

From the Perspective of Ecological Systems Theory: A Study on the Factors Influencing the Willingness of Chinese Higher Vocational Colleges Students on the Degree Program

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Abstract. In higher vocational colleges in China, More and more students choose to get undergraduate degree through examination. This study focuses on the ecosystem of higher vocational college students, exploring the influencing factors of their willingness to the degree program from three levels: micro (personal cognition), medium (family and school), and macro (social policy and social environment). It does propose an important viewpoint that exploring the reasons why higher vocational college students choose to upgrade should go beyond their own factors and take factors such as parents, teachers, classmates, policies, and social environment into consideration as well.

Keywords: Higher vocational college students, China; the degree program for higher vocational college students; Ecological systems theory; Binary logistic regression.

1. Introduction

China's higher vocational education is a part of vocational and technical education, which have basic principles such as “employment-oriented, service-aimed, production-learning-research combined” (Potter et al., 2011). It is located in the primary stage of post high school education, according to ISCED that was published in 1997 by UNESCO(2006), the curriculum of which focuses on practical vocational skills, rather than leading directly to an advanced research qualification such as a degree (Xiong, 2011). Meanwhile, China's higher vocational education is also a part of higher education system which is composed by vocational, undergraduate, and postgraduate education, of which vocational education refers to higher vocational education, where students who complete their graduation are awarded non degree diplomas (Potter et al., 2011). In higher education, the term ‘higher’ has inclusive meaning when it is used to describe the degree program or their equivalent offered by any provider or a more exclusive use when it is used to describe university-based diplomas and degrees (Young, 2006). In China, enrollment of higher education is conducted in a certain order (Hayhoe et al., 2004), and higher vocational colleges are at a lower level in the recruitment team of public higher education systems, so it can only recruit students with lower scores in the gaokao (Xiong, 2013). Individual academic achievement is highly valued in Chinese society, with vocational education students positioned at the bottom of the educational hierarchy and suffering considerable societal prejudice (Wang & Doyle, 2022). Therefore, higher vocational education is considered a inferior type of education in China.

Ever since 1999, students in higher vocational college can get further education in universities by taking the “upgrading examination” (Ministry of Education & National Development and Reform Commission, 2006) and obtain a bachelor's degree and a bachelor's degree after studying in vocational colleges for at least three years and undergraduate school for another two years. From the perspective of ecological systems theory, this paper designs a questionnaire around the ecosystem of higher vocational college students to explore the impact of various subsystems and system factors on the willingness of higher vocational colleges graduates on the degree program. The first section will briefly introduce the reasons why higher vocational college students choose the degree program. The second section will introduce the ecological systems theory and the ecosystem research related to student education. The third section will elaborate on the variables of

higher vocational college students' willingness on the degree program as well as of macro, mezzo, micro systems. The fourth Section will establish a model based on variables for binary logistic regression. The fifth section will discuss and conclude the above research. The sixth section will discuss some limitations of this study and provide future research prospects.

2. The reasons of choosing the degree program

In recent years, an increasing number of vocational students choose the degree program to get an undergraduate certificate, the reasons are as follows: firstly, as mentioned before, students in higher vocational colleges generally have lower scores in the *gaokao*. Academically oriented students are considered 'cultivated' and possess 'more cultural quality' (M. Weber 1970), whereas, students in higher vocational college are considered lazy, intellectually and morally suspicious young people, with "poor" academic performance (Woronov, 2015). They are regarded as "bad students" and "losers" by Chinese society with low "educational prestige" (M. Weber 1970). Under this effect, employers are more willing to hire graduates with higher educational degrees, which the higher vocational college students do not have (Liu, 2006). Secondly, the education concept in Chinese society is deeply influenced by Confucianism, which focusing on moral accountability, Confucianism values theories relating to the practice of government and confers highest status on scholars who become officials. The Confucian notion of the scholar-official has resulted in discriminatory attitudes towards higher vocational education and skilled workers in the Chinese context (Xiong, 2011). Therefore, there is a phenomenon of resistance from social cognition towards higher vocational education that is practical skills oriented. Thirdly, although China's imperial examination system (Wang, 2012) was abolished more than a hundred years ago, various exams are still important ways for China to select talents, such as high school entrance exams, *gaokao*, master's entrance exams, doctoral entrance exams, and civil service and public institution selection exams. Nowadays, civil servants and most positions in public institutions require at least a bachelor's or master's degree, although there are also some related positions that allow vocational students to apply for, these positions are at the lowest level, and have poor working conditions (Xiong, 2011), which has led to a large number of vocational students choosing the degree program to obtain the qualification to participate in the selection of civil servants and public institutions. Finally, in China it is now accepted that individuals have to make choices within an excessively aggressive culture of 'competition' (Shue & Wong 2007; Ong & Zhang 2008). It is within this public discourse that young people are negotiating their education choices.

