

Influencing Factors of Choosing Modern Apprenticeship Program for Higher Vocational College Students—Taking E-commerce Major of A University as an Example

Yu Zhao^{1, 2, *} and Huaxin Wang³

¹ *School of Business Administration, Shandong Institute of Commerce and Technology, Jinan, 250103, China*

² *North-Chiang Mai University, Chiang Mai, 50130, Thailand*

³ *School of Business Administration, Shandong Institute of Commerce and Technology, Jinan, 250103, China*

* *Corresponding author. Email: 55108000382@qq.com*

ABSTRACT

Based on the TPB theory, this work constructed a model, collected questionnaire data from students majoring in e-commerce in a higher vocational college in eastern China, and used Probit model to test the factors affecting students' choice of modern apprenticeship program. The results showed that the factors such as further study programme, family members' support, influence of seniors, family residence, etc., were significantly related to whether students chose modern apprenticeship program, and there was a primary and secondary relationship. Results offer reference for the optimization of modern apprenticeship training mode in higher vocational colleges.

Keywords: *Modern apprenticeship; TPB; Probit model; Further study programme; Family members' support*

1. INTRODUCTION

Modern apprenticeship is a vocational education mode that integrates the advantages of traditional apprenticeship training and modern school education. It adapts to the needs of large-scale social production and is one of the trends in developing vocational education in the world. In recent years, the state has issued relevant policies in succession to promote the deep integration of production and education in vocational colleges, and promote the implementation of modern apprenticeship teaching reform in vocational colleges. In 2017, "Several Opinions of the General Office of the State Council on Deepening the Integration between Production and Education" pointed out that it should deepen the system reform for running full-time vocational schools. In technical and practical majors, it is necessary to comprehensively implement modern apprenticeship system and new enterprise apprenticeship system, promote the connection between school enrollment and enterprise recruitment, and achieve the "dual subject" of school enterprise education. Article 9 of "the National Vocational Education Reform Implementation Plan" issued by the State Council in January 2019 stated that "knowledge and practice should be integrated and work and study should be integrated". In the first sentence, it is proposed to draw lessons from the "dual system" and other models, sum up the experience of

the modern apprenticeship system and the new apprenticeship system pilot in enterprises, and jointly study and formulate talent training programs. Accordingly, modern apprenticeship is an important carrier to deepen school enterprise cooperation under the background of new technology, new industry, new format and new mode. Although the modern apprenticeship in China has developed rapidly in recent years, the fireplace effect in the process of its development has become increasingly apparent. The phenomenon of "hot inside and cold outside" can be seen as "government hot, enterprise cold", "school hot, students cold", which seriously affects the implementation effect of apprenticeship and restricts the development of craftsman talents. Taking the e-commerce major of a higher vocational college in eastern China as the research object, this study found that students were hesitant in choosing modern apprenticeship programs. Through in-depth investigation and analysis, the influencing factors of higher vocational students' participation in modern apprenticeship project were found. This work discussed the issue of "cold students" in the modern apprenticeship program from the source, and put forward the solution, which was of great practical value for higher vocational colleges to optimize the training mode of modern apprenticeship.

2. THEORETICAL BACKGROUND

2.1. Literature Review

In recent years, studying modern apprenticeship has gradually become the focus of college teachers, especially higher vocational teachers. Various literature shows that modern apprenticeship is an important talent training mode in higher vocational education. National policies are vigorous, and schools have high enthusiasm. The issues mainly focus on the attitude of enterprises and students. For example, Wang Shuwei studied the cognition of students' roles in modern apprenticeship programs, and pointed out that it was necessary to carry out accurate enrollment publicity and clarify role identity and expectations in modern apprenticeship projects [1]. At the same time, he also proposed that students who participated in the modern apprenticeship program had problems with "juggling work with study and time management". Qin Ming's research focuses on the loss of middle school students in school-enterprise cooperative order classes similar to modern apprenticeship programs [2]. The research found that the opinions of the students' family members, the income obtained from the program and the students' future career development were all significant factors that caused the loss of students. On the other hand, the publicity related to corporate culture also had a certain impact. Zeng Hao, et al., studied the relationship between enterprises and apprentices in modern apprenticeship program [3]. At the pre-set stage before recruitment, the apprentice tried to obtain information about the company's main business, welfare benefits, working environment, reputation, etc., by logging on the company's official website or asking relatives and friends. Ma Xinyue, et al., studied the psychological contract structure of apprenticeship students [4]. They found that learners lacked correct cognition of their dual roles as both school students and enterprise employees, which affected the realization of apprenticeship itself.

