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The Impact of Components in Marketing - Mix Strategy on Customer Satisfaction and Loyalty: Case Study at Codegym Vietnam Joint Stock Company, Hue Branch

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ABSTRACT

This study aims to analyze the impact of 7 components on the marketing - mix strategy on the satisfaction and loyalty of programming course students at the branch of CodeGym Vietnam Joint Stock Company in Hue. The study combined exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) to measure the impacts of each component into the success of marketing - mix strategy then applied linear structural modeling (SEM) to test the related hypothesis of driving parameters to the customers' satisfaction and loyalty. The finding indicated that there are 3 major factors having positively impact on customer satisfaction and loyalty, including: product, distribution and process. On the contrary, price, promotion, people and facilities factors have a negative impact on student satisfaction. The study also suggests several important implications to enhancing the efficiency of marketing mix strategy - with a need to focusing on developing marketing mix programs for centers to enhance customer satisfaction and loyalty.

Keywords: Marketing Strategy, Satisfaction, Brand Loyalty
JEL Classifications: M30, M390, M370

1. INTRODUTION

With the strong development of the current era of digital technology and digital economy, information technology is being evaluated as one of the key industries of the Vietnamese economy. However, the biggest challenge for Vietnam to further develop in the field of technology is the problem of human resources lacking both quality and quantity at a high level. Racing with the increasing demand for IT human resources, the supply of IT from universities, colleges, and centers also explodes and develops to meet the great demand in the technology field (Linh, 2021). In particular, technology training companies are growing rapidly and blooming with many different scales, creating a vibrant IT training market. With fierce competition in this market, satisfaction and loyalty determine a company's success (Linh, 2021). Loyalty influences the intention to maintain, return to buy or support a company's products. To maintain customer satisfaction and loyalty, businesses have many different strategies, of which marketing mix is an effective tool (Kotler et al., 2007; Yen, 2018).

In Hue city, there are many centers specializing in training programmers of many different scales. Prominent among them is CodeGym Vietnam Joint Stock Company - an enterprise specializing in training modern programmers. 5 years ago, CodeGym was the first business to apply the Coding Bootcamp model in Vietnam, this is also the strongest competitive advantage to gain market share and attract customers to CodeGym company. But today, more and more businesses are applying this model and applying more superior models, requiring CodeGym to have appropriate strategies to assert its position in this fiercely

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competitive market. From there, CodeGym can earn profits and survive and develop. To accomplish this, the company needs to do many things, but first, it needs to develop a clear marketing strategy and, most importantly, review the effectiveness of its current marketing mix.

To date, many studies have been conducted to examine the relationship between the marketing mix, satisfaction and loyalty in a variety of contexts and sectors. A typical example is research on the impact of marketing strategies and satisfaction on student loyalty (Chen, 2016). Research focuses on learner satisfaction from the influence of marketing mix aspects have received much attention on the current Era (Koes et al., 2011; Phuoc, 2019; Yen, 2018). Through research, these scholars have not been able to evaluate related studies on this relationship in the field of education in Vietnam. On the contrary, there are many studies in other fields such as dining, banking, hotels receiving much concerns and conduction on typically food services, domestic tourists and tourism attraction (Hai, 2020; Le et al., 2022) In Hue city, there have been studies focusing on analyzing the impact of marketing mix on customer satisfaction such as uniform products (Thi, 2019) and wedding invitation products (Phuoc, 2019). Therefore, the relationship between marketing mix, satisfaction and loyalty is of interest to many researchers, but there are very few studies on this relationship in a specific information technology training center.

Conducting this research allow to mine the role of marketing mix on customer satisfaction and loyalty to CodeGym Hue's educational services. Preliminary findings were the fundamental principles to suggest several early implications for developing marketing mix programs for CodeGym in particular and other training centers in general.

2. LITERATURE REVIEW

2.1. Marketing Mix

The term Marketing Mix appeared in the 40s of the 20th century from the research of professor Neil Borden with the purpose of describing the main marketing elements that businesses must plan to satisfy customer needs. By 1960, E. Jerome McCarthy continued to research and propose to classify the elements in the marketing mix into 4 elements: product, price, distribution and promotion, briefly called 4P (McCarthy, 1960). According to McCarthy, the 4P model can help planners outline a clear direction for a company's marketing strategy and, if applied well, will effectively carry out marketing activities while achieving profits (McCarthy, 1960). The 4P model with outstanding benefits is widely applied by businesses in many fields and continues to develop with the times. Marketing mix becomes an important tool to help businesses achieve their business goals. In the past few years, the marketing mix model has been expanded to meet flexibility in each field and promote the importance of three factors: people, processes and physical evidence. These three elements add to the 4P model and are collectively known as the 7P model.

