



# Analysis of Factors that Influenced the Participation Rates in Upper-secondary Vocational Schools in China

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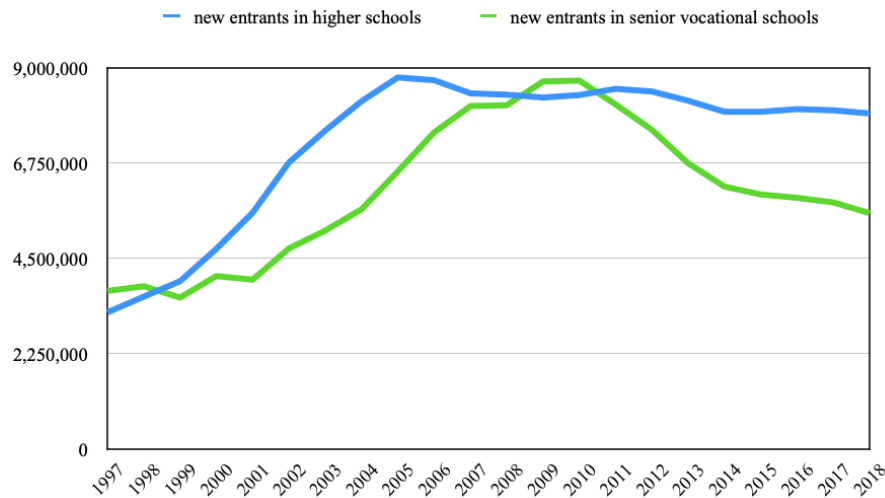
**Abstract:** Vocational education and training has been treated as a good pathway to smoothly promote youth from school to the workplace. However, for many reasons, the vocational education in Asian countries is not as popular as general education, and the participation rate in vocational schools is normally lower than it is in general schools. This paper builds a theoretical model about the factors that influence the participation rate in Chinese upper-secondary vocational schools and explains the possible related indicators through a regression analysis method. The results show that the most positive factor is related to the number of male students in vocational schools, followed by the number of female vocational teachers. Other staff in vocational schools also have a positive effect, while the youth unemployment rate and the number of men vocational teachers both have negative relationships with the participation rate. In China, it is possible to improve the rates of new entrants into vocational schools from the aspects of the gender issues, the training methods for vocational teachers, and the social recognition of vocational education. First sentence describes the nature or the background information on the field of study. Subsequent sentences provide the problem statement or objectives and scope of the research. Next sentences explain the methods and materials used in the work. Main results and important findings are then highlighted. Finally, a summary of conclusions is put forth. Length of abstract can be proportional to the length of the article.

**Keywords:** Participation rate, upper-secondary vocational schools, influenced factors, technical vocational education and training, ordinary least squares regression analysis

## 1. Introduction

The vocational education and training (VET) system in Germany is treated as an effective measurement to simultaneously promote local economic growth and to reduce youth unemployment rates in many developed countries (Euler, 2013). The governments in most developing countries have treated the VET as an education investment with significant returns both in economic benefits and in social benefits (Wahba, 2012). The well-known dual system is one part of the compulsory education system in Germany, and it is a cooperation model between training companies and initial vocational schools. In China, on the other hand, the main formal VET model is school-based model, which means both theoretical learning and practical training normally happened at schools. It is divided into two school levels, senior VET in middle school level and higher VET in technical college level. The senior vocational school provides senior VET for students who have finished the nine years of compulsory education in China, and students can obtain basic theoretical knowledge and skills training at the same time. This kind of vocational school normally provides training place or cooperate with companies to provide training chances for students. While the technical college provides for students who have completed twelve years of education, and students can obtain further education and training.

There is a cultural tradition in most East Asian countries that the reputation of academic education is normally higher than that of vocational education (Euler, 2013). As a result, it is difficult to promote and to improve VET in those countries. In recent years, the Chinese government has made a lot of effort and achieved some positive experiences in promoting vocational education, especially senior vocational education. Figure 1 shows the number of new entrants in formal senior education schools in China from 1997 to 2018 and shows that the development lines in both school types has maintained a similar trend. Around 2010, the number of new entrants into upper-secondary vocational schools was even higher than the number entering high schools, but after that, there was an obvious declining trend.



**Fig. 1 - The number of new entrants in Higher School and Upper-Secondary Vocational Schools 1997-2018 in China**

In many countries, the beginning of technical vocational education and training is the upper-secondary level education (Gambin, 2009), which has three main models:

- A school-based model (like the VET system in China);
- A workplace-based model (for example the dual system in Germany); and
- Special programs.

Improving the participation rate of upper-secondary VET has been treated as one method by government to reform the whole VET system (Gambin, 2009). On the one hand, keeping the training system targeted to youth might not only reduce the youth unemployment rate but also be good for the country’s economic demands (Euler, 2013). On the other hand, as the main education method is to provide new professional workers to new occupations, VET has been treated as one solution to solve the problem of having insufficient skilled workers, which has led to allowing more aged students in. In the past 20 years, the Chinese upper-secondary VET participation rate has remained at 40%, which represents a medium level. This paper attempts to find some related factors that could influence the participation rate through the ordinary least squares (OLS) research method.

## 2. Theoretical Background

Many researchers have discussed students’ choice in different kind of schools, and, of course, the reasons are diverse. Some subjective factors like parents/ suggestions or students’ ideal occupational preferences could influence the students’ final choice for either a vocational school or high school (Aypay, 2003). The participation rate in schools could also be affected by such factors as public transportation and students’ housing areas (Muller, 2008). Most researches have focused on specific influencing factors rather than looking from a comprehensive perspective that would include social factors, economic factors, etc.

