

RESEARCH ARTICLE

Determinants of learner satisfaction with the quality of pharmacy education at a private university in Vietnam

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Abstract

Background: Learner satisfaction is a key indicator of training quality and institutional competitiveness in higher education. However, empirical evidence on the determinants of satisfaction among pharmacy learners in Vietnam's private university sector remains limited. This study aims to identify determinants of learner satisfaction with the quality of pharmacy education at a private university in Vietnam and to compare satisfaction between current students and alumni. **Methods:** A cross-sectional descriptive study was conducted in 2024, including 315 valid responses (109 current students; 206 alumni) at Thanh Do University. Data were analysed using Cronbach's alpha, exploratory factor analysis (EFA), multiple linear regression, and the independent-samples t-test. **Results:** Four determinants were identified: Training Programme (TP) ($\beta = 0.477$), Institutional image and reputation (IIR) ($\beta = 0.442$), Faculty and support staff (FSS) ($\beta = 0.365$), and Facilities and learning resources (FLR) ($\beta = 0.338$). All showed positive and statistically significant associations with overall learner satisfaction. The model explained 66.7 percent of the variance in satisfaction. Alumni reported significantly higher satisfaction than current students (mean $\pm$ SD: 3.54 ± 0.62 versus 3.16 ± 0.72 ; Cohen's $d = 0.582$; $p < 0.001$). **Conclusion:** Private pharmacy education providers should prioritise improving Training Programme (TP) quality. Feedback from students and alumni supports continuous quality assurance and accreditation compliance.

Introduction

Learner satisfaction has emerged as a core indicator of educational quality and institutional effectiveness in higher education, receiving sustained attention in both research and policy discourse. Satisfaction reflects the degree to which student expectations are met and predicts consequential outcomes including enrolment persistence, positive institutional advocacy, and alumni engagement (Ghobehei *et al.*, 2019). These dynamics carry particular weight for private universities, which face pronounced accountability pressures and must justify higher tuition fees through demonstrable educational value (Venkateswarlu *et al.*, 2020).

In pharmacy education, satisfaction data hold additional significance because pharmacy training requires students to acquire not only theoretical knowledge but also clinical skills and professional attitudes for safe and effective practice (International Pharmaceutical Federation, 2017). Satisfaction therefore functions as a multidimensional quality signal spanning both the learning process and graduate preparedness, a function now formalised in Vietnamese policy. Circular No. 04/2025/TT-BGDĐT, effective from April 2025, mandates that programmes establish and benchmark stakeholder satisfaction as a condition of accreditation (MOET, 2025). Accordingly, institutions require empirical evidence on the determinants of satisfaction to prioritise quality improvement resources effectively.

Despite growing research interest, four gaps in the existing literature motivate the present study.

First, the practical context highlights an important need for empirical evidence. As of 2024, Vietnam had 42 higher education institutions offering pharmacy programmes, comprising 25 private (60%) and 17 public (40%) institutions. Despite private institutions representing the majority of pharmacy education providers, empirical evidence on learner satisfaction in this sector remains limited (Ha *et al.*, 2026). Second, most existing studies have focused on public training institutions or large universities (Nguyen, 2023; Thang *et al.*, 2025; Vu & Tran, 2022), leaving the determinants of satisfaction in the private university context insufficiently understood. Private universities operate under distinct conditions in terms of governance arrangements, financing structures, and learner expectations. For these institutions, learner satisfaction is particularly relevant because perceived educational value and institutional reputation can influence their ability to attract and retain students in a competitive higher education environment. These contextual characteristics may shape how learners evaluate training quality, yet their implications for learner satisfaction remain insufficiently understood. Third, prior studies in Vietnam have primarily surveyed students enrolled in college-level pharmacy programmes (Nguyen, 2023; Vu & Tran, 2022) or three-year bridging programmes from intermediate vocational training to university level (Thanh-Thao *et al.*, 2024). In contrast, students in the five-year full-time undergraduate pharmacy programme in Vietnam, who experience the complete and continuous training pathway from foundational sciences to clinical education, have not been studied to an extent commensurate with their central role in undergraduate pharmacy education. Fourth, most satisfaction research has focused on current students at a single point in time, with limited work comparing current students and alumni using the same measurement framework. The study by Duarte and colleagues (2012) in Portugal is among the few that compared satisfaction between current students and alumni and showed that the relative contribution of determinants explaining satisfaction differed markedly between the two groups. Alumni perspectives are particularly valuable because graduates can assess the Training Programme's relevance and value in light of their workplace experience. This perspective complements employer-based evidence from Vietnam showing that workplace evaluations of BPharm graduates are strongly associated with graduates' knowledge, skills, autonomy, and responsibility (Trang *et al.*, 2026). Integrating learner perspectives during and after training may therefore provide a more comprehensive

assessment of educational quality across the learning process and subsequent professional practice.

