Post-Epidemic Era Drives Digital Reform of Vocational Education

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Abstract

In the current context of digital transformation of education, in order to promote the digital reform of vocational education and promote the high-quality development of vocational education. This paper proposes a few development suggestions to explore the development path of vocational education in the context of the current development situation.

Keywords

Vocational education, Digital reform, Integration of industry and education.

1. Introduction

At present, the digital economy is booming and digital technology is widely used in all fields of society, providing a strong impetus to promote high-quality economic development. Vocational education is an important cornerstone of national development and social progress, and an important part of the national education system and human resource development. Digital technology has promoted the reform and innovation of vocational education, and provided a wide space and effective way for students to grow and become successful in a comprehensive and individual way. In the digital era, if vocational education wants to better adapt to social changes, it must take the initiative to respond to the trend of technological revolution and industrial changes, and continuously improve its ability to innovate in science and technology and serve social and economic development. And with the rapid development of technologies represented by big data, artificial intelligence, cloud computing and blockchain, which are continuously integrated into social life, the digital transformation and upgrading of global industries have become a major trend.

The Digital Economy Employment Impact Study Report shows that by 2020, the digital talent gap in China will be close to 11 million and is gradually expanding. [1] As an important part of national education, vocational education should follow the progress of society, follow the trend of the times, actively participate in digital reform, and cultivate modern digital talents. Internationally, many developed countries such as the United States and Germany have long started their digital reform, taking digital skills training, digital infrastructure construction and digital resources development and utilization as the key action areas for the digital transformation of vocational education. Digital reform has also long been a trend in the development of vocational education. [2]

In the context of today's post-epidemic era, we also need a large number of digital talents to enhance the country's competitiveness at the international level. How to promote the high-quality development of vocational education in the new era and seize the development opportunities in the post-epidemic era has become a major issue for the development of vocational education in China.

2. Problems with the Digitalization of Vocational Education

Vocational education is a type of education that combines multiple fields, contains elements of education and business production, and is closely integrated with the production of social life.

The development of digital technology is changing the life of society while promoting the development and change of vocational education. At present, in the process of China's education informatization, although there have been many cases of digitalization, but from the overall point of view, there are still problems such as low level of digital infrastructure construction and insufficient supply of digital resources, which make it difficult to give full play to the application of digital technology.

From the situation of vocational colleges themselves, most vocational education's current talent training model is out of touch with enterprises' needs, and students' skills are out of touch with job requirements, making it difficult to meet enterprises' needs for modern digital talents; some people think that digital transformation of vocational education is non-essential and will consume existing teachers' teaching enthusiasm, increase schools' management costs, and increase students' learning costs, thus creating a certain resistance; digital teaching resources in vocational colleges are not rich enough to meet the individual needs of students at different levels; the current digital level of vocational education is generally not high, and some vocational colleges have a weak digital foundation, insufficient investment in digital infrastructure construction, old equipment, incomplete functions and unstable systems are more obvious, making it difficult to promote digital reform and meet the high-quality development The current digital transformation of education lacks systematic management and teaching methods, and the built resource sharing platform lacks openness and flexibility, and there are certain differences among institutions in various regions, and some regions lack advanced digital enterprises and cannot get technical support and deep cooperation from enterprises, which in turn leads to some policies not being implemented, the digital process lacks guidance, and the overall digital The overall digitalization process is slow.

From the social level, the traditional education concept emphasizes theory rather than ability, knowledge rather than practice, and relies more on teachers to impart knowledge in the classroom, which leads to the social recognition of vocational education emphasizing skills training is not high; some groups are not familiar with and do not understand the digital transformation of vocational education and its related policies, and still think that digital transformation is far away from us, and it is difficult to recognize the students trained by vocational education institutions. Although the digital economy at the social level is developing very rapidly, the related concepts are not popularized, resulting in people's lack of understanding of the relevant theories and their neutral or even negative attitude towards the digital transformation of vocational education; moreover, in today's post-epidemic era, the offline courses may be converted into online courses at any time, and The practical ability of students will also drop significantly as a result, leading to a lack of confidence in digital transformation.