Chapman has expressed the belief that there are three main indicators that might influence students’ decisions about schools, namely: social factors, economic factors, and a combination of both factors (Chapman, 1981). The school environment could also facilitate students’ participation in school (Egilson, 2009). How to find related factors as completely as possible in this research is the first problem. Based on this question, Chapman’s view about students’ choice is used as the foundational model here. There are two reasons for choosing this model:

- a. According to previous research, the modern Chinese education system was built based on education models of Western countries like the United States and some European countries since the end of the Qing dynasty (Barabasch, 2009).
- b. According to Moogan and Baron (2003) most researches about the college choices of potential students has been conducted in the United States of America.

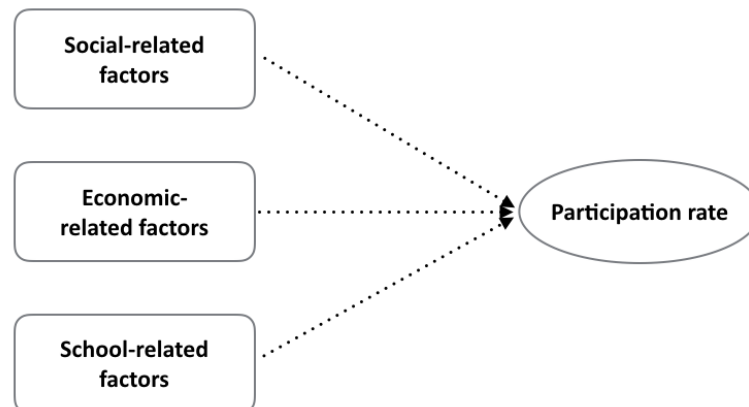
When this model is applied to the Chinese case, some changes need to be made, such as considering the specific factors and data that could be collected from the public dataset. The first social indicator is the demographic changes. On the one hand, the birth rate in China has declined by 27.8%, and on the other hand, the population over 65 increased by 50.7% from 1997 to 2019 (Un, 2019). Those two main demographic problems have led to having a smaller youth workforce entering the market, and a larger older workforce leaving the labour market. From this prospective, the government should focus more on how to attract more youth to choose vocational education and should train more skilled workers who can meet the demands of the labour market in the coming years (Tabbron, 1997).

The next social indicator is the gender problem. In some developing countries, the vocational education has been treated as a provision reserved for men, and because of cultural beliefs, women normally have had less of a chance to receive any vocational education (Wahba, 2012). As we know, gender injustice remains a social issue in VET and in the labour market (Niemeyer, 2015). From Jørgensen's point of view (Jorgensen, 2015), vocational education represents a highly effective transition from school to work for youth, and in Denmark there is one reason that more males choose VET: It is because the major settings in vocational schools have been biased towards traditional VET programs and the manufacturing industry. This is a normal situation. In many countries, VET has been more attractive to young men than to young women. Not only has the ratio of male to female students in vocational schools influenced the participation rate, but it has also influenced the gender problems as related to the teachers. Teachers in vocational schools are employed for different types of positions, and their qualifications and work forms are different (Kopsen, 2017). And in different vocational areas, the distribution of men and women teachers may have great differences (Kopsen, 2017).

The economic indicator of most significance to this paper is the youth unemployment rate. The well-known German dual system has been applied in many developing countries as a successful vocational education model in recent years. One reason is that it could help youth find more suitable positions in the labour market and reduce the youth unemployment rate (Euler, 2013). Youth are considered to be a vulnerable category of workers, since they are newly entering the labour market (Caroleo, 2017). Any observation of the severity of youth unemployment in different countries may depend on how the school-to-work institutions are organised (Ryan, 2001). Even though the general education has recently expanded, and the general education level has been improved, the connection between the education system and the labour market have often been questioned (Caroleo, 2017). In the following section, this paper will examine whether the participation rate in vocational schools has a correlation with the youth unemployment rate in the Chinese labour market.

Since the Chinese VET system is a school-based system, the main education and training places have been vocational schools. This paper will mainly discuss some school-related factors. The first factor is the vocational teachers. In vocational schools, there are two main types of full-time professional teachers who are responsible for teaching, and other staffs are responsible for other things. More professional teachers have been proved, through many previous empirical researches, to have a positive influence on attracting more students to vocational schools (Bakar, 2018). But there is one problem: In many countries there is a shortage of vocational teachers. Qualifications for professional vocational teachers should have related occupational knowledge and skills (Fejes, 2014). However, vocational teachers' training has been based on the general teachers training, but it is essential to improve teachers' qualifications in vocational schools.

According to previous related researches and combined with the collected data, the research structure and the model of this paper are shown in Figure 2, and detailed contents are presented in Table 1. Additionally, this research mainly focuses on the related macro-social factors.



**Fig. 2 - The research model of the participation rate in Upper-Secondary Vocational Schools in China**

**Table 1 - The research model of the participation rate in Upper-Secondary Vocational Schools in China**

Factors	Explanations	Supporting literatures
Social-related:		
Demographic changes	The demographic changes about youth in the labour market.	Tabbron,G. (1997)
Gender problems	The gender difference between female and male students.	Niemeyer,B. (2015)
Economic-related:		
Youth unemployment rate	The relationship between VET and youth unemployment rate.	Caroleo, F. E. (2017)
School-related:		
Vocational teachers	The types and gender difference between vocational teachers	Bakar, R. (2018)

### 3. Methods

The upper-secondary vocational school is the initial part of VET in China, and it is also the first time for youth to choose their focus and enter into the vocational education system. The research target in this paper mainly focuses on analysing the related objective indicators that might influence the participation rate in upper-secondary vocational schools in China. The related factors in China will be shown and the related suggestions on how to improve the attractiveness about the initial vocational education will be given in the following part, as based on the analysis results.