Summarizing the existing research results in China, the apprenticeship research mainly focuses on modern apprenticeship personnel training mode, management mode, mobilizing the enthusiasm of enterprises, etc. There are few studies on the factors influencing students' choice and withdrawal from modern apprenticeship projects, and quantitative research is very rare. This is the contribution of this work.

2.2. Theory of Planned Behaviour

In order to make up for the deficiency of the existing research on modern apprenticeship, this study takes the theory of planned behavior (TPB) as the basic theoretical model to carry out quantitative research on the influencing factors of choosing modern apprenticeship program for higher vocational college students [5-6]. TPB theory includes five elements: behavior attitude, subjective norm, perceived behavior control, behavior intention and actual behavior. Among them, behavior attitude is an individual's understanding of behavior result and estimation of value. Subjective norm is an individuals' understanding of norms and motivation to keep consistent with others' opinions. Perceived behavior control is an individual's understanding of control factors and perception promotion factors. These three kinds of factors often have indirect influence on actual behavior through behavioral intention. Generally speaking, the individual behavior attitude has a positive impact on the behavior intention, and the individual subjective norm has a positive impact on the behavior intention. If the individual's behavior attitude and subjective norm are positive, and the stronger the perceived behavior control is, the stronger the individual behavior intention will be [5-6].

Accordingly, the research model of choosing modern apprenticeship program for higher vocational college students is constructed based on TPB, as shown in Fig. 1. To some extent, behavior can be reasonably inferred from behavioral intention. Based on TPB theory, students' behavior in choosing apprenticeship classes can be reasonably inferred from their willingness to choose apprenticeship classes. Therefore, this study focuses on the factors influencing students' choice intention. First of all, students' demographic characteristics (this study focuses on four variables: gender, achievement, family residence and cadre status) may affect their behavior attitude or perceived behavior control, thus influencing their willingness to choose modern mentoring programs. Secondly, students' cognitive characteristics (for example, students' employment intention, employment optimism, study plan, etc.) may also affect their behavior attitude or perceived behavior control, thus influencing their willingness to choose modern apprenticeship programs. Thirdly, the promotion means (including but not limited to: the attractiveness of the enterprise's position, the influence of the enterprise's salary, the influence of the seniors, etc.) may affect the subjective norms or perceived behavior control, and influence the willingness to choose apprenticeship programs. On the other hand, support from family members may affect subjective norms and the willingness to choose apprenticeship classes.