Building on the theoretical and practical gaps outlined above, this study aimed to examine the determinants of learner satisfaction with the quality of pharmacy education at a private university in Vietnam and to compare satisfaction between current students and alumni using the same measurement framework. The study extends previous research in two respects. First, by simultaneously examining current students and alumni within the same five-year BPharm programme, it captures evaluations of training quality from both ongoing educational experience and retrospective post-graduation perspectives. Second, by focusing on a private university, the study provides empirical evidence from an underexamined but substantial sector of pharmacy education in Vietnam, with findings that may inform continuous quality improvement and quality governance in private pharmacy education.

Learner satisfaction in higher education is conceptualised as a cumulative evaluative state that forms through repeated comparisons between perceived experiences and prior expectations across the course of study. The present study draws primarily on Oliver's Expectancy Disconfirmation Theory (EDT), which proposes that satisfaction arises when experiences meet or exceed prior expectations (Oliver, 1980). EDT is particularly relevant here because current students and alumni rely on different evaluative reference points: students assess the programme against pre-enrolment expectations, whereas alumni incorporate post-graduation experience into retrospective judgements. In the private higher education context, Zeithaml's Perceived Value Theory further suggests that higher tuition fees intensify scrutiny of programme quality (Zeithaml, 1988). Consistent with this view, Dhawan (2022) identified academic quality and support services as the strongest predictors of satisfaction across higher education settings.

Determinants of learner satisfaction

(1) Training Programme (TP): The training programme constitutes the core academic component through which professional competence is developed, and its quality has been consistently identified as a primary predictor of learner satisfaction in pharmacy education (Thanh-Thao *et al.*, 2024). Recent scholarship indicates a shift from an emphasis on curricular comprehensiveness to a learner-centred focus on preparedness for professional practice, aligned with international pharmacy competency frameworks (Katoue & Schwinghammer, 2020; International Pharmaceutical Federation, 2014; Nguyen *et al.*, 2024).

H1: The quality of the Training Programme (TP) has a positive effect on learner satisfaction in pharmacy education.

(2) Faculty and Support Staff (FSS): The quality of faculty and support staff influences learner satisfaction through multiple pathways, encompassing teaching expertise, the quality of academic feedback, assessment fairness, and the responsiveness of non-academic support services. A meta-analysis by Caskurlu *et al.* (2020) reported a moderate-to-strong positive association between teaching presence, defined as the visible and active engagement of instructors in the learning environment, and learner satisfaction. In the Vietnamese context, Thang *et al.* (2025) found that a factor capturing staff responsiveness, respectful interactions, and assessment transparency had the strongest influence on satisfaction among postgraduate pharmacy learners, suggesting that the role of support systems may become more pronounced as learners acquire greater professional autonomy.

H2: The quality of Faculty and Support Staff (FSS) has a positive effect on learner satisfaction in pharmacy education.

(3) Facilities and Learning Resources (FLR). In pharmacy education, physical infrastructure extends beyond providing a comfortable study environment: laboratories, practice equipment, simulation spaces, and digital learning resources are prerequisites for developing clinical competence. Evidence from Vietnam supports this view; Thanh-Thao *et al.* (2024) and Thang *et al.* (2025) each identified facility quality as a key determinant of pharmacy learner satisfaction at the undergraduate and postgraduate levels, respectively (Thang *et al.*, 2025). Under Circular No. 04/2025/TT-BGDĐT, adequate practice facilities are a mandatory condition for programme accreditation, further underscoring the non-discretionary status of this determinant (MOET, 2025).

H3: The quality of Facilities and Learning Resources (FLR) has a positive effect on learner satisfaction in pharmacy education.

(4) Institutional Image and Reputation (IIR): Institutional reputation shapes learner satisfaction both prospectively, by generating expectations before enrolment, and concurrently, by influencing how learners interpret the value of ongoing academic experiences (Spence, 1978). In private higher education, reputation also functions as a direct component of perceived value relative to tuition fees, as well as a signal of the qualification's labour market standing (Finch *et al.*, 2013).

H4: Institutional Image and Reputation (IIR) has a positive effect on learner satisfaction in pharmacy education

Empirical evidence from Vietnam, 2020 to 2025: Between 2020 and 2025, a growing number of empirical studies began to examine learner satisfaction in health-related education in Vietnam, providing an important comparative base for the present study (Thanh-Thao *et al.*, 2024; Tran *et al.*, 2023; Thang *et al.*, 2025). Overall, evidence from Vietnam during 2020 to 2025 highlights two key points. First, the Training Programme and teaching staff consistently emerge as important determinants across studies. Second, the relative strength of determinants varies substantially by level of study and training mode. Notably, research that compares current students and alumni within the same five-year undergraduate programme remains limited, and this is the gap the present study seeks to address.