The ordinary least squares regression analysis method was applied in this research. The reason for choosing this method was based on the assumption that there is a linear relationship between the dependent and independent variables, and this regression analysis showed which factors really have a relationship with the participation rate. The structural equation is as follows:

$$Y = A + B * X \tag{1}$$

Y is the dependent variable, representing the value being the participation rate in upper-secondary vocational schools in China (1997-2018). X is different independent variables that were collected depending on the previous theoretical model. All independent variables were collected from the Chinese Statistic Yearbook. The dependent variable is calculated as follows:

$$Y = A / (A + B) \tag{2}$$

A represents the number of enrolled students in upper-secondary vocational schools, and B represents the number of enrolled students in normal high schools, since the secondary education system after compulsory education in China is divided into upper-secondary vocational school and normal high school. As it mentioned before dependent variable is the participation rate in upper-secondary vocational schools and independent variables include the number of female/male students, full-time/other staff teachers, female/male youth population, female/male teachers in vocational schools and youth unemployment rate in the labour market. After data collection, we assumed that those indicators have cor relationship with the participation rate in vocational schools. Combined with literature review and collected data, here states 10 assumptions:

- i. The number of female students is positively related to the participation rate.
- ii. The number of male students is negatively related to the participation rate.
- iii. The number of full-time teachers is positively related to the participation rate.
- iv. The number of other staffs is positively related to the participation rate.
- v. The youth 15-24 female population is positively related to the participation rate.
- vi. The youth 15-24 male population is negatively related to the participation rate.
- vii. The number of female teachers is positively related to the participation rate.
- viii. The number of male teachers is negatively related to the participation rate.
- ix. The number of graduates is positively related to the participation rate.
- x. The youth unemployment rate is negatively related to the participation rate.

Under those assumptions that all indicators could influence the result, the next step was to see whether all related factors were correlated, and, if they were, to find out if they had positive or negative functions, and then to discover which were the most positive and which the negative factors. All data were collected from 1997 onward for two main reasons. First, during this time, the higher education system in China began to expand, and as a result, the attractiveness of vocational education has declined. The second reason is that The Act of Vocational Education and Training in People's Republic of China was enacted in 1996. Since 1997, on the one hand, we have to consider the politics and laws supporting the promotion of vocational education's development, and on the other hand, we have to face the challenges about the

competition students face to get into higher education; therefore, finding ways to improve the participation rate in vocational schools has become a hot issue until now. In addition, as we known, all collected data are secondary data, and thus, theoretically, every use of the existing data could be marked as "secondary data analysis" (Boeren, 2018). Smith (2008) has expressed the belief that secondary data analysis is an underutilized methodology in social science, and the existing data analysis could be used multiple times from different exploring aspects. There is not as much quantitative research about vocational education as there is about general education in China, thus secondary data analysis in vocational education is necessary and meaningful. All data are collected from the government data set Chinese Statistical Yearbook, and the accuracy of the numbers can be guaranteed.

#### 4. Results

Table 2 is the descriptions and changes of all collected independent variable data from 1997 to 2018 in China. What's more, the data is from China Statistical Yearbooks in National Bureau of Statics and except the factor 'Youth unemployment rate' is from World Bank. There are 10 factors in this table totally, and they are all the possible effect indicators related to the participation rate in upper-secondary vocational schools in China.

**Table - 2 Changes of all related factors 1997-2018 in China**

	Female Students	Male Students	Full-time Teachers	Other Staffs	15-24 Female Population	15-24 Male Population	Female Teachers	Male Teachers	Graduates	Youth unemployment rate
1997	4251700	7452300	598800	422200	92472000	95625000	412000	609000	3357500	0.0652
1998	5323400	6886600	759200	575100	88690000	93846000	419500	914800	3602800	0.0661
1999	5421800	6632900	759500	511200	83949000	86782000	415500	855200	3742300	0.0689
2000	5146700	6181600	716400	458200	96788403	100815936	391300	783300	3916000	0.0695
2001	5295900	5295200	632600	446100	83949000	88349000	366900	711800	3644900	0.0804
2002	5016900	6248600	651900	379500	90127000	93982000	350300	681100	3372800	0.0891
2003	5518300	5346357	596252	363408	91943991	96764767	385500	574160	3240254	0.0976
2004	6046331	8046169	708500	331800	96393374	99116978	386900	653400	3591939	0.0955
2005	6756500	9243900	749800	343380	92920377	94265057	394700	698480	4181897	0.0956
2006	8494300	9604600	799100	338300	97498346	102262404	498300	639100	4790528	0.0936
2007	9092900	10777200	858900	337200	96180000	101061111	516500	679600	5309032	0.0917
2008	9482500	11388373	894887	327358	96022805	99751716	541400	680845	5806595	0.0984
2009	9977876	11799049	902869	315422	95052691	100998855	544535	673756	6192325	0.1011
2010	10173667	12143970	867386	348969	111388229	115913403	549671	666684	6591774	0.0978
2011	11072780	10980520	881938	329259	107817647	114482353	550515	660682	6603460	0.0989
2012	9625498	11511373	880962	308476	101942238	109436823	543168	646270	6748946	0.1027
2013	8724737	10504969	867943	285459	96087591	106006083	534906	618496	6744396	0.1044
2014	7973063	9579760	858413	273695	90060827	99116789	532216	599892	6229463	0.1062
2015	7355968	9211056	844086	257728	82902774	92605936	524661	577153	5678833	0.1076
2016	6994470	8995657	839589	246511	78971326	89086022	526379	559721	5336240	0.1065
2017	6810275	9114693	839196	240516	75128640	85594661	531693	548019	4968770	0.105
2018	6571223	8981411	833519	232785	71550000	82484146	533597	532707	4872763	0.1059

Table 3 is the OLS regression result, and we take use of SPSS software(edition 26) to do the multiply linear regression analysis. The value of R-squared is 0.959, the value of Adj. R-squared is 0.934 and the value of effect size (R) is 0.966. The value of Prob (F-statistic) is 2.29e-06, which is quite smaller than 0.05, thus the regression result is significant. This model built based on the combination of literature review, available collected data, and 10 research assumptions. There are three main aspects' factors that could influence the participation rate, in fig.2 and table.1. Later those related data have been collected from public and official database, the changes of demographic have been shown in table.2. Firstly, we focus on the value of P, which points to five indicators that are close to or smaller than 0.05. The next considered value is t. Among those five factors, there are three positive and two negative results.