2.2. Customer Satisfaction

Satisfaction is the level of a person's feeling state obtained from comparing the results obtained from the product with that person's expectations (Armstrong et al., 2014; 2018; Zineldin and Philipson, 2007). Minh Dao Tran posed: "*Customer satisfaction is the level of a consumer's perceived state created from comparing the results obtained when consuming a product with their expectations* (Minh, 2006). Thus, satisfaction is measured by the difference between the actual benefits and their expectations when deciding to use the service. Based on customers' feelings, they may feel comfortable or uncomfortable with the products and services that the business provides. This assessment plays a key role in marketing results in particular and business results in general. Creating and maintaining customer satisfaction will bring many benefits to businesses.

2.3. Customer Loyalty

According to Gremler and Brown (1996), the definition of customer loyalty to products and services is as follows: *"The extent to which customers exhibit repeat purchasing behavior from a service provider, possessing a positive attitudinal tendency toward the provider. And when the need for that service exists, they only consider using that service provider"*. Customer loyalty is one of the factors that reflects a business's success in providing products and services, determining the competitive position of a business in the market. Customers have a preference for that business in many subsequent purchases when they feel satisfied with the products and services in the previous purchase and have a need at that time. Businesses will achieve good revenue after efforts to satisfy customers. Not only that, loyal customers will be the most valuable reference sources for potential customers and support businesses in increasing customer conversion rates.

3. RESEARCH HYPOTHESES, PROPOSED MODELS AND METHODS

3.1. Research Hypotheses, Proposed Models

Ideals by several published studies, the relationship between marketing mix and customer satisfaction needs to be emphasized and emphasized and has been tested in many different contexts (Anderson RE, 2003; Zineldin and Philipson, 2007). In the service sector, the authors focused on studying the impact of 7 elements in the marketing mix, all of which showed a positive impact on customer satisfaction. Some scholars agreed that marketing mix impacts strongly positive on the level of customer satisfaction in the tourism sector (Rasyid and Muhamadiyah, 2017). And no exception in the field of vocational education, research by Chen 2016 also shows a positive relationship between marketing mix and customer satisfaction. Therefore, the first hypothesis H1 is proposed as follows:

H1: Marketing mix 7Ps has a positive impact on customer satisfaction.

Businesses strive to coordinate elements in the marketing mix to reach their target customers. If customers use a product and have a high level of satisfaction, Reichheld and other researchers also believe that customers will repeat purchase that product the next time they use it and be loyal to the product (Reichheld, 1996). This shows that customer satisfaction also has a positive influence on loyalty and has also been proven in many areas. A typical example is the research of Lee and Kim 2015 regarding of dining