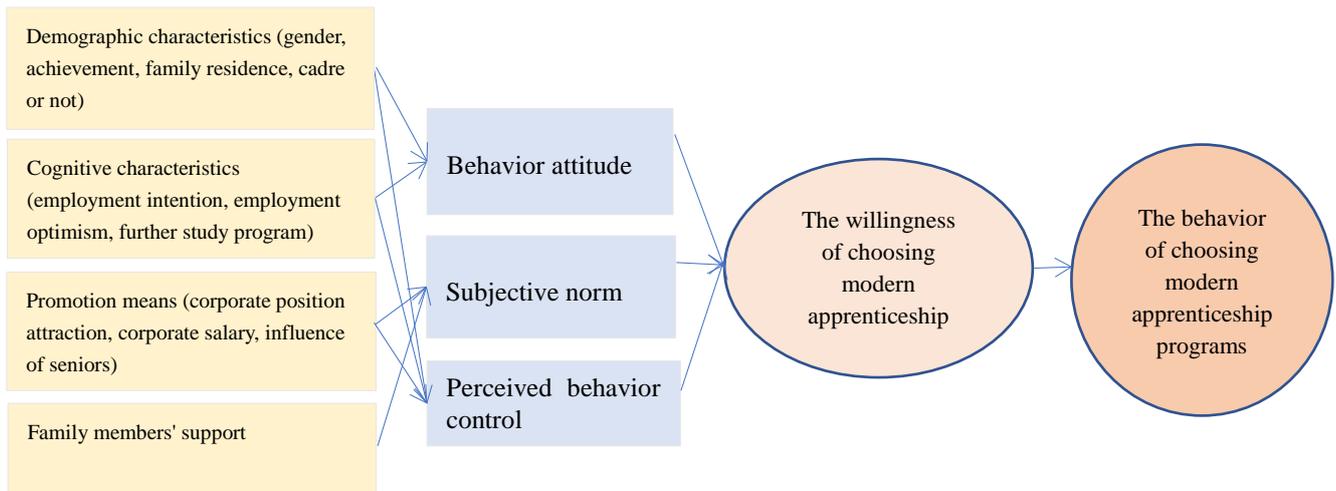


Figure 1. The research model based on TPB

3. EMPIRICAL ANALYSIS

3.1. Setting up a Model

Whether vocational college students choose modern apprenticeship program or not is a binary choice issue. For such binary dependent variable, they can generally choose to establish Logit model or Probit model. The Probit model is selected due to the Probit model is more suitable for the generalized normal distribution assumption. The model is constructed as follows:

$$P(y = 1 | x) = f(\beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \dots \beta_ix_i)$$

In the model, y represents the willingness of choosing modern apprenticeship programs for higher vocational students. f is the cumulative distribution function of standard normal distribution, and β is the parameter. i is each sample, and the explanatory variable x is the influencing factors of students' willingness to choose modern apprenticeship programs.

3.2. Variable Selection and Data Sources

3.2.1. Description of Variable Selection

3.2.1.1. Dependent variable

The dependent variable set in this model is the willingness of choosing modern apprenticeship program for higher vocational students. In the randomly selected sample, students' choice of modern apprenticeship program is a reflection on their subjective will, which is taken as a dependent variable to examine the influence of different factors on students' choice of modern apprenticeship program. The dependent variable that is willing to participate in the modern apprenticeship program is set to "1", and the dependent variable that is not willing is set to "0".

3.2.1.2. Independent Variable

Many factors affect the choice of apprenticeship class. This study examined the following factors: gender, achievement, further study programme, family members' support, enterprise job attraction, influence of senior students, enterprise salary, employment optimism, employment intention, family residence, student cadres. The above 11 variables were taken as independent variables and set as $x_1 \sim x_{11}$ respectively. The related variable names, assignments and descriptions are shown in Table 1.

Table 1. Variable name, meaning and assignment

Variable name	Variable meaning	Assignment
Y (the willingness of choosing modern apprenticeship program for higher vocational students)	Whether students have the will to choose a modern apprenticeship program in their sophomore year	Yes =1; No =0
X1 (gender)	Students' gender	Male =1; female =0
X2 (achievements)	Average academic performance of freshmen	[90-100]=4; [80-90]=3;

Variable name	Variable meaning	Assignment
		[70-80]=2; [60-70]=1; [60-0]=0
X3 (further study programme)	Whether students have plans for further study such as upgrading from junior college to undergraduate	Yes =1; No =0
X4 (family members' support)	Whether students' parents or other family members support their participation in the modern apprenticeship program	Support =1; not supported =0
X5 (enterprise job attraction)	Whether the position offered by the modern apprenticeship program partner attractive to you	Yes =1; No =0
X6 (influence of senior students)	Whether the feeling summarized by the last student of modern apprenticeship program attractive to you	Will =1; will not =0
X7 (enterprise salary)	Whether the salary offered by the cooperative of modern apprenticeship program will influence the students' choice	Will =1; will not =0
X8 (employment optimism)	Whether students are optimistic about their future employment situation	Optimistic =1; not optimistic =0
X9 (employment intention)	Students' future employment intention	Jinan local =1; back home = 0
X10 (family residence)	Student's family residence	Urban =1; rural =0
X11 (student cadres)	Whether students are student cadres in class or college	Yes =1; No =0

3.2.2. Data Source

In this study, questionnaire survey was used to collect data. The research objects are mainly college students majoring in e-commerce in a vocational college in eastern China. 261 questionnaires were distributed and collected, and 244 valid questionnaires were obtained after sorting.