**Table 3 - OLS regression result**

Model	Coefficients	Standard Error	t	P>   t
Intercept	0.16	0.07	2.33	0.038
Female Students	-0.04	0.11	-0.3	0.764
Male Students	0.39	0.12	3.27	0.007
Full-time Teachers	-0.18	0.12	-1.5	0.157
Other Staffs	0.35	0.11	3.1	0.009
Population 15-24 Female	-0.06	0.68	-0.08	0.934
Population 15-24 Male	0.08	0.71	0.11	0.908
Female Teachers	0.34	0.18	1.86	0.088
Male Teachers	-0.27	0.08	-3.46	0.005

**Table 3 - Continue**

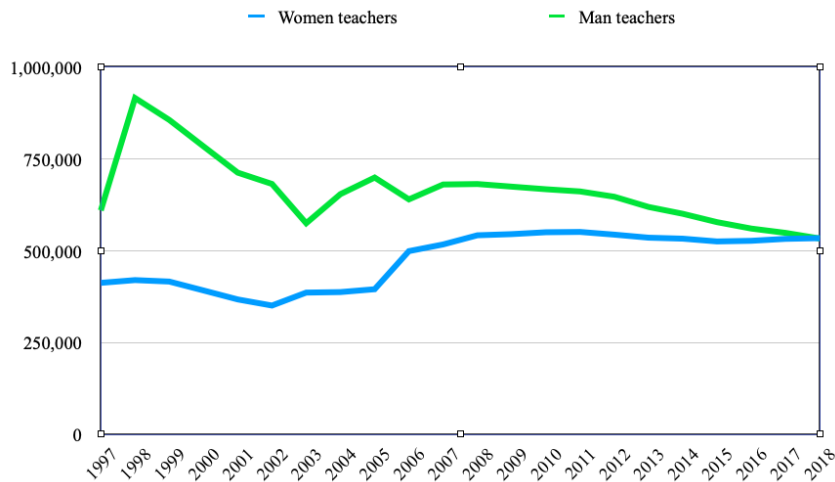
Model	Coefficients	Standard Error	t	P>  t
Graduates	-0.02	0.1	-0.22	0.832
Youth unemployment rate	-0.37	0.16	-2.3	0.040

The most positive indicator is the number of male students in upper-secondary vocational schools. The proportion of female and male students has changed from 36.1% : 63.9% in 1997 to 42.1% : 57.4% in 2018. With the decline of the gender difference gap, the participation rate in vocational schools has decreased. There are two possible reasons to explain this situation. The first one is about historical and cultural background in China. Because China is influenced by the Confucius theory, which focuses more on morals than on accountability, there has been a strong prejudice against skilled workers who have been trained in vocational education in China (Xiong, 2011). And internationally, household work is still mainly undertaken by women while the work in the labour market is undertaken more by men (Niemeyer, 2015). However, some women still must work in the labour market and then go home and do the household work, which means these women are charged with a double workload (Niemeyer, 2015). Compared to the men's side of the workforce, women also face such problems as lower average salaries, worse work environments, higher risks, etc. Another reason that the decline of the gender difference gap has led to vocational schools' participation rate decreasing is related to a particular social policy in China. The modern Hukou system[ Hukou is a system of household registration used in mainland China. The system itself is more properly called "hujū", and has origins in ancient China; hukou is the registration of an individual in the system. A household registration record officially identifies a person as a resident of an area and includes identifying information such as name, parents, spouse, and date of birth.], which originated in the 1950s, divided the population into two groups: urban and rural. The social differences between urban and rural areas in China include economic status, employment, medicine, education, and other social aspects. The demand of education in rural areas is lower than in urban areas, and the one child policy[ The one-child policy was part of a birth planning program designed to control the size of the rapidly growing population of the People's Republic of China. It set a limit on the number of births parents could have, making it the world's most extreme example of population planning. It was introduced in 1979 (after a decade-long two-child policy), modified beginning in the mid 1980s to allow rural parents a second child if the first was a daughter.] was implemented mostly in cities. As a result, the parents of girls in urban cities prefer to invest in higher education (Zeng, 2014). Because of economic problems, parents in rural areas prefer to send their boys rather than their girls to be educated in schools. In the past 20 years, girls' vocational education opportunities have increased significantly, while the attractiveness of VET has decreased. Although women's status in the labour market has not changed very much, higher education is still more attractive for them, especially for urban young girls.

The second positive indicator is the number of other staff members in vocational schools. VETs have always had a deep connection with the workplace, and as a result, vocational teachers have highly professionalised qualifications (Grollmann, 2007). The Chinese dataset has divided vocational teachers into two groups: full-time teachers and other staff. In China, most full-time teacher training is similar to general teacher training: They first obtain a Bachelor of Arts degree (Zhao, 2007). One problem is that they normally transition from school to school without more practice or training activities; thus they have a shortage of professional knowledge and teaching methods (Zhao, 2007). Both government and vocational schools have recognized this issue already, and more specifically skilled workers have been recruited as part-time teachers who are responsible for the practical teaching courses. The analysis result shows that the other staff in vocational schools are more attractive to new enrollees, which could be one reason. The other aspect is related to both social and economic status, which have caused vocational teachers to have lower recognition. The average salary not only for vocational teachers but also for general teachers is not very high, and the social environment has been discriminating against VET for a long time (Zhao, 2007). The employment situation in vocational schools, especially for younger teachers, is unstable. Hiring more part-time teachers could increase the variety of teaching styles and teaching methods and make up for the shortage of professional teachers, to some extent, in vocational schools.

