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Measuring Students' satisfaction with higher education service – An experimental study at Thainguyen University

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ABSTRACT: *Recent reforms in higher education lead to the increasing of privatization and marketisation trends in universities in Vietnam. The transformation of higher education from the dependency on government funding to the competitive market indicates that universities have to compete for educating better students for the recruitment markets and therefore, must care more for students and employers satisfaction. Many papers argue that university managers need to understand its customer needs and wants in order to remain competitive and survive among higher education providers. This paper reviews the role of students' satisfaction and factors that may influence students' satisfaction and presents the empirical research with the case with Thainguyen University. Main results are: 1. Five factors in SERVQUAL model influence on students' satisfaction in the order of decreasing importance as follow: Tangible, Assurance, Reliability, Empathy and Responsiveness; 2. The Two-Way Anova test and Tukey Post Hoc Tests show there is no difference in assessing satisfaction of male and female students and 1-year student and 5-year student have difference in accessing their satisfaction.*

KEYWORDS – *education services, higher education, students' satisfaction, Thainguyen University, university marketing.*

I. INTRODUCTION

With the demand of high quality human resource for the development of society and the more increasing competitiveness in higher education sector, universities nowadays face significant challenges to recruit new students and high quality with students' high satisfaction level is one of important keys to this situation of universities. The knowledge about student satisfaction become particularly important for universities to better understand how students perceive the offered services as universities will compete with each other to both keep and attract the best students (Douglas et al, 2006).

In Vietnam, the transformation of higher education from the dependency on government funding to the competitive market makes universities have to compete for educating better students for the recruitment markets and therefore, must care more for students' satisfaction. Thai Nguyen University is one of the largest regional universities in Vietnam, however, in the past three years, the number of students enrolled in Thai Nguyen University in general and each member in particular has been decreasing. The decreasing trend of annual enrollment rate has a great impact on prestige, development of Thai Nguyen University, and becomes a challenge to its current position in general and other member universities in particular in the system of training establishments of the whole country. The causes and solutions to this issue have been evaluated, analyzed, and identified by leaders of Thai Nguyen University and its members. One of the most important issues considered as the main solution for Thai Nguyen University and its members to maintain their prestige is to improve the quality of training, ensuring that human resources are trained to best meet the needs of the society, especially in the current context of integration.

This paper reviews the role of students' satisfaction and factors that may influence students' satisfaction and presents the empirical research with the case with Thainguyen University. Respondents to this research were 400 official undergraduate students at five colleges of Thainguyen University. It is hoped that this study will provide some new information of what are important to students' satisfaction to universities managers for proposing suitable education marketing strategies.

II. LITERATURE REVIEW

Satisfaction

Since the first mention in research of Cardozo in 1965, the concept of satisfaction has been extensively studied in many areas of life. However, up to now, researchers can't reach the common ideal and framework for this content. Three main disagreements on satisfaction definitions expressed at: 1. Whether satisfaction were a process or reaction of a process; 2. Satisfaction is either a cognitive response or an effective response; 3. Who is decisive satisfaction, final consumer or customers in general;

The lack of a consensus definition for satisfaction creates three serious problems for consumer satisfaction research: selecting an appropriate definition for a given study; operationalizing the definition; and interpreting and comparing empirical results. These three problems affect the basic structure and outcomes of research and theory testing (Joan L. Giese, Joseph A. Cote, 2002).

In this study, satisfaction is refers to the feeling of pleasure or disappointment resulting from comparing perceived performance in relation to the expectation (as in Kotler & Keller, 2012). Customers will satisfy when services fit with their expectation, so, it is a function of relative level of expectation connecting with people's perception

Students' satisfaction

The literature on student's satisfaction and their perception of the educational experience is very complex. Views of the authors on the concept of student's satisfaction are quite diverse.

