

Cultivation of Technical Expert: Quality Enhancement in the Context of Vocational Education Expansion in China

Jingjing Hong

School of Environment Education and Development, University of Manchester, Manchester, United Kingdom

jingjing.hong@student.manchester.ac.uk

Abstract. In the background of Confucianism and the college entrance examination system (CEE), China's academic education has received too much attention. However, in different industries, there is a lack of enough high-quality technical experts compared with academic talent. Vocational education has therefore gained widespread concern as the primary means of producing technical specialists. In tandem with the development of higher education, the Chinese government developed many related initiatives to increase vocational education. However, after analyzing the general situation of vocational education, the characteristics of technical experts, and the supply of different talents in the labor market in China, this paper finds that the expansion of vocational education in the current stage has not been able to satisfy the demand for high-quality and high-quantity technical experts. That is caused by the cross-cutting influence of the CEE education system and the stakeholders of vocational education--students' parents, teachers, and government. Based on this, this paper proposes some measures to increase the number of highly qualified teachers in vocational schools, adjust the curriculum, and improve school-enterprise cooperation in vocational education.

Keywords: Technical experts, vocational education, expansion of vocational education.

1. Introduction

While China's economy has boomed in recent years, the importance of education has also grown, both the government and citizens are becoming aware of the double impact of education and the economy for both the country and individuals. The government and students, however, place a higher value on the advantages of academic education than they do on vocational training. Individuals tend to choose academic education because they think it will help them have greater potential to find a good job and earn higher incomes while giving up receiving vocational education. Nationally, because the country's college entrance examination system (CEE) screens students through academic ability, students with high grades just want to choose academic education instead of vocational education. So, both the subjective choices of individuals and the education system have led to the real status of vocational education being much less favorable than that of academic education. What's worse, when too many highly qualified academics are in the labor market, which means there is a high supply of academic talents with low demand, these students will face the issue of unemployment. On the contrary, enterprises lack a large number of technical talents, but the quality of vocational education makes it difficult to provide it, which has made companies forced to train their employees themselves. So, to address the problem of the lack of high-quality and high-quantity technical experts, this paper will analyze the role of vocational education and discuss how to expand vocational education in light of China's national conditions to cultivate technical experts. Then, giving some concrete measures to solve the problems where the expansion of vocational education is not considered effective.

2. Vocational Education in China

2.1. History of Vocational Education in China

Vocational education (VE) often contributes to the modernization of a country by producing highly skilled people [1]. At the end of the 20th century, China underwent a period of reform and opening up. In this stage, education underwent significant modifications as a key strategy for boosting the country's productivity. As Koo mentions, the 'Six-year Compulsory Education Stage' introduced in China in 1986 and the 'Action Plan for Revitalising Education in the Twenty-first Century' introduced in 1999 have both attempted to expand higher education [2]. Among them, the model and scale of vocational education have also been reformed and changed. In 1991, China issued the 'Decision on Energetically Developing Vocational and Technical Education', which gradually transformed many of China's high schools into vocational schools. It is worth noting that before acting on this policy and starting the education reform, China was in a planned economy where skilled labor was often trained by the government and automatically assigned to lifelong jobs [3]. China's planned economy was abolished during its reform, and vocational education institutions began to offer training instead. China separated higher education into two categories during the reform era: academic education and vocational education, with equal status and priority. Nevertheless, these classifications fail to take into account three aspects: the public's opinion of these two forms of education, the allocation of government investment funds, and the failure of vocational education programs to generate the skills demanded by businesses.

2.2. Status of Vocational Education in China

So, it is clear from the above, that vocational education just formally has the same status as academic education, but in fact, it has a relatively low status in China. As mentioned by Guan and Blair, China's higher education system consists of three parts. In the three categories, public research universities have the highest status, followed by provincial and local universities, while vocational colleges are located at the bottom [4]. The reason for this stratification is mainly due to the Gaokao system. In China, access to any form of higher education is largely dependent on the national college entrance examination (CEE), which is a high-stakes, academically orientated examination [3]. Through the CEE, students choose their higher education institution based on the score line, with vocational education requiring the lowest score line. It leads to the general public stereotyping students in vocational education as less capable, and the vocational education institutions have less government funds and hard to improve the facilities required for the campus.

In addition to the influence of CEE on vocational education, three stakeholders can also affect the effectiveness of vocational education reform: parents, school managers, and the government. Firstly, from most parents' perspectives, traditional Confucianism in China has led to the low status of vocational education in the intrinsic values of the general public, and therefore most parents are not willing to allow their children to receive vocational education. Wang mentions that in China, Confucianism indicates that a person's social standing and reputation should be determined by their level of education rather than their financial situation [5]. In addition, in ancient Confucianism, occupations were divided into four classes: shi (learned officials), nong (farmers), gong (artisans), and shang (merchants) [4]. This resulted in academic education being quite high in the minds of Chinese parents and a tacit acknowledgment that vocational education produces children who will attain a lower social status, and therefore a reluctance to allow their children to pursue vocational education.