From the teachers' side, the digital teaching concept is still in the initial exploration stage. Teachers were exposed to online teaching at the beginning of the epidemic and started to learn about digitalization passively. However, part of the teachers, due to their age, their digital ability is insufficient, and they do not have the ability to use digital devices well for teaching, so it is difficult to realize digital transformation quickly and learn the relevant digital technology, and forcing digital advancement is just a futile burden, which may also lead to the decrease of their classroom teaching efficiency; on the other hand, due to the lack of corresponding digital knowledge and skills, most of the teachers cannot On the other hand, most teachers are unable to produce high-quality digital courses due to the lack of appropriate digital knowledge and skills, which leads to the weakening of teachers' enthusiasm in the face of digital transformation. In addition, starting from the students' own situation, students who have received traditional education for a long time have difficulty in fully converting their learning style for a while. In China, there is also a relative lack of successful experience in digital transformation. Without the reference of successful transformation experience, frequent changes in teaching methods

or forced digital integration into the classroom will lead to lower learning efficiency of students and form a negative feedback to digital transformation during the assessment. In the process of digital transformation, students also need to spend extra money on cell phones, computers and other digital devices, which increases the pressure on students' families.

3. The Need for Digitalization of Vocational Education

At the international level, the U.S. Federal Department of Education issued different versions of the U.S. National Education Plan as early as 1996, 2000, 2004, 2010, 2016, and 2017 to increase investment in the digitization of education and the development of digital talent. Germany also promulgated the strategy "Education Action for a Digital Knowledge Society" in 2016, making digital education a key element of Germany's education reform in the medium to long term (up to 2030). [3] In 2020, the European Commission released the Digital Education Action Plan (2021-2027), which focuses on promoting more digital technology platforms and multiple teaching models for improving and expanding educational formats, improving learners' ability to cope with digital transformation The Digital Education Action Plan 2021-2027 focuses on promoting more digital technology platforms and multiple teaching and learning models to improve and expand education, increase learners' resilience to digital transformation, and promote a high-performance digital education ecosystem. In 2021, the Russian government also promulgated the "Directions for Strategic Transformation of Education Digitalization Related to the Activity Areas of the Russian Ministry of Education", which incorporates strategic transformation of education digitalization into the framework of national strategic development goals and clarifies the direction of transformation in several aspects. At the same time, the Russian government has also built a legal-policy framework system for digital transformation of vocational education, relying on a special financial budget to build a digital infrastructure for vocational education. [4] From the perspective of international development, digital transformation has been an inevitable trend.

While the traditional education model relies more on teachers to impart knowledge in the classroom, the digital education model tends to digitize the teaching and learning process and realize the management, delivery and learning of educational information through various network technologies, software and hardware. There is no doubt that digital reform is an inevitable trend of social progress and an important help to promote high-quality development of vocational education in the new era. The digital reform of vocational education is also never simply combining digital technology with vocational education, but a deeper level of integration, including corresponding changes in the subject of vocational education, training objectives and educational philosophy. In this process, we should not simply pursue digitalization, but choose a digital reform method that suits our own development needs and characteristics, taking into account the actual situation of social industrial transformation and upgrading. Only by adapting to social development and training students according to the needs of industries, trades and jobs can we better accomplish our educational goals and train suitable talents for enterprises. Digital reform, on the other hand, can make up for the shortcomings of traditional vocational education, such as: sharing educational resources and diversifying teaching modes through big data, cloud computing and artificial intelligence; accurate learning for students at different stages with the help of blockchain technology; and knowledge visualization by using big data analysis technology, etc. Therefore, vocational education in the era of digital economy should fully integrate with the current social development trend and innovate the way of talent cultivation.

In the context of the current post-epidemic era, the application of artificial intelligence is gradually widespread, and some work contents that can be completed by using only hard knowledge will gradually be taken over by artificial intelligence, and humans will be more

engaged in the learning and construction of soft knowledge, and the future learning must also be the cooperative learning of human-computer integration. [5] The digital reform of education in the new era is in promoting the process of human-computer integration, using digital technology to carry out teaching and learning, and cultivating learners' digital abilities, which will enable learners to work, learn, live and develop better in the digital era. [6]

4. How to Make A Digital Transformation

4.1. Building a "smart campus" and digital platform

The digital reform of vocational education cannot only rely on external forces to promote, but also needs to change in vocational education itself, and take the initiative to accept and learn the changes brought by digitalization, which can not only accelerate the process of digital reform, but also make the digital reform achieve better results.