Another division for vocational teachers is the gender difference. It is obvious from the analysis results that men teachers have a negative influence, and women teachers have a positive influence on the participation rate in upper-secondary vocational schools. Firstly, it is worth considering school-age female students in rural areas in China. As previously mentioned, in rural areas the priority of education is for males, and with the expansion of higher education in the past decades, those males prefer higher education over vocational education. Since 2010, the Chinese government has promoted free upper-secondary vocational schools, and girls in the rural countryside have more chances to attend vocational education. Banerjee (2000) used a randomized experiment in India to see if hiring more teachers, especially women teachers, would improve the quality of education, and the results showed that increasing the number of women teachers increased the attendance rate of female students, while it had no obvious influence on the male students. In addition, according to OECD (The Organisation for Economic Co-operation and Development) data, in all OCED countries around two-thirds of the teachers from preschool education to higher education are women, and the gender gap between primary and secondary education has increased, while in higher education the gap has narrowed (OECD, 2015). In the past 20 years, the proportion gap of women and men vocational teachers has decreased, as shown in Figure 3, and the employment rate of women in vocational schools has increased. Furthermore, the economic situation might also have an influence. Compared to other highly educated workers, the men teachers' average salary in secondary education is

76% of that of men working in other fields. (OECD, 2015). Lower average salaries may lead to unstable work environments, which means men teachers may find it easier to leave than would women teachers.



**Fig. 3 - The number of women. vs. man teachers in Vocational Schools in China 1997-2018**

The second negative factor is the youth unemployment rate in the labour market. There is no doubt that the youth unemployment rate has an interactive relationship with the participation rate in vocational schools. In Germany the dual vocational education system is famous for decreasing the youth unemployment rate (Euler, 2013), which means that if students receive a vocational education, they might also have a better chance at finding a job position in the labour market. Thus, vocational education has been treated as a standard pathway into the labour market in Germany (Biavaschi, 2012). While in China, higher education has greater social recognition than has vocational education (Zhao, 2007), and a graduation certification from general education is more attractive than a vocational education in the labour market. Because of religions and different cultures, China is not the only country where it is difficult to find a decent job for youth through vocational education (Biavaschi, 2012). If the youth unemployment rate in China has decreased, the competition in general education and higher education has become more intense. In different areas, youth labour may be influenced by culture factors, including the demand-supply relationship between the education system and the labour market. One further reason may be that the quality of vocational education is not high enough, while general education has a long history of development, so the theoretical and practical experience are much richer. In many countries, the school-based education system is the main pathway for youth to transfer to the workplace, and in recent years, with the expansion of general education, there is a solid primary and secondary education system in China. However, the available evidence suggests that vocational education and training—especially the dual vocational training model—could build an early relationship with employers for youth and help them develop the needed market-related skills (Biavaschi, 2012).

Even though this research has not shown that the demographic indicators have an obvious correlation with the participation rate, we could ignore their functions. As we know, in most formal technical and vocational education systems, the main demographic is the youth aged between 15 and 24 years old (Idriss, 2002), and, as Figure 4 shows, the demographics of youth in this age group has changed in the past 20 years in China. The number of girls in this population has always been smaller than the number of males, but before 2010, the gender difference was not obvious. Since 2010, the gap has grown. In combination with the previous analysis, inasmuch as VET has been more attractive to male students than to female students, the gender issue between male and female students in upper-secondary vocational schools cannot be ignored.



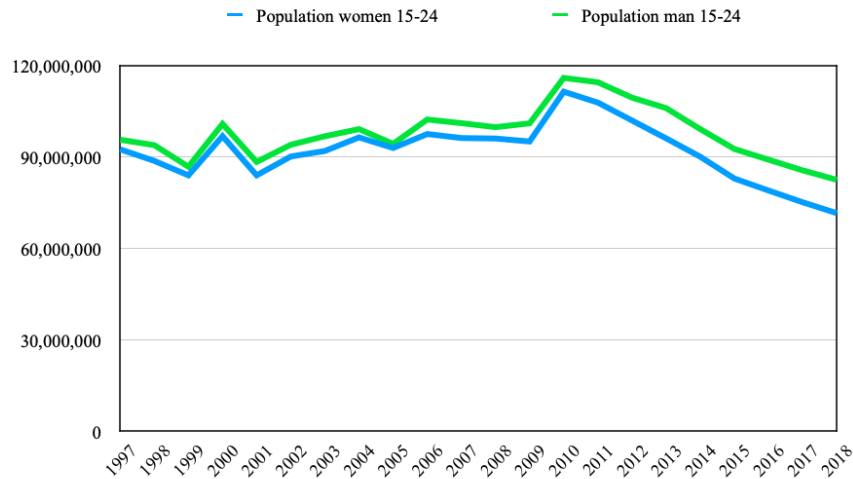


Fig. 4 - The number of population 15-24 in China 1997-2018

## 5. Discussions

According to the OLS regression analysis result, there are 4 research assumptions have been proved to be related. And among those 4 assumptions, three of them have been proved to be corrected. The number of other staff in vocational schools has a positive cor-relationship with participation rate, the number of male teachers, and the youth unemployment rate has a negative cor-relationship with participation rate. And the number of male students has negative affection on the participation rate. The left 6 research assumptions have no statistical significance.

Different countries and areas have different education models and systems to organize youth to better integrate into society, and technical vocational education and training have proved to be a good pathway to help youth build an earlier and closer relationship with the labour market (Jabarullah, 2019). In recent years, China faced one problem about VET: that the participation rate in vocational schools is much lower than in general high schools. The way to improve the participation rate and attractiveness of vocational schools is a hot problem. Discussion about related factors on senior vocational schools in China may have reference significance for many Asia countries, because developing VET is an international trend recently (Tran, 2017).