On the basis of the theoretical review and the empirical evidence presented above, this study proposes a model with four groups of determinants affecting learner satisfaction with the quality of pharmacy education: (1) Training Programme (TP) (H1); (2) Faculty and support staff (FSS) (H2); (3) Facilities and learning resources (FLR) (H3); and (4) Institutional image and reputation (IIR) (H4). Together, these determinants capture core academic elements, quality enabling conditions, and the signalling value of education in the private university context.

In addition to the four determinant hypotheses, the study proposes a group comparison hypothesis. Prior evidence suggests that although overall satisfaction may be broadly similar between current students and alumni, the relative importance of satisfaction determinants may shift after graduation (Duarte *et al.*, 2012). Pharmacy alumni may also evaluate programmes retrospectively through the lens of professional competence and workplace relevance (Elshami *et al.*, 2023). Accordingly, the study proposes the following hypothesis.

H5: There is a statistically significant difference in satisfaction with the quality of pharmacy education between current students and alumni at Thanh Do University.

Methods

Research design

A cross-sectional descriptive study was conducted from March to December 2024 at Thanh Do University,

Vietnam, to assess learner satisfaction with the quality of pharmacy education.

Two participant groups were included: (i) current students enrolled in the five-year undergraduate pharmacy education programme (Training Programme, TP) at Thanh Do University and (ii) alumni who had graduated from the same five-year programme in the three most recent cohorts. Exclusion criteria were withdrawal from study, academic suspension, compulsory discontinuation, refusal to participate, prior participation in the pretest, or inability to be contacted.

Both groups were approached using a census within the accessible population. However, data collection procedures were tailored to the characteristics of each group.

Measurement instrument

Data were collected using a structured questionnaire developed from the literature review and adapted from previously validated scales. The instrument measured four independent determinant groups, namely (1) Training Programme (TP), (2) Faculty and support staff (FSS), (3) Facilities and learning resources (FLR), and (4) Institutional image and reputation (IIR), together with overall learner satisfaction as the dependent variable. All items were rated on a five-point Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied). Overall learner satisfaction was assessed separately using a single item rated on the same five-point scale.

Instrument development comprised three steps. First, a draft questionnaire was constructed based on the literature and existing validated measures, then adapted to fit the study context and participants. Second, content validity was assessed by a panel of five experts in pharmacy education and quality management, including senior academic staff and quality assurance managers with more than ten years of experience. The expert review evaluated contextual relevance, content coverage, and clarity of wording. Based on expert feedback, six items were reworded to improve clarity and suitability for pharmacy education in Vietnam. Third, a pretest was conducted with 30 representative participants. The pretest results showed Cronbach's alpha values above 0.80 for all scales, indicating adequate internal consistency prior to the main survey.

Data collection procedures

Current students (N = 118): The questionnaire was embedded in the learning management system, PTM EMS Education, and administered at the end of each module, when students had completed the full learning

experience and were able to provide informed evaluations. The system was configured with sequential access, meaning that students completed the survey within the same login session before their module results were displayed. This approach was used to achieve an adequate response rate in a small accessible population and is consistent with accepted practice in health professions education research conducted in settings with limited cohort sizes (Draugalis *et al.*, 2008; Phillips *et al.*, 2016). Students were informed in advance that completing the survey would not affect their academic results and that they could exit the system at any time without disadvantage. Responses were not linked to student identities, ensuring full anonymity. In total, 109 of 118 responses were valid, yielding a response rate of 92.4 percent.

Alumni (N = 384): An online questionnaire was distributed using Google Forms through the university's contact lists via email, telephone, and Zalo. To improve response rates, the research team implemented scheduled reminders and used multiple contact channels. Participation was entirely voluntary. Quantitative items were set as required to minimise systematic missing data, whereas demographic questions were optional. A total of 206 of 384 responses were valid, corresponding to a response rate of 53.6 percent.

After the survey closed, data were cleaned using predefined criteria to remove low-quality responses, including straight-lining across the scale and repetitive patterned answers. The final analytical sample comprised 315 valid questionnaires, including 109 current students and 206 alumni, with an overall response rate of 62.75 percent.