3. The impact of ecosystems

The Ecological systems theory was proposed by Bronfenbrenner (1977), who regards 'people as people in society', because of people born and raised in society, thus the activities with other people, environments, and systems in society is inevitably. It is exactly the interaction with the surroundings that provides resources and information such as habitat, social status, psychological support, and living environment for people. The structure of human interaction with the surrounding environment is a mosaic structure, similar to Matryoshka doll, in which people not only gain personal growth from their surroundings, but their own role is also constantly influencing the environment (Bronfenbrenner, 2000). In Zastrow et al.'s (2019) discussion on Ecological systems theory, individuals belong to micro systems, which forms a layered mosaic structure, surrounded by the mezzo system (family, occupational group, and other social groups) and the macro system (social, political, and economic conditions and policies). The division of ecosystems in this study mainly draws on the conceptual definition of Zastrow et al.

In the ecosystem research related to student education, Sandfur and Wells (1999) explained the common and unique impact of family structure on siblings' education level, Uwaifo (2008) studied the impact of family structure and parental identity on the academic performance of Nigerian

university students, The research results indicate that there is a significant difference in academic performance between students from single parent families and those from two parent families.

Oliver and Kettley's (2010) explored how teachers' political and moral tendencies, as well as their social capital, can potentially influence students' decision-making on higher education, especially on elite university applications. Ansong et al. (2017) conducted a study on the supportive role of parents, classmates, and teachers in student behavior participation, and found that classmate support is most closely related to student participation, followed by parental support. Teacher support is neither an intermediary nor a direct factor affecting student behavior participation. Hoxby and Terry (2000), Boozer and Cacciola (2001), Vandenberg (2002), Rangvid (2003), Robertson and Symons (2003), Ammermueller and Pischke (2006), These studies find that having better peers tends to improve a student's own academic performance. Bell and Stevenson (2006) argued from the perspective of educational policies that each learner's personal experience is decisively influenced by a broader policy environment.

This study will focus on the ecosystem of higher vocational college students, exploring the influencing factors of their willingness to the degree program from three levels: micro (personal cognition), medium (family and school), and macro (social policy and social environment).

4. Research design

4.1 General situation of data and samples usage

This study used questionnaires for data collection, which includes basic personal information, whether to choose the degree program, and the impact status of the ecosystem. The impact of ecosystems can be further divided into three parts, namely individual cognition, family and school, and social policy and social cognition, each question provided a single choice to investigate the influencing factors of each factor on the respondents.

This study conducted a survey questionnaire in Hubei, Shandong, and Fujian provinces in China, selecting one vocational college from each province to ensure that the samples come from different locations. We distributed a total of 725 questionnaires and collected a total of 711 valid questionnaires. Among the 711 higher vocational students surveyed, 60.2% were male and 39.8% were female. In terms of grade distribution, freshmen account for 37.6%, sophomores account for 37.6%, and juniors account for 25.3%. Descriptive statistics were conducted using SPSS 26.0 software on the four basic indicators of gender, major category, grade, and student origin of the survey subjects. The results are shown in Table 1.