To carry out a comprehensive digital reform, the first need for digital infrastructure construction, hardware facilities is the top priority. Starting from the "smart classroom", advanced digital production equipment, projection equipment, interactive teaching equipment, classroom recording equipment, etc. will be equipped to the classroom, but also pay attention to the layout of the classroom space, dynamic adjustment of desks and chairs, wall background color, etc.; to "focus on interaction, according to the need to match With the guideline of "focus on interaction and match according to needs", according to the characteristics of subjects and students, through the combination and matching of each equipment, the smart classroom creates a multiform interactive teaching mode such as group discussion, research study, interactive communication, high-quality course recording and remote interactive teaching, forming a teaching system coordinated with conventional and special features. [7]

In addition to hardware aspects, it also includes management aspects and teaching aspects. Building a digital campus management platform can help schools handle academic affairs, optimize the process of processing, save processing time, and complete the work directly from the mobile terminal to achieve digital, scientific and refined management. Integrating digital devices into teaching, including introducing one point of advanced digital production facilities into schools, or reproducing digital production methods with VR virtual reality technology, and teaching hands-on in the classroom and in students' practice to help students better master digital technology. Especially with today's rapid development of artificial intelligence technology, students can be taught to communicate with, learn from, and solve problems using artificial intelligence. Students can be put in a digital environment, and digital technology can be integrated into their lives to create a deeper understanding of digital learning.

The construction of a digital management platform may be too burdensome for a particular school, so the construction of a digital platform should seek regional cooperation and negotiate with other vocational institutions in the region to jointly establish a scientific management model. In addition to building a management platform, a resource sharing platform should also be established to share excellent courses or teaching methods. The institutions should strengthen communication and exchange, enhance the awareness of sharing, give full play to their respective advantages, and explore scientific methods of cooperation to further promote the sharing of digital resources. Some institutions are more specialized in certain aspects, so they can be used as model schools to show some advanced experiences and achievements within the school, and make full use of the advantages of the Internet to establish a corresponding feedback mechanism to provide timely feedback and improvement of problems in the digital teaching process or shared resources to help schools and teachers quickly solve problems and ensure teaching quality and teaching effectiveness. Institutions can also develop some courses with localized and regional characteristics and then put them into the sharing platform to strengthen the communication between regions.

In addition, the platform should be designed for current developments and future development trends through resource collection and processing, and provide students with advice on employment and development to help them better integrate into social life. The platform is regularly maintained and upgraded to enrich its functions, increase practicality and interactivity, and achieve true sharing of high-quality digital resources.

4.2. Using a digital teaching model

The digital reform of vocational education in the new era should start from changing the traditional education mode, changing the public's traditional education concept, enhancing the public's recognition and inclusiveness of vocational education; encouraging teachers to learn, accept and explore the teaching methods in line with digitalization in the new era; adopting online education, virtual practical training, combining online first off education mode, exercising students' practical ability, improving teaching efficiency, broadening learning scope, change the traditional learning style, enhance the learning experience and improve the learning effect; design a reasonable curriculum system and establish a suitable evaluation audit and feedback mechanism. In addition, we should strengthen the construction of education informatization, establish a perfect education information system, improve the level of education management, and enhance the quality of education.

4.3. Building a digital faculty

The nature of vocational education determines the need for dual-teacher teachers, and schools should strengthen the situation of their teacher teams and improve the digital literacy and related competencies of school teachers. As the digitization process advances, teachers' need for new technologies will expand as they learn digital skills. Special training is conducted regularly to enhance the digital capabilities of teachers in schools through learning. Establish a teacher support system to bring in advanced teachers and share their experiences as role models to brainstorm and help teachers with difficulties to ensure the presence of fresh blood in the education team. Helping teachers to realize the transformation in the context of the digital era, to better understand digitalization and use digital technology also helps to realize the digital transformation of vocational education institutions. At the same time, it is possible to deepen school-enterprise cooperation by bringing professional and technical personnel from enterprises who have mastered technology into schools and employing them to teach as teachers in schools. The professional and technical personnel of enterprises have rich experience and practical operation ability, and can skillfully use modern information equipment for digital production, which will enable these professionals to directly teach the technology they master to students, thus promoting the digital transformation of vocational education. [8]

These teachers from enterprises can also communicate and share with school teachers, bring the problems in actual production into classroom teaching, combine theory with practice, and promote teachers' development to dual-teacher type, thus enhancing teachers' professional and technical abilities and helping the digital transformation of vocational education.

