



# Analysis of Factors Affecting the Willingness of Students in Vocational Colleges to Attend MOOC Micro-Specialty in the Context of Education Digitalization

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## Abstract

The rapid development of education digitalization has brought opportunities for online courses, amid which micro-specialty has been promoted. "Micro-specialty" is an employment-oriented and customized professional systematic training program. It is a new stage of the development of online education in China. To clarify the relationship among the willingness of students in higher vocational colleges in Shandong to attend micro-specialty, course and individual, Logit model is used to conduct positive analysis on the data from questionnaire survey of willingness of 443 higher vocational students to study micro-specialty and affecting factors. It is concluded that academic degree promotion, useful knowledge acquisition, recognition by famous enterprise, teaching by a famous teacher and clarity of employment goal of college students all have significant effect on the willingness to attend MOOC micro-specialty. Suggestions are given with respect to the content optimization of MOOC micro-specialty and course promotion.

**Keywords:** student in the higher vocational college; MOOC micro-specialty; willingness to study; Logit model.

## 1. INTRODUCTION

### 1.1 Background

The deep integration of digital technology and education has become the future direction of education development. Digital transformation has provided innovative solutions for the reform in the education industry, changed the past teaching methods, removed the obstacles of allocating high-quality teachers across colleges, benefited more students, broaden students' vision and improved their interest in learning. The comprehensive and in-depth application of digital technology in the field of education has brought significant changes to the forms of education and learning. Meanwhile, the education industry has gathered pace in digital transformation. Against such backdrop, micro-specialty has gradually developed.

"Micro-specialty" is a group of core courses set towards the goal of employment and around a specific academic field, research focus or core qualification,

whereby learners can gain certain professional capabilities through training, and obtain certificates after passing examinations. "Micro-specialty" has removed the barriers in learning and practice, making online education an important way of "career development" learning.

Higher vocational colleges, as an important type of higher education and an important part of China's vocational education, shoulder the mission of cultivating highly skilled and application-oriented professionals. The new normal of digital economy and economic development affects students' career changes, which raises new requirements for higher vocational colleges in talent cultivation. Many higher vocational colleges have launched talent cultivation and teaching reforms. MOOC micro-specialty and the cultivation mode of "platform + module" have become effective measures to make talent cultivation better meet industrial development needs<sup>[1]</sup>. Micro-specialty can make learners quickly meet the core skill requirements of a certain field through career-oriented professional courses<sup>[2]</sup>. Through the analysis of

willingness of business students in higher vocational colleges to attend MOOC micro-specialty, factors affecting their willingness to study can be explored and thus practical advice can be given.

## 1.2 Literature Review

Relevant researches at home and abroad mainly focus on the construction, description and causality analysis of talent cultivation modes.

Scholars at home and abroad have studied the motivation of using online education contents for a long time. It is found that there are three major types of motivation: understanding knowledge (Allon, 2012), curiosity driven (Jacobs, 2013), self-challenge (Young, 2013), etc.

Some scholars described the learning of MOOC micro-specialty from different angles and put forward optimization suggestions. For example, Tian Aili et al (2020) put forward the direction and ideas of optimizing MOOC learning experience based on the results of research on learners' learning. Chen Feifei et al (2019) took "https://www.icourse163.org/university/icourse/#/c" platform as an example to investigate the learners in and around colleges (including those who have completed or have not completed courses), with a view to probe into the willingness of, ways to and effect of online course learning by college students, and analyzing the effect of learners' personality, motivation and other factors on learning experience. Suggestions are given in respect of online course platform, collages and students. Huang Xiaohua (2019) analyzed factors affecting students' willingness to attend MOOC, and put forward appropriate suggestions on countering these factors.

For the research of students' willingness to attend MOOC, scholars cited Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) for research attempts: For example, Zhang Min et al. (2016) built a model based on the typical TAM by introducing variables such as platform controllability, process controllability, perceived resource, connectivity and responsiveness. Wen Dandan (2018) built a model about college students' willingness to attend microlecture based on TAM and self-efficacy theory, and designed a measurement scale. Peng Huijun et al. (2019) learned about college students' willingness to attend general courses of MOOC and factors affecting it through a questionnaire survey. The research results show that college students have strong willingness to learn, but it is affected by factors such as perceived usefulness, perceived ease of use, subjective norms, perceived risk, use attitude, etc.

