



The Opportunities and Challenges for New Entrants of The Application Oriented University and College Carrying Out Vocational Education in New Period in China

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Abstract. Most of the works of traditional manufacturing industry can be qualified by the skill type talents with single skill cultivated by traditional vocational education institutes. However, at present digital period, the digital manufacturing is the main stream. It is the deep cross and fusion of the digital technology and the traditional manufacturing techniques. Digital manufacturing works need not only talents with crossed and fused multiple skills, but also require the talents are capable to adapt to rapid development of digital technology. The new talents should have higher learning capacity and adaptability than traditional talents, and must have composite vocational quality. So, the personnel training objective of the traditional vocation education cannot meet the requirements of the digital period. The new digital period needs vocational and general fused undergraduate education to complete the new requirements. At present, the vocational undergraduate education in our country is mainly completed by vocational schools at the undergraduate level. However, their quantity is small, the number of students in these schools is limited, and their social recognition degree, students' ability to learn, innovate, adapt, cross and integrate cannot meet the requirements of the new era and need to be continuously advanced. The new entrants of application-oriented universities are the best choice to solve this problem. The newly promoted application-oriented universities are mostly upgraded from higher vocational colleges or junior colleges and with vocational education experience. After years of undergraduate major construction, their research ability, teacher resource strength and social recognition all achieve a certain degree of improvement. And the number of these universities is big, their scale is large. So, it is the urgently social and economic requirement for these universities to carry out the training of technical and skilled talents for the construction of digital power. And this is also the practical path to realize their self-worth.

Keywords: Vocational undergraduate education; Newly promoted application-oriented universities; Digital period; Compound vocational quality

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1 Introduction

On October 14, 2021, General Office of the Communist Party of China and State Council General Office print and distribute “Opinions on promoting the high-quality development of modern vocational education”, pointing out “Application oriented undergraduate schools are encouraged to carry out vocational undergraduate education. According to the principle of professional matching to guide application oriented undergraduate schools and vocational undergraduate schools attract more graduates from secondary and higher vocational schools to apply for the examination.” This provides policy guidance for the vocational education of new applied oriented universities. The new application-oriented universities carrying out vocational education is also the objective need of social economic development and their self-development.

In the report to the 20th Party Congress, the general secretary Xi Jin Ping proposed “To speed up the development of digital economy, promote the deep integration of the digital economy and the real economy, and build the digital industry cluster with international competitiveness.” This pointed out the direction for a period of time in the future for the construction of our manufacturing power, that is to build digital manufacturing power.

Deep integration of digital economy and real economy is not only the internal needs for upgrading traditional industries and making manufacturing industry bigger and stronger, but also the only way of high-quality development of social economy in the new era [1].

In February 2017, the Ministry of Education issued “Manufacturing Industry Talent Development Planning Guide” jointly compiled by Ministry of Human Resources and Social Security, Ministry of Industry and Information Technology and Ministry of Education, which pointed out the imbalance between supply and demand for the technical and skill talented person for our country social economy development need continues to grow, and it is estimate that by 2025, in ten key areas of manufacturing, high-quality technical talents huge gap will be up to 30 million[2]. And with the development and further expansion of the application area of digital technology, the phenomenon will further intensify in future.

Digital manufacturing is the transformation and upgrading of traditional manufacturing industry by applying new emerging technology in their domain. It is the deep intersection and fusion of digital technology and manufacturing, and the quality requirement for technical and skilled talents must be different from that of traditional manufacturing industry. Single skill talents cultivated by traditional vocational education can be competent for most of the tasks of traditional manufacturing. However, digital manufacturing requires that talents are not only with multiple crossed and fused skills, but also with the capability of adapting to fast development characteristic of the digital technology. The higher compound vocation quality requirements have the training goal between the vocational education and applied general undergraduate education, and need vocational and general fused undergraduate education to complete.

Application oriented undergraduate universities and colleges carrying out vocational education is the urgent social and economic requirement. And there are many

international precedent examples. Such as, in Germany, Japan, Singapore, and so on, many applied science and technology universities and colleges all carry out industry oriented vocational education and have achieved remarkable social and economic benefits [3-5].

This paper investigates the path of the talent cultivation of the new entrants of application oriented undergraduate universities and colleges oriented to building digital manufacturing power. That has significant application and academic value and practical meaning. At present, many articles have been published about vocational education system and theory, vocational undergraduate education, and the forms of integration of industry and education [6-14]. And articles related to how to carry out vocational education for the new entrants of application oriented undergraduate universities and colleges has been published very little.