4.4. Helping students develop digital literacy

Students are the core element of digital reform in vocational education, and the ultimate goal of digital transformation in vocational education is for students to become digitally literate, adapt to the digital society, and realize their personal and social values. The digital transformation of students goes hand in hand with the digital reform of education, which requires students to master the basic digital technology knowledge, have the corresponding digital skills and be able to use them proficiently, learn and improve themselves through digital technology. In order for students to achieve better digital transformation, first of all, students should be guided to establish values and correct digital literacy in line with the development of

the times. While ensuring that students are digitally educated, they should be trained to observe healthy digital ethics and use digital technology safely. Second, make full use of digital infrastructure, digital teaching management platforms and digital resource sharing platforms to establish a comprehensive digital learning environment for students and integrate advanced digital technologies into their learning lives. Develop three-dimensional teaching resources, use digital technology to break the restrictions that exist between majors, schools, and regions, and establish immersive, interactive, and diverse learning contexts so that students can communicate and cooperate regardless of time and space constraints. Provide personalized learning resources on the digital resource sharing platform. Through the analysis of big data and artificial intelligence, we understand students from many aspects, recommend personalized learning resources for students based on their interests and acquired knowledge, and meet the special learning requirements of each student.

4.5. Building a high-quality digital curriculum

Digitalization deepens the connection between industries and jobs, and also puts forward new requirements for jobs, leading to the original jobs will change the previous independence and singularity, and the technical level required by the jobs themselves will be upgraded and turned into composite jobs, so as to further adapt to the progress of society and the development of productivity. The digital industry is highly dependent on Internet technologies, through which it can greatly save costs, form production advantages, technological advantages, innovation advantages, and promote the improvement of production efficiency. And to achieve this goal, it needs multifaceted composite talent skills. For this reason, vocational education should not only focus on the cultivation of high-tech talents, but also link them to various different work fields and scenarios, so that the talents cultivated by vocational education can become composite talents who can adapt to multiple environments in the new era. The most fundamental landing point of digital transformation of vocational education is the digitalization of curriculum, and conversely the digitalization of curriculum is also the touchstone to test the effectiveness of digital transformation of vocational education. [9] In today's digital information era, the impact of digital technology on the classroom is also significant, so it is necessary to establish a curriculum system to match it.

A reasonable curriculum system is designed, a new and complete evaluation system is established, a teaching management platform and a resource sharing platform are combined, a comprehensive evaluation of the curriculum, students and teachers is conducted, and a single grade is no longer used as a standard to measure the effectiveness of student learning, multiple aspects are integrated, and teachers and students cooperate with each other to better complete the teaching content and achieve teaching goals. Strengthen the management of educational organization and set corresponding requirements to ensure that teachers can abide by the rules and regulations in the teaching of digital classroom to avoid various problems. It is also necessary to actively use digital technology to create a digital culture suitable for the school, to further improve students' recognition and understanding of digitalization, and to enhance teaching effectiveness.

With the advancement of digitalization, the curriculum of the new era should be built with students in mind. In the classroom, situational teaching, cooperative teaching, flexible teaching and student-led teaching should be realized differently from traditional classroom teaching, and timely evaluation and feedback should be given after teaching to help students master what they have learned in depth. In this process, we should further strengthen the integration with digital resources, combining the integration of online and offline teaching, the integration of teaching and learning, the integration of theory and practice, and the integration of enterprises and schools, so that students can fully integrate into the classroom, better understand the meaning of digital, and realize the mutual growth of teaching and learning. From the

perspective of students, digital courses can break through the time and space limitations of knowledge, enhance the flexibility of the learning process, enrich the learning experience, and improve the efficiency of individual learning. From the perspective of curriculum effectiveness, digital courses can make up for the shortcomings of traditional offline courses, make full use of the advantages of the platform of "Internet + education", present diversified teaching forms in the form of course resource libraries to meet different teaching needs and realize digital teaching with the advantage of technology. [10] Vocational education needs to cultivate students with practical skills, increase the proportion of specialized and practical courses in teaching, and promote "learning by doing" and result-oriented teaching methods. With the completion of digital infrastructure in vocational institutions, students can operate digital production equipment in practical classes, or use VR virtual reality technology to simulate operations, and then combine with big data platforms to create actual production situations for immersive learning.