3.3. Statistical Description

As shown in Table 2, a statistical analysis on 244 questionnaires collected above shows that the proportion of respondents choosing modern apprenticeship programs is generally low. The proportion of male students choosing apprenticeship program is 40.86%, and that of female students is 31.13%. The willingness of male students to choose apprenticeship program is relatively more obvious. The proportion of students with scores above 90 in the apprenticeship class was 34.51%, and that in 80-90 scores was 34.51%, and that in 70-80 scores was 39.66%. Therefore, it can be seen that the influence factors of

performance on students' choice of apprenticeship class is not obvious. 26.67% of the students who have further education plan (such as upgrading from junior college to undergraduate) choose apprenticeship class, and 51.9% of the students have no plan. Students who are directly employed after graduation are more likely to choose apprenticeship programs. 63.64% of the students supported by family members chose apprenticeship program, which was much higher than that of family members who did not support. The proportion of students who thought that the position offered by enterprises was attractive was 47.24%, which was higher than that of students who thought it was not attractive. 52.63% of the students chose the apprenticeship program due to the influence of the elders. The influence of enterprise salary on students' choice of apprenticeship program is not obvious. The proportion of students willing to work locally was 39.02%, higher than that of returning home. Students who live in rural areas are more willing to choose apprenticeship program, and the proportion is 42.14%. Student cadres are more willing to choose apprenticeship program, and the proportion is 40.74%.

Table 2. Statistical description of influencing factors on choosing apprenticeship classes for vocational college students

Influencing factors	Value	Number of samples	Number of persons choosing apprenticeship programmes	Proportion of choosing apprenticeship (%)	Number of persons not choosing apprenticeship programmes	Proportion of not choosing apprenticeship (%)	
X1	Male	1	93	38	40.86%	55	59.14%
	Female	0	151	47	31.13%	104	68.87%
X2	90	4	40	13	32.50%	27	67.50%
	80-90	3	142	49	34.51%	93	65.49%
	70-80	2	58	23	39.66%	35	60.34%
	60-70	1	3	0	0.00%	3	100.00%
	60	0	1	0	0.00%	1	100.00%
X3	Yes	1	165	44	26.67%	121	73.33%
	No	0	79	41	51.90%	38	48.10%

X4	Support	1	99	63	63.64%	36	36.36%
	No support	0	145	22	15.17%	123	84.83%
X5	Yes	1	127	60	47.24%	67	52.76%
	No	0	117	25	21.37%	92	78.63%
X6	Yes	1	114	60	52.63%	54	47.37%
	No	0	130	25	19.23%	105	80.77%
X7	Will	1	176	64	36.36%	112	63.64%
	Will not	0	68	21	30.88%	47	69.12%
X8	Optimism	1	148	57	38.51%	91	61.49%
	Not optimistic	0	96	28	29.17%	68	70.83%
X9	Jinan local	1	164	64	39.02%	100	60.98%
	Back home	0	80	21	26.25%	59	73.75%
X10	Urban	1	85	18	21.18%	67	78.82%
	Rural	0	159	67	42.14%	92	57.86%
X11	Yes	1	81	33	40.74%	48	59.26%
	No	0	163	52	31.90%	111	68.10%

3.3.1. The Survey Questionnaire Test of Reliability and Validity

The reliability analysis method of this study is to use SPSS to test the Cronbach α coefficient in each variable. After testing, the coefficient is 0.578, which is acceptable. The above indicators show that the scale has good reliability and validity, which can be used to measure the selection factors of modern apprenticeship programs.