Student's satisfaction can be defined as a short term attitude resulting from an evaluation of a students' educational experiences (Elliott, K. & Healy, M., 2001; Yusoff, 2015; Salinda et al, 2017). It is the result and outcome of an educational system (Zeithaml, 1988; Elliot & Shin, 2002). Student satisfaction is a continually changing construct in the Higher Education environment due to repeated interactions and it is a dynamic process that requires clear and effective action as a result of an institution listening to its students (Elliott and Shin 2002). Therefore, student's satisfaction is also defined as a function of relative level of experiences and perceived performance about educational service during the study period (Mukhtar et al, 2015). Meanwhile, some other definitions emphasize student's satisfaction as a result of an overall evaluation after using education services (WiersJenssen et al. 2002; Li-Wei Mai, 2005). However, student satisfaction as a process is more often used in studies (Shahsavar T, Sudzina F., 2017). In order to avoid consequences of concerning about processes more than outcomes, universities can help students to clarify their long-term goals and expectations.

Students' satisfaction is a multidimensional process which is influenced by different factors. Appleton-Knapp & Krentler (2006) identified two groups of influences on student satisfaction in higher education as personal and institutional factors. Personal factors cover age, gender, employment, preferred learning style, student's GPA and institutional factors cover quality of instructions, promptness of the instructor's feedback, clarity of expectation, teaching style. Wilkins & Balakrishnan (2013) identified quality of lecturers, quality of physical facilities and effective use of technology as key determinant factors of student satisfaction. As well as, student satisfaction in universities is greatly influenced by quality of class room, quality of feedback, lecturer-student relationship, interaction with fellow students, course content, available learning equipment, library facilities and learning materials (Garcl a-Aracil, A., 2009; Sojkin et al, 2012]. In addition to that, there are many factors are found to have influence on student' satisfaction in many other researches over the world, Salinda et al (2017) rendered an available constructive literature about students' satisfaction with a sound theoretical and empirical background. Data were collected from refereed journals and conference papers, and are constructively analyzed from different point of views to filter a sound background for future studies (table 1).

Table 1. Summary of Student's Satisfaction researches

Author and Year	Study	Variables
Elliot, K.M. Healy, M.A. 2001	Key factors influencing student satisfaction related to recruitment and retention	Academic advising, Effectiveness, Campus climate, Campus life Campus support services, Concern for the individual, Instructional effectiveness, Recruitment and financial aid effectiveness, Registration effectiveness, Campus safety and security, Service excellence, Student centeredness
Mercedes M. Navarro Marta P. Iglesias Pilar R. Torres, 2005	A new management element for universities: satisfaction with the offered courses	Teaching Staff, Teaching Method, Administration, Enrolment, Infrastructures
Oscar W. DeS. Jr Ali Kara ErdenerKaynak, 2005	Determinants of business student satisfaction and retention in higher education: applying Herzberg's two-factor theory	Faculty, Advising Staff, Classes, student college experience
Douglas Jacqueline Alex Douglas Barry Barnes, 2006	Measuring Student Satisfaction at UK universities	Professional Environment, Student assessment and Learning experiences, Classroom environment, Lecture and tutorial facilitating goods, Textbooks and tuition fees, Student support facilities, Business procedures, Relationship with the teaching staff, Knowledgeable and responsive faculty, Staff helpfulness, Feedback, Class sizes
Ramzi N. Nasser Bechara Khoury Kamal Abouchedid 2006	University students' knowledge of services and programs in relation to satisfaction	Academic experience, Academic advisor, Campus life, Personal development opportunities, Resources and student services.
Qinggang Wang Ross Taplin Alistair M. Brown 2011	Chinese students' satisfaction of the study abroad experience	Preparation, Culture, Technical Teaching
Pathmini MGS Wijewardhena WP Gamage CT Gamini LPS 2012	Impact of Service Quality on Students' Satisfaction in Newly Established Public Sector Universities in Sri Lanka:	Tangibility, Competence Empathy, Curriculum, Delivery, Reliability
S. Farahmandian, H. Minavand, M. Afshardost 2013	Perceived service quality and student satisfaction in higher education	Student advising, Curriculum , Teaching quality, Financial assistance, Tuition costs, Facilities
Stephen Wilkins Melodena Stephens Balakrishnan 2013	Assessing student satisfaction in transnational higher education	Lecturers, Program, Assessment and Feedback, Resources, Technology, Facilities and Social Life.
MazirahYusoff Fraser McLeay Helen Woodruffe-Burton 2015	Dimensions driving business student satisfaction in higher education	Professional and comfortable environment, Student assessments and learning experiences, Classroom environment, Lecture and tutorial facilitating goods, Textbooks and tuition fees, Student support facilities, Business procedures, Relationship with teaching staff, Knowledgeable and responsive faculty, Staff helpfulness, Feedback, Class sizes
Thor-Erik Sandberg Hanssen G. Solvoll, 2015	The importance of university facilities for student satisfaction at a Norwegian University	University facilities, Location ,Job prospects, Costs of studying, Reputation
Sami KarnaPaiviJulin 2015	A framework for measuring student and staff satisfaction with university campus facilities	Workspace facilities, Laboratory facilities, Teaching facilities, General purpose facilities, Facility maintenance, Campus accessibility and movement, Outdoor areas
MazirahYusoff Fraser McLeay Helen Woodruffe-Burton 2015	Dimensions driving business student satisfaction in higher education	Professional Environment, Student assessment and Learning experiences, Classroom environment, Lecture and tutorial facilitating goods, Textbooks and tuition fees, Student support facilities, Business procedures, Relationship with the teaching staff, Knowledgeable and responsive faculty, Staff helpfulness, Feedback, Class sizes
Nara Martirosyan 2015	An examination of factors contributing to student satisfaction in Armenian higher education	Faculty services, Academic experience Student support facilities Campus life Social integration