Table 1. Descriptive Statistics on the Basic Information of Survey Subjects

Statistic indexes	Classification	Number of samples	Proportion (%)
Gender	Male	428	60.20
	Female	283	39.80
Classification of majors	Science and engineering	322	45.29
	Humanities and Social Sciences	231	32.49
	Art and Sports	158	22.22
Grade	Freshman	267	37.55
	Sophomore	264	37.13
	Junior	180	25.32
Hometown	Big cities	124	17.44
	Middle and small-sized cities	336	47.26
	Rural	251	35.30

4.2 Variable measurement

4.2.1 The Willingness of the degree program

For the measurement of the influencing factors of higher vocational college students' willingness on the degree program, the first step is to ask the interviewees whether they choose the degree program. Secondly, according to the hierarchy of the ecosystem, inquire about the impact of detailed factors at each level on the respondents. The results showed that out of 711 surveyed students, 414 said they would choose "yes" on the degree program, accounting for 58.23%, and 297 chose "no", accounting for 41.77%.

4.2.2 Micro systems: personal cognition

The micro system aspect includes three issues related to personal cognition. Ying&Lv (2012) conducted a study on academic performance of 440 students from two higher vocational colleges and found that 41.6% of the surveyed subjects have a high degree of academic procrastination, which affects their academic performance. Therefore, the academic performance of higher vocational college students can represent their attitude towards learning, which may affect whether they choose the the degree program. In this question, the classification is based on the median class ranking. The significance of the second question is that for students who choose the degree program to pursue a bachelor's degree, they can continue to pursue a master's degree at the end of their undergraduate studies. However, for others, they may choose get a job due to financial and family pressures, and continue to participate in adult education after work (Hunter&Keehn, 2018) or take the master's degree exam after two years of work (Zhang&Li, 2019) to improve their academic qualifications, and then choose a more satisfactory job. In the fourth question, the proportion of respondents who are "under planning" is the highest, reaching 43.46%. As shown on Table 2.

Table 2. Frequency statistics of micro system influencing factors

Variable	Option	Number of samples	Proportion%
How's your academic performance?	Top 50% of class	392	55.13
	The last 50% of class	319	44.87
Will you choose to continue improving your education in various ways in the future?	Yes	372	52.32
	Not sure	200	28.13
	No	139	19.55
Do you have a long - term plans for the future?	Yes	279	39.24
	Under planning	309	43.46
	No	123	17.30

4.2.3 Mesoscopic System: School and Family

The influencing factors of the school mainly involve the manipulation of indicators by teachers and classmates. Teacher's evaluation can have an impact on students' learning attitudes (Ferris, 1997). The support of classmates can also affect one's academic performance and motivation (Henderson et al., 1978; Ansong et al., 2017). The specific influencing factors of the family are measured by whether there are multiple highly educated relatives, the monthly income of the family, parental expectations, whether parents have had higher education experience, and the level of parental trust in oneself. As shown in Table 3, the monthly income of families surveyed within the range of 5000 to 10000 yuan, in which the proportion of parents who expect their children to choose the degree program is 40.93%, while those who do not expect it are 14.63%; 58.23% of parents who have higher education expect their children to choose the degree program, while for parents who don't have higher education, the proportion is 42.05% . The proportion of parents who trust their children and hope them to get a degree program is 46.13%, while the proportion of parents who do not trust their children is 11.67%.

Table 3. Frequency Statistics of Factors Influencing Mesoscopic Systems

Variable	Option	Number of samples	Proportion%
Does the teacher often guides you to choosing a college upgrade?	Often	313	44.02
	Sometimes	257	36.15
	Never	141	19.83
Do you follow your classmates on the degree program?	Yes	227	31.93
	Mediocre	268	37.69
	No	216	30.38
Do you have relatives that most of them are highly educated?	Yes	203	28.55
	Mediocre	296	41.63
	No	212	29.82
What is the monthly income of your family?	Below 5000 yuan	174	24.89
	5000-10000 yuan	388	54.57
	10000-20000 yuan	144	20.25
	Above 20000 yuan	5	.70
Does your parents expect you to choose the degree program?	Yes	291	40.93
	Mediocre	316	44.44
	No	104	14.63
Did your parents received higher education (college or above)?	Yes	119	16.74
	One of them	295	41.49
	No	299	42.05
Does your parents trust you?	Yes	328	46.13
	Mediocre	300	42.19
	No	83	11.67