Although relevant research results are relatively fruitful, from the content point of view, the research on

the factors affecting the willingness to attend micro-specialty is not complete. For the research subject, there is a lack of analysis on the factors affecting the willingness of such special group as students in higher vocational colleges to attend micro-specialty. Therefore, based on previous studies, this paper takes the students in higher vocational college as the research object, integrates the factors such as curriculum, platform, society and family, and analyzes the factors affecting the willingness of this special group to attend micro-specialty.

## 2 THEORETICAL ANALYSIS

Based on the theoretical research on MOOC micro-specialty at home and abroad and the current situation of vocational education in China, this paper constructs a theoretical model based on TPB. On this basis, students in higher vocational colleges are randomly selected for survey and analysis by using the binary logistic regression model.

Accordingly, this paper puts forward the following original assumptions:

H1: Students' learning factors (e-learning years, major category, academic promotion and acquisition of useful knowledge) are consistent with enhancement of college students' entrepreneurial intention. That is, different learning situations of higher vocational college students make little difference in increasing their willingness to attend micro-specialty.

H2: Platform and course factors (whether the certificate is related to the major, recognized by well-known enterprises, platform easy to operate, image of teachers, teaching by famous teachers, etc.) make little difference in increasing the willingness of students in higher vocational colleges to attend micro-specialty.

H3: Environmental factors (surrounding learning atmosphere, family support, employment optimism, clarity of employment goals, etc.) make little difference in increasing the willingness of students in higher vocational colleges to attend micro-specialty.

## 3 POSITIVE ANALYSIS

### 3.1 Modelling

$$\ln \frac{p}{1-p} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \quad (1)$$

Pi is the probability of an event, which refers to the probability that higher vocational college students are willing to attend micro-specialty. That is, the probability of "y=1".  $X_j$  ( $j = 1, 2, 3, \dots, m$ ) represents the  $j$ th independent variable of the above factors,  $m$  represents the number of independent variables.  $\beta_0$  is constant,  $\beta_j$  ( $j = 1, 2, \dots, m$ ) represents the regression coefficient of independent variable, which can

be obtained by the maximum likelihood estimation method. If  $\beta_j$  is positive, it means that the  $j$ th factor has a positive effect on the willingness of students in higher vocational colleges to attend micro-specialty; if  $\beta_j$  is negative, it means that the  $j$ th factor has a negative effect on the willingness of students in higher vocational colleges to attend micro-specialty.

## 3.2 Data Source and Variable Selection

### 3.2.1 Data Source and Questionnaire Reliability Test

All data in this paper is from the "questionnaire on the willingness of students in higher vocational colleges to attend micro-specialty". The survey is targeted at randomly interviewed college students in various majors in commercial and vocational colleges in Shandong. 443 questionnaires are recovered, and 424 valid questionnaires are obtained after sorting.

In order to determine whether the samples are stable and reliable, the Cronbach's alpha is used to measure the consistency of the scale, and the reliability of the surveyed samples is tested. It is generally believed that when Cronbach alpha reaches 0.6, it indicates that the scale is reliable. SPSS26.0 is used to test the reliability of the questionnaire. If Alpha is 0.908, it indicates high reliability of the questionnaire.

### 3.2.2 Variable Selection and Description

#### 3.2.2.1 Dependent Variable

The dependent variable set in this model is the willingness of higher vocational students to attend micro-specialty. In the randomly selected sample, college students' choice to attend micro-specialty reflects their subjective willingness. It is taken as a dependent variable to study the effect of different factors on higher vocational students' willingness to attend micro-specialty. When students are willing to attend micro-specialty,  $Y = 1$ ; Otherwise,  $Y = 0$ . It is assumed in this research that, there are 13 factors affecting the decision of students in higher vocational colleges to attend micro-specialty, and the probability of choosing micro-specialty ( $Y=1$ ) is  $P$ .

#### 3.2.2.2 Independent Variable

Among many factors affecting college students' willingness to attend micro-specialty, this paper mainly studies the following factors in conjunction with the questionnaire survey results: Gender, e-learning years, major category, academic promotion, acquisition of platform knowledge, authority of issuer, interaction of course resources, micro-specialty learning of surrounding students, family support, recognition by well-known enterprises, teaching by famous teachers, operability of course progress, optimistic employment and clarity of employment goal.

The above 16 factors are taken as independent variables and set as  $XX_1 - X_{19}$ . Related variable names, meanings and value assignment descriptions are shown in Table 1.