Table 1: Scales and origins of research scales

Encryption	Variable name	The scale	Relevant studies
1	Product (SP)		
SP1	Personalized learning and training pathways	Likert 1-5	Phuoc, 2019; Thi, 2019; Chen, 2016
SP2	The course has high practical application		
SP3	Regularly organize seminars, skills classes and other activities for learners		
SP4	The training method following the Coding Bootcamp model is effective and outstanding		
2	Price (CP)		
CP1	Suitable for personal and family finances	Likert 1-5	Pardiyono, 2020; Chen, 2016
CP2	Tuition fees correspond to the quality of training		
CP3	Flexible payment methods		
CP4	Announce revenue clearly		
3	Place (PP)		
PP1	The center is located in a recognizable and easy-to-find location	Likert 1-5	Thi Phuong Thao and Đinh Binh, 2016
PP2	The center is located near businesses operating in the information technology field		
PP3	Flexible learning format: combining online and face-to-face		
PP4	The center is near where you live, convenient to travel		
4	Promotion (XT)		
XT1	Diverse communication channels (search engines, social networks, flyers, banners)	Likert 1-5	Pardiyono, 2020
XT2	Organize and participate in many activities (minigames, career consulting, sponsorship)		
XT3	Many attractive promotions are launched regularly		
XT4	Honest and trustworthy advertising content		
5	People (CN)		
CN1	Old students help and support new students	Likert 1-5	Pardiyono, 2020; Thi Phuong Thao and Đinh Binh, 2016
CN2	Instructors have high professional qualifications and reputation in the profession		
CN3	Admissions consultants are cheerful, thoughtful, and give enthusiastic advice		
CN4	Instructors teach enthusiastically, happily and care about students		
6	Process (QT)		
QT1	The entrance exam process is clear	Likert 1-5	Thi Phuong Thao and Đinh Binh, 2016; Chen, 2016
QT2	Clear training roadmap		
QT3	The process of evaluating learning outcomes is fair and clear		
7	Physical evidence (VC)		
VC1	Spacious classrooms, meeting theoretical and practical learning requirements	Likert 1-5	Thi Phuong Thao and Đinh Binh, 2016; Chen, 2016
VC2	Spacious parking system, clean restrooms		
VC3	Equipped with modern technological equipment for learning		
VC4	The classroom is conveniently arranged for learning and exchange between students in the class		
8	Satisfaction (HL)		
HL1	I am satisfied with my decision to take a programming course at CodeGym	Likert 1-5	Anderson, 2003; Muala and Qurneh, 2012
HL2	I think I made the right decision when choosing CodeGym as a place to study		
HL3	I am satisfied with CodeGym's marketing activities		
9	Loyatly (TT)		
TT1	I will return to CodeGym when I decide to take more programming courses	Likert 1-5	Anderson, 2003; Koes et al., 2011; Yoon and Uysal, 2005
TT2	I will prioritize choosing CodeGym over other centers for future study		
TT3	I will recommend CodeGym to my relatives and friends who want to learn programming		

Total: 33 observed variables
Source: Researched and compiled by the author

in chicken restaurants in Korea (Zineldin and Philipson, 2007) or in the higher education environment of (Chen, 2016). Therefore, the next hypothesis is proposed:

H2: Customer satisfaction has a positive impact on customer loyalty.

By referring to related research models, the author has adjusted them to suit the research topic. The proposed research model is shown in the Diagram 1 below:

Diagram 1: Research model

Source: Suggested by author

3.1.1. Measurement scale

The scale measuring the co-directional impact between three marketing factors, satisfaction and loyalty, was built based on an overview of research by many authors. At the same time, observed variables were added and adjusted from the results of in-depth interviews conducted by the author. The total number of variables after the qualitative research is 33 variables with 9 criteria determined from the research model. The measurement of observed variables was performed using a 5-level Likert scale and quantitative findings were made (Table 1).

3.2. Methods

3.2.1. Bases of sample size

The minimum sample size in research using exploratory factor analysis (EFA) is 50, and it is better with a sample size of 100 or more (Hu et al., 1999; Kono and Sato, 2023; Laing, 2015; Leguina, 2015). The ratio of the number of observed variables to one measured variable is 5:1 or 10:1, with the number of observations being the number of valid survey responses required for the study and the measured variable being a unit of content needing investigation from the survey subjects, specified by a question in the survey form.

The sample size (n) is determined as follows (Bollen and Paxton, 1998):

$n \geq 5 \times a$

(a: Number of observed variables)

For this study, with the number of observed variables being 33, the minimum sample size is 165 samples. However, to ensure high reliability and mitigate risks, the author distributed 190 questionnaires.

3.2.2. Pathway of sample selection

To facilitate access to survey learners, the author divided the research object into classes that learners attended and surveyed a total of 24 classes. Of these, 12 classes are currently studying and 12 classes have completed the program. Actual results of surveying 190 learners using simple random method. The author conducted a survey using a questionnaire combining both face-to-face and online forms with the results of a total of 190 responses, of which 175 were valid questionnaires used for processing, analysis and evaluation.

3.2.3. Analysis method

Conduct data cleaning and coding after collecting a sufficient number of observation samples. Data were further analyzed using SPSS 20 and AMOS 20 software to clarify the research problem using descriptive statistical methods, scale reliability testing, and exploratory factor analysis. At the same time, analyze in depth using confirmatory factor analysis methods and test hypotheses using linear structural models.