Source: Salinda et al (2017)

The model measuring the students' satisfaction with the higher education service

Similar to studies on customer satisfaction with service in other field, in studies on students' satisfaction with higher education service, SERVQUAL and SERVFECT models are the most commonly used (Yusoff, 2015; Salinda, 2017).

The SERVQUAL model was proposed by Parasuraman et al. in 1985 to measure service quality. The SERVQUAL scale is built on the basis of external perspectives on service quality, which states that the customers' assessment of service quality is paramount. This assessment is defined as the difference or gap between what the customers want from the quality of one type of service and their evaluation on the performance of the supplier. This kind of assessment is not straightforward as the model of Parasuraman et al (1985) was first built, the service quality was a multi-dimensional structure with 10 parts. Three years later, in 1988, Parasuraman and his team reduced them to five categories: Reliability, Assurance, Tangibles, Empathy and Responsiveness.

The SERVPERF model was developed from the SERVQUAL model by Cronin and Taylor in 1992. The SERVPERF scale measures the quality of service by using customer perception. The SERVPERF scale represents a significant improvement on the SERVQUAL scale. It is not only a more effective scale in reducing the number of items to be measured by 50%, it also gains experience based on the SERVQUAL scale for the ability to explain larger difference in the overall service quality measured, using a single scale. Numerous studies have been conducted to assess the preeminence of the two scales, and further consistency can be achieved to determine which scale is better. Although it still limitedly applied in comparison with the SERVQUAL scale, researchers have begun to intensify the use of this scale to measure service quality (Cronin et al., 2000).

Measuring the quality of educational services has distinguished characteristics; therefore, F.Abdullah (2006) has proposed the HEEPPERF scale (Higher Education Performance), a new and more comprehensive scale to measure service quality of higher education. The HEdPERF service quality scale consists of 41 criteria, of which 13 were derived from SERVPERF, 28 criteria were developed through literature review and qualitative research (group discussion, experimental testing and working with experts). The HEdPERF-41 criterion scale has been tested by Abdullah for reliability and validity, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA). In addition, in 2010 Sultan and Wong conducted a comparative study between HEdPERF and SERPERF, and the results showed that HEdPERF was more relevant in measuring the quality of higher education services. Abdullah [9] believed that higher education institutions could use HEdPERF to improve service quality. Fridaus Abdullah has categorized 5 components of service quality in higher education as follows: (1) Non-academic factor - or administrative; (2) Academic factor; (3) Reputation factor; (4) access factor; (5) Training program factor.