2 Vocational and general fused undergraduate education

The digital economy embraces the emerging areas of national economic, including internet, cloud computing, big data, internet of things, artificial intelligence, 5G communication and aerospace, and so on. Digital economy is a breakthrough and innovation to the development of traditional social economy. And it also expands and promotes its functioned domains in digital economy period. Hence, it must be different from the traditional industry and digital economy independent development of the old model. It needs to build a new model on existing development models by innovating and integrating their respective technologies of various national economy departments. The new model needs to break the thresholds of various economy sections and make a deeply crossed and fused development.

Digital technology is changing with each passing day. It requires technical and skilled talents have a certain degree of innovation and learning ability to adapt to the fast development of new technologies and new applications.

Workers in traditional industries commonly know well only one skill about their works, but know little about other skills. Hence, they cannot meet the requirement of the digital economy. To solve this problem, it is urgently needed to re-train the workers in traditional industries to promote their ability of innovation, learning and intersection and fusion. And it is also needed that the vocational education system and the higher general education system swiftly change the mode of personnel training to output a lot of technical and skilled talents for society with higher capability of innovation, learning, adapting, and multiple compound skills. The higher compound vocational quality requirements have the training goal between the vocational education and applied general undergraduate education, and need vocational and general fused undergraduate education to complete.

At present, the vocational undergraduate education in our country is mainly completed by vocational schools at the undergraduate level. However, their quantity is small, the number of students in these schools is limited, and their social recognition degree, students' ability to learn, innovate, adapt, cross and integrate cannot meet the requirements of the new era and need to be continuously advanced. The new entrants

of application-oriented universities are the best choice to solve this problem. The newly promoted application-oriented universities are mostly upgraded from higher vocational colleges or junior colleges and with vocational education experience. After years of undergraduate discipline construction, their research ability, teacher resource strength and social recognition all achieve a certain degree of improvement. And there are a lot of these universities in China and their whole scale is large. So, it is the urgently social and economic requirement for these universities to carry out the training of technical talents for the construction of digital power. And this is also the practical path to realize their self-worth.

The essence of digital manufacturing is to upgrade the traditional manufacturing industry by applying new emerging technologies. It is the crossed and fused application process of the new technology in the traditional industry. There is common technical foundation for all economy department in digital economy era. The common technical foundation is just the emerging technologies. Hence, digital manufacturing requires the technical and skilled graduates of the schools all must master the digital technology firstly, which is the common requirement for all economy departments in digital era.

In addition, the application of digital technology in the process of education will inevitably lead to the development of deeply crossed and fused vocational and general undergraduate education. Traditional vocational education is better at practical education than traditional general higher education and traditional general undergraduate education is better at theoretical education than vocational education. However, the digital technology applying in education has made the two forms education deeply crossed and fused.

The practical education has been undergoing deeply transformation in digital era: the apprenticeship class can be replaced by live video or can be accomplished by remote online visiting; the experiment can be completed by simulation software. Intelligent cloud vocational education (ICVE) providing a remote internet cloud education platform with plenty of teaching resources has been making on-scene teaching reality. With the development of information and intelligence, a lot of work can be done by facing computer. As long as a reasonable way of evaluation being adopted, the effect of the new method of practical teaching will not be compromised.

On the other hand, with the increasing abundance of online education resources, application-oriented universities can also adopt the on-scene teaching method to teach theory classes, and can apply theory to solve practical problems in the process of on-scene teaching.

In summary, the profound reform of teaching resources and teaching methods is making theoretical teaching and practical teaching deeply integrated: theory teaching being carried out in the process of on-scene practical teaching, and practical teaching being increasingly becoming mental work. These raise new requirements for current higher application oriented undergraduate education system and require a vocational and general deeply fused higher education process to implement the demands. The new entrants of the application-oriented universities and colleges are the best choice for these goals.

3 Conclusions

In the new times, the popularization and application of digital technology in traditional industries has put forward new requirements for personnel training in higher colleges and universities. The construction of a powerful country of digital manufacturing needs a large number of high-quality compound technical and skilled talents. At the same time, the application of emerging technologies in education has also had a far-reaching impact, which has not only changed the form of educational resources, but also made the process of vocational education and general higher education deeply integrated. There are increasingly blurred boundaries between practical and vocational education. It is the requirement of the new times for the newly established applied undergraduate colleges to carry out the undergraduate education of the integration of vocational and general higher education. It is also the best answer to the contradiction faced at present and in the near future between the social talent demand and the talent cultivated by higher education colleges and universities.

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