Testing the Relationship Between Training Programs and Learning Support Systems for Student Satisfaction Across Different Types of Training – A Case Study of Thanh Dong University

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Abstract: *In the context that higher education in Vietnam is facing the requirement of fundamental and comprehensive innovation to meet social needs and increasing competitive pressures, student satisfaction has become an important measure reflecting the quality of training and the prestige of educational institutions. The study aims to examine the relationship between training programs and learning support systems and student satisfaction at Thanh Dong University. Using 238 survey samples and quantitative analysis methods such as reliability testing, exploratory factor analysis, correlation analysis, and multivariate linear regression, the results show that both training programs and learning support systems have a positive impact on student satisfaction at Thanh Dong University. Based on these findings, the study offers several management implications to help the university improve its training programs, enhance the quality of learning support services, enrich the learning experience, and increase student satisfaction and engagement.*
Keywords: *Training program; Learning support system; Student satisfaction; Thanh Dong University; Vietnam.*

1. INTRODUCTION

In the context of globalization and the rapid advancement of the Fourth Industrial Revolution, Vietnamese higher education overall, and non-public universities specifically, face continuous pressure to innovate to meet the growing demands of society, the labor market, and students. According to UNESCO's 2023 report, the global demand for higher education is rising by an average of 4.2 percent annually, highlighting the increasingly vital role of higher education in developing high-quality human resources. In Vietnam, the Ministry of Education and Training also affirmed the goal of fundamental and comprehensive reform of higher education, where student satisfaction is seen as a key indicator for evaluating the quality of training and how well universities fulfill their missions. Today, training quality is measured not only by graduation output or employment rates but also by the satisfaction level of students, who directly experience, assess, and reflect on the effectiveness of the school's training activities. Student satisfaction therefore becomes a key indicator of the prestige, brand, and competitiveness of higher education institutions. In particular, the training program plays a crucial role, shaping the entire learning and career development process for students. A scientifically designed, up-to-date program aligned with practical requirements will help students gain the knowledge, skills, and attitudes necessary to prepare for integration. However, if the program lacks systematic updates, progresses slowly, or does not meet labor market needs, it will negatively impact learning motivation and student satisfaction. At the same time, the learning support system, which includes facilities, libraries, laboratories, online learning platforms, academic advising services, and student life support, is a vital complementary element. It creates positive conditions for learners to access knowledge and develop their personal potential. Many domestic and international studies have also demonstrated that the quality of training programs combined with comprehensive learning support services significantly influences satisfaction, thereby boosting student engagement and learning outcomes.

For Thanh Dong University, over the years, the institution has implemented many innovative solutions, such as building training programs aligned with practical needs, strengthening cooperation with businesses, adopting digital technology in teaching and learning, and investing in upgrading facilities and student support services. However, based on reflections from students in different training systems (formal, work-study, transfer, postgraduate), there are still some issues that need attention. These include an unbalanced program that emphasizes theory over practice, even though facilities have improved but are not well synchronized. Additionally, learning support services still lack personalization, and there are notable differences in the learning experiences between training systems. This reveals that a gap still exists between students' expectations and the actual educational services provided by the university. Based on this, there is an urgent need to evaluate the relationship among the training program, the learning support

system, and student satisfaction. This evaluation will serve as a foundation for the school to continue improving the training program, enhancing the quality of learning support services, and thereby improving the learning experience, increasing student satisfaction, and boosting engagement.

