

Food technology learning scheme and students' satisfaction: The case of Dong Nai University of technology

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Abstract:

The primary objective of this study is to identify the current satisfaction level of customer at Dong Nai University of Technology. Exploring previous studies enables the context of customer satisfaction shall be impacted by antecedents, including (1) Non – academic factor, (2) academic factor, (3) reputation factor, (4) access factor, (5) program issues factor and (6) understanding factor. Measuring the impacts of each antecedent to customer satisfaction requires applying quantitative research method with linear regression technique. Achieved results show that antecedents above are modified after exploratory factor analysis and new components consists of (1) academic aspect, (2) reputation aspect excepting well-known level of the university, (3) program issues aspect in excepting flexibility in structure and syllabus of Food Technology learning, (4) access aspect, (5) understanding aspect, (6) attitude, stipulated time, and connection of non-academic staffs, (7) availability and communication skills of non-academic staffs, (8) well-known level of the university, and (9) flexibility in structure and syllabus of Food Technology learning. All new components can explain for 59.8 percent of total respondents and it is showed through R-Square value in model summary table. Statistically, all new components can explain for 59.8 percent of changes in student satisfaction as well. Among those components, reputation aspect excepting well-known level of the university as it has estimated beta value of 0.174 compared than estimated beta values of other components.

Keywords: learning scheme, food technology, student's satisfaction, learning and teaching

1. Introduction

Vietnam has been benefited by growth in its economy of which GDP of Vietnam in 2012 stood at US\$141.7 billion for the population of more than 88 million of people (World Bank, 2013), leading to the opportunities for the development of many industry sector and the country is also determined as good location for taking tourism. Wisconsin International Trade Team (2012) asserts that the dollar for food imports in Vietnam has increased more than 25 times

in last decade, it was only US\$20 million in 2000 and now reaching to US\$525 million in 2010. Along with the economic development in general, Vietnam is also well known as the country with good competitive advantage in natural food production as well as its imported foods are also consumed high proportion in importing structure of the country (State Government Victoria, 2009).

With the fact that food technology is considered as major sector of the economy, Ministry of Agriculture and Rural Development and Ministry of Education and Training have cooperated with each

other in opening new education programs and trainings. This encourages people participate in learning scheme and then they will utilize the knowledge into the real life context. Dong Nai University of Technology (DNTU) has also been integrated into this program.

Considering the fact that DNTU is now located in the biggest province in Southern Vietnam with the main kinds of land are bazon and alluvial soil. Dong Nai province is determined as the best place for growing industrial plants such as rubber, coffee and orchard. Dong Nai is also determined as famous industrial zones as it is surrounded by major economic areas such as Lam Dong in the north, Binh Thuan in the east, Ba Ria - Vung Tau in the south, Binh Duong, Binh Phuoc and Ho Chi Minh City in the west. Additionally, the climate in the province is always between 25.4 and 27.2 Celsius degree and such climate supports to growing many kind of vegetables and feeding animals. In this context, the study is strongly emphasized that DNTU has to enhance its higher

education scheme on food technology in order to take the competitive advantage of geographic area and gain the benefit from food industry. In more detail, the quality of education and training of food technology subject is the most important one whether student satisfaction is crucial factor for assessing the effectiveness of education. The problem should be addressed by this study about the quality of higher education and training on food technology at DNTU has not been reviewed and accessed before. And until now, there is no official research on the quality of education and training of food technology faculty through assessing the level of students' satisfaction. The author would like to choose the topic named: **“Food technology learning scheme and students' satisfaction at Dong Nai University of Technology”**.

The conceptual model of the research is based on the HEDPERF model of Firdaus, which will be presented in the next section, as below:

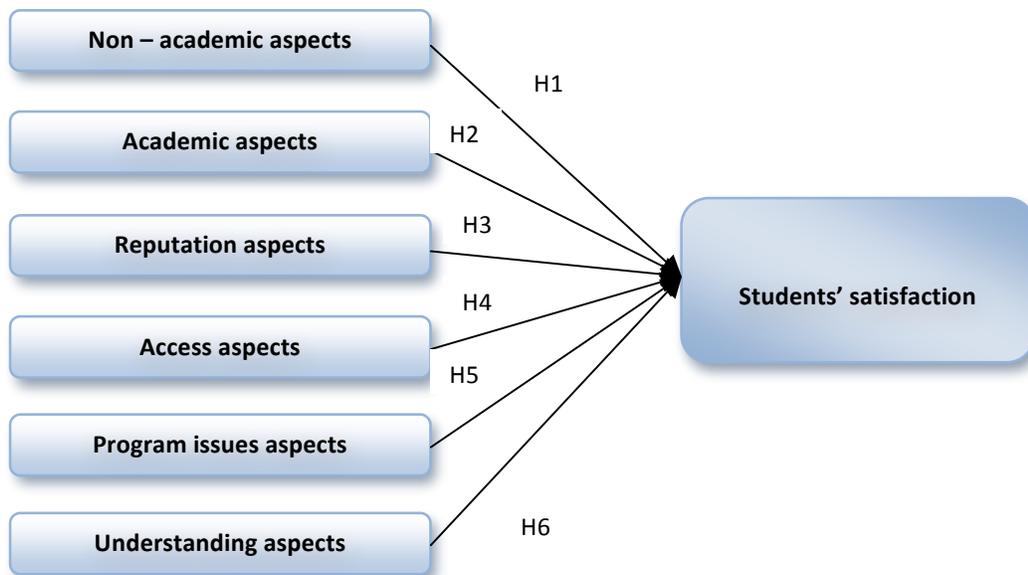


Fig 1: The conceptual model of the research. Source: adapted from Firdaus (2006)

According to the conceptual model of the research as well as the analysis in the above part about the relationship between six factors and student's satisfaction, the hypotheses of the research is again illustrated as below:

H1₀: There is no relationship between non-academic aspect and student satisfaction with learning program on food technology at DNTU

H1_a: There is a relationship between non-academic aspect and student satisfaction with learning program on food technology at DNTU

H2₀: There is no relationship between academic aspect and student satisfaction with learning program on food technology at DNTU

H2_a: There is a relationship between academic aspect and student satisfaction with learning program on food technology at DNTU

H3₀: There is no relationship between reputation aspect and student satisfaction with learning program on food technology at DNTU

H3_a: There is a relationship between reputation aspect and student satisfaction with learning program on food technology at DNTU

H4₀: There is no relationship between understanding aspect and student satisfaction with learning program on food technology at DNTU

H4₁: There is a relationship between understanding aspect and student satisfaction with learning program on food technology at DNTU

H5₀: There is no relationship between access aspect and student satisfaction with learning program on food technology at DNTU

H5_a: There is a relationship between access aspect and student satisfaction with learning program on food technology at DNTU

H6₀: There is no relationship between program issues aspect and student satisfaction with learning program on food technology at DNTU

H6₁: There is a relationship between program issues aspect and student satisfaction with learning program on food technology at DNTU

According to figure above, the dependent variable of the model is students' satisfaction and the independent variables of the models are: non – academic aspects, academic aspects, reputation aspects, access aspects, program issues aspects and understanding aspects.

2. Experimental methodology

2.1. Research method

In this research, the author would like to adopt both of qualitative and quantitative research method, however, quantitative method will be the main research method as the one of the main objective of this research measuring the relationship between student's satisfaction and its antecedents in order to predict the trend of student's satisfaction based on the factors impacting their satisfactions. Moreover, the deductive research approach, which is considered as the approach commonly used for quantitative research method according to Bryman & Bell (2007) has been chosen to apply in this study as mentioned in the earlier part of the research. In more detail, the qualitative method was conducted by the application of survey of questionnaire with a sample of students studying in food technology faculty of DNTU.

2.2. Sample size

As mentioned above, the author would like to collect the primary data from survey of questionnaire on a sample of people who are studying in food technology faculty of DNTU. The author self – recognized that it was necessary to conduct the sample technique to generate adequate sample size for later data analysis.

According to Tabachnick & Fidell (1996), the sample size should be calculated from the number of predictor factors used in the research, the calculation for the sample size is illustrated as below:

Sample size = 50 + 8 * Number of predictor factors

As mentioned from Chapter II, the conceptual model of the research contains 6 factors including: non – academic aspects, academic aspects, reputation aspects, access aspects, program issue aspects and understanding aspects. The author applied the calculation for sample size of Tabachnick & Fidell (1996) for sample size as: Sample size = 50 + 8 * 6 = 98. However, 98 respondents as sample size is quite small whether the student's satisfaction is considered as the new phenomenon which was studied in DNTU.

In another opinion, Roger (2006) stated that the sample size for social phenomenon should be range from 150 – 200 observations. The author decides to choose 200 people as the size of the sample because this number is suitable with the number of students in food technology faculty of DNTU (278 students). However, 278 survey of questionnaire were sent out by the author to make sure that the target number of respondents will be met due to the occurring of unqualified answers.

