT, and TAM. According to the findings, learning motivation in the field of teacher education can be seen as being influenced by pedagogical interaction and institutional reliability, and not merely by technology or environmental aspects. In terms of practice, there is a need for greater emphasis on developing the pedagogical skills of teachers, building institutional infrastructures, and investing in digital resources in line with innovations in instruction. However, there is a need for continued cooperation between universities, families, and policymakers. Generally, this study highlights that improving students' learning motivation in teacher training calls for concerted action that combines good pedagogy, stability, and contextual support in the wider context of the HE transformation process in Vietnam.

AUTHOR CONTRIBUTIONS

HTT and NTTT have made equal contributions to the empirical investigation carried out for this work, which includes the concept formation, literature review, analysis, and writing of the manuscript. Both authors have approved the final version of the manuscript.

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