Statistical analysis

Data were coded and analysed using SPSS version 27. Scale reliability was assessed using Cronbach's alpha. Factor structure was examined using exploratory factor analysis with principal component extraction and Varimax rotation. Sampling adequacy and suitability for factor analysis were evaluated using the Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity (Hair Jr *et al.*, 2019). The effects of the determinants on overall satisfaction were estimated using multiple linear regression, reporting standardised coefficients β , adjusted R^2 , and the overall F test. Multicollinearity was assessed using variance inflation factors. Differences in satisfaction between current students and alumni were examined using the independent samples *t*-test, with effect size quantified using Cohen's *d* (Cohen, 2013). Statistical significance was set at $p < 0.05$.

Research ethics

The study was approved by the Executive Board of Thanh Do University. All participants were informed of the study objectives and their right to withdraw. Data collection was anonymous and used exclusively for research purposes.

Results

Participant characteristics

The survey was distributed to 502 learners comprising 118 current students and 384 alumni, yielding 335

initial responses. Following data cleaning, 315 valid responses were retained for analysis, representing an overall response rate of 62.75%. Female participants comprised 79.68% of the sample, consistent with the gender distribution typically observed in pharmacy in Vietnam. Current students accounted for 34.60% of the sample ($n = 109$; mean age 20.61 years) and alumni for 65.40% ($n = 206$; mean age 25.57 years). Detailed characteristics are presented in Table I.

Table I: Participant characteristics (n = 315)

Characteristic		Frequency	Percentage (%)
Sex	Male	64	20.32
	Female	251	79.68
Age, mean (min to max)	Current students	20.61 (19 to 28)	
	Alumni	25.57 (24 to 39)	
Participant group	Current students	109	34.60
	Alumni	206	65.40

Scale reliability and exploratory factor analysis

Scale reliability assessment

Prior to exploratory factor analysis, the reliability of the observed items was examined using Cronbach's alpha. Items were retained if the scale-level Cronbach's alpha was at least 0.60, the corrected item total correlation exceeded 0.30, and the value of Cronbach's alpha if the item was deleted was not higher than the overall alpha for the scale.

Reliability testing indicated that the study scales showed acceptable to very good internal consistency, with alpha values above 0.60 and most items meeting the corrected item total correlation threshold of 0.30. Specifically, the scales for Facilities and learning resources (FLR) ($\alpha = 0.875$), Training Programme (TP) ($\alpha = 0.927$), and Faculty and support staff (FSS) ($\alpha = 0.898$) demonstrated good reliability, and all items were retained. For the Institutional image and reputation (IIR) scale, although Cronbach's alpha was acceptable ($\alpha = 0.818$), two items did not meet the item total correlation criterion: IIR 15, which assessed whether the university regularly organised extracurricular activities, networking events, and professional seminars to support skills development and career orientation ($r = 0.233$), and IIR 16, which assessed whether the university supported graduates' job seeking and ensured alignment between the training programme and labour market needs ($r = 0.206$). As both correlations were below 0.30, IIR15 and IIR16

were removed to improve scale quality prior to subsequent analyses. Overall, the retained instrument comprised four factors with 30 independent observed items measuring the perceived quality of the pharmacy education training programme and was considered reliable for further exploratory factor analysis.

Exploratory factor analysis results (EFA)

After the scales had met the required reliability criteria, exploratory factor analysis was conducted using principal component extraction with Varimax rotation. The purpose was to reduce the initial 30 independent observed items into meaningful factor groups and to assess the structural validity of the measurement scales. The Kaiser-Meyer-Olkin value was 0.948, indicating excellent sampling adequacy, and Bartlett's test of sphericity was statistically significant ($p < 0.001$). These results confirm that the data were suitable for exploratory factor analysis.

In the first EFA solution, four factors were extracted with a minimum eigenvalue of 1.555, explaining 62.325 percent of the total variance, which exceeds the commonly accepted threshold of 50 percent. However, the item FLR 5, which assessed the campus landscape and learning environment, showed cross-loading on two factors and did not meet the requirement for adequate convergent validity. The item was therefore removed, and EFA was repeated.

The second EFA, based on 29 observed items, again supported a four-factor structure. The Kaiser-Meyer-Olkin value remained high at 0.947, and Bartlett's test remained significant ($p < 0.001$). Four factors were extracted with a minimum eigenvalue of 1.540, explaining 62.528 percent of the cumulative variance. All retained items had factor loadings above 0.50,

supporting convergent and discriminant validity. The rotated factor matrix is presented in Table II.

Following two rounds of exploratory factor analysis, four factors were extracted: (1) Training Programme (TP), (2) Faculty and support staff (FSS), (3) Facilities and learning resources (FLR), and (4) Institutional image and reputation (IIR).