3. Data analysis and results

3.1. Overview of respondent information

There are four demographic information are collected in survey with 278 students who are learning Food Technology in DNTU. It is worth to denote that there are 78 questionnaires that have not been passed the quality of answers due to these respondents have not answered many questions. Hence, the response rate is about 72 percent (200/278 = 0.719). The table below is prepared to summary about demographic information of 200 respondents:

Table 1: Demographic information

Variable	Attributes	Number	Percent
Marital status	Single	181	90.5%
	Divorce	0	0.0%
	Marriage	19	9.5%
	Others	0	0.0%
Age	Less than 20 years old	68	34.0%
	20-24 years old	132	66.0%
	24-30 years old	0	0.0%
	>30 years old	0	0.0%
Sex	Male	102	51.0%
	Female	98	49.0%
Natio-nality	Vietnamese	200	100.0%
	Others	0	0.0%

As shown in the table above, marital status has four attributes, including single, divorce, marriage, and other (i.e. living alone or living with family). Result shows that more than 90 percent of students are single and they live in Dong Nai City for learning Food Technology in the university. High number of single student is true as the students in DNTU are still young and they are learning higher education on Food Technology and they do not want to get marriage.

The second demographic information is age, there are four age group categories, including less than 20 years old, 20-24 years old, 24-30 years old, and more than 30 years old. Among age categories, there are 34 percent and 66 percent of respondents lying in the first and second groups. Indeed, the students are young due to Vietnamese culture encourage people to go to school very early. It is different from students in

Western countries where students often go to work in trials before they go to university for achieving higher education. The third demographic information is sex or gender of respondents; there are 51 percent of male and 49 percent of female students involved in the survey. The number of male students is higher than female one accordingly. The last demographic information is nationality of students. The result shows that all students are from Vietnam. Or on the other hand, there are not students come from other countries.

3.2. Reliability test analysis

The table below is prepared to provide results of reliability test analysis for six aspects in conceptual research model:

Table 2: Result of reliability test analysis

No	Factors	Cronbach's alpha	Notes
1	Non-academic aspect	0.768	All attributes have Item-Total Correlation higher than 0.3
2	Academic aspect	0.911	A3 is removed as it has Item-Total Correlation lower than 0.3
3	Reputation aspect	0.896	All attributes have Item-Total Correlation higher than 0.3
4	Access aspect	0.877	All attributes have Item-Total Correlation higher than 0.3
5	Program issues aspect	0.899	All attributes have Item-Total Correlation higher than 0.3
6	Understanding aspect	0.830	All attributes have Item-Total Correlation higher than 0.3

As shown in the table, non-academic, academic, reputation, access, program issues, and understanding aspects have mean values of 0.768, 0.911, 0.896, 0.877, 0.899, and 0.8310 that are higher than the minimum value of 0.6, according to Hair et al. (2011). Among these factors, only non-academic aspect has one attribute (A3) with Item-Total Correlation of 0.287 that is lower than 0.3. Thus, A3 attribute has to remove from data analysis and Cronbach's alpha value will be 0.786 after this attribute is removed (Appendix II). It is worth to indicate that non-academic aspect is good reliability of survey scale while other factors have Cronbach's alpha values higher than 0.8 or they are very good reliability of survey scale.

Additionally, academic aspect is recorded as highest Cronbach's alpha value (0.911) and this result

is true since the students take into account what they can learn when joining in the university. In this context, their satisfaction and interests will be aligned with academic programs in food faculty at DNTU. Program issues aspect has second highest Cronbach's alpha value (0.899) and it is appropriate as any program issues will affect directly to what the student can learn from the university and they will impact negatively to the final results of the students in last semester.

3.3. Exploratory factor analysis

The table below described how many components are attracted from survey of questionnaire with 200 students in DNTU regarding to Food Technology teaching and learning.