This paper analyses the possible influencing factors on the participation rate in upper-secondary vocational schools in China in hopes that the government or other countries can see the related experience from the case in China. There are three aspects that will be discussed here based on the previous analysis. The first one is about the gender problem. No matter the gender difference among teachers or students, they all have different aspects related to VET's attractiveness (Jambo, 2018). More current male students than female students could attract more next-generation students to choose vocational education. On the one hand, influenced by the historical and cultural factors, males have always had a priority in education and work opportunities (Tjaden, 2017), and with the demographic changes and the promotion of gender equality (Ledman, 2018), the situation has changed a lot. On the other hand, maybe because of the majors setting in vocational schools. In most vocational schools, there are more male-dominated professions, for example, mechanical, IT, chemical, etc. More man students choose vocational schools if they could find a good job position after they graduated; more next man students will continue to choose VET. The participation rate in vocational schools then will be increased. While, female students in China have more opportunities to take part in schools than before, especially under the implementation of the one-child policy (Alpermann, 2019) 40 years ago, in the past 20 years the urban girls in China could obtain the only education investment from their families, and those girls tended to choose general education. In rural areas, most parents of girls have preferred to send their daughters to vocational schools (Wang, 2019). One possible reason is that the fees for secondary vocational schools in China are free, and the schooling time is shorter than for general schools. These students are more concerned about obtaining the return on their education as soon as possible. This is another reason why the man students could influence the participation rate in upper-secondary vocational schools. In China, compared with male students, female students always have a disadvantage in education source choosing. Even in some rural areas, female students have less opportunity to go to school. Vocational schools provide free vocational education and skills training for them, it is social progress about girls also have a chance to obtain education source after they finished their nine years of compulsory education.

However, the man teachers in vocational schools have less attractive to students. Why man teachers may decrease the participation rate in vocational schools? On the one hand, the women teachers have an ideal leading function for the next generation of women students (Langher, 2017), especially in rural areas. This means female teachers may attract more next female generation to choose VET because it may bring girls a job opportunity when they finished their studies. Furthermore, compared with men teachers, women teachers are more stable in their likelihood of continuing to teach in



vocational schools. More stability from female teachers may represent that they could focus on their teaching work more concentrated than male teachers could, and the teaching quality could also be better guaranteed.

The second aspect is related to the innovative training methods of vocational teachers. In addition to full-time teachers, other staff members in vocational schools could also attract more new entrants. It is worthwhile to think about the concern related to the education process and training method for teachers. It is currently similar for vocational teachers and for general teachers, as they graduate from school to school without enough practice courses (Andersson, 2018). While the most obvious difference between vocational education and general education is that it has a closer relationship to the real workplace. Thus students need more practice and guidance during their studying time. In other countries, for example in Germany, the VET system is based on the dual system, and thus they have enough trainers from the workplace to give guidance to apprentices (Li, 2019). In China, improving other staff members in vocational schools is not enough; reforming the training methods of vocational teachers is behind the problem. It includes pre- and post-education and training. During the pre-employment period, the teachers' training mainly happened in the university, and adding more practice activities is necessary and urgent (Boldrini, 2019). During the post-employment period, the changes and innovations in the labour market are ongoing, so teacher training could be treated as a kind of lifelong learning (Onstenk, 2017). Thus, improving vocational teachers' skills training may attract more students to choose vocational schools in the future. Both vocational teachers and vocational students, they need related skills training to meet the requirement of labour market. Especially in China, because the VET system is school-based model, the function of vocational teachers who provide practical skills training for students is more important.

The third aspect is the youth unemployment rate. It has a negative influence on the participation rate in vocational schools. Normally high-skilled workers have a lower unemployment rate compared with less-skilled workers (Biavaschi, 2012), while in China the youth unemployment rate has not been quite as low as it was in the past years. A higher youth unemployment rate leads to a lower participation rate in vocational schools, which signals that vocational education is more unstable when facing with problems in the labour market, which is one reason that the general education has a bigger proportion in the whole education system and greater social recognition than vocational education (Ibrahim et al., 2020; Hampf, 2017). In China, general education normally has a higher participation rate than vocational education, because higher education has more social recognition and it is easier for students to obtain a decent and stable job position. Under higher youth unemployment rate, students may prefer to choose general education in order to have job competition in the labour market. The other reason is that the education quality in vocational education is not as good as general education. Improving the vocational education quality could be one of the most direct ways to improve its recognition.

## 6. Conclusion

Improving the participation rate in initial vocational schools is a quite important issue and it has relevance to improve the attractiveness of VET in most nations. VET has been treated as an effective training method transferring unskilled population into the human resource, as well as it gets employees ready for the workplace (Böckerman, 2018). VET could also contribute to the development of economic by providing training for highly skilled workers who have been demanded in the labour market (Wheelahan, 2017). However, in most Asia countries higher education has more attractiveness than VET (Agrawal, 2017) because they believe that academic education could bring more honour for them. Of course, in China, there is a similar issue and improving the participation rate in initial vocational schools is an urgent social problem. Improving the participation rate of upper-secondary VET is treated as one method to improve the whole VET system (Gambin, 2009). On the one hand, to remain the age-appropriate youth in the education and training system could not only reduce the youth unemployment rate but also good for the demand of the development of economic (Euler, 2013) The other hand, as the main education method to provide new professional workers in new occupations, the VET has been treated as one solution to solve the lack of skilled workers which the ageing problem brings.