Table II: Results of the second exploratory factor analysis (n=315)

Rotated factor matrix							
No.	Item content	Factor				Mean (SD)	SD
		1	2	3	4		
TP20	The volume of specialised subject knowledge is appropriately designed and aligns with learners' career orientation.	0.786				3.38	0.95
TP22	The curriculum is updated periodically to meet practical needs.	0.767				3.43	0.96
TP21	The Training Programme (TP) emphasises the development of essential soft skills, such as communication, teamwork, and critical thinking.	0.764				3.48	0.99
TP17	The programme workload and number of credits are appropriate for the programme duration.	0.761				3.54	0.98
TP19	The volume of foundational subject knowledge is appropriately designed.	0.738				3.28	0.93
TP18	The curriculum maintains an appropriate balance between theory and practice.	0.731				3.32	0.96
TP25	Assessment methods are diverse and objective and accurately reflect learners' competence.	0.724				3.37	0.97
TP23	The curriculum is delivered as planned and meets the intended timeline.	0.715				3.46	0.91
TP24	Class size is allocated appropriately.	0.694				3.31	0.96
FSS32	Support staff are friendly and willing to address learners' needs.		0.764			3.6	0.92
FSS31	Faculty assess learners' academic performance accurately and fairly.		0.759			3.57	0.95
FSS30	Faculty promote self directed learning, creative thinking, practical skills, and research skills.		0.745			3.59	0.82
FSS29	Faculty are enthusiastic and supportive both during and outside class hours.		0.726			3.61	0.81
FSS27	Faculty provide comprehensive module information, including objectives, content, learning materials, and assessment methods.		0.714			3.5	0.87
FSS28	Faculty use effective and clear teaching methods.		0.690			3.68	0.89
FSS26	Faculty have strong professional knowledge and continuously update teaching content in line with pharmacy practice.		0.572			3.57	0.95
FLR8	University dormitories provide good living and study conditions, including hygiene, security, and facilities.			0.828		3.11	0.92
FLR7	The canteen meets hygiene standards and provides food at reasonable prices.			0.767		2.86	0.99
FLR2	Practice laboratories have sufficient equipment and chemicals to meet learning and research needs in pharmacy.			0.687		3.22	0.84
FLR6	Facilities adequately support sports and extracurricular activities.			0.673		3.29	0.95
FLR4	The university internet connection is stable and fast.			0.659		2.55	1.04
FLR1	Lecture rooms provide sufficient seating and are equipped with essential facilities, including sound, lighting, and projectors.			0.618		3.19	0.89
FLR3	The library provides a comfortable space, diverse resources, and regularly updated materials.			0.578		3.01	0.95
IIR12	The university has clear and appropriate learning support policies, such as scholarships and financial support.				0.784	3.68	0.89

Rotated factor matrix						
No.	Item content	Factor				Mean (SD)
		1	2	3	4	
IIR14	The university places emphasis on receiving and responding to learner feedback.				0.730	3.6
IIR13	The university website provides comprehensive, diverse, and regularly updated information.				0.724	3.74
IIR10	The university location is convenient for learners' study and daily living.				0.717	3.59
IIR11	The programme tuition fee, 900,000 VND per credit, is considered affordable by most learners.				0.700	3.44
IIR9	The university has a good reputation in pharmacy education.				0.506	3.46
Overall satisfaction						3.41
Eigenvalues						0.68
Variance explained (%)						
Cumulative variance (%)						
		11.697	2.956	1.940	1.540	
		20.025	15.341	14.053	13.109	
		20.025	35.365	49.419	62.528	

Note: TP = Training Programme; FSS = Faculty and support staff; FLR = Facilities and learning resources; IIR = Institutional image and reputation.

Multiple linear regression analysis

After the four main factors had been identified, multiple linear regression was used to estimate the effect of each determinant on overall learner satisfaction with the quality of the pharmacy education programme. The regression model showed good fit (adjusted $R^2 = 0.667$, $p < 0.001$). Multicollinearity was not a concern, with VIF values of 1.000 for all predictors. All standardised coefficients were positive

and statistically significant, indicating that each determinant was positively associated with overall learner satisfaction (Table III).

The standardised regression equation was:

$$\text{Overall satisfaction} = 0.477 \cdot \text{TP} + 0.365 \cdot \text{FSS} + 0.338 \cdot \text{FLR} + 0.442 \cdot \text{IIR}$$

All four determinants were statistically significant ($p < 0.001$), supporting H1 to H4.