Besides these most famous models, there are many other models to assess students' satisfaction in higher education and every model is more or less criticized by scholars. As a result, old models have been gradually developed with new insight.

III. RESEARCH FRAMEWORK

Basing most scale in SERVQUAL model, this study used the model in Figure 1 to measure the student's satisfaction with education service of Thai Nguyen University. The dependent variable in this study is the student's satisfaction regarding the service quality provided by Thai Nguyen University; independent variables are tangibles, reliability, responsiveness, assurance and empathy. It is assumed that the student's satisfaction with education services of Thai Nguyen University will be different according to gender, time to study at the University (year-time) of students. These main hypotheses were tested:

H1: Tangibles has positive effect on students' satisfaction with education services of TNU.

H2: Reliability has positive effect on students' satisfaction with education services of TNU.

H3: Responsiveness has positive effect on students' satisfaction with education services of TNU.

H4: "Assurance" has positive effect on students' satisfaction with education services of TNU.

H5: Empathy has positive effect on students' satisfaction with education services of TNU.

H6: There are differences in assessing the satisfaction of students in different gender and year-time status with education service of TNU.

H7: There are differences in assessing the satisfaction of students in different major with education service of TNU.

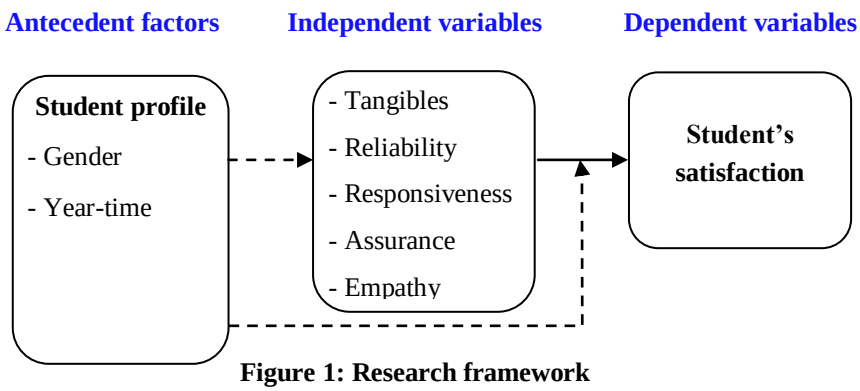

Figure 1: Research framework

IV. METHODOLOGY

Sample respondents

The respondents of this study are regular college students of five universities under Thai Nguyen University: University of Technology; University of Education, University of Medicine, University of Economics and Business Administration and University of Agriculture and Forestry. Detail information about respondents of research is in Table 2.

Table 2: Characteristic of respondents

		Universities					
		Tnu of Education	Tnu of Medicine and Pharmacy	Tnu of Technology	Tnu of Agriculture and Forestry	Tnu of Economics and Bussiness administration	Total
Sex	Male	41.25	50	78.75	48.75	35	50.75
	Female	58.75	50	21.25	51.25	65	49.25
Year	1	11.25	3.75	8.75	10	16.25	10
	2	40	20	28.75	18.75	28.75	27.25
	3	32.5	47.5	30	33.75	27.5	34.25
	4	16.25	13.75	22.5	25	27.5	21
	5	0	8.75	10	12.5	0	6.25
	6	0	6.25	0	0	0	1.25

Source: Author's survey

Sampling Technique

The students sample size was determined by using the Slovin formula as below:

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

n is the sample size.

e is the accepted error (5%).

N is the total population size.

It is usually estimated with 50%/50% and this is the biggest probability of sample in population

The sample size of population 29,780 students (with error Δ = 0.05) was 395.

With the experience in selecting the appropriate sample size above, the authors decided to use 400 questionnaires in the official investigation to prevent situations where some questionnaire sheets had to be removed due to the lack of information.

Data gathering

Preliminary information on student's satisfaction with education services was collected through direct personal interviews: at university gates, late in the morning and early in the afternoon.

A group of 4 students from the University of Economics and Business Administration and 4 students from University of Technology where the authors work were trained to help with collecting information and encoding the information inserted into SPSS software 22.0.