**Table 1:** variable name, meaning and value assignment

Name of Variable	Meaning of variable	Value assignment
Y	Willingness to attend micro-specialty	Yes=1; No=0
X1	Gender	Female=0; male=1
X2	E-learning years	None=1; No more than 1 year=2; 1-3 years=3; 3-5 years=4
X3	Category of major	Literature and history = 1, social science= 2, science = 3, engineering = 4, agronomy = 5, medicine = 6
X4	Willingness to academic promotion	Willing=1, unwilling=0

Name of Variable	Meaning of variable	Value assignment
X5	Knowledge acquisition	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X6	Relevance to major	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X7	Authority of issuer	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X8	Interaction of course resources	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X9	Learning atmosphere	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X10	Family support	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X11	Recognition by well-known enterprises	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X12	Teaching by famous teachers	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X13	Random control over course learning progress	Strongly agree = 5, agree = 4, general = 3, disagree = 2, strongly disagree = 1
X14	Employment optimism	Very optimistic =5, relatively optimistic=4, generally optimistic=3, not optimistic=2, very pessimistic=1
X15	Clear employment goal	Yes=1, No=0

### 3.3 Descriptive Statistical Analysis of Variables

**Table 2:** descriptive statistics of variables

Variable	Observed	Average	Standard error	Minimum	Maximum
Y	424	1.3986	0.02381	1	2
X1	424	1.684	0.02261	1	2
X2	424	2.7948	0.03727	1	4
X3	424	2.7972	0.07226	1	6
X4	424	0.8939	0.01498	0	1
X5	424	3.6132	0.05304	1	5
X6	424	3.809	0.05106	1	5
X7	424	3.9198	0.04926	1	5
X8	424	3.8019	0.05094	1	5
X9	424	3.7075	0.05352	1	5
X10	424	3.7052	0.0512	1	5
X11	424	3.7877	0.05146	1	5
X12	424	3.875	0.04978	1	5
X13	424	3.8491	0.04977	1	5
X14	424	3.3231	0.05046	1	5
X15	424	0.5849	0.02396	0	1

### 3.4 Positive Analysis Results

SPSS26.0 is used to estimate Probit model. The obtained regression coefficient and estimation results are shown in Table 4. Model I involves all of the above independent variables. It can be seen from Hosmer-

Lemeshow test on significance that the overall fit for the model is good. In addition, Model II in the table takes the variable "gender" X1 as the control variable and then estimates it. It can be seen from Hosmer-Lemeshow test on significance that the overall fit for Model II is also very good.

**Table 3:** Estimation Results via Probit Model

	Model I	Model II
<b>Gender</b>	-0.575 (0.029)	
<b>Learning year(s)</b>	-0.047 (0.761)	-0.078 (0.755)
<b>Category of major</b>	0.156 (0.049)	0.151 (0.050)
<b>Academic promotion</b>	2.053 (0.000)	2.052 (0.000)
<b>Useful knowledge acquisition</b>	0.749 (0.001)	0.66 (0.000)
<b>Platform operation convenience</b>	-0.037 (0.777)	-0.053 (0.877)
<b>Authority of issuer</b>	-0.37 (0.129)	-0.399 (0.150)

	Model I	Model II
Interaction of courses	-0.09 (0.444)	-0.127 (0.705)
Surrounding learning atmosphere	0.222 (0.299)	0.242 (0.297)
Family support	-0.322 (0.216)	-0.355 (0.207)
Recognition by well-known enterprises	0.407 (0.094)	0.391 (0.089)
Teaching by famous teachers	0.528 (0.070)	0.452 (0.086)
Random control over progress	0.261 (0.378)	0.256 (0.376)
Employment optimism	-0.11 (0.373)	-0.136 (0.342)
Clear employment goal	0.138 (0.065)	0.15 (0.085)
Constant	6.083 (0.000)	5.151 (0.000)
Hosmer-Lemeshow test on significance	0.330	0.692

Estimation results of two groups of models show that: Seen from model I, two variables of academic promotion and useful knowledge acquisition have passed the high significance (1%) test. This shows that academic promotion and knowledge learning have particularly significant effect on the willingness of higher vocational students to attend micro-specialty.

Three variables of recognition by well-known enterprises, teaching by famous teachers and clarity of employment goal have passed the significance (10%) test, and all coefficient symbols are positive. This indicates that students with clearer employment goals are more inclined to attend micro-specialty. Whether micro-specialty recognized by well-known enterprises and it is taught by famous teachers has effect on the willingness of higher vocational college students to attend micro-specialty.