2. LITERATURE REVIEW AND RESEARCH MODEL

According to the ISO 8402 standard, a service results from the interactions between the supplier and the customer, as well as the supplier's internal activities aimed at meeting the customer's needs. The nature of the service is shaped by this interaction process, in which customers are not only beneficiaries but also actively participate in creating the service. From a marketing perspective, Kotler and Armstrong (2004) argue that a service is an activity or benefit provided for exchange, which is primarily intangible and does not involve the transfer of ownership. The performance of the service may or may not be linked to the physical product. The basic characteristics of the service are intangible, inseparable, heterogeneous, and difficult to store (Parasuraman et al., 1985). Service quality is a concept that can be defined quite clearly in the production of tangible products, but it is hard to measure in the service sector due to its intangibility and challenges in standardization. As a result, service quality is increasingly recognized as a strategic advantage (Seth et al., 2005). In higher education, training services share the same characteristics as commercial services. The curriculum and learning support system are key components of the services that the university offers to students. The outcome of the training process includes not only knowledge and skills but also the learning experience, academic environment, and supportive services that come with it. In particular, the training program is the overall plan of educational activities that outlines the objectives, content, methods, implementation conditions, and expected results, aiming to ensure learners meet output standards within a specific timeframe. According to Hollis and Campbell (1935), a training program is a collection of knowledge, skills, and experiences that learners gather under the guidance of the school. The training program is viewed as a series of experiences designed to help learners strengthen discipline, enhance thinking skills, and build their capacity for action. It encompasses all the knowledge learners need to acquire to reach specific goals and objectives. Wheeler (1997) states that training programs are deliberately designed learning experiences where the expected outcomes are set from the beginning. Tanner and Tanner (1975) defines training programs as planned learning experiences with predetermined learning outcomes that are systematically provided through knowledge and expertise to help learners develop continuously, improve understanding, and enhance personal and social capacities. According to Wentling (1993), a training program is an overall plan for a training activity. That activity can be a short-term training course lasting a few hours, a day, a week, or even several years. This overall blueprint defines the entire content to be covered, clearly indicating what learners can achieve after participating in the program. Additionally, the training program outlines the process needed to implement the training content, the training methods, and how to test and evaluate learning outcomes, all organized according to a strict timetable. In Vietnam, the legal framework for training programs is clearly outlined in Circular 04/2016/TT-BGDDT, which specifies that a training program must include the objectives, standards for knowledge, skills, and attitudes of learners to be achieved after graduation; training content, methods, and activities; conditions of material and technical facilities; organizational structure, functions, tasks, and academic activities of the unit responsible for implementing training in that discipline.

A learning support system includes tools, services, and resources designed to assist the learner's educational process, improve the effectiveness of acquiring knowledge, and develop skills. According to Ellis (2009), the learning support system is part of a learner-centered environment, creating favorable conditions for learners to achieve their educational goals. In the modern educational environment, learning support systems include not only facilities like libraries, classrooms, and technology equipment but also extend to digital technology support such as learning management systems (LMS), e-learning platforms, digital resource warehouses, online academic advising systems, and interactive tools like Zoom, MS Teams, Google Classroom, and others. According to Truong and Le (2022), an effective learning support system must include three elements: (i) providing rich learning resources, (ii) supporting interaction between lecturers, students, and learning content, and (iii) facilitating self-learning and self-research. Additionally, according to Tait (2000), the learning support system also involves a psychosocial support aspect, including counseling, encouragement, guidance on learning skills, and resolving personal difficulties during the learning process. This is especially important in online education, where cohesion and support are crucial factors for learner satisfaction and success. Learning support systems are considered essential foundations for improving the quality of training services, enhancing the learning

experience, and helping develop comprehensive competencies for learners in the context of today's digital transformation of education.

Satisfaction is a person's feeling level that results from comparing the perception of a product to their expectations (Kotler & Keller, 2006). The studies of Oliver (1999) and Zineldin (2000) both suggest that customer satisfaction is the perceived feedback from customers to the service provider based on comparing what they receive with their previous expectations. Meanwhile, Giese and Cote (2000) proposed that satisfaction consists of three main factors: 1) an emotional response that varies in intensity; 2) focus on product choice, purchase, and/or consumption; 3) the timing of the decision, which varies depending on different situations and time limits. The researchers all have different views on customer satisfaction, but they agree that satisfaction is measured through the consumption process. Meanwhile, customers should compare the perceived results with their expectations before use to assess quality. Additionally, Tse and Wilton (1988), satisfaction is the consumer's reaction when desires are met, and Brown (1992) defines customer satisfaction as a state in which what customers want, need, and expect from products and services is satisfied or exceeded. The result is repeat purchases, loyalty, and positive word-of-mouth that brings delight. In simple terms, customer satisfaction with a service is how the customer reacts to the service meeting their expectations. Concerning the link between service quality and customer satisfaction, Zeithaml and Bitner (2000), Cronin and Taylor (1992) studied this relationship and found that perceived service quality results in customer satisfaction. Customer satisfaction is a broad concept that refers to the overall feeling of happiness when using a service, while service quality concerns specific elements of the service. Studies have shown that service quality is the foundation of satisfaction and a key factor influencing it. The quality of service is affected by many different factors, which are part of what determines satisfaction (Parasuraman et al., 1985). Zeithaml and Bitner (2000) have argued that customer satisfaction is a broad concept, whereas service quality focuses only on particular aspects of the service.