3.3.2. Multicollinearity Test

For the above 11 variables, the multicollinearity test was carried out with SPSS. As shown in Table 3, there is no high correlation between the variables. Therefore, 11 variables can be determined as the influencing factor indicators to judge whether students choose modern apprenticeship program in the model.

Table 3. Multiple contribution analysis of variables

Correlation matrix between items												
	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
Y	1.000	.099	-.007	-.248	.499	.271	.350	.052	.096	.126	-.210	.087
X1	.099	1.000	-.021	-.088	.022	.027	.009	-.096	.131	-.117	.099	.056
X2	-.007	-.021	1.000	.232	.024	.096	.138	.033	.175	-.074	.042	.151
X3	-.248	-.088	.232	1.000	-.106	-.033	-.002	-.228	.052	-.035	.083	.023
X4	.499	.022	.024	-.106	1.000	.342	.447	.160	.136	.115	-.166	.144
X5	.271	.027	.096	-.033	.342	1.000	.504	.135	.067	.203	-.056	.119
X6	.350	.009	.138	-.002	.447	.504	1.000	.179	.182	.199	-.167	.090
X7	.052	-.096	.033	-.118	.160	.135	.179	1.000	-.052	.092	-.044	.128
X8	.096	.131	.175	.052	.136	.067	.182	-.052	1.000	.099	.008	.033
X9	.126	-.117	-.074	-.035	.115	.203	.199	.092	.099	1.000	-.167	.066
X10	-.210	.099	.042	.083	-.166	-.056	-.167	-.044	.008	-.167	1.000	.069
X11	.087	.056	.151	.023	.144	.119	.090	.128	.033	.066	.069	1.000

3.4. Empirical Analysis Results

3.4.1. Results Analysis

For the above model, the maximum likelihood function method is adopted to fit the data using Eviews software, and the results are shown in Table 4.

Table 4. Probit model fitting results

Variable	Coefficient	Std. Error	z-Statistic	Prob.
X1	0.1976	0.1987	0.9946	0.3199
X2	-0.1322	0.0939	-1.4074	0.1593
X3	-0.7771	0.2056	-3.7791	0.0002
X4	1.0771	0.2099	5.1306	0.0000
X5	0.2261	0.2258	1.0015	0.3166
X6	0.4576	0.2326	1.9672	0.0492
X7	-0.3678	0.2165	-1.6992	0.0893
X8	0.0048	0.2061	0.0232	0.9815
X9	-0.0288	0.2016	-0.1428	0.8865
X10	-0.5061	0.2128	-2.3789	0.0174
X11	0.1048	0.2093	0.5009	0.6165

Through the above fitting results, the following analysis results can be obtained:

(1) Significant variables are X3, X4, X6 and X10. Both variables X3 and X4 have passed the significance level test of 1% significance level. X3 (further study program) is negatively correlated with Y value, which indicates that students will fully consider whether to further their studies in the future when choosing apprenticeship programs, and the students who want to further their studies are more reluctant to choose apprenticeship program classes. X4 (family members' support) will also affect students' choice, and students supported by family members are more willing to choose apprenticeship program classes. Variables X6 and X10 have passed the significance level test of 5% significance level. X6 (influence of seniors) is positive correlation, indicating that previous students' experience sharing and good apprenticeship program experience have a significant impact on lower grade students' choice of apprenticeship program classes. X10 (family residence) is a negative correlation factor, and students from rural areas are more willing to choose apprenticeship program classes.

(2) X8 (employment optimism) and X9 (employment intention) are not significant, indicating that college students are still relatively confused about their future employment status, and students do not have good plans for their future career planning.

(3) X1 (gender), X2 (achievement) and X11 (student cadre) are not significant, which shows that the basic characteristics of students are difficult to affect students' choice of modern apprenticeship program.

3.4.2. Robustness Test

Considering the robustness of the above Probit model variables, the Logit model is used to fit the data in this paper again to conduct robustness test. The results of Logit model fitting show that the significance of variables is exactly the same as Probit model used in this work (i.e., it is reasonable and stable to use the model of this work to describe the factors affecting the selection of modern apprenticeship programs). As shown in Table 5.