3.2.4. Reliability test of the scale using cronbach's alpha

The Cronbach's alpha reliability test is a tool to examine how reliable the observed variables are through the reliability coefficient of the scale. The reliability coefficient of the scale reflects the degree of correlation between observed variables within a single factor. Therefore, the higher the reliability coefficient, the more reliable the scale is, making it suitable for research. Cronbach's alpha coefficient ranges from 0 to 1. If the reliability coefficient approaches 0, it means the observed variables in that factor group are loosely correlated. Conversely, if the reliability coefficient approaches the upper limit of 1, it indicates a strong correlation between the variables within that factor. A Cronbach's alpha coefficient of 0 means there is no correlation among the variables, and a coefficient of 1 indicates perfect correlation, though these two extremes are very rare.

Studies using Cronbach's Alpha reliability test must follow certain standards to ensure significant results [38,29]:

$0.8 \leq$ Cronbach's alpha ≤ 1: Very good scale

$0.7 \leq$ Cronbach's alpha ≤ 0.8: Good scale

$0.6 \leq$ Cronbach's alpha ≤ 0.7: Acceptable scale for new research

Cronbach's alpha ≤ 0.6: Inappropriate scale.

The Corrected Item-Total Correlation coefficient should be ≥ 0.3 for a good scale. The Corrected Item-Total Correlation reflects the correlation between each observed variable and the remaining observed variables in the factor. The higher this coefficient, the better the quality of the observed variable. Another important coefficient is Cronbach's Alpha if Item Deleted, which indicates the value of Cronbach's alpha if that observed variable is removed. If the value of Cronbach's alpha if Item Deleted is higher than the Cronbach's alpha (when the initial Cronbach's alpha does not meet standards), it is necessary to consider removing the observed variable to increase the reliability of the scale.

3.2.5. Exploratory factor analysis (EFA)

Exploratory factor analysis (EFA) is an important method for in-depth analysis of research results. The outcomes processed using this method help evaluate factors and observed variables, or in other words, it helps reduce a set of k observed variables to a set F smaller than k while still reflecting their initial meaning. Through the EFA analysis step, the relationship between variables within each factor is examined. Variables that load on multiple factors or are incorrectly loaded will be removed for further analysis. The standard values to consider in EFA after performing Principal Components Analysis with Varimax rotation include:

KMO (Kaiser-Meyer-Olkin) coefficient: $0.5 \leq$ KMO ≤ 1 (indicates the adequacy of sampling for the factor analysis).

Bartlett's Test of Sphericity: sig Bartlett's Test <0.05 (indicates whether the observed variables are correlated with the factor).

Eigenvalue: Eigenvalue >1 (criterion for determining the number of factors).

Total variance explained: Total variance explained $\geq 50\%$ (reflects the model's suitability).

Factor loading: Multivariate data analysis ≥ 0.5 (indicates the correlation between observed variables and the factor).

According to the research by Hair et al. (2010), Factor Loading should be considered with corresponding sample sizes to the following standard values: Factor Loading of $\pm$ 0.3 ($\approx$350 samples): the minimum value for retaining an observed variable; Factor Loading of $\pm$ 0.5 ($\approx$120 samples): indicates a good observed variable; Factor Loading of $\pm$ 0.7 ($\approx$60 samples): Indicates a very good observed variable.

3.2.6. Confirmatory factor analysis (CFA)

Confirmatory factor analysis (CFA) is a type of structural equation modeling (SEM) that focuses on measuring the relationship between observed variables without distinguishing between independent and dependent variables.

The purposes of using CFA include:

Assessing the fit of the research model with indices such as Chi-square/df, GFI, TLI, CFI, RMSEA, etc.; Evaluating the quality of observed variables, confirming whether factor structures meet standards; Assessing the discriminant and convergent validity of variables in the model.

3.2.7. Hypothesis testing using structural equation modeling (SEM)

Structural equation modeling (SEM) is a technique for analyzing the multidimensional relationships between variables in a model. This technique can verify the relationships between variables by combining the model with quantitative data and pre-established hypotheses. The results from this analysis method highlight the research problem and provide a basis for proposing solutions. Hypothesis testing using SEM can help researchers analyze and evaluate the model based on statistical attributes such as multiple regression models, the relationship between variables according to the research hypothesis, and modeling multidimensional relationships between variables in a model.