Secondly, at the school level, the learning atmosphere and infrastructure of vocational education are far less developed than that of academic education. Guan and Blair's survey of vocational school students in China found that negative descriptions such as bullying in schools and students being unmotivated to study and focus on love were labeled as vocational education [4]. One of the students' descriptions mentioned that 90% of them do not study, they play with mobile phones, fall in love, fight, and even teachers are fear of interfering with them and letting them focus on study. From the

survey, it is easy to see that the learning atmosphere in vocational education is not sufficient for students to learn the skills they need. They just are forced to receive an education and do not know why they need to learn and the direction of their future career.

Finally, although the government's investment in vocational education has risen in recent years, the government ignores vocational education institutions require higher operating costs than academic institutions. According to Minglun, in 1996, China's budgeted funding for vocational education accounted for only 11.53 percent of the total funding for education, yet the cost of higher vocational education institutions is 2.64 times higher than the cost of general academic higher education institutions [6]. As a result, the combined influence of the CEE system and the above three stakeholders has led to the low status of vocational education.

2.3. Expansion of Vocational Education in China

The impact of the aforementioned elements, in addition to changing the status of vocational education, also brings a negative effect on the expansion of vocational education. Xue and Li mention that in recent years, China has put forward documents related to the expansion of vocational education, such as 'deepening the integration production and education in the vocational school university', hoping that China would cultivate highly skilled personnel through vocational education and integrate teaching and learning with actual production to help the development of different industries [7]. Therefore, originally, the expansion of vocational education was expected to produce a sufficient number of skilled experts of good quality to meet the demands of the labor market. In reality, however, the expansion of vocational education in China has only enriched the number of higher vocational institutions (from high schools to vocational colleges), but the public's stereotypical view of vocational education, as well as the poor curricula and atmosphere in the vocational schools themselves, have led to a decline in enrolment in the vocational schools year after year, and have failed to create the appropriate number of high-quality skilled personnel.

3. Technical Expert

3.1. The Importance of Technical Expert

The job requirements for occupations in different fields are different, and the market needs a wide range of multi-skilled people to help organizations perform tasks that are becoming more complex by the day [8]. Technical experts are emergently needed employees for the labor market. Although it is difficult to define what a technical expert is, in most industries technical experts share some similar characteristics. Templeton mentions that a technical expert in a technology-related industry needs to have expertise in the industry, the ability to be creative, a passion for keeping up with the latest technology, and a spirit of self-directed learning or research [9]. Lark supplementary notes that, the technical experts for the secondary sector like the food processing and production industry, are not just standard-setters or good employees who can implement guidelines perfectly, but that they should also be able to lead the industry in innovation [10]. These characteristics make technical experts crucial for one country. Furthermore, it is worth noting that they can not only bring innovative technology in different industries to the country but also help some disadvantaged individuals, who spend less cost of education to become technical experts, increasing more possibility of high income. When these disadvantaged groups become pathways to higher income groups, it also helps to reduce the social class gap and enhance the well-being of the whole society.

3.2. The Relationship between Vocational Education and Technical Expert

So how do disadvantaged people become technical experts with good employment prospects at less cost, vocational education is probably the best way to do that. Students from lower-income, economically disadvantaged families, do not have sufficient funds to access the same quality academic educational resources as students from middle-class families. As a result, most of them find it difficult to get the same or better grades in the CEE as students from better economic backgrounds.

This is consistent with Wang and Guo's finding that students from disadvantaged family backgrounds are more likely to attend vocational education schools in China [11]. Thus, if disadvantaged groups with lower academic performance are trained to become technical experts through vocational education, they may have the potential to earn higher incomes, thereby reducing the social income gap. To achieve this goal, the effectiveness of the curriculum and the quality and quantity of teachers is crucial.

When the labor market demand for specialists in an industry is high but the actual number of specialists is low in a country, vocational education should be oriented towards the training of specialists and the re-proportioning of the relevant curricula. This inner relationship can be found in the objectives of vocational education. As per Jing et al., Developing human qualities, imparting technical knowledge, and encouraging employment, innovation, and entrepreneurship are all made possible by vocational education. These objectives are similar to the features of technical experts [12]. To achieve the objectives, Chinese vocational education divides the curriculum into two categories: teaching knowledge in textbooks and taking students into enterprises for real practical education. In this way, vocational education not only teaches students theoretical knowledge but also cooperates with local enterprises to let students implement the theoretical knowledge in the workplace and attempt to educate high-quality technical experts. However, in real life, students do not seem to be as well trained in vocationally relevant skills as might be expected.