A number of domestic and international studies on student satisfaction with the quality of training, including Diamantis and Benos (2005), have examined student satisfaction based on the following criteria:

(i) Training related to the quality of the training program and the teaching staff, including the diversity of courses, syllabus, career guidance, lecturers' knowledge, teaching methods, communication skills, and assessment methods.

(ii) Infrastructure related to school facilities and technical equipment, including school supplies, laboratory equipment, laboratory operating hours, adequacy of electronic libraries, and library space.

(iii) Administrative support including staff knowledge, reliability, processing speed, and friendliness of service staff.

(iv) Image of the faculty or unit in relation to the university's reputation, credibility, and recognition, including expectations, the job market, promotional activities, and its connection to employment opportunities.

Jain et al. (2013) examined the following factors: (i) Input quality, (ii) Facilities, (iii) Training programs, (iv) Academic support, (v) Interaction with the business, (vi) How the non-academic process impacts the quality of training. The results show that there are three factors: training program, learning support, and quality of interaction with businesses, which are statistically significant. Research by Gamage et al. (2008), based on the SERVPERF scale, also indicates that the quality of training services is influenced by several factors affecting student satisfaction, namely: (i) lecturers; (ii) training programs; (iii) reputation; (iv) expenses; (v) facilities; (vi) learner support services. Additionally, the study by Bui and Dao (2013) surveying student satisfaction with the quality of training at the University of Economics - Vietnam National University, Hanoi, also used scales and analytical tools similar to the research articles mentioned above. The factors that had the strongest impact on student satisfaction at that school are (i) training program; (ii) facilities; (iii) serviceability; and (iv) lecturers. The study by Hoang and Chu (2008) examined the same relationship between the quality of training services and student satisfaction, and they found that when students value the quality of services provided by the university, they tend to be more satisfied with their school.

Through theoretical summaries and previous research, it has been demonstrated that studies on the quality of training services have developed various scales. However, they all share the common point that factors related to training programs, lecturers, facilities, and learner support services all influence the "satisfaction" of learners. Therefore, building on the results of previous studies and within the scope of

this article, the author focuses on two main groups of factors: "Training program" and "Learning support system." Consequently, the author proposes the research model as follows:
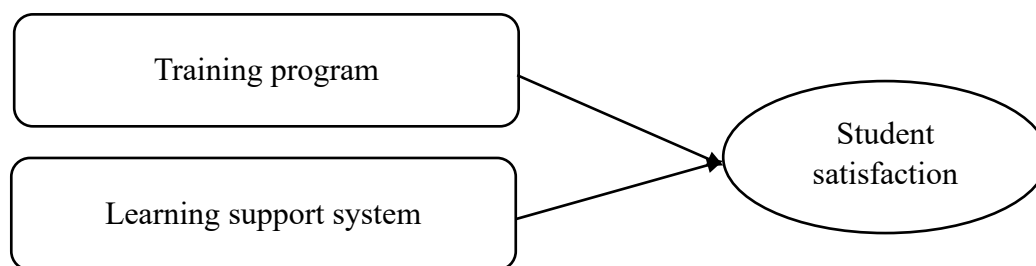

Figure 1. Research model
Source: Author suggestions
H1: The training program has a positive effect on student satisfaction.
H2: The learning support system have a positive effect on student satisfaction.

3. Research methods

The research scale is developed based on inheritance, with adjustments from both domestic and international studies in the overview. To ensure it is suitable for the research subjects and purposes before including it in the formal survey, the author consults with several experts to evaluate the relationships between factors and to modify the observable variables for clarity. The formal scale shown in Table 1 includes 17 observational variables, in which the scale of training program has six variables, the scale of learning support system has eight variables, and the scale of student satisfaction has three variables.