4. FINDINGS AND DISCUSSION

4.1. Characteristics of the Study Sample

In this study, the author surveyed students who have been studying at CodeGym Hue. According to the processing results in Table 2, we see that the surveyed students make up the majority of the current class (56.60% corresponding to 99 people). Through the survey results, there is a clear gender gap between students studying at CodeGym Hue. Specifically, the proportion of men accounts for up to 90.09% with 159 students, while the proportion of women accounts for only 9.10%, corresponding to 16 students. CodeGym Hue's students are mainly distributed between the ages of 18-30 years old, specifically, the age group from 18 to 22 had 87 survey participants, accounting for the largest proportion of 49.70%; Second is the age group from 23 to 30 with 78 people, equivalent to 44.60%. Survey participants included both students and alumni, so there was a distribution across all income levels, of which income levels under 4.5 million VND accounted for more than 50%. Of the 175 valid surveys, the Bootcamp Java Web Full-stack programming course accounted for the highest proportion with 58.30%.

Table 2: Information about surveyed students

Targets	Number of students	Proportion (%)
Sex		
Male	159	90.9
Female	16	9.1
Age		
Under 18	0	0.0
From 18 to 22 years old	87	49.7
From 23 to 30 years old	78	44.6
From 30 years old or older	10	5.7
Income (VND)		
Under 3,000,000	43	24.6
3,000,000-4,499,999	51	29.1
4,500,000-7,499,999	30	17.1
7,500,000-14,999,999	32	18.3
Over 15,000,000	19	10.9
Selected course		
Website programming with PHP Laravel	56	32.0
Full-stack Java Website Bootcamp Programming	102	58.3
NET core Bootcamp programming (part-time - 9 months)	17	9.7
Study status		
Studying	99	56.6
Graduated	76	43.4

Source: Results of processing survey data of 175 students, 2023

4.2. Testing Scale Reliability (Cronbach's Alpha)

Table 3 shows that the cronbach's alpha coefficients of the independent and dependent variables are all >0.7 and the total variable correlation coefficients all meet the required level (>0.3). The Cronbach's Alpha coefficient if the variables "SP1," "VC1" and "CN1" are eliminated has a value greater than the Cronbach's Alpha coefficient of the corresponding independent variable, but the variable is not eliminated because the Cronbach's Alpha coefficient has met the standard. Therefore, all 33 observed variables are suitable and achieve good reliability, so they will continue to be used in subsequent analyses.

4.3. Exploratory Factor Analysis (EFA)

First EFA analysis for independent variables: KMO coefficient = 0.667 > 0.5 and Bartlett's test has Sig value. = 0.000 < 0.05, thus meeting the requirements of factor analysis. 27 observed variables were used for factor analysis with the standard Eigenvalue >1, resulting in 8 factors. The total variance extracted is 65.06%, indicating that these 8 factors explain 65.204% of the variation in observed variables. However, the variable "CN1" has a factor loading of <0.5 and the variable "VC1" is located separately in the 8th factor, so it was removed from the model.

Second EFA analysis for independent variables: Results of second EFA analysis with 25 observed variables, value of KMO coefficient = 0.674 > 0.5 and Bartlett's test has Sig value. = 0.000 < 0.05 shows satisfactory factor analysis. At the same time, the 7 groups of factors after rotation all have an Eigenvalue coefficient

Table 3: Testing scale reliability

Variable name	Description	Cronbach's alpha coefficient
SP	Product	0.785
CP	Price	0.716
PP	Place	0.743
XT	Promotion	0.781
CN	People	0.738
QT	Process	0.733
VC	Physical evidence	0.741
HL	Satisfaction	0.747
TT	Loyalty	0.736

Source: Results of processing survey data of 175 students, 2023

>1 and the total variance extracted is 63.558% >50%, which means that the 7 groups of factors that have been synthesized can explain 63.558% of the variation in the data. At the same time, all Loading-Factor loadings are >0.5, so factor analysis with is appropriate.

The EFA exploratory factor analysis method is used similarly to the indicators measuring student satisfaction and loyalty. After analysis, the results showed that Eigenvalue >1 and the total variance extracted was >50%, so no variables were eliminated.

4.4. Confirmatory Factor Analysis (CFA)

After performing CFA analysis, the results are as follows: CMIN/DF = 1,354 <3; CFI = 0.908, GFI = 0.842 and RMSEA = 0.045 <0.08, the results show that the indexes are at a good level and reflect that the model is suitable for market data (Table 4). However, after processing the data, the Standardized Loading Estimates index of the variable "CP1" = 0.478 < 0.5, so this variable was eliminated to increase reliability. After removing the "CP" variable, the measurement indicators improved, so this model was continued to be used for analysis in the next steps.

