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Research on Factors Affecting High School Students' Decision to Choose Hanoi University of Industry

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Abstract— *In fact, the admissions process of some universities gradually becomes difficult when there are schools that cannot recruit enough quotas due to the increase in enrollment quotas from large public universities. This leads to a situation where some schools lack quotas and are forced to lower entry scores to get enough students, thereby making it difficult to ensure the desired entry. In addition, many situations of students also choose majors according to emotions, lack of understanding of the profession, leading to discouragement, lack of motivation to study during the learning process, causing the output of schools to be affected. To meet the set goals, many universities have focused more on communication campaigns to provide necessary information to high school students and improve the status of schools. But not all communication efforts can be effective when schools don't fully understand what students and parents want when choosing their college aspirations. In order to solve the outstanding problem as well as realize the importance of choosing a school for high school students, with universities in general and Hanoi University of Industry in particular, the group decided to study the topic "Research on factors affecting the decision of high school students to choose Hanoi Industrial University" with the goal of Through research, Hanoi University of Industry will be able to come up with appropriate policies to attract students, train qualified and qualified people to first be able to compete in the labor market and then develop science and technology to contribute to the national economy.*

Keyword— *Choice, selection decision.*

I. INTRODUCTION

Choice is about weighing two or more things about their characteristics and characteristics in order to make a decision on the most appropriate one based on available information, values, goals, feelings and situations. The selection process can be applied in many different fields (Glasser, 1998).

A choice can be subjectivity or objectivity, intentionally or arbitrarily.

To be able to make effective choices, each person needs to have sufficient information and knowledge about the options available, and analyze and evaluate important factors such as values, goals, and situations to be able to make the right decision. In addition, making choices also requires the alertness and decisiveness of each person, because making the wrong choice can lead to serious consequences and affect the lives of oneself and those around them.

II. OVERVIEW

Research hypothesis

Hypothesis 1: The factor *"influential individuals"* positively affects the intention of high school students to choose Hanoi University of Industry
Hypothesis H2: The *"school's communication efforts"* factor positively affects the intention of high school students to choose Hanoi University of Industry
Hypothesis H3: The factor *"fixed characteristics of the school"* positively affects the intention of high school students to choose Hanoi University of Industry
Hypothesis H4: The factor *"learners' personal characteristics"* positively affects the intention of high school students to choose Hanoi University of Industry

Study design

To carry out this study, the authors studied through 2 main stages:
Qualitative research aims to develop questionnaires to survey opinions of high school students in Vietnam.
Quantitative research to collect information, analyze data for research purposes.

III. RESULT AND DISCUSSION

A. Reliability of Cronbach's Alpha scale

- Cronbach's Alpha coefficient is denoted as: α
- The coefficient α is as large as possible. However, if > 0.95 – 1, it is not good. Because this proves that many indicators measuring that variable have the same phenomenon.

$0.60 \le \alpha < 0.70$: Acceptable (In case of new research or new research context)
$0.70 \le \alpha < 0.80$: Acceptable
$0.80 \le \alpha < 0.90$: Good
$0.90 \le \alpha \le 1.00$: Acceptable – *Not good*

- Reliability testing for scale Q5.1 -External factors

TABLE 3.1. Reliability statistics of Q5.1 – External factors

Reliability Statistics	
Cronbach's Alpha	N of Items
.807	5

TABLE 3.2. Statistics of total items of Q5.1 – External factors

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q5.1.1	14.28	10.378	.525	.793
Q5.1.2	14.57	9.897	.650	.752
Q5.1.3	14.65	10.966	.547	.784
Q5.1.4	14.67	10.083	.692	.741

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Q5.1.5	14.81	10.612	.563	.779

- Reliability accreditation for scale Q5.2 - School communication efforts

TABLE 3.3. Q5.2 Reliability Statistics - School Communication Efforts

Reliability Statistics	
Cronbach's Alpha	N of Items
.869	5

TABLE 3.4. Q5.2 Item Total Statistics - School Communication Efforts

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q5.2.1	14.64	10.337	.678	.847
Q5.2.2	14.86	10.507	.737	.831
Q5.2.3	14.74	11.037	.716	.838
Q5.2.4	14.70	10.617	.703	.840
Q5.2.5	14.90	11.087	.643	.854