Instruments

Questionnaire was used as the main tool - The questionnaire consisted of 3 main parts:

The first part of the questionnaire would collect information on the respondent's personal profile including: age, gender, year-time, major, etc.

The second part would gather information on the quality of training services provided by Thai Nguyen University with such components as: tangibles, reliability, responsibility, assurance, and empathy. Respondents would be presented in the column corresponding to the 5 point Likert scale: 5: strongly agree; 4: agree; 3: Neutral; 2: Disagree; 1: strongly disagree.

The final part would gather information on students' feedbacks to improve the quality of training services to enhance customer satisfaction.

Data processing

Excel 2007 and SPSS 22.0 software were used to analyze the student' s satisfaction with education services at Thai Nguyen University.

Information analyzing method

Descriptive statistics Method was used to investigate, synthesize and analyze data on the current status of education services at Thai Nguyen University, personal information of respondents.

Comparisons Method was used to compare the satisfaction of all subjects related to the training services of Thai Nguyen University members.

Using regression analysis process: Test the reliability of scales (Cronbach Alpha) and Exploratory factors analysis were used to adjust the scales

Correlation analysis was used to examine the correlation between dependent variables for each independent variable and the correlation between these variables.

Multiple Linear Regressions was used to specify the affective level of the factors to the student satisfaction with education services of ThaiNguyen University

The two-way ANOVA was used to find if there is an interaction between the two independent variables (Sex and year-time of students) on the dependent variable (Satisfaction).

V. RESULTS AND DISCUSSION

5.1. Evaluation the reliability of effective factors on students' satisfaction model scales

Reliability of effective of independent factor

Table 3 show that Cronbach's Alpha of all groups are both more than 0.600 so these group factors reliability are acceptable in Academic research. 32 elements indicators have Corrected Item - Total Correlation> 0.300 are accepted to remain in model and 8 elements indicators have Corrected Item - Total Correlation< 0.300 are deleted, including: Tan.6, Rel.6, Res.3, Res.4, Ass.3, Ass.5, Emp.1 and Emp.5. And all retained elements

have Cronbach's Alpha if Item Deleted smaller than Cronbach's Alpha of groups so they have correlation with other factors and should be retained in model.

Table 3: Reliability and Item-Total Statistics of students' satisfaction scale

Code	Variable	Cronbach's Alpha	Number of items
Tan	Tangibles	0.647	8
Rel	Reliability	*0.656*	8
Res	Responsiveness	*0.627*	8
Ass	Assurance	*0.604*	8
Emp	Empathy	*0.622*	8
	Total		40

Source: Author's survey

Reliability of effective of dependent factor

Table 4: Reliability and Item-Total Statistics

	Cronbach's Alpha	N of Items
	.811	3

Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Sat.1	.677	.760
Sat.2	.704	.696
Sat.3	.675	.764

Source: Author's survey

Cronbach's Alpha of groups is 0.811> 0.700 so this group factors reliability are good (Table 4). All elements indicators have Corrected Item - Total Correlation> 0.300 and Cronbach's Alpha if Item Deleted smaller than Cronbach's Alpha of groups so they have correlation with other factors and should be retained in model. The mean score of these three items will be used to measure satisfaction and is recoded SAT.

5.2. Analysis the explore factor (EFA)

KMO coefficient = 0.629, ensures the requirements that 0.5 <KMO <1; with significance level Sig. = 0.000 meets the conditions Sig. <0.005 (Table 5).

Table 5: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.629
Bartlett's Test of Sphericity	Approx. Chi-Square	2588.568
	Df	496
	Sig.	,000

Source: Author's survey

With a rotation matrix 5 total factor model explained approximate 40 % of the variation of total factor. Rotation matrix result of converging factors warrant the request of Factor loading: With 400 samples, Factor

loading samples of the elements must be greater than 0.300 (According to Hair and et al), and as result on Table 6, all factor in the model have Factor loading more than 0.30 and they are remained.

