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Research on the Path Selection of Innovative Vocational Education Evaluation System in the Era of Artificial Intelligence

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Abstract: The traditional evaluation system has drawbacks such as single standard and convergence of means, which is difficult to meet the development requirements of the era of artificial intelligence. The AI-enabled vocational education evaluation system needs to meet the needs of cultivating high-quality technical and skilled talents, and the innovative vocational education evaluation system can become the driving force to promote the reform of vocational education. Based on the opportunities and challenges brought by artificial intelligence to the vocational education evaluation system, the paper proposes the path selection of promoting multi-subject participation, using data-driven evaluation, and improving interdisciplinary ability evaluation, and establishes an effective guarantee system to ensure smooth practice.

Keywords: Artificial Intelligence; Evaluation System; Vocational Education.

1. Introduction

With the development of artificial intelligence technologies such as ChatGPT and big data, great changes have been brought to human social life and work. Artificial intelligence technology is not only accelerating the industrial structure restructuring and socioeconomic transformation of the Fourth Industrial Revolution, but also playing a huge potential in promoting talent training and education reform. The development of artificial intelligence is unprecedentedly active and urgently needs the support of intelligent professionals to promote industrial upgrading. In the context of the two-way empowerment of artificial intelligence and education, how to use artificial intelligence to promote the high-quality development of education in the new era has become an important topic that needs urgent research[1]. Under the current context of the artificial intelligence era, vocational education shoulders the mission of cultivating high-quality innovative and technical talents, and constructing and optimizing the quality evaluation system of vocational education talent training is an important link and a key monitoring measure for the high-quality development of vocational education. However, the traditional evaluation system has drawbacks such as single standard and convergence of means, which is difficult to meet the development requirements of the era of artificial intelligence. Some scholars have explored the opportunities for vocational education development in the era of artificial intelligence and put forward action strategies, but the research on vocational education evaluation system remains inadequate. Therefore, according to the requirements of vocational education training goals, based on the rapid development of artificial intelligence, from the perspective of practice, to explore the path selection for innovative vocational education evaluation system under the perspective of artificial intelligence.

2. Challenges and Opportunities of Artificial Intelligence to Vocational Education Evaluation System

Since the advent of the third wave of artificial intelligence, artificial intelligence has quickly integrated into various industries with strong advantages, and there has been a trend of "AI in all", which has prompted society from the 'Internet+' era into the 'AI+' era. In this context, the process of education informatization also shows a trend of advanced development from the "education + Internet" stage to the "education+AI" stage[2]. The emergence of artificial intelligence has brought a revolutionary impact on the traditional education concept, and vocational education can best reflect the objective internal needs of economic society. At present, China is situated under major national strategies such as education informatization 2.0, Industry 4.0, "The Belt and Road" and "Made in China 2025", especially the high-quality development proposed by the 20th National Congress of the Communist Party of China, which requires vocational education to train urgently needed technical and intelligent talents to help economic transformation and upgrading[3]. Therefore, vocational education needs to revisit and revise its evaluation system to better address the challenges and seize the opportunities presented by artificial intelligence. Establishing a more effective and adaptive vocational education evaluation system, that can continuously provide a steady stream of backup power for high-quality development.

2.1. Artificial Intelligence has Brought Challenges to the Vocational Education Evaluation System

The traditional educational evaluation system has been unable to meet the needs of innovation ability, interdisciplinary ability and technology application ability in the era of artificial intelligence, so the research of innovative vocational education evaluation system has become particularly important. The development of artificial intelligence technology, for the traditional vocational

education evaluation is not limited to the classroom, especially for vocational education "theory + practice" learning mode, the era of artificial intelligence for vocational education evaluation also brings some challenges.

2.1.1. Ai is Driving the Evolving Demand for Skills

The rapid development and application of artificial intelligence is changing the skill needs of many industries, the emergence of new technologies and the transformation of traditional occupations require people to have different skills and knowledge. This puts forward new requirements for vocational education evaluation, which requires timely understanding and adapting to the ever-changing skill needs, understanding the latest technological trends and occupational needs, and adjusting evaluation standards and methods accordingly. It is essential to ensure that the evaluation system accurately reflects both current and future professional requirements.

2.1.2. Artificial Intelligence Promotes the Updating and Adjustment of Evaluation Criteria

In October 2020, the Central Committee of the Communist Party of China and The State Council issued the Overall Plan for Deepening the Reform of Educational Evaluation in the New Era, in which it was clearly proposed to "make use of modern information technology innovation evaluation tools such as artificial intelligence and big data" and "improve the scientific, professional and objective of educational evaluation"[4]. Therefore, one of the primary challenges that emerging technologies brought by artificial intelligence aim to address is the issue of evaluation criteria. In the era of artificial intelligence, traditional evaluation criteria may not be able to fully cover the requirements of emerging technologies and occupations. Traditional subject knowledge evaluations may not be able to assess innovation and problem solving in the field of artificial intelligence. This requires the evaluation system to constantly update and adjust the evaluation criteria to ensure that the evaluation can comprehensively and objectively reflect the comprehensive ability and potential of students.

2.1.3. A Lot of Jobs Will Be Replaced by Artificial Intelligence

The extensive application of artificial intelligence will inevitably lead to the replacement of some positions by artificial intelligence. Some scholars point out that many occupations that do not necessitate specialized skills or in-depth expertise, along with those characterized by repetitive and routine tasks are most likely to be replaced in the future[5]. In addition, most of the current vocational colleges and universities are operating positions with low technical content on the assembly line, which have great substitutability[6]. Facing the AI era of future development trends, evaluation agencies and educational institutions maintain close ties with the industry, understand the latest technological trends and career needs, and adjust evaluation criteria and methods accordingly, thereby providing better employment opportunities.

2.1.4. Diversified Learning Paths and Learning Resources

In July 2017, the "New Generation of Artificial Intelligence Development Plan" issued by The State Council clearly proposed in education informatization that "intelligent campus construction should be carried out to promote the application of artificial intelligence in the whole process of teaching, management, and resource construction." Develop a three-dimensional integrated teaching field and an online learning education platform based on big data intelligence."[7]. It can be seen from this that in the era of artificial intelligence, learning paths and learning resources have become more diverse and rich. Student learning is not limited to the classroom, school, students can acquire knowledge and skills through online learning, independent learning, project practice and other ways. However, traditional assessment methods may not adequately assess the abilities and outcomes students acquire in non-traditional learning environments, such as online learning. Evaluation