- Reliability verification for scale Q5.3 - Fixed characteristics of the field

TABLE 3.5. Reliability statistics of Q5.3 - Fixed characteristics of the field

Reliability Statistics	
Cronbach's Alpha	N of Items
.934	9

TABLE 3.6. Statistics of the total number of items of Q5.3 - Fixed characteristics of the field

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q5.3.1	29.79	43.886	.712	.929
Q5.3.2	29.76	44.572	.756	.927
Q5.3.3	29.81	42.788	.778	.925
Q5.3.4	29.59	42.542	.791	.925
Q5.3.5	29.45	43.846	.783	.925
Q5.3.6	29.78	42.961	.760	.927
Q5.3.7	29.73	42.883	.813	.923
Q5.3.8	29.66	43.507	.829	.923
Q5.3.9	29.97	45.341	.589	.937

- Reliability testing for scale Q5.4 - Individual characteristics of learners

TABLE 3.7. Q5.4 Reliability Statistics - Learner Personal Characteristics

Reliability Statistics	
Cronbach's Alpha	N of Items
.917	5

TABLE 3.8. Statistics of total items of Q5.4 - Individual characteristics of learners

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q5.4.1	15.92	10.897	.802	.895
Q5.4.2	15.98	10.982	.790	.898
Q5.4.3	15.91	10.361	.842	.887
Q5.4.4	15.89	11.189	.813	.893
Q5.4.5	16.19	12.068	.693	.916

- Reliability accreditation for the Y scale - Intent to choose Hanoi University of Industry

TABLE 3.9. Statistics on the reliability of the Y scale – Intention to choose Hanoi University of Industry

Reliability Statistics	
Cronbach's Alpha	N of Items
.876	3

TABLE 3.10. Statistics of Y scale – Intention to choose Hanoi University of Industry

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Y1	7.42	3.526	.815	.780
Y2	7.71	3.575	.709	.873
Y3	7.63	3.444	.766	.822

B. Examination factor analysis – EFA

Definition: Testing the convergence and differentiating values of the observed variable:

Convergence value: Observed variables with the same property will converge on the same factor. When represented in a rotation matrix, these variables will be in the same column together.

Differentiating value: The observed variables converge on one factor and must be distinguishable from the observed variables that converge on another. When represented as a rotation matrix, each group of variables will be separated into separate columns.

With Cronbach's Alpha scale reliability testing, we are evaluating the relationship between variables in the same group and the same factor, not the relationship between all the variables observed in the factors. different. Meanwhile, EFA looks at the relationships between variables in all the different groups (factors) to detect observed variables that upload multiple factors or observed variables that are misfactored from the beginning. (Loc)

Criteria in EFA analysis

The KMO (Kaiser-Meyer-Olkin) is an indicator used to consider the appropriateness of factor analysis. The value of the KMO must reach a value of 0.5 or higher ($0.5 \leq KMO \leq 1$) which is a sufficient condition for factor analysis to be appropriate. If this value is less than 0.5, then factor analysis is likely not appropriate for the study dataset.

Bartlett's test of sphericity is used to see if the variables observed in a factor correlate with each other. It should be noted that the necessary condition for applying factor analysis is that observed variables reflecting different aspects of the same factor must be correlated. This point relates to the convergence value in the EFA analysis mentioned above. Therefore, if the test shows no statistical significance, factor analysis should not be applied to the variables under consideration. The Bartlett test is statistically significant (sig Bartlett's Test < 0.05), demonstrating that observed variables are correlated with each other in the factor.

Dependent variables

TABLE 3.11. KMO and Bartlett's Test table

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.721
Bartlett's Test of Sphericity	Approx. Chi-Square	184.301
	df	3
	Sig.	<.001

KMO = 0.721 demonstrates data suitable for EFA analysis

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Sig. < 0.001 demonstrates that observed variables are correlated in factors

TABLE 3.12. Total variance table Excerpt

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.412	80.400	80.400	2.412	80.400	80.400
2	.373	12.437	92.837			
3	.215	7.163	100.000			

The results of the analysis showed that one factor extracted at the eigenvalue was equal to 2.412 >1. This factor explains 80,400% of the data variation of the 3 observed variables participating in EFA

Component Matrix[a]

	Component 1
Y1	.924
Y3	.900
Y2	.865

Extraction Method: Principal Component Analysis.