Table 3: Rotated component matrix with Varimax rotation technique

Attributes	Component								
	1	2	3	4	5	6	7	8	9
B6	.943								
B4	.940								
B7	.938								
B5	.836								
B3	.640								
B2	.620								
B1	.599								
C4		.975							
C3		.964							

C6		.948							
C5		.942							
C1		.564							
E3			.972						
E4			.957						
E1			.948						
E5			.929						
D3				.929					
D4				.929					
D2				.782					
D1				.746					
F3					.907				
F4					.883				
F2					.747				
F1					.656				
A5						.869			
A6						.866			
A1						.730			
A4							.779		
A2							.665		
C2								.605	
E2									.677

The table above described about 9 components with factor loading of belong attributes:

- The first component includes 7 attributes of academic aspect, including B1, B2, B3, B4, B5, B6, and B7 with factor loadings of 0.599, 0.620, 0.640, 0.940, 0.836, 0.943, and 0.938. Among 7 attributes, B6 has highest factor loading value so pedagogical behavior of academic staffs will have highest impact on this component. This component is named as academic aspect.
- The second component includes 5 attributes of reputation aspect, including C1, C3, C4, C5, and C6 with factor loadings of 0.564, 0.964, 0.975, 0.942, and 0.948. Among 5 attributes, C4 has highest factor loading value so the specialization of DNTU on Food Technology will have highest impact on this component. This component is named as reputation aspect excepting well-known level of the university.
- The third component includes 4 attributes of program issues, including E1, E3, E4, and E5 with factor loadings of 0.948, 0.972, 0.957, and 0.929. Among 4 attributes, E3 has highest factor loading value so the designation of programs of food technology faculty are designed will have highest impact on this component. This component is named as program issues aspect in excepting

flexibility in structure and syllabus of Food Technology learning.

- The fourth component includes 4 attributes of access aspect, including D1, D2, D3, and D4 with factor loadings of 0.746, 0.782, 0.929, and 0.929. Among 4 attributes, D3 and D4 have highest factor loading values so accesses to academic staffs and to laboratory system will have highest impact on this component. This component is named as access aspect.
- The fifth component includes 4 attributes of understanding aspect, including F1, F2, F3, and F4 with factor loadings of 0.656, 0.747, 0.907, and 0.883. Among 4 attributes, F3 has highest factor loading value so the ease to ask for counseling advices from teachers and faculty will have highest impact on this component. This component is named as understanding aspect.
- The sixth component includes 3 attributes of non-academic aspect, including A1, A5, and A6 with factor loadings of 0.730, 0.869, and 0.866. Among 3 attributes, A5 has highest factor loading value so stipulated time provided by non-academic staffs will have highest impact on this component. This component is named as attitude, stipulated time, and connection of non-academic staffs.
- The seventh component includes 2 attributes of non-academic aspect, including A2 and A4 with factor loadings of 0.779 and 0.665. Among 2 attributes, A4 has highest factor loading value so

communication skills of non-academic staffs will have highest impact on this component. This component is named as availability and communication skills of non-academic staffs.

- The eighth component includes C2 as attribute of reputation aspect with factor loading of 0.605. This component is named as well-known level of the university.
- The ninth component includes E2 as attribute of program issues aspect with factor loading of 0.677. This component is named as flexibility in structure and syllabus of Food Technology learning.

Then, following hypotheses are prepared:

- Hypothesis 1: Academic aspect impacts positively on student satisfaction in Food Technology learning at DNTU
- Hypothesis 2: Reputation aspect excepting well-known level of the university impacts positively on student satisfaction in Food Technology learning at DNTU
- Hypothesis 3: Program issues aspect in excepting flexibility in structure and syllabus of Food Technology learning impacts positively on student satisfaction in Food Technology learning at DNTU

- Hypothesis 4: Access aspect impacts positively on student satisfaction in Food Technology learning at DNTU
- Hypothesis 5: Understanding aspect impacts positively on student satisfaction in Food Technology learning at DNTU
- Hypothesis 6: Attitude, stipulated time, and connection of non-academic staffs aspect impacts positively on student satisfaction in Food Technology learning at DNTU
- Hypothesis 7: Availability and communication skills of non-academic staffs impacts positively on student satisfaction in Food Technology learning at DNTU
- Hypothesis 8: Well-known level of the university impacts positively on student satisfaction in Food Technology learning at DNTU
- Hypothesis 9 : Flexibility in structure and syllabus of Food Technology learning impacts positively on student satisfaction in Food Technology learning at DNTU

3.3. Linear regression and hypothesis test

Table 4: Linear regression results between student satisfaction and 9 components

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.785	.617	.598	.287

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.175	.020		156.334	.000
	Academic aspect	.170	.020	.376	8.373	.000
	Reputation aspect excepting well-known level of the university	.174	.020	.384	8.543	.000
	Program issues aspect in excepting flexibility in structure and syllabus of Food Technology learning	.137	.020	.301	6.705	.000
	Access aspect	.098	.020	.216	4.814	.000
	Understanding aspect	.142	.020	.313	6.965	.000
	Attitude, stipulated time, and connection of non-academic staffs	.110	.020	.244	5.427	.000
	Availability and communication skills of non-academic staffs	.078	.020	.172	3.821	.000
	Well-known level of the university	-.027	.020	-.059	-1.310	.192
Flexibility in structure and syllabus of Food Technology learning	.001	.020	.003	.064	.949	

The table above showed that all new respondents and it is showed through R-Square value components can explain for 59.8 percent of total in model summary table. Statistically, all new

components can explain for 59.8 percent of changes in student satisfaction as well. Among those components, reputation aspect excepting well-known level of the university as it has estimated beta value of 0.174 compared than estimated beta values of other components.