4.2.4 Macro System: Social Policy and Social Environment

Different educational backgrounds can affect an individual's promotion speed (Spilerman & Lunde, 1991), and the opportunity to enter better paying enterprises and units as well. Compared to undergraduate and graduate students, most higher vocational students can only enter small companies or even cannot find suitable jobs. The outbreak of the COVID-19 pandemic has further intensified unemployment resulted from the serious global economic downturn (Mok et al., 2021). After the COVID-19, more and more Chinese companies have raised the access threshold, some of them even taking the master's degree as the access condition, which has brought great employment pressure to higher vocational students and undergraduates. In the question "Can I find a satisfactory job after graduating from a vocational college in this major?", 24.89% of students chose "Yes", while in the question "Can I find a satisfactory job after graduating with a bachelor's degree in this major?", the number of students who chose "Yes" increased to 27.99%. However, in the denial option, this data decreased from 33.47% to 10.83%. 38.96% of students are uncertain whether society recognizes those with higher educational qualifications. 41.35% of students admit to choosing the degree program due to policy expansion. See Table 4.

Table 4. Frequency statistics of macro system influencing factors

Variable	option	Number of samples	Proportion%
Will you get a satisfactory job after graduating from a higher vocational college in this major?	Yes	177	24.89
	Not sure	296	41.63
	No	238	33.47
Will you get a satisfactory job after graduating from a university in this major?	Yes	199	27.99
	Not sure	435	61.18
	No	77	10.83
Are highly educated individuals more popular nowadays?	Yes	252	35.44
	Not sure	277	38.96

	No	182	25.60
Would you choose the degree program due to policy expansion?	Yes	294	41.35
	Not sure	242	34.04
	No	175	24.61

5. Research findings

Table 5 is a list of variable assignments. Table 6 shows a binary logistic regression analysis of the relationship between the ecosystem and whether higher vocational college students choose the degree program. The regression analysis is conducted between the micro system (personal cognition), the mezzo system (family and school), and the macro system (social policy and social environment) and whether they choose to pursue a degree program. The vertical columns of the table list three models, which are the micro system model, the mezzo system model, and the macro system model.

Table 5. List of Variable Assignments

Variable	type	Description of variable assignment
dependent variable		
Do you choose the degree program?	Classification	Yes = 1, No=0
independent variable		
How's your academic performance	Sequencing	Top 50% of class = 1, The last 50% of class = 0
Will you choose to continue improving your education in various ways in the future?	Sequencing	Yes = 3, Not sure=2, No=1
Do you have a long-term plans for the future?	Sequencing	Yes = 3, Under planning =2, No = 1
Does the teacher often guides you to choosing a college upgrade?	Sequencing	Often = 3, Sometimes = 2, Never = 1
Do you follow your classmates on the degree program?	Sequencing	Yes = 3, Mediocre = 2, No = 1
Do you have relatives that most of them are highly educated?	Sequencing	Yes = 3, Mediocre = 2, No = 1
What is the monthly income of your family?	Sequencing	Above 20000 yuan = 4, 10000-20000 yuan = 3, 5000-10000 yuan = 2, Below 5000 yuan=1
Does your parents expect you to choose the degree program?	Sequencing	Yes = 3, Mediocre = 2, No = 1
Did your parents received higher education (college or above)?	Classification	Yes = 3, One of them = 2, No = 1
Does your parents trust you?	Sequencing	Yes = 3, Mediocre = 2, No = 1
Will you get a satisfactory job after graduating from a higher vocational college in this major?	Sequencing	Yes = 3, Not sure=2, No=1
Will you get a satisfactory job after graduating from a university in this major?	Sequencing	Yes = 3, Not sure=2, No=1
Are highly educated individuals more popular nowadays?	Sequencing	Yes = 3, Not sure=2, No=1
Would you choose the degree program due to policy expansion?	Sequencing	Yes = 3, Not sure=2, No=1