Table III: Multiple linear regression results (dependent variable: overall satisfaction)

Coefficients ^a								
Model		Unstandardised coefficient		Standardised coefficient	t	Sig.	Multicollinearity statistics	
		β	SE				Tolerance	VIF
1	(Constant)	3.406	0.022		153.582	0.000	1.000	1.000
	FAC1_2_TP	0.325	0.022	0.477	14.646	0.000	1.000	1.000
	FAC2_2_FSS	0.249	0.022	0.365	11.218	0.000	1.000	1.000
	FAC3_2_FLR	0.231	0.022	0.338	10.380	0.000	1.000	1.000
	FAC4_2_IIR	0.301	0.022	0.442	13.565	0.000	1.000	1.000

a. Dependent variable: OS33 overall satisfaction.

Differences in learner satisfaction levels

The overall mean satisfaction score for the full sample was 3.41 (SD = 0.68) on a five-point scale, indicating that learners were moderately satisfied with training quality. The distribution of responses across the five satisfaction categories is presented in Figure 1. The proportion of respondents who reported being satisfied or very satisfied was 42.86 percent. An independent samples t -test showed that alumni

reported significantly higher satisfaction than current students (Table IV)

Levene's test supported the assumption of equal variances ($F = 0.346$, $p = 0.557$). Alumni reported significantly higher satisfaction than current students ($M = 3.54$ vs 3.16 ; mean difference = 0.383 , 95% CI, 0.230 – 0.536 ; $t(313) = -4.912$, $p < 0.001$), with a moderate effect size (Cohen's $d = 0.582$; Hedges' $g = 0.580$), supporting H5.

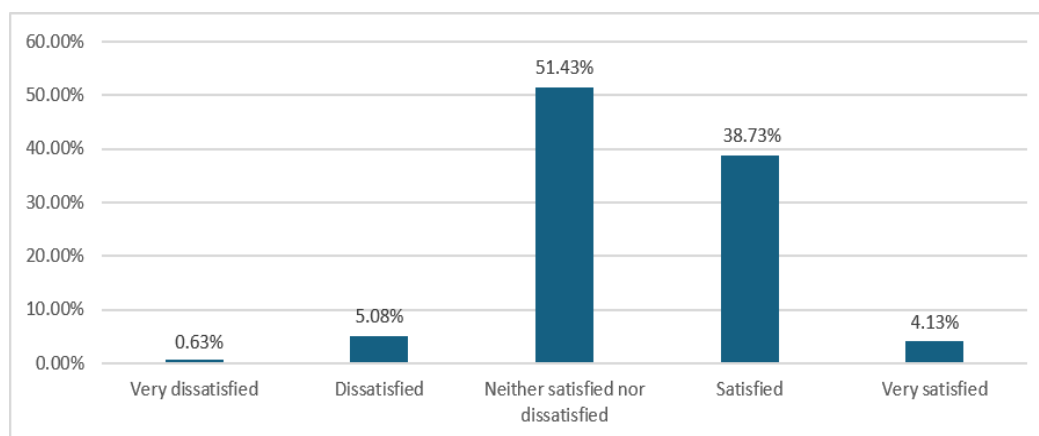


Figure 1: Overall learners' satisfaction ratings for the quality of pharmacy education

Table IV: Comparison of satisfaction levels by target group

Group	N	Mean (M)	Std. deviation	Levene's F	Levene's p	t	df	p	Cohen's d
Students	109	3.16	0.722	0.346	0.557	-4.912	313	<0.001	0.582
Alumni	206	3.54	0.622						

Discussion

Determinants of learner satisfaction with the quality of pharmacy education at Thanh Do University

The study identified four positive determinants of learner satisfaction: Training Programme ($\beta = 0.477$), Institutional image and reputation ($\beta = 0.442$), Faculty and support staff ($\beta = 0.365$), and Facilities and learning resources ($\beta = 0.338$). The model explained 66.7 percent of variance, comparable with explanatory levels in recent health professions education studies (Wong & Chapman, 2023). Alumni reported significantly higher satisfaction than current students (Cohen's $d = 0.582$).

Training Programme (TP)

The regression results indicate that Training Programme (TP) quality was the strongest predictor of learner satisfaction ($\beta = 0.477$, $p < 0.001$), supporting H1 and aligning with prior research in pharmacy education. This pattern is consistent with international evidence on the central role of programme quality in shaping satisfaction in health professions education. Tran et al. (2025) reported in their systematic review that programme-related dimensions are among the most consistently identified determinants across the international literature. In addition, Dhawan's (2022) meta-analysis across multiple countries and settings concluded that academic quality and curriculum design

show the strongest predictive power in models of higher education satisfaction.