The study used a 5-level Likert scale from 1 (strongly disagree) to 5 (strongly agree). The sample size was chosen based on the optimal ratio in the EFA analysis, as suggested by Hair et al. (2010), of 10:1 to ensure sufficient significance in the analysis and to prevent the survey sample from being invalid and discarded during cleaning. Actually, 250 samples were emitted. This study utilizes a convenient non-probabilistic survey, whereby the number of survey papers is directly communicated to students at Thanh Dong University. The survey was administered from January 2025 to March 2025, and following the removal of invalid samples, a total of 238 samples were obtained. The data underwent cleaning, encoding, and analysis using SPSS 26 software at a 5% significance level. Based on the model and the proposed research hypotheses, the overall research equation is shown below:

$$SS = \beta_0 + \beta_1 * TP + \beta_2 * LSS + \varepsilon$$

In which:

SS (Dependent Variable): Student satisfaction

Independent variables (X_i): Training program (TP), Learning support system (LSS).

β_k: Regression coefficient (k = 0. 1, 2).

ε: Random error

4. Research results

The statistical results from 238 valid responses show that 96 were male, making up 40.3%, while females accounted for 59.7%. Regarding age, students aged 20 to 22 were the largest group, at 52.1%, followed by those under 20. who made up 24.4%. Students aged 23 to 25 accounted for 16.8%, and those over 25 made up 6.7%. Concerning the training system, regular students comprised the majority at 76.5%. The intermediate system accounted for 13.4%, and the work-study system made up 10.1%. In terms of year of study, second-year students were the most numerous, at 76.5%, followed by third-year students with 29.4%. First-year students accounted for 13.4% and were the smallest group. Among majors, economics and management majors had the highest participation at 38.7%. Information technology followed with 22.7%, language majors with 17.6%, medicine and pharmacy with 12.6%, and other majors with 8.4%.

Table 1. Descriptive statistics

Scale	Sign	Items	Mean
Training program	PT1	Training program aligned with job requirements.	3.98
	PT2	The training program offers many elective courses suited to job needs.	
	PT3	The number of courses is reasonable, well-organized, and scientifically flexible, making them easy to register for.	

Scale	Sign	Items	Mean
	PT4	The content is regularly updated and innovated to meet social needs.	
	PT5	The course sequence is logically arranged.	
	PT6	Examinations are conducted in accordance with the course content.	
Learning support system	LSS1	Learning materials are complete.	4.06
	LSS2	The website is consistently updated with essential and current information.	
	LSS3	Well-organized e-learning forum with extensive learning materials.	
	LSS4	Classrooms and their equipment support effective teaching and learning.	
	LSS5	Easily accessible information (via website, bulletin board, or through class formals).	
	LSS6	The enthusiastic attitude of the staff towards service	
	LSS7	Quality of guaranteed and suitable learning support services.	
	LSS8	The university swiftly and efficiently addresses problems faced by students.	
Student satisfaction	SS1	Students are prepared to present and promote the university's image.	4.12
	SS2	Students will continue to select the school to pursue higher education.	
	SS3	Students take pride in discussing their university.	

Source: Analysis results from SPSS26

The descriptive statistics in Table 1 showed that students rated the scales positively, with the mean score being above 3.9. The scale of the training program has a mean score of 3.98, reflecting students' good appreciation of the practicality and career orientation of the program. It indicates that the university's training program is suitable and that there is a certain cohesion between the training content and labor demand. For the learning support system, the mean rating is 4.06, proving that students value the university's support services. Student satisfaction has the highest mean score of 4.12, reflecting students' relatively high trust and satisfaction with the university's reputation and brand.