After controlling the variable of "gender", it can be seen from the estimation results of Model II that: The effect of the two variables of academic promotion willingness and knowledge acquisition is still significant. This indicates that the students intending to upgrade to university from college or needing to acquire knowledge have a stronger willingness to attend micro-specialty courses.

#### 4 CONCLUSIONS AND POLICY SUGGESTIONS

Through the analysis through the above Logit quantitative model, it is not difficult to see that the explanatory variables of academic promotion and

acquisition of useful knowledge, recognition by well-known enterprises, teaching by famous teachers and clarity of employment goals have significant effect on the explained variables, as analysed below.

#### 4.1 Conclusions

##### 4.1.1 Students who are willing to improve their academic qualifications and love learning generally have higher willingness to learn micro professional courses

The learning period of micro-specialty is short, and technical skills required by the actual position can be learnt efficiently, and some micro-specialties are awarded appropriate certificates after learning and passing assessment, which is of great help to students who want to improve their academic qualifications and learn more professional skills.

##### 4.1.2 Students with clear employment goals are more willing to take micro-specialty courses

Micro-specialty is a special talent training program and curriculum specially developed and created for specific positions of enterprises<sup>[3]</sup>, which is career oriented and professional ability centred. It can effectively solve the problem that traditional education cannot accurately cater to social needs. Through the learning of micro-specialty, students can quickly and effectively master relevant core technologies and abilities required for a professional post in a short time, so as to enhance their employment competitiveness.

#### *4.1.3 Higher vocational college students are generally willing to learn micro-specialty courses taught by famous teachers*

Higher vocational students have a few opportunities to learn courses taught by famous teachers, and the teaching forms and methods of famous teachers are more acceptable and understood by students. The professional knowledge and specific development of the industry understood by famous teachers can be explained by inserting the actual situation into the students' teaching. Therefore, the willingness to take micro-specialty courses taught by famous teachers will be stronger.

#### *4.1.4 Higher vocational college students are generally willing to learn micro-specialty courses recognized by well-known enterprises*

The micro-specialty recognized by well-known enterprises are generally more applicable in practical work. Enterprises are scarcer of talents in this kind of specialty, resulting in talent bottleneck problems. Through the learning of this kind of micro-specialty, higher vocational college students can quickly solve the problem of talent shortage and the employment needs of enterprises. Meanwhile, the problem of difficult employment of college students is also tackled.

### **4.2 Suggestions and Measures**

#### *4.2.1 Optimization of the content design of micro-specialty courses*

Micro-specialty courses should be such designed as to improve students' abilities, ensure clear and flexible, highlight key courses, delete unnecessary contents, turn complexity into simplicity and increase consolidation links. In addition, micro-specialty courses should be jointly developed by enterprise mentors and teachers to transform abstract and complex theoretical knowledge into microlectures, and improve students' learning efficiency and quality<sup>[4]</sup>. At the same time, a teaching resource database should be built to facilitate students' learning after class and resource sharing. The setting of resources should highlight students' cognitive level and rules.

#### *4.2.2 Improvement of overall qualifications of micro-specialty teachers*

The flexible faculty mechanism should be implemented in the construction and promotion of micro-specialty to produce results. It is explicitly proposed in the Opinions of the Ministry of Education on Implementing the Plan for Developing High-level Higher Vocational Schools and Majors with Chinese Characteristics issued in 2019 that: A sufficient number of high-level teacher (full-time and part-time) teams in

reasonable structure should be built with the standard of "lofty ideals, moral integrity, good education and a strong sense of discipline". The flexible faculty mechanism should also be promoted according to such requirements. The teachers of the micro-specialty team should improve their operation and practical abilities through "field practice" and "enterprise participation"<sup>[5]</sup>, so as to meet the requirements of micro-specialty users.

#### *4.2.3 Stronger cooperation with well-known enterprises in the development of micro-specialty courses*

It is important to strengthen the joint participation by colleges and well-known enterprises in the construction and design of curriculum resources. As enterprises stay updated on the trends of the industry and the knowledge and skills required for career development, their participation in the curriculum design process can enable students to master actual development trends of the industry, make the knowledge and qualifications of the students more in line with the requirements of enterprises, and help the students to make a more reasonable career plan. Professional comprehensive skill training is the process of applying professional knowledge. With the focus on project-based cases, students can improve their ability to apply knowledge and deal with practical problems in the project, so as to better ensure the quality of practical application oriented talents cultivated by application-oriented colleges.

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