The particularly strong effect of Training Programme (TP) quality observed in this study may reflect characteristics of the private higher education context in Vietnam. Students in private universities typically pay substantially higher tuition fees than those in public institutions, which raises expectations regarding educational value and programme relevance. In line with Perceived Value Theory, higher financial investment tends to intensify learners' scrutiny of programme quality (Zeithaml, 1988). In addition, private pharmacy programmes often face greater legitimacy pressures compared with long-established public universities. In this context, programme quality becomes a key basis through which learners evaluate the labour market value of their qualification.

Comparisons with previous Vietnamese studies provide further insight. Thanh-Thao et al. (2024), examining learners in a three-year bridging pharmacy programme, identified learner support activities as the strongest determinant of satisfaction. In contrast, the present study found that TP quality was the most influential factor for learners in the five-year full-time programme. This difference may reflect variations in learner backgrounds. Bridging students often enter with prior professional training and may therefore prioritise support services, whereas full-time undergraduate students rely more heavily on the programme structure to develop foundational knowledge and professional

competence. A similar pattern was reported by Thang *et al.* (2025), who found that support and assessment systems were the strongest determinants among postgraduate pharmacy learners. A complementary perspective is provided by recent employer-based evidence from the same institutional context. Trang *et al.* (2026) found that employer satisfaction with BPharm graduates was most strongly associated with graduates' Knowledge and Skills ($\beta = 0.597$), while gaps remained in higher-order practical competencies. Taken together, these findings suggest that the relative importance of satisfaction determinants may vary across learner groups and training levels, while the complementary employer perspective underscores the importance of translating programme content into competencies relevant to professional practice.

From a quality governance perspective, these findings suggest that improvement priorities may differ across learner groups and training modes. For full-time undergraduate pharmacy programmes in private universities, strengthening programme content, curriculum structure, and alignment with professional practice should remain a central focus. This emphasis is also consistent with Vietnam's regulatory framework. Circular No. 04/2025/TT-BGDĐT requires higher education programmes to monitor and benchmark stakeholder satisfaction as part of programme accreditation, reinforcing the importance of continuous improvement in training programme quality (MOET, 2025).

Institutional image and reputation (IIR)

Institutional image and reputation (IIR) was the second strongest determinant ($\beta = 0.442$), supporting H4. This finding is consistent with Signalling Theory (Spence, 1978). In education markets where training quality cannot be fully assessed before enrolment, institutional reputation functions as a quality signal that shapes initial expectations and influences how learners evaluate their experiences. In private higher education, IIR also forms part of perceived value relative to tuition fees (Melean Romero *et al.*, 2024; Zeithaml, 1988). It may influence satisfaction through both a socio-psychological channel, by fostering learning motivation and affiliation, and an economic channel, by shaping the perceived labour market value of the qualification. These mechanisms may help explain why IIR had a relatively strong effect in the present study. Prior research likewise links institutional reputation with student satisfaction, loyalty, and employability outcomes in higher and health professions education (Brown & Mazzarol, 2009; Wong & Chapman, 2023).

Faculty and support staff (FSS)

Faculty and support staff (FSS) were the third strongest determinant ($\beta = 0.365$), supporting H2. Caskurlu *et al.* (2020) likewise reported a moderate-to-strong positive association between teaching presence and learner satisfaction, confirming the importance of programme delivery quality in shaping the educational experience.

In pharmacy education, faculty transmit knowledge, supervise skills-based practice, and uphold professional standards, while non-academic staff reduce administrative barriers and support competence development. Consistent with this interpretation, Thang *et al.* (2025) found that support and assessment systems had the strongest effect on satisfaction among postgraduate pharmacy learners, suggesting that the importance of FSS may increase as learners gain greater professional autonomy.

The comparatively smaller effect of FSS relative to TP may reflect the characteristics of five-year full-time undergraduates, who rely heavily on programme structure to build foundational knowledge from the outset. Nevertheless, programme quality generates value only when it is translated into an effective learning experience through teaching and support practices: TP shapes what should be learned, whereas FSS determines how effectively it is delivered in practice. Improving both determinants in parallel is therefore important for enhancing overall learner satisfaction.

Facilities and learning resources (FLR)

Facilities and learning resources (FLR) had a positive and statistically significant association with learner satisfaction ($\beta = 0.338$), supporting H3 and aligning with the position of this determinant in the international literature. Tran and colleagues (2025), in their systematic review of nine studies on measuring satisfaction in pharmacy education, reported that facilities-related dimensions are among the four most consistently identified determinants across international evidence. This consistency suggests that FLR is a core component of satisfaction in pharmacy education regardless of national context. Evidence from Vietnam reinforces this argument. Thanh-Thao and colleagues (2024) found that facilities quality had a direct and substantial effect on overall satisfaction among pharmacy students at the same institution ($\beta = 0.378$); Thang and colleagues (2025) likewise identified Facilities and Library as a key determinant of perceived quality among postgraduate pharmacy learners.