Table 5. Logit model fitting results

Variable	Coefficient	Std. Error	z-Statistic	Prob.
X1	0.3855	0.3439	1.1208	0.2624
X2	-0.2341	0.1614	-1.4507	0.1469
X3	-1.3549	0.3592	-3.7717	0.0002
X4	1.8770	0.3649	5.1433	0.0000
X5	0.3844	0.3953	0.9723	0.3309
X6	0.7998	0.4070	1.9652	0.0494
X7	-0.6407	0.3774	-1.6978	0.0896
X8	-0.0296	0.3581	-0.0827	0.9341
X9	-0.0547	0.3500	-0.1562	0.8758
X10	-0.8670	0.3726	-2.3269	0.0200
X11	0.2015	0.3613	0.5578	0.5769

4. CONCLUSION AND POLICY RECOMMENDATIONS

4.1. Conclusion

Based on TPB theory, this study constructed a research model, and analyzed the data by using Probit model. Consequently, the factors that affected the students' choice of modern apprenticeship programs in vocational colleges were revealed. The results show that students' further study programme is a negative and influential factor for students to choose modern apprenticeship programs. The family members' support, family residence and influence of senior students are the positive and significant influencing factors for students to choose modern apprenticeship programs, among which the support from family members is the most significant. This study is a few empirical researches in the field of modern apprenticeship, which is centered on students' will. The research conclusion effectively makes up for the deficiency of existing qualitative research. The research results will offer reference for the promotion and optimization of modern apprenticeship training mode in higher vocational colleges.

4.2. Recommendations

4.2.1. Explaining and promoting modern apprenticeship programs to students' family members

The results show that the support from family members has a significant impact on students' choice of apprenticeship programs. Therefore, the publicity of policies related to modern apprenticeship and the situation of cooperative enterprises should not only target students, but also explain and publicize their family members through the Internet, telephone, etc. Consequently, parents can cooperate with the school in the selection and career planning of students' apprenticeship.

4.2.2. Students from previous apprenticeship programs share experiences regularly

The results show that the students' choice of apprenticeship program classes is greatly influenced by the previous senior students. Therefore, senior students of apprenticeship program classes should be regularly invited to share their experience, answer questions and show their results. This can effectively promote the junior students' understanding and enthusiasm for the apprenticeship programs.

4.2.3. Strengthening the education of students' career choice and career planning

The results show that the factors such as employment intention, enterprise job attraction, employment optimism, etc., are not significant variables influencing students' choice of modern apprenticeship programs, indicating that students do not know much about their future career planning. In the form of class, after class, visit, lecture, etc., students should be guided to understand the future employment position and ability requirements of their major. Also, students should be assisted to dig out their characteristics, and make career choice and career planning.

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REFERENCES

- [1] Wang Shuwei, Men Hongliang, Liu Wei. Qualitative Research on Dual Role Cognition of Modern Apprenticeship Students [J]. Vocational and Technical Education, 2019, 40 (10): 24-29.
- [2] Qin Ming. Research on the Loss of Students in School-enterprise Cooperation Order Classes - Taking Guangzhou Saishi International Freight Forwarding Co., Ltd. as an example [J]. Old District Construction, 2018 (08): 91-93.
- [3] Zeng Hao, Le Xilin, Huang Lihua. Research on the Relationship between Enterprises and New Generation of Apprentices in New Apprenticeship System - Based on the Psychological Contract Theory [J]. Vocational Education Forum, 2019 (03): 45-50.
- [4] Ma Xinyue, Shi Weiping. An Empirical Research on the Psychological Contract Structure of Modern Apprenticeship Learners in Higher Vocational Colleges [J]. Vocational Education Forum, 2019 (04): 115-121.
- [5] I. Ajzen. From Intentions to Actions: A Theory of Planned Behavior, 1985, Springer.
- [6] I. Ajzen. The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes, 1991, 50 (2): 179-211.