Table 6: Rotated Component Matrix

	Component				
	1	2	3	4	5
Tan.1	.630				
Tan.2	.688				
Tan.3	.581				
Tan.4	.487				
Tan.5	.556				
Tan.7	.529				
Tan.8	.528				
Rel.1		.481			
Rel.2		.631			
Rel.3		.466			
Rel.4		.536			
Rel.5		.573			
Rel.7		.719			
Rel.8		.533			
Res.1			.616		
Res.2			.592		
Res.5			.431		
Res.6			.442		
Res.7			.764		
Res.8			.683		
Ass.1				.554	
Ass.2				.488	
Ass.4				.668	
Ass.6				.674	
Ass.7				.577	
Ass.8				.573	
Emp.2					.589
Emp.3					.499
Emp.4					.746
Emp.6					.565
Emp.7					.448
Emp.8					.549

Source: Author's survey

After analysing the explore factor by SPSS, all items are grouping in 5 factors. Tangibles is measured by 7 items (Tan.1 to Tan.5, Tan.7, Tan.8); the representative value of these items created by SPSS will be used to measure Tangibles and is recoded TAN. Reliability is measured by 7 items (Rel.1 to Rel.5, Rel.7, Rel.8); the representative value of these items created by SPSS will be used to measure Reliability and is recoded REL. Responsiveness is measured by 6 items (Res.1, Res.2, Res.5 to Res.8); and the representative value of these items created by SPSS will be used to measure Responsiveness and is recoded RES. Assurance is measured by 6 items (Ass.1, Ass.2, Ass.4, Ass.6 to Ass.8); the representative value of these items created by SPSS will be used

to measure assurance and is recoded ASS. Empathy is measured by 6 items (Emp.2 to Emp.4, Emp.6 to Emp.8); and the representative value of these items created by SPSS will be used to measure empathy and is recoded EMP.

5.3. The effectiveness of factors on students's satisfaction to education services of Thainguyen University

The correlation analysis is used to find the strength of relationship between 5 independent variables and students' satisfaction. Correlation analysis results show that all variables are positively correlated with students' satisfaction (Table 7). And according to Cohen (1988, pp. 79-81), Tangibles Reliability, Assurance, Empathy have an average correlation with students' satisfaction (r = 0.30 to 0.49); Responsiveness has a weak correlation with students' satisfaction (r < 0.30). All the variables have Sig. (2-tailed) less than 0.01 so they have statistical significance and the 5 variables are included in the analysis model regression.

Table 7: Pearson Correlations

		TAN	REL	RES	ASS	EMP	SAT
TAN	Pearson Correlation	1	.000	.000	.000	.000	.407**
	Sig. (2-tailed)		1.000	1.000	1.000	1.000	.000
	N	400	400	400	400	400	400
REL	Pearson Correlation	.000	1	.000	.000	.000	.330**
	Sig. (2-tailed)	1.000		1.000	1.000	1.000	.000
	N	400	400	400	400	400	400
RES	Pearson Correlation	.000	.000	1	.000	.000	.297**
	Sig. (2-tailed)	1.000	1.000		1.000	1.000	.000
	N	400	400	400	400	400	400
ASS	Pearson Correlation	.000	.000	.000	1	.000	.339**
	Sig. (2-tailed)	1.000	1.000	1.000		1.000	.000
	N	400	400	400	400	400	400
EMP	Pearson Correlation	.000	.000	.000	.000	1	.309**
	Sig. (2-tailed)	1.000	1.000	1.000	1.000		.000
	N	400	400	400	400	400	400
SAT	Pearson Correlation	.407**	.330**	.297**	.339**	.309**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	400	400	400	400	400	400

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Author's survey

The results of regression are provided in Table 8. Multiple regression analysis by Enter method was used to test role of independent variables in predicting the students' satisfaction. According to Adjust R Square, the model accounts for 57,4% of variable students' satisfaction.

Table 8: Model Summary by Enter method

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.758[a]	.574	.569	.34955	1.587

a. Predictors: (Constant), EMP, ASS, RES, REL, TAN

b. Dependent Variable: SAT

Source: Author's survey

With df = 5, the result of regression analysis showed that the value in ANOVA test of F = 106.146 and Sig statistically significant = 0.000 less than the α critical index (0.05), so we rejects the hypothesis that the study elements are heterogeneous and concludes that there is statistical difference between the independent variables and the dependent variable (Table 9).