With the results of data processing, the combined reliability of the factors is above 0.7 and the AVE value is >0.5, so it can be concluded that the scale has good reliability.

After performing confirmatory factor analysis, the result is that the standardized weights of the observed variables all have a value >0.5 (Table 5). At the same time, the key unstandardized weights are all statistically significant (P-value < 0.05). Therefore, we can conclude that the scale achieves convergent validity.

From the analysis results shown in Table 6, it shows that the square root values of AVE are all greater than the correlation coefficient between that variable and other variables in the model. The second condition has been satisfied, so the model's distinctiveness is guaranteed.

In summary, after evaluating the model using confirmatory factor analysis, CFA with the factors of suitability, reliability, convergence and discrimination all yielded good results. Therefore, the research model after adjustment is used in the linear structural model SEM.

4.5. Structural Equation Modeling (SEM)

4.5.1. Analysis of the first SEM model

According to the analysis results, it shows that the indexes assessing the model's suitability with market data are guaranteed, specifically: CMIN/DF=1.301 < 3; TLI = 0.911; CFI = 0.923 > 0.9; RMSEA = 0.042 < 0.08 (Figure 1). Thus, the model is kept intact and continues to be used to analyze the SEM model.

From the analysis results in Table 7, the following conclusions can be drawn:

- The factors of "Product Policy," "Distribution Policy" and "Process Policy" in relationship with "Satisfaction" have a P = 0.008 respectively; 0.014; 0.018 is <0.05, so these factors all have the same impact on student satisfaction. On the other hand, satisfaction also has a great impact on loyalty with P < 0.05. Therefore, hypotheses H1, H3, H6, H8 are retained in the model for further analysis.

Table 4: Factor rotation matrix

Observed variables	Factors in the research model						
	1	2	3	4	5	6	7
SP2	0.849						
SP4	0.807						
SP3	0.721						
SP1	0.719						
XT3		0.810					
XT4		0.765					
XT1		0.754					
XT2		0.750					
PP2			0.791				
PP3			0.733				
PP1			0.715				
PP4			0.689				
CP2				0.789			
CP3				0.725			
CP4				0.725			
CP1				0.619			
CN3					0.842		
CN2					0.765		
CN4					0.750		
QT2						0.821	
QT1						0.800	
QT3						0.742	
VC4							0.829
VC2							0.795
VC3							0.782

Source: Results of processing survey data of 175 students, 2023

Table 5: Results of reliability analysis

Factor	CR	AVE
Product	0.799	0.502
Price	0.783	0.522
Place	0.749	0.518
Promotion	0.716	0.501
People	0.764	0.520
Process	0.755	0.513
Physical evidence	0.760	0.517
Satisfaction	0.766	0.529
Loyalty	0.752	0.516

Source: Results of processing survey data of 175 students, 2023. CR: Composite reliability, AVE: Aggregate variance extracted

- The factors "Price policy," "Promotion policy," "Human policy" and "Facilities policy" have a negative impact on student satisfaction because of the P value. =value >0.05. Therefore, hypotheses H2, H4, H5, H7 are removed from the model.

4.5.2. Analyze the 2nd SEM model

Results after second SEM model analysis with indexes CMIN/DF = 1.368 <3; TLI = 0.938 > 0.9; CFI = 0.949 > 0.9 and RMSEA = 0.046 < 0.08 show that the model fits market data (Figure 2).

The results of the second SEM model analysis shown in Table 8 show that the P-value of the hypotheses is <0.05, so the factor groups "Product Policy," "Distribution Policy," "Process Policy" all have a positive influence on students' "Satisfaction" and "Satisfaction" has a positive influence on students' "Loyalty."