Table 2. Reliability testing (the second)

Items	Cronbach's Alpha	Corrected Item-Total Correlation	Cronbach's Alpha if Item deleted
Training program			
PT1		0.621	0.815
PT2		0.608	0.803
PT4	0.826	0.578	0.789
PT5		0.594	0.771
PT6		0.513	0.762
Learning support system			
LSS1		0.639	0.796
LSS3		0.690	0.775
LSS4	0.809	0.657	0.761
LSS5		0.599	0.754
LSS7		0.624	0.743
LSS8		0.588	0.729
Student satisfaction			
SS1		0.589	0.806
SS2	0.812	0.612	0.793
SS3		0.607	0.778

Source: Analysis results from SPSS26

Table 2 showed that the observation variables TP3, LSS2, and LSS6 did not meet the requirements recommended by Hair et al. (2010) because TP3 and LSS6 had Corrected Item-Total Correlations of 0.145 and 0.206, respectively, which are less than 0.3. Additionally, LSS2 has a Cronbach's Alpha if Item Deleted is higher than the overall Cronbach's Alpha. Therefore, three observed variables should be removed, and a second reliability test should be performed. The results of the second analysis show that the total Cronbach's Alpha coefficient is greater than 0.7, the Corrected Item-Total Correlation is above 0.3, and the Cronbach's Alpha if Item Deleted is less than the overall Cronbach's Alpha. Therefore, the scales meet the reliability criteria outlined by Hair et al. (2010), allowing us to proceed to the next step.

Table 3. The results of EFA

KMO = 0.817, Sig. = 0.000		
Items	**Loadings**	
	1	**2**
PT1	0.811	
PT2	0.803	
PT4	0.792	
PT5	0.778	
PT6	0.765	
LSS1		0.825
LSS3		0.807
LSS4		0.791
LSS5		0.774
LSS7		0.756
LSS8		0.730
Eigenvalue	2.853	1.424
% of Variance	69.154	76.886
KMO = 0.806, Sig. = 0.000		
SS1		0.816
SS2		0.794
SS3		0.771
Eigenvalue		1,893
% of Variance		77.389%

Source: Analysis results from SPSS26

The results of the exploratory factor analysis using the Components extraction method with Varimax rotation, stopping at an Eigenvalue greater than 1, showed that for independent factors, the KMO coefficient was 0.817 and Bartlett's test Sig. value was less than 0.05, indicating the data included in the analysis was statistically significant. In the rotation matrix table, two groups of factors were extracted at an Eigenvalue of 1.424, with a total variance of 76.886%, satisfaction exceeding 50%, and the factor loadings of the observed variables greater than 0.5, so none of the observed variables were excluded.

Regarding the dependent variable, the results indicated satisfaction according to the recommendation of Hair et al. (2010) when both the KMO coefficient and the factor loadings were above 0.5 and below 1. At an Eigenvalue of 1,893, three observed variables were combined into a single factor group with a total variance of 77.389%. Therefore, the scales of independent and dependent variables have convergent and discriminant validity.

Table 4. Correlation analysis

		SS	PT	LSS
SS	Correlation coefficient	1	0.735**	0.708**
	Sig. (2-tailed)	0.000	0.000	0.000
	N	238	238	238
PT	Correlation coefficient	0.735**	1	0.261**
	Sig. (2-tailed)	0.000	0.000	0.000
	N	238	238	238
LSS	Correlation coefficient	0.708**	0.261**	1
	Sig. (2-tailed)	0.000	0.000	0.000

	N	238	238	238

Source: Analysis results from SPSS26

The results of the correlation analysis showed that all independent factors were positively correlated and statistically significant with student satisfaction at a $p < 0.01$, with a correlation coefficient greater than 0.4. There is a low to moderate correlation between independent factors ($r < 0.3$), indicating no sign of multicollinearity, which makes them suitable for inclusion in the next linear regression analysis.

Performing a linear regression analysis with the Enter method, the factors are included simultaneously to test the theoretical model for the following results:

Table 5. Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Durbin-Watson
1	0.793[a]	0.781	0.775	0.317	1,793
a. Predictors: (Constant), PT, LSS					
b. Dependent Variable: SS					

Source: Analysis results from SPSS26

The analysis results showed that the determination coefficient R^2 reached 0.781, indicating that the model explained 78.1% of the variability of the dependent variable using the independent variables. This demonstrates that the model's suitability is very good. Additionally, the adjusted R^2 value of 0.775 is very close to R^2, confirming that the model is neither redundant nor inconsistent with the overall dataset. The Durbin-Watson statistic of 1.793 suggests there is no autocorrelation in the model, ensuring the residuals are independent.