Independent variables

TABLE 3.14. KMO and Bartlett's Test table

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.934
Bartlett's Test of Sphericity	Approx. Chi-Square	2323.452
	df	276
	Sig.	<.001

KMO = 0.934 demonstrates data suitable for EFA analysis
Sig. < 0.001 demonstrates that observed variables are correlated in factors

TABLE 3.13. Rotating number matrix table

TABLE 3.15. Total variance table extracted

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.538	56.410	56.410	13.538	56.410	56.410	6.843	28.512	28.512
2	1.599	6.663	63.073	1.599	6.663	63.073	3.840	16.001	44.512
3	1.050	4.374	67.447	1.050	4.374	67.447	3.317	13.819	58.332
4	1.005	4.188	71.634	1.005	4.188	71.634	3.193	13.303	71.634
5	.796	3.316	74.950						
6	.722	3.007	77.957						
7	.604	2.515	80.473						
8	.530	2.209	82.681						
9	.507	2.111	84.792						
10	.477	1.988	86.780						
11	.448	1.866	88.646						
12	.389	1.622	90.268						
13	.289	1.203	91.471						
14	.284	1.185	92.656						

The eigenvalues of the 4 independent variables are all >1, so all 4 variables are retained in the model.

The total direction after extraction of the 3 variables is equal to 71.634% > 50%. Thus, valid models and variables explain 71.634% of the variability of the model.

TABLE 3.16. Rotating number matrix table

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
Q5.4.3	.803			
Q5.4.4	.772			
Q5.4.2	.652			
Q5.4.1	.619			
Q5.4.5	.595			
Q5.3.9		.766		
Q5.3.6		.668		
Q5.3.1		.595		
Q5.3.8		.556		
Q5.2.1			.741	
Q5.2.2			.740	
Q5.1.3				.812
Q5.1.4				.620
Q5.1.5				.560

The load factors of observed variables > 0.5 satisfying the condition should be retained

The observed variables of each independent variable are uploaded to converge into the same group

The 4 independent variables of the uploaded model differentiate into 3 different groups. Demonstrates that there is no correlation between independent reading variables. So the model fits perfectly.

C. Multivariate regression analysis

TABLE 3.17. Model Summary table

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.854[a]	.729	.719	.48238	1.798
a. Predictors: (Constant), MEAN_Q5.4, MEAN_Q5.2, MEAN_Q5.1, MEAN_Q5.3					
b. Dependent Variable: MEAN_Y					

Adjusted R Square = 71.9% i.e. independent variables explain 71.9% of the dependent variable. Demonstrating the independent variable in the model explains as much as the independent variable does.

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TABLE 3.18. ANOVA table

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.755	4	17.189	73.869	<.001[b]
	Residual	25.596	110	.233		
	Total	94.352	114			
a. Dependent Variable: MEAN_Y						
b. Predictors: (Constant), MEAN_Q5.4, MEAN_Q5.2, MEAN_Q5.1, MEAN_Q5.3						

The ANOVA table gives test results F to assess the conformity hypothesis of the regression model. The Sig. test value F < 0.001 < 0.05 then the regression model is suitable.

TABLE 3.19. Coefficients table

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.051	.236		-.215	.830		
	MEAN_Q5.1	.254	.102	.220	2.500	.014	.318	3.142
	MEAN_Q5.2	-.068	.099	-.060	-.683	.496	.318	3.141
	MEAN_Q5.3	.406	.119	.366	3.417	<.001	.214	4.664
	MEAN_Q5.4	.416	.113	.377	3.665	<.001	.234	4.280
a. Dependent Variable: MEAN_Y								

Variable MEAN_Q5.2 has a test sig value of t equal to 0.496 > 0.05, so this variable has no meaning in the regression model, in other words this variable has no effect on the dependent variable MEAN_Y. The remaining variables including MEAN_Q5.1, MEAN_Q5.3, MEAN_Q5.4 all have a test sig t less than 0.05, Therefore, these variables are statistically significant, all acting on the dependent variable MEAN_Y. The regression coefficient of these independent variables all bears a positive sign, so the independent variables have a positive effect on the dependent variable.