5.1 The connection between micro System and Whether Higher Vocational Students Choose the degree program

In the micro system model of Table 6, there is significance in terms of academic performance, continuing to improve academic qualifications, and future planning. It can be seen that in this survey, the personal cognition contained in the micro system has a significant impact on whether vocational college students choose the degree program.

Table 6. The connection of binary logistic regression analysis of ecosystem and whether vocational college students choose the degree program

Variable	The impact of micro systems	The Impact of mezzo systems	The impact of macro systems
How' your academic performance?	8.363(2.124) ***	5.086(1.626) ***	4.748(1.558) **
Will you choose to continue improving your education in various ways in the future?	12.963(2.562) ***	2.990(1.095) **	3.603(1.282) **
Do you have a long-term plans for the future?	10.155(2.318) ***	5.138(1.637) ***	3.262(1.182) *
Does the teacher often guides you to choosing a college upgrade?		5.098(1.629) ***	4.356(1.472) ***
Do you follow your classmates on the degree program?		2.800(1.030) **	2.069(.727) *
Do you have relatives that most of them are highly educated?		1.410(.343)	1.409(.343)
What is the monthly income of your family?		1.549(.438)	1.356(.305)
Does your parents expect you to choose the degree program?		3.250(1.179) **	2.477(.907) *
Did your parents received higher education (college or above)?		1.963(.674)	2.481(.909) *
Does your parents trust you?		4.074(1.405) **	2.526(.927)
Will you get a satisfactory job after graduating from a higher vocational college in this major?			0.997(-.003)
Will you get a satisfactory job after graduating from a university in this major?			4.007(1.388) **
Are highly educated individuals more popular nowadays?			1.492(.400)
Would you choose the degree program due to policy expansion?			1.713(.538)

Note: Outside the parentheses are the advantage ratio $Exp(\beta)$, inside the parentheses is the non standardized regression coefficients B ; * $P < .05$, ** $P < .01$, *** $P < 0.001$

5.2 The connection between mezzo System and Whether Higher Vocational Students Choose the degree program

The mezzo system model is divided into four levels: teachers, classmates, relatives, and parents. It can be seen that the guidance of teachers and the overall high educational level of relatives have no significant impact on whether students choose the degree program. However, the influence of classmates shows great significance, each time the level their classmates' choices upgrades, the probability of students choosing the degree program increasing by 2.8 times. This is consistent with Ansong et al.'s (2017) study on the impact of student groups. The author assigns a value of 4-1 to different levels of family monthly income in order of high and low, but in the mezzo system model, it was not found that the level of family income has a significant impact on whether students choose

the degree program. The educational background of parents does not significantly affect students' choice of the degree program, but the probability of students choosing the degree program increases by 3.25 times each time the level of "parental expectations" upgrades. Parents' trust in their children, as a form of family social capital, is a resource embedded in social structures and networks (Lin, 1992) that can provide motivation and capital for children. As shown in this study that the probability of students choosing the degree program increases by 4.074 times each time the level of "parental trust" upgrades.

5.3 The connection between macroscopic System and Whether Vocational College Students Choose to Upgrade from College to Undergraduate

The macro system model includes the employment situation of college graduates and undergraduate graduates in this major, whether society is more accepting of highly educated individuals, and whether the relaxation of admission policies will affect individuals' choice of the degree program, it turns out that there is no significant difference in "finding satisfactory jobs after graduating from a higher vocational college in this major." Correspondingly, the recognition that "finding satisfactory jobs after graduating with a bachelor's degree in this major" is highly significant. For each level of improvement in the option, the probability of choosing the degree program will increase by four times. The other two issues did not show statistical differences.