Hypothesis 1

Academic aspect impacts positively on student satisfaction with estimated beta value of 0.170, meaning that when DNTU improves its academic performance by 1 percent, student satisfaction will be improved by 0.170 percent accordingly. This component has second highest beta value of DNTU has to take into account academic aspect in order to improve its customer satisfaction.

Hypothesis 2

Reputation aspect excepting well-known level of the university impacts positively on student satisfaction with estimated beta value of 0.174, meaning that when DNTU improves this component performance by 1 percent, student satisfaction will be improved by 0.174 percent accordingly. Reputation aspect excepting well-known level of the university has highest beta value compared to other component so that DNTU has to take into account this component in order to improve its customer satisfaction.

Hypothesis 3

Program issues aspect in accepting flexibility in structure and syllabus of Food Technology learning impacts positively on student satisfaction with estimated beta value of 0.137, meaning that when DNTU improves this component by 1 percent, student satisfaction will be improved by 0.137 percent accordingly. Access aspect has second lowest beta value compared to other component so that DNTU does not need to take into account this component in short term.

Hypothesis 4

Access aspect impacts positively on student satisfaction with estimated beta value of 0.098, meaning that when DNTU improves this component by 1 percent, student satisfaction will be improved by 0.098 percent accordingly. Access aspect has second lowest beta value compared to other component so that DNTU does not need to take into account this component in short term.

Hypothesis 5

Understanding aspect impacts positively on student satisfaction with estimated beta value of 0.142,

meaning that when DNTU improves this component by 1 percent, student satisfaction will be improved by 0.142 percent accordingly. Understanding aspect has third highest beta value compared to other component so that DNTU does not need to take into account this component in short term.

Hypothesis 6

Attitude, stipulated time, and connection of non-academic staffs aspect impacts positively on student satisfaction with estimated beta value of 0.110, meaning that when DNTU improves this component by 1%, student satisfaction will be improved by 0.110 percent accordingly. Access aspect has third lowest beta value compared to other component so that DNTU does not need to take into account this component in short term.

Hypothesis 7

Availability and communication skills of non-academic staffs impacts positively on student satisfaction estimated beta value of 0.078, meaning that when DNTU improves this component by 1 percent, student satisfaction will be improved by 0.078 percent accordingly. Access aspect has lowest beta value compared to other component so that DNTU does not need to take into account for this component in short term.

Hypothesis 8

This hypothesis is rejected due to estimate beta value that is not statistical significance at 5 percent of confidence interval (Sig. value = 0.192 > 0.05).

Hypothesis 9

This hypothesis is rejected due to estimate beta value that is not statistical significance at 5 percent of confidence interval (Sig. value = 0.949 > 0.05). Indeed, the students often do not have much idea on structure and syllabus of food technology learning at DNTU. This is also recognized as key problem in all local universities whether the students have not been actively involved in program designing. On the other hand, it means that structure and syllabus in DNTU are designed by group of teachers and therefore, their ideas may not be aligned with students' demands.

4. Conclusions

The study is conducted with the application of quantitative research method and it is proposed to use three types of data analyses. The first one is reliability test for the survey scale with the objective of identifying the factors that have meaninglessness in

the scale. The second one is exploratory factor analysis in order to recognizing the underlying constructs between factors used in the conceptual research model. The last one is linear regression of which it helps to test proposed hypotheses based on T-Test at confidence interval of 95 percent. The major weakness is the application of exploratory factor analysis that is determined as not good in case of this analysis is often conducted when there are strong theories and concepts for the relationship between factors in the conceptual research model. Chosen conceptual research model, however, were true in several previous studies but it might not be true in the study. Conclusion, DNTU should establish foreign study teaching community. When the teachers participate in this community, they will be benefited by experiences and expertise from other teachers in teaching foreign study in general and teaching Food technology in particular. Furthermore, the university should reserved the room for teachers to carry their own researches on Food Technology teaching methods as well as supporting for higher degrees.

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