Table 6. ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	77.718	2	52.739	362.703	0.000
Residual	36.875	235	0.368		
Total	114.593	237			

Source: Analysis results from SPSS26

The results of the ANOVA analysis and the F test also showed that the statistical value had a Sig value of 0.000, indicating that the regression model was statistically significant.

Table 7. Multivariate regression analysis

		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
		B	Standard Deviation	Beta			Tolerance	VIF
1	(Constant)	1.458	0.031		6.758	0.012		
	PT	0.317	0.024	0.329	5.312	0.004	0.643	1.734
	LSS	0.340	0.029	0.356	6.143	0.001	0.695	1.808
Dependent Variable: SS								

Source: Analysis results from SPSS26

Table 7 showed that all factors had a significance level of Sig. The t-test value was less than 0.05, confirming that the model was statistically significant. The Variance Inflation Factor (VIF) for the independent factors listed in the table is below 2, indicating no multicollinearity among the independent variables. In addition to the quantitative analysis results, diagnostic regression tests such as scatterplots, histograms, and probability plots (P-P Plot) all indicate that the multivariate linear regression model meets basic assumptions well. The scatterplot shows the residuals are randomly distributed around the mean of zero, with no distinct pattern or trend, suggesting a reasonable linear relationship between variables and homoscedasticity of errors. The histogram reveals that residuals roughly follow a standard normal distribution, with a mean near zero and a standard deviation close to 1, satisfying the normality assumption. Meanwhile, the P-P Plot shows data points close to the diagonal line, indicating the residuals follow a normal distribution in a logical manner, ensuring the model does not violate key assumptions.

The Sig. value of the t-test is below 0.05, confirming that the regression coefficients are statistically significant and that the model is appropriate. Therefore, the research hypotheses are accepted. The standardized regression equation model is written as follows:

SS = 0.356*LSS + 0.329*PT + ε

The equation shows that student satisfaction at Thanh Dong University is positively impacted by both the training program and the learning support system. It highlights the central role of the curriculum in delivering knowledge, skills, and career guidance to students, and stresses the importance of learning support services and resources in helping students acquire skills and develop holistically.

5. Implications

Firstly, Thanh Dong University needs to increase investment in modern facilities and equipment for learning, such as electronic libraries, laboratories, practice rooms, and e-learning systems, to create the most favorable conditions for students to access knowledge. The school's information channels (website, forum, bulletin board, mobile application) should be updated regularly to ensure transparency, timeliness, and easy access. It is necessary to promote the role of support staff and school personnel, improve service attitudes, and strengthen academic counseling, career guidance, and psychosocial support for students. Enhance administrative and academic support services (course registration, application procedures, inquiry resolution) through digitalization to increase speed, accuracy, and convenience. This helps minimize hassle and boosts student satisfaction.

Secondly, Thanh Dong University needs to continuously review, adjust, and update its training program content to better align with labor market demands and societal development trends. Courses should strike a reasonable balance between theory and practice, boosting relevance and professional skills. It's important to develop more elective modules, diversify learning pathways, and give students the opportunity to choose based on their personal career goals. Teaching methods must also be innovated to encourage active participation from learners, heavily incorporate information technology, digital learning materials, and interactive teaching techniques to foster creative thinking, teamwork skills, and problem-solving abilities. Assessment and evaluation systems should be improved to accurately measure student capacity, blending process and outcome evaluations while emphasizing practical skills and soft skills.

Finally, Thanh Dong University should establish a system for regular feedback from students through periodic surveys, feedback boxes, or dialogue forums, thereby listening to, acknowledging, and quickly adjusting training policies and learning support. It is important to foster a "student-centered" culture throughout the school, viewing students not only as learners but also as partners and valued customers in the education system. In addition to training programs and learning support, the university can broaden cooperation with businesses to organize internships and career seminars, thereby increasing employment opportunities and strengthening the connection between students and the university after graduation.

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