Table 9: ANOVA[a] by Enter method

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	64.846	5	12.969	106.146	.000[b]
	Residual	48.140	394	.122		
	Total	112.986	399			

a. Dependent Variable: SAT

b. Predictors: (Constant), EMP, ASS, RES, REL, TAN

Source: Author's survey

Table 10: Regression Results

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.520	.017		201.375	0.000		
	TAN	.217	.017	.407	12.392	.000	1.000	1.000
	REL	.176	.017	.330	10.039	.000	1.000	1.000
	RES	.158	.017	.297	9.043	.000	1.000	1.000
	ASS	.181	.017	.339	10.319	.000	1.000	1.000
	EMP	.164	.017	.309	9.389	.000	1.000	1.000

a. Dependent Variable: SAT

Source: Author's survey

As in Table 10, all elements have Beta valuable > 0; each of these factors has values of statistical significance Sig less than the α - critical value (0.01) shows that all the factors are statistically significant. Results of multivariate regression analysis showed that all the independent variables are correlated with the dependent variable and there isn't multicollinearity between variables (Collinearity Tolerance of all variables are less than 1 with VIF tolerance are less than 1). These results also indicate that all factors in model have positive correlations with students' satisfaction. Tangibles and Assurance have strongest correlation with students' satisfaction.

From the results in Table 10, the regression equation is formed as in (1).

$$SAT = 0.407TAN + 0.330REL + 0.297RES + 0.339ASS + 0.309EMP \quad (1)$$

Testing hypothesis 1 to 5

H1: Tangibles has positive effect on students' satisfaction with education services of Thainguyen University. The regression analysis from the collected data shows that Beta coefficient of the independent variable TAN: $\beta_{TAN} = 0.407 > 0$, and t statistics of TAN has p-value = 0.000< 0.01 (Table 10). Thus, with 99% confidence interval, TAN is significant and therefore H1 is supported.

H2: Reliability *has positive effect on students' satisfaction with education services of Thainguyen University.* The regression analysis from the collected data shows that Beta coefficient of the independent

variable REL: β_{REL}= 0.330 > 0, relevant t statistics has p–value = 0.000 < 0.01 (Table 10). Thus, with 99% confidence interval, REL is significant and therefore H2 is supported.

H3: Responsiveness *has positive effect on students' satisfaction with education services of Thainguyen University.* The regression analysis from the collected data shows that Beta coefficient of the independent variable RES: β_{RES}= 0.297 > 0, relevant t statistics has p–value = 0.000 < 0.01 (Table 10). Thus, with 99% confidence interval, RES is significant and therefore H3 is supported.

H4: "Assurance" has positive effect on students' satisfaction with education services of Thainguyen University. The regression analysis from the collected data shows that Beta coefficient of the independent variable ASS: β_{ASS}= 0.339 > 0, relevant t statistics has p–value = 0.000 < 0.01 (Table 10). Thus, with 99% confidence interval, ASS is significant and therefore H4 is supported.

H5: *Empathy has positive effect on students' satisfaction with education services of Thainguyen University.* The regression analysis from the collected data shows that Beta coefficient of the independent variable EMP: β_{EMP}= 0.309 > 0, relevant t statistics has p–value = 0.000 < 0.01 (Table 10). Thus, with 99% confidence interval, EMP is significant and therefore H5 is supported.

5.4. Differences in assessing the overall satisfaction with education services of Thainguyen Universities of students by gender and year-time in university

Table 11: Levene's Test results

Dependent Variable: SAT

F	df1	df2	Sig.
.935	11	388	.507

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Sex + Time + Sex * Time

Source: Author's survey

Levene's Test for Equality of Variances has p–value = 0.507 > 0.050 (Table 11), Hypothesis "Equal variances assumed between group" is supported and the data is statistic significant to use ANOVA - Test.