The relatively smaller β coefficient compared with the other determinants may reflect a threshold effect. When facilities and resources reach an acceptable level

in learners' perceptions, their marginal contribution to satisfaction may diminish, whereas programme-related and human factors continue to create greater differentiation in evaluations. This mechanism is consistent with service quality theory, which suggests that foundational conditions, often described as hygiene factors, may not increase satisfaction beyond a threshold but become a clear source of dissatisfaction when they are inadequate (Douglas *et al.*, 2008)

In pharmacy education, however, the importance of FLR extends beyond convenience. Under Vietnam's national accreditation requirements set out in Circular No. 04/2025/TT BGDĐT, practice facilities and laboratory equipment are mandatory conditions to ensure that students develop adequate clinical competence before entering professional practice (MOET, 2025). Deficiencies in any of these elements are therefore likely to have a direct impact on graduates' readiness for safe practice.

Differences in satisfaction between current students and alumni

The group comparison showed that alumni reported higher satisfaction than current students ($M = 3.54$ versus 3.16 ; Cohen's $d = 0.582$; $p < 0.001$), supporting H5 and aligning with the prediction of Expectancy Disconfirmation Theory that reference points for evaluation change across career stages. The moderate effect size suggests that satisfaction is not a static judgement. Rather, it is dynamic and may shift as learners accumulate academic experiences during study and professional experiences after graduation.

This difference reflects a shift in evaluative focus. Current students respond primarily to immediate operational experiences, such as study pressure and support service quality, which are sensitive to short-term fluctuations. By contrast, alumni assess training quality through post-graduation utility, evaluating the extent to which their knowledge and skills support effective professional practice.

From a behavioural perspective, several mechanisms may account for this pattern. Value confirmation occurs when workplace experience allows alumni to verify the relevance of what they learned. Additionally, hindsight bias may lead graduates to reinterpret student-period challenges more favourably in retrospect. At the same time, potential non-response bias should be acknowledged, as alumni with more positive experiences may be more likely to participate voluntarily.

From a quality governance perspective, this finding has an important implication. Programme quality should not be judged using a single source of feedback.

Student feedback provides timely information about operational issues during study, whereas alumni data provide evidence on the relevance of learning outcomes and practice readiness, which are central criteria in pharmacy education. Integrating both sources is consistent with the requirement in Circular No. 04/2025/TT BGDĐT to monitor and benchmark stakeholder satisfaction for quality improvement. It also enables a continuous improvement cycle that balances enhancements to the learning experience with adjustments to programme content in response to labour market signals.

Limitations

Several limitations should be noted. First, the study was conducted at a single private institution, limiting generalisability to other pharmacy providers in Vietnam where differences in governance models, resource capacity, and learner characteristics may affect quality perceptions. Second, the study relied on self-reported data collected at a single time point. Such data may be affected by measurement error and response bias and do not capture objective indicators of educational quality, such as academic performance, practical competence, or post-graduation employment outcomes. Third, the cross-sectional design and the comparison of two independent samples, current students and alumni, do not allow inference about within-person changes in satisfaction over time. Conclusions about the dynamics of satisfaction should therefore be interpreted with caution. Finally, although the model explained 66.7 percent of the variance in satisfaction, additional determinants were not included, such as tuition policy, opportunities for clinical placements in hospitals, and individual psychological factors and expectations. Future studies should broaden the sampling frame to similar private institutions to improve generalisability and incorporate qualitative methods to identify factors not captured by the quantitative model. Longitudinal designs following learners from enrolment to post-graduation, with outcomes such as employment, job fit, and professional satisfaction, would provide a more comprehensive assessment of the long-term value of pharmacy training.

Conclusion

This study identified four determinants that were positively and statistically significantly associated with learner satisfaction with the quality of pharmacy

education at a private university in Vietnam: Training Programme (TP) ($\beta = 0.477$), Institutional image and reputation (IIR) ($\beta = 0.442$), Faculty and support staff (FSS) ($\beta = 0.365$), and Facilities and learning resources (FLR) ($\beta = 0.338$). The model explained 66.7 percent of the variance in satisfaction. Alumni reported higher satisfaction than current students, with a moderate effect size (Cohen's $d = 0.582$), indicating that quality assurance should integrate feedback from both groups. From a governance perspective, the findings suggest prioritising improvements in programme content and structure, alongside strategies to strengthen academic reputation, enhance delivery quality through teaching and learner support, and ensure adequate facilities and learning resources. Together, these actions provide a foundation for continuous improvement in the quality of pharmacy education.

Conflict of interest

The authors declare no conflict of interest.

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