3.3. The Issues of Developing Technical Experts in China

3.3.1. Education and training models

In reality, vocational education in China has the question that teaching written knowledge helps only a small number of students, and the mandatory internships in the last year of education do not effectively enable students to acquire many skills and experiences related to their professional knowledge. Koo suggests that students in vocational training schools are required to complete a one-year, full-time internship before they can obtain their vocational degree and successfully graduate [2]. During this year, they often work as cheap labor in manufacturing or electronics factories. Some vocational school graduates have the same positions as people without education, performing the same low-paying jobs that require few skills. This leads to the fact that although vocational education is theoretically the main way to train Technical Experts, in practice, students trained by vocational education do not have much experience in related industries, so companies may still have a shortage of technical experts. In this case, companies often choose to recruit graduates with advanced academic degrees, who, although they may also not have relevant practical experience, are perceived as having more theoretical knowledge, a higher level of competence, and a higher potential for work efficiency. After recruiting these highly educated graduates, companies can train them to be technical experts by themselves.

Therefore, when the education effect of vocational education is unsatisfactory and companies are relied upon to train technical experts, and where the world is rapidly advancing in technology with high demand for technical experts, China lacks a sufficient number of technical experts. The World Economic Forum has predicted that half of the world's workforce will need to be re-skilled by 2025 [13]. Such a large scale of training is not possible for companies alone, because the cost of training is often only affordable for large organizations, but the need for technical experts exists in any scale of organization. As Helms Jørgensen argues, more and more jobs require formal education, so more and more areas of work that previously did not require skills are now included in training and education [14]. Thus, the expectation that vocational education should produce a sufficient number of technical experts is also demonstrated in China's policy of expansion of vocational education. However, the non-rigorous curriculum of vocational education makes it hard to do so.

3.3.2. The lack of high-quality and high-quantity teachers

In addition to the curriculum problems that exist in vocational education, teachers are also a major factor that influences whether the country lacks technical experts. Teachers can only produce students

with the potential to become technical experts if they fulfill the characteristics of being technical experts. In other words, if they have theoretical and practical in-depth knowledge of the industry, as well as autonomy of innovation, they can educate technical experts. However, there are two major problems with teachers in vocational education in China: a lack of sufficient numbers of teachers and a lack of high-quality and high-ability teachers. Although teachers in vocational education have the same titles and status as teachers in academic education, the influence of Confucianism makes highly educated people tend to choose to become teachers in universities rather than in vocational schools. In addition, the limited income also makes more highly educated people not stick to conducting research or teaching, and they prefer to work in enterprises. Moreover, Guan and Blair found that teachers in vocational colleges are not poorly educated, instead, they have high enough diplomas to be able to train technical experts, but they do not have access to real, up-to-date, industry-relevant training, and a large proportion of them have only received theoretical education without working experience in the relevant industry [4]. With teachers having only outdated theoretical knowledge and no access to up-to-date knowledge and practical experience, vocational education is hard to produce students to become technical experts in their field.

4. Solutions

Therefore, to solve the problem of teachers' resources and to enhance the possibility of training technical experts directly by improving the level of teachers, the government should make systematic adjustments to the distribution of teachers who are lacking in vocational colleges in different regions. Teachers who teach theoretical knowledge should be required to have richer and more up-to-date knowledge related to theory, to consolidate the basic knowledge required for vocational and make them become technical experts. For teachers who train students to do practical work, vocational institutions may consider not necessarily requiring them to have high academic qualifications, but hiring experienced technical experts from the industry to teach students to ensure that students are not just mastering abstract concepts. Of course, under the premise of ensuring the quality and quantity of teachers, vocational colleges should also adjust their learning atmosphere and curriculum to match the teachers' efforts to enable students to acquire vocationally relevant knowledge and skills. Vocational colleges should tighten control over incidents of violence in schools and instill in teachers the idea that students should be given higher academic expectations to motivate more students. The government should also strengthen control and publicity of vocational schools so that students are more secure in school and parents have a correct perception of vocational schools. Additionally, institutions should consider cooperating with more diversified enterprises. The government can also build more relevant policies to help vocational schools obtain more enterprise cooperation resources. These opportunities to work with high-caliber companies can then be allocated within the vocational institutions to students who have the potential to become technical experts to develop their relevant experience.

5. Conclusion

In conclusion, the current expansion of vocational education in China is only an expansion of the number of colleges and universities, but due to the problems of culture, teaching environment, weak teachers, and the lack of cooperation between schools and enterprises, students are not willing to enter vocational education, and they are not able to get the expected academic results to become technical experts to help the country's economy after entering vocational education. Therefore, the government should give more detailed policies to solve these four problems rather than just issuing policies to increase the enrolment rate of vocational education, because making education mandatory for students is not the ultimate goal, but rather, one of the real goals of education is to give students a meaningful and good education and to cultivate usable talents for the society.

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