In the past almost 20 years, the number of youth students choose VET has been increased before 2010 and then it has declined again. The linear regression analysis result shows that the most related factors influence the final participation rate are social related problems. Male students always have more education opportunities than female students for a long time, here the data also shows that in China boys have more attentiveness than girls in the initial vocational schools. In addition, there is a research limitation should be stated which is the data could not distinguish the different situation in rural and urban areas. Maybe it has a larger gap between male and female students in different areas, the road for education equity is difficult and it will take a longer time to overcome (Wu, 2018). The issue of vocational teachers in China displays that the training method for them has not a significant difference between other teachers (Chen, 2018), a professional training method for vocational teachers should be paid more attention in the future. The higher youth unemployment rate will lead to a lower attractiveness in VET, it may represent a signal that the social cognition of vocational education in China is not as good as academic education. The honour or the sense of security which VET brings is not enough, especially when the society is unstable.

How to improve the attractiveness of VET is a global difficult problem, this paper demonstrates several factors which are related to Chinese vocational education system. Among them, some factors display a good process of the development of VET in China, for example, more female students obtain vocational education opportunities in the past 20 years and the gender quality in vocational education area has been developed better than before. Some factors also reflect that there are still problems that need to be solved, such as the training methods for vocational teachers in the

Chinese education system. Even though, as other countries training method such as Germany, the vocational teachers should obtain at least a bachelor related subject degree before they enter in the job positions. The practical training parts for teachers are missing, while the Chinese VET system is an almost school-based model. As a direct result, the VET in Chinese vocational schools will not professional and the transition from vocational schools to the workplace will not be smooth. In addition, VET has been proved that it is good to reduce the youth unemployment rate in Germany (Kohlrausch, 2012) and it has also brought a hot research topic in recent years which was in most countries or areas it was necessary to pay more attention to the development of VET. Especially in some developing countries, where the youth unemployment rate is quite high. Under this background, this research could be treated as a case or research idea for those countries which also prefer to improve the participation rate in vocational schools.

Of course, there are still some shortcoming in this research paper. Firstly, there are not too many similar published papers in this area and as a result, it is difficult to find an appropriate theoretical structure. It is not difficult to find that the guiding theory in this paper is developed from the higher education area. Secondly, there are a lot of possible factors which could influence the dependent variable. However, because all data are collected from official publications and it is impossible to test every factor and the author could only test factors as comprehensive as possible.

In 2020, especially affected by the COVID-19 all aspects of our society are not as usual as before. The youth unemployment rate in China in April 2020 is around 13.8% higher than 10.3% in 2019, it is possible for Chinese government transition VET to skilled-based model and help youth to find a suitable job position in the labour market more smoothly. It is not only good for the economic development which could provide more skilled match workers in the future but also good for the social stability because the low youth unemployment rate is also a protection for youth generation (Breen, 2005).

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## References

- Agrawal, T., & Agrawal, A. (2017). Vocational education and training in India: a labour market perspective. *Journal of Vocational Education & Training*, 69(2), 246-265
- Alpermann, B., & Zhan, S. (2019). Population planning after the one-child policy: shifting modes of political steering in China. *Journal of Contemporary China*, 28(117), 348-366
- Andersson, P., & Köpsén, S. (2018). Maintaining competence in the initial occupation: Activities among vocational teachers. *Vocations and Learning*, 11(2), 317-344
- Aypay, A. (2003). The tough choice at high school door: an investigation of the factors that lead students to general or vocational schools. *International Journal of Educational Development*, 23(5), 517-527
- Bakar, R. (2018). The influence of professional teachers on Padang vocational school students' achievement. *Kasetsart Journal of Social Sciences*, 39(1), 67-72
- Banerjee, A., Jacob, S., Kremer, M., Lanjouw, J., & Lanjouw, P. (2000). Promoting school participation in rural Rajasthan: Results from some prospective trials. *With Jenny Lanjouw and Peter Lanjouw. Working paper, Massachusetts Institute of Technology, Cambridge, MA*
- Barabasch, A., Huang, S., & Lawson, R. (2009). Planned policy transfer: The impact of the German model on Chinese vocational education. *Compare*, 39(1), 5-20
- Biavaschi, C., Eichhorst, W., Giulietti, C., Kendzia, M. J., Muravyev, A., Pieters, J., ... & Zimmermann, K. F. (2012). *Youth unemployment and vocational training*. Now Publishers Incorporated
- Boeren, E. (2018). The methodological underdog: A review of quantitative research in the key adult education journals. *Adult Education Quarterly*, 68(1), 63-79
- Boldrini, E., Sappa, V., & Aprea, C. (2019). Which difficulties and resources do vocational teachers perceive? An exploratory study setting the stage for investigating teachers' resilience in Switzerland. *Teachers and Teaching*, 25(1), 125-141
- Borgonovi, F., Organisation for Economic Co-operation and Development, & Achiron, M. (2015). *The ABC of gender equality in education: Aptitude, behaviour, confidence*. OECD Publishing