6. Conclusion and Discussion

In summary, in today's higher vocational colleges, there are more and more students who choose the degree program. In this survey, about 60% of students chose the degree program, and the micro, mezzo, and macro systems had an impact on their decision.

Students regulate their motivation and behaviors depending on their goal orientation and their perceptions of task value (Pintrich et al., 1993). Generally speaking, the examination of the degree program and the courses in universities are closely related to the courses in college, which means that students who choose the degree program must study hard in college, and be well prepared for university. As mentioned above, there are various ways to improve one's education, but for higher vocational colleges students, most of them will choose to take the degree program. Vocational education is employment-oriented (Li & Jiao, 2021), however, students who choose to take the degree program will obtain more satisfactory jobs by improving their academic qualifications, and that's a long-term plan.

For the mezzo system, the influence of classmates and the expectations and trust of parents are both significant reasons for students to choose the degree program. They get to know the degree program mostly because of their classmates and then collect information themselves after the introduction of their classmates. In families, on the one hand, high expectations from parents may affect a child's academic trajectory (Yamamoto & Holloway, 2010), on the other hand, as one of the sources of social capital for children, the family, with trust as its core, cultivates a good family atmosphere (Fuller, 2014), which enable parents and children to respect each other and support their children's choices.

On the macro level, the most significant influencing factor is whether they can find a satisfactory job after graduating from their undergraduate major. For most students, regardless of their educational background, their ultimate goal is still to find a job with suitable compensation. Higher vocational students often find it difficult to find a job that matches their major or educational level, which significantly affects their job satisfaction and income. In terms of starting salary, there is also a significant difference between higher vocational college graduates and undergraduate graduates (P. Yang et al., 2015), so more higher vocational college students choose to upgrade from college to university.

This study provides an important breakthrough point for scholars and teachers' research by demonstrating the relationship between the ecosystem and the choice of the degree program. In

addition, this article also adds a broader discussion on the different perceptions and treatment of higher vocational college graduates and undergraduate graduates in society. What makes some higher vocational college students not choose the degree program.? How can policy makers, teachers, parents, and other relevant personnel help students choose reasonable channels for further education? Although this study does not directly answer these questions, it does propose an important viewpoint that exploring the reasons why higher vocational college students choose to upgrade should go beyond their own factors and take factors such as parents, teachers, classmates, policies, and social environment into consideration as well.

As one of the most important educational targets of higher education in China, vocational college students also have higher requirements and expectations on education, instead of just being satisfied with vocational education, they need to receive higher level academic education to find their self-worth (Ramdhani & Nkoane, 2010). At the same time, with the advent of the era of knowledge economy (Antonelli & Fassio 2016), the society have attached more and more importance on the cultural quality and comprehensive ability of talents, and a pathway for improving vocational education qualifications has been gradually established (Ling et al., 2021), which, objectively creates a good external environment for higher vocational college students. Of course, compared to undergraduate colleges, vocational colleges tend to cultivate skilled talents with solid basic knowledge and practical abilities that integrate production, construction, service, and management as needed by society, rather than blindly pursuing "decent work", which, obviously, is influenced by social public opinion. The choice for higher vocational college students is diverse. Some students would like to improve their education through degree program, which should be encouraged, but for the others who choose to realize their self-worth in practical work and aim to be a great craftsman, we should encourage and respect them as well.

7. Limitation

There are still some limitations in this study, which can be addressed in future studies. Most provinces in China do not support cross major degree program, and students can only choose majors that are relevant or similar to their college majors. After being approved by the university, students are allowed to take the exam. The three provinces in this study also strictly adhere to this policy, but some provinces have relatively open policies that allow students to apply for across majors. Therefore, in fact, questions such as "Are you interested in this major?," "Are there any other majors that you are interested in?" Can also be used as variables to measure the influencing factors for higher vocational college students in these regions to choose the degree program. In future research, the author will expand the scope of research and further explore such issues.

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