Table 6: Discriminant values

	SP	XT	PP	CP	CN	QT	VC	HL	TT
SP	0.708								
XT	−0.031	0.689							
PP	−0.028	0.092	0.654						
CP	0.068	0.156	0.337	0.677					
CN	0.003	−0.139	0.429	0.200	0.721				
QT	−0.092	0.113	0.081	0.370	0.188	0.716			
VC	0.325	0.041	0.155	0.133	0.148	0.034	0.719		
HL	0.268	−0.007	0.295	0.235	0.115	0.235	0.270	0.728	
TT	0.251	0.039	0.258	0.222	0.174	0.206	0.170	0.367	0.719

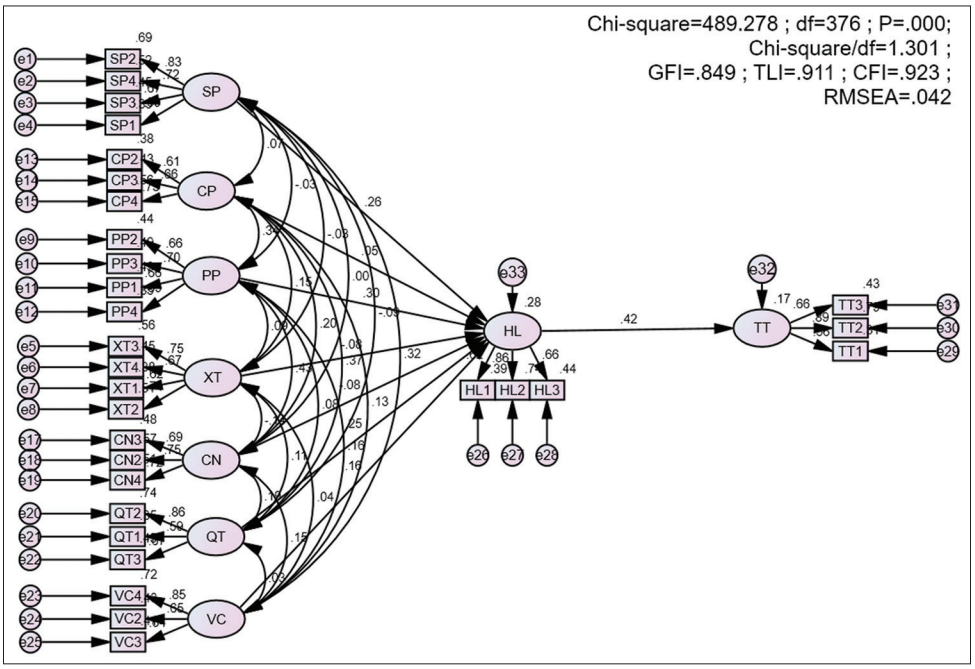
Source: Results of processing survey data of 175 students, 2023

Table 7: Results of the first structural equation modeling model analysis

Dependent variables	Loading direction	Independent variables	Estimate	SE	CR	P	Standard coefficient
HL	←	SP	0.234	0.089	2.634	0.008	0.262
HL	←	CP	0.056	0.131	0.423	0.672	0.047
HL	←	PP	0.297	0.121	2.454	0.014	0.300
HL	←	XT	−0.088	0.105	−0.839	0.401	−0.078
HL	←	CN	−0.070	0.093	−0.752	0.452	−0.083
HL	←	QT	0.200	0.084	2.368	0.018	0.253
HL	←	VC	0.113	0.071	1.556	0.111	0.157
TT	←	HL	0.367	0.099	3.694	***	0.417

Source: Results of processing survey data of 175 students, 2023. CR: Composite reliability, SE: Standard error

Figure 1: 1st structural equation modeling linear structural model

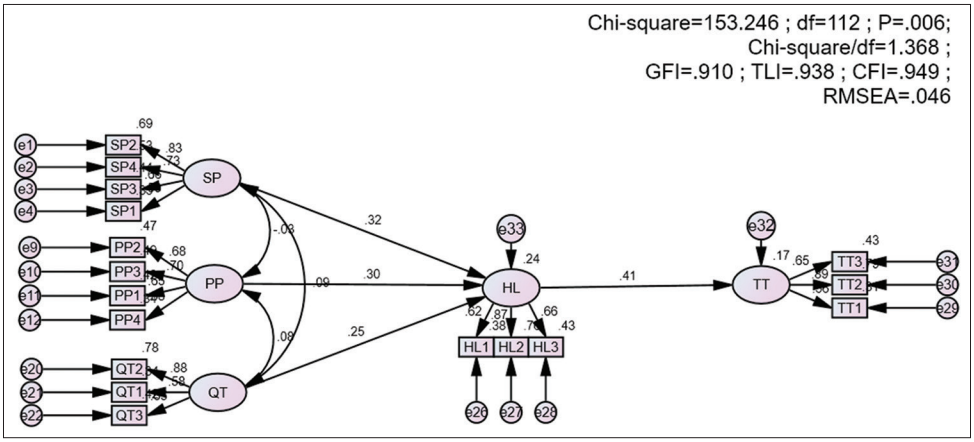


Source: Results of processing survey data of 175 students, 2023

The standardized coefficient is a value that reflects the level of impact between the relationships that need to be considered. Therefore, based on the results in Table 8, we have the following conclusions:

- The factor group "Product Policy" has a standardized coefficient of 0.315, indicating that if this group changes by 1 unit, the "Satisfaction" of students will change by 0.315 units. Compared to other factors in the marketing mix that impact satisfaction, the product policy factor group has the strongest impact.
- "Distribution policy" also has a positive impact on "Satisfaction." With a standardized coefficient of 0.296, it shows that if "Distribution Policy" changes by 1 unit, "Loyalty" will also change by 0.296 units in the same direction.
- Student "satisfaction" is least affected by the factor group "Process policy" with a standardized coefficient of 0.248. This number means that if the procedural policy changes by 1 unit, student satisfaction changes by 0.248 units in the same direction of change.

Figure 2: 2nd structural equation modeling linear structural model



Source: Results of processing survey data of 175 students, 2023

Table 8: Results of the second structural equation modeling model analysis

Dependent variables	Loading direction	Independent variables	Estimate	SE	CR	P	Standard coefficient
HL	←	SP	0.280	0.084	3.324	***	0.315
HL	←	PP	0.280	0.094	2.971	0.003	0.296
HL	←	QT	0.188	0.071	2.638	0.008	0.248
TT	←	HL	0.363	0.099	3.652	***	0.410

Source: Results of processing survey data of 175 students, 2023. CR: Composite reliability, SE: Standard error

- "Satisfaction" is very closely related to the "Loyalty" of students. Specifically, the standardized coefficient of 0.410 means that if "Satisfaction" changes by 1 unit, "Loyalty" will also change by 0.344 units.

5. CONCLUSIONS AND POLICY IMPLEMENTATIONS

The programmer recruitment market in Vietnam is increasingly growing and the need to learn programming is also increasing, so there is fierce competition between programming training systems nationwide. Each center must really focus on building a Marketing Mix policy to ensure it meets customer needs. At the same time, meeting customer needs well will increase reputation and competitiveness, thereby creating conditions for long-term, sustainable development.

Research on the topic shows that the importance of marketing mix policy for CodeGym Hue in a fiercely competitive environment affects the satisfaction and loyalty of students to the center. At the same time, the project also achieved a number of research objectives as follows:

- Systematize theoretical and practical issues of marketing mix policy, customer satisfaction and loyalty as well as summarize the current status of the programming training market in Thua Thien Hue province.
- From a theoretical and practical basis, the author analyzes and evaluates the impact of marketing mix on student satisfaction and loyalty to the modern programming training system - CodeGym Hue. Research has shown that factors affecting satisfaction and loyalty include: "Product Policy," "Distribution Policy" and "Process Policy." In which "Product Policy" is the factor that has the greatest impact on the satisfaction and loyalty of students at CodeGym Hue. The factors "Price policy," "Promotion policy," "People policy" and "Facilities policy" do not have a positive impact on student satisfaction and loyalty. The study also shows that customer satisfaction plays a significant mediating role between the impact of marketing mix on customer loyalty. This is the basis for the center to enhance customer loyalty by considering the indirect role of student satisfaction.
- Based on those assessments, the author proposes solutions to improve student satisfaction and loyalty through the marketing mix policy of CodeGym Vietnam Joint Stock Company Hue branch in the coming time.

Although many efforts have been made in the process of researching this topic, the author realizes that the research topic has some limitations as follows:

- The author only collected data from customers who have been studying at the branch of CodeGym Vietnam Joint Stock Company in Hue with a sample number of <200 samples. This cannot be reflected for the entire CodeGym brand as the company has many branches in other regions and regions.
- Due to time constraints, marketing factors are only measured using three or four characteristics. Therefore, the impact results only partially describe the factors in the 7Ps marketing mix on customer satisfaction and loyalty. These may be gaps for further research on this topic.

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