- Breen, R. (2005). Explaining cross-national variation in youth unemployment: Market and institutional factors. *European sociological review*, 21(2), 125-134
- Böckerman, P., Haapanen, M., & Jepsen, C. (2018). More skilled, better paid: labour-market returns to postsecondary vocational education. *Oxford Economic Papers*, 70(2), 485-508
- Caroleo, F. E., Ciociano, E., & Destefanis, S. (2017). Youth labour-market performance, institutions and vet systems: A cross-country analysis. *Italian Economic Journal*, 3(1), 39-69
- Chapman, D. W. (1981). A model of student college choice. *The Journal of Higher Education*, 52(5), 490-505
- Chen, Z., Ryymin, E., & Kunnari, I. (2018). The comparisons of vocational teacher education in Finland and China. *HAMK Unlimited Professional*, 18, 2018
- Desa, U. N. (2019). World population prospects 2019: Highlights. *New York (US): United Nations Department for Economic and Social Affairs*
- Egilson, S. T., & Traustadottir, R. (2009). Participation of students with physical disabilities in the school environment. *American Journal of Occupational Therapy*, 63(3), 264-272
- Euler, D. (2013). Germany's dual vocational training system: a model for other countries?
- Fejes, A., & Köpsén, S. (2014). Vocational teachers' identity formation through boundary crossing. *Journal of Education and Work*, 27(3), 265-283
- Gambin, L. (2009). Initial vocational education and training (IVET) in Europe: Review. *Thesaloniki: CEDEFOP, European Centre for the Development of Vocational Training*
- Grollmann, P., & Rauner, F. (2007). VET Teachers: An Endangered Species or Professional Innovation Agents?. In *International perspectives on teachers and lecturers in technical and vocational education* (pp. 1-26). Springer, Dordrecht
- Hampf, F., & Woessmann, L. (2017). Vocational vs. general education and employment over the life cycle: New evidence from PIAAC. *CEifo Economic Studies*, 63(3), 255-269
- Ibrahim, B. B., Mohamad, N. H. B., Aziz, A. B. A., Kadir, M. B., Hamid, Z. B. A. (2020). A look at grit: A study about malaysian technical instructors' performance retention. *International Journal of Innovation, Creativity and Change*, 11(12), 620–636
- Idriss, C. M. (2002). Challenge and change in the German vocational system since 1990. *Oxford Review of Education*, 28(4), 473-490
- Jabarullah, N. H., & Hussain, H. I. (2019). The effectiveness of problem-based learning in technical and vocational education in Malaysia. *Education+ Training*
- Jambo, S., & Pilz, M. (2018). Perceptions of teachers in industrial training institutes: an exploratory study of the attractiveness of vocational education in India. *International Journal of Training Research*, 16(1), 4-18
- Jørgensen, C. H. (2015). Some boys' problems in education—what is the role of VET?. *Journal of Vocational Education & Training*, 67(1), 62-77
- Kohlrausch, B. (2012). *Youth unemployment in Germany: Skill biased patterns of labour market integration*. Friedrich-Ebert-Stiftung, Internat. Dialogue
- Köpsén, S., & Andersson, P. (2017). Reformation of VET and demands on teachers' subject knowledge—Swedish vocational teachers' recurrent participation in a national CPD initiative. *Journal of Education and Work*, 30(1), 69-83
- Langher, V., Caputo, A., & Ricci, M. E. (2017). The potential role of perceived support for reduction of special education teachers' burnout. *International Journal of Educational Psychology*, 6(2), 120-147
- Ledman, K., Rosvall, P. Å., & Nylund, M. (2018). Gendered distribution of 'knowledge required for empowerment' in Swedish vocational education curricula?. *Journal of Vocational Education & Training*, 70(1), 85-106
- Li, J., Wiemann, K., Shi, W., Wang, Y., & Pilz, M. (2019). Vocational education and training in Chinese and German companies in China: a 'home international' comparison. *International Journal of Training and Development*, 23(2), 153-168
- Moogan, Y. J., & Baron, S. (2003). An analysis of student characteristics within the student decision making process. *Journal of further and Higher Education*, 27(3), 271-287

- Muller, S., Tscharaktschiew, S., & Haase, K. (2008). Travel-to-school mode choice modelling and patterns of school choice in urban areas. *Journal of Transport Geography*, 16, 342-357
- Niemeyer, B. Why do we need (another) special issue on gender and VET? Original Citation Niemeyer, Beatrix and Colley, Helen (2015) Why do we need (another) special issue on gender and VET? *Journal of Vocational Education & Training*, 67 (1). pp. 1-10. ISSN 1363-6820. *The Journal*, 10(13636820.2014), 971498
- Onstenk, J., & Duvekot, R. (2017). Vocational and professional education and lifelong learning. In *Enhancing Teaching and Learning in the Dutch Vocational Education System* (pp. 39-56). Springer, Cham
- Ryan, P. (2001). The school-to-work transition: a cross-national perspective. *Journal of economic literature*, 39(1), 34-92
- Smith, E., & Smith Jr, J. (2008). *Using secondary data in educational and social research*. McGraw-Hill Education (UK)
- Tabbron, G., & Yang, J. (1997). The interaction between technical and vocational education and training (VET) and economic development in advanced countries. *International Journal of Educational Development*, 17(3), 323-334
- Tjaden, J. D. (2017). Migrant background and access to vocational education in Germany: Self-selection, discrimination, or both?. *Zeitschrift für Soziologie*, 46(2)
- Tran, L. T., & Dempsey, K. (2017). Internationalization in VET: An overview. *Internationalization in Vocational Education and Training*, 1-15
- Wahba, M. (2012). Technical and vocational education and training (VET) challenges and priorities in developing countries. Retrieved February, 11, 2012
- Wang, A., & Guo, D. (2019). Technical and vocational education in China: enrolment and socioeconomic status. *Journal of Vocational Education & Training*, 71(4), 538-555
- Wheelahan, L. (2015). Not just skills: What a focus on knowledge means for vocational education. *Journal of Curriculum Studies*, 47(6), 750-762
- Wheelahan, L., & Moodie, G. (2017). Vocational education qualifications' roles in pathways to work in liberal market economies. *Journal of Vocational Education & Training*, 69(1), 10-27
- Wu, X., & Ye, Y. (2018). *Technical and vocational education in China*. Springer Singapore
- Xiong, J. (2011). Understanding higher vocational education in China: Vocationalism vs Confucianism. *Frontiers of Education in China*, 6(4), 495-520
- Zeng, J., Pang, X., Zhang, L., Medina, A., & Rozelle, S. (2014). Gender inequality in education in China: A meta-regression analysis. *Contemporary Economic Policy*, 32(2), 474-491
- Zhao, Z., & Lu, L. (2007). China's VET teachers and their professionalization. In *International perspectives on teachers and lecturers in technical and vocational education* (pp. 55-75). Springer, Dordrecht