4.6.   Building new digital teaching materials

Digital reform, in addition to the school infrastructure and teaching environment, is also a very important part of the teaching materials. Textbooks are important materials that contain the basic knowledge and fundamental connotations of the subject, are important standards for students' learning reference, are logical and systematic summaries of subject knowledge, build the infrastructure of the entire subject, and are also an important basis for teachers' teaching. With the advancement of digitalization, paper-based textbooks are constantly being transformed into digital textbooks and are widely used. Some researchers believe that digital textbooks are information and knowledge materials that exist in digital form, can be loaded on digital terminals for reading, can dynamically update their contents, and can record interaction trajectories in a timely manner [11]. Some researchers also consider digital textbooks as knowledge frameworks and learning guides based on traditional paper-based textbooks, as well as a system of learning materials suitable for students' personal development [12]. Digital textbooks should meet the teaching needs of teachers and the learning needs of students, but also be able to reflect the characteristics of digital teaching.

The construction of digital teaching materials is not only about digitizing the original contents of books, but also about integrating modern technology into them, combining them with advanced digitization, and selecting advanced, useful, and student development-enhancing contents for the construction of digital teaching materials after strict screening and testing. At a micro level, it relies on technology to enhance the interest and ease of learning in content presentation, while providing a source of resources and learning tools. In addition, by combining teaching management platforms and resource sharing platforms and using big data analysis, it enables diagnosis of teaching and timely feedback to teachers, which in turn improves teaching efficiency. At a macro level, building a digital teaching material system can provide high-quality digital resources for vocational education, improve teachers' digital literacy, and thus promote the realization of high-quality digital teaching. [13] The digital textbook system highlights the value and potential of foundational core resources in the digital teaching environment breaking through the drawbacks of the paper-based textbook system that can only provide static content, adding new momentum to enhance the interactivity, interest, and effectiveness of teaching and learning. Compared with paper-based teaching materials, digital teaching materials are richer in form and more convenient to use for personalized teaching.

4.7.   Promoting the integration of industry and education

The integration of industry and education is one of the characteristics of vocational education and an important development method of vocational education. From a macro perspective, the integration of industry and education is an organic whole formed by the integration between

regional enterprises and vocational education institutions, where the development and training mode of vocational education institutions depend on the development and requirements of enterprises, and the production methods and efficiency of enterprises depend on the talents trained by vocational education institutions. From a micro perspective, the integration of industry and education is the overall combination of enterprise production and school education, the integration of actual production operation and classroom theory teaching, using theory to summarize and improve practice, using practice to verify theory and promote theory development.

The era of digital economy brings new technology and development mode. Digital technology is continuously integrated into social life and production, upgrading the industrial chain and changing the traditional production methods of enterprises, while the modernized industrial chain needs high-tech talents to support and develop. In the context of the development of digital economy, the integration of industry and education should be oriented to the development of digital economy and promote the combination of industrial digitalization and education digitalization. As technologies such as artificial intelligence and cloud computing continue to integrate with various work scenarios, new demands and new occupations will emerge, and the market requirements for talents will change and become diversified and complex, which requires vocational education to reform, adapt to the development of modern society, and deliver new types of technical talents to society. While vocational education is changing, it will further promote the integration of industry and education and bring a new model of industry-education integration.

The integration of industry and education has always been a difficult point in China's vocational education, while the development of digital economy and digital reform provide new ideas and cooperation methods for the integration of industry and education. On the one hand, the digital reform of vocational education needs to be carried out from itself, starting from the teaching methods, teaching objectives, teaching contents and teaching materials, so that students can have a comprehensive exposure to digital contents and better understand the connotation of digital reform. On the other hand, the production aspect of enterprises will also contribute to the digital reform of education. The production methods of enterprises are constantly adapting to the development of society, and the upgraded digital industry chain will provide directions for the digital reform of vocational education and complement the digital reform of vocational education, thus transforming into a new model of integration of industry and education. The production of enterprises will promote the digital reform of vocational education, and the highly skilled talents cultivated by vocational education will promote the change of production methods of enterprises, reaching a win-win situation for both enterprises and education, and pushing the integration of industry and education to a new height. In addition, digitalization will also bring new achievements in the integration of industry and education, deepening the connection between vocational education and the life and production of social enterprises.

5. Conclusion

Digital reform can improve the efficiency of vocational education, broaden the scope of learning, enhance the learning experience, improve the learning effect, improve the level of education management, improve the quality of education, better adapt to the needs of social development, better serve the society, and strengthen vocational education in general. Moreover, as an important part of China's education system, vocational education bears the important responsibility of serving the country and the people in the new era. Only under the guidance of national policies, we can better serve the society by firmly carrying out digital reform and cultivating digital talents in the new era.

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