Table 12: ANOVA – Test results

Dependent Variable: SAT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5.892[a]	11	.536	1.941	.033	.052
Intercept	1177.503	1	1177.503	4266.082	.000	.917
Sex	.901	1	.901	3.263	.072	.008
Time	3.914	5	.783	2.836	.016	.035
Sex * Time	2.761	5	.552	2.001	.078	.025
Error	107.094	388	.276			
Total	5067.738	400				
Corrected Total	112.986	399				

a. R Squared = .052 (Adjusted R Squared = .025)

Source: Author's survey

Results in Table 12 show that there is only group students in different year in university has different mean of satisfaction because of sig value = 0.016< 0.05.

In detail, only 1- year students group and 5- year students group has significant different mean of satisfaction because Tukey Post Hoc Tests has p–value = 0.049<0.5; the mean difference between two group is -0.3433 (Table 13).

Table 13: Post – hoc test results

Dependent Variable: SAT

Tukey HSD

(I) Time		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.0	2.0	-.1523	.09712	.620	-.4304	.1259
	3.0	-.0624	.09442	.986	-.3328	.2081
	4.0	-.0635	.10093	.989	-.3526	.2255
	5.0	-.3433	.13394	.049	-.7270	.0403
	6.0	-.4477	.24921	.469	-1.1615	.2660
2.0	1.0	.1523	.09712	.620	-.1259	.4304
	3.0	.0899	.06743	.766	-.1032	.2830
	4.0	.0888	.07628	.854	-.1297	.3072
	5.0	-.1911	.11650	.572	-.5247	.1426
	6.0	-.2955	.24028	.822	-.9836	.3927
3.0	1.0	.0624	.09442	.986	-.2081	.3328
	2.0	-.0899	.06743	.766	-.2830	.1032
	4.0	-.0011	.07281	1.000	-.2097	.2074
	5.0	-.2810	.11426	.139	-.6082	.0463
	6.0	-.3854	.23920	.592	-1.0705	.2997
4.0	1.0	.0635	.10093	.989	-.2255	.3526
	2.0	-.0888	.07628	.854	-.3072	.1297
	3.0	.0011	.07281	1.000	-.2074	.2097
	5.0	-.2798	.11969	.181	-.6226	.0630
	6.0	-.3842	.24184	.606	-1.0769	.3084
5.0	1.0	.3433	.13394	.049	-.0403	.7270
	2.0	.1911	.11650	.572	-.1426	.5247
	3.0	.2810	.11426	.139	-.0463	.6082
	4.0	.2798	.11969	.181	-.0630	.6226
	6.0	-.1044	.25738	.999	-.8415	.6327
6.0	1.0	.4477	.24921	.469	-.2660	1.1615
	2.0	.2955	.24028	.822	-.3927	.9836
	3.0	.3854	.23920	.592	-.2997	1.0705
	4.0	.3842	.24184	.606	-.3084	1.0769
	5.0	.1044	.25738	.999	-.6327	.8415

Based on observed means.

The error term is Mean Square(Error) = .276.

Source: Author's survey

VI. CONCLUSION

This study has contributed to identify student's satisfaction towards the education services that are delivered by Thainguyen University as a higher educational institution in Vietnam. After analyzing data from the survey, the results of regression analysis process show that all 5 initially proposed factors of the research framework are significant to stakeholders' satisfaction with education services of Thainguyen University. The factors influence students' satisfaction in the order of decreasing importance as follow: Tangible, Assurance, Reliability, Empathy and Responsiveness. The influence of these factors is shown in the formula (1):

SAT = 0.407TAN+ 0.330REL + 0.297RES + 0.339ASS + 0.309EMP (1)

This study's results have the same results from many of other studies that reviewed in literature reviews and give more proofs for the suitable of the SERVQUAL model to assess effective factors to stakeholders' satisfaction with education service of universities.

Secondly, the Two-Way Anova test and Tukey Post Hoc Tests show that 1-year student and 5-year student have difference in accessing their satisfaction (Tukey Post Hoc Tests has p–value = 0.049 < 0.050), the mean difference is -0.3433.

These results can help Thainguyen University managers give suitable strategies to improve the service quality for gaining higher students' satisfaction.

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