Hypothetical conclusion:

H1: External factors (MEAN_Q5.1) affect the intention of high school students to choose Hanoi University of Industry (Accepted)

H2: The school's communication efforts (MEAN_Q5.2) affect the intention of high school students to choose Hanoi University of Industry (Rejected)

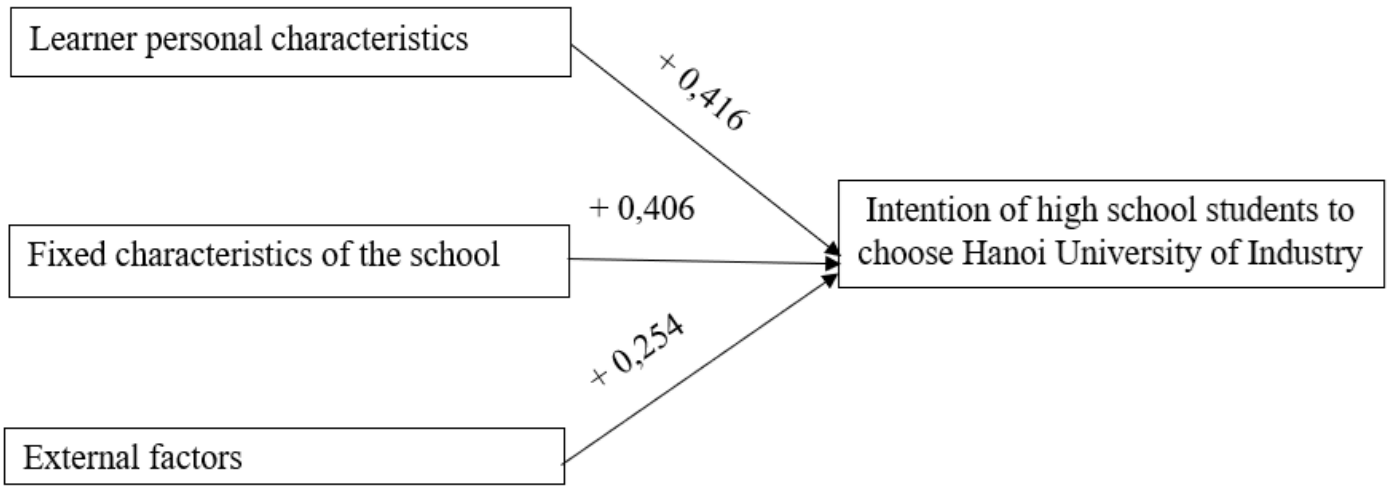
H3: Fixed characteristics of the school (MEAN_Q5.3) affect the intention of high school students to choose Hanoi University of Industry (Accepted)

H4: Learner's personal characteristics (MEAN_Q5.4) affect the intention of high school students to choose Hanoi University of Industry (Accepted)

From the regression coefficient, we construct a normalized regression equation in the following order:

$$Y = 0.416*Q5.4 + 0.406*Q5.3 + 0.254*Q5.1 + \varepsilon$$

Official Model:



Nguồn: Nhóm nghiên cứu

For a Normal P-P plot, if the data points in the residual's distribution stick to the diagonal lines, the residual has a normal distribution.

IV. CONCLUSION

The study aims to explore and examine the influence of factors on the decision of high school students to choose Hanoi University of Industry. Based on past studies, analyzing the current enrollment situation in Vietnam, the team has proposed research hypotheses: External factors affecting the intention of high school students to choose Hanoi University of Industry (H1); The school's communication efforts influence the intention of high school (H2) students to choose Hanoi University of Industry. The fixed characteristics of the school affect the intention of students to choose Hanoi University of Industry (H3). Learners' personal characteristics influence the intention of high school students to choose Hanoi University of Industry (H4).

By preliminary evaluation of scales constructed through the Cronbach Alpha coefficient, total variable correlation and factor discovery analysis show that the established research concepts are all intrinsically consistent and are unidirectional scales. Factor-affirmative analysis with measurement models and critical models shows that research concepts using measured factors are compatible with actual data, concepts that achieve convergent value and differentiating value. This

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suggests that the research concepts used have been shaped for high school graduates when surveys or, in other words, the set of scales used for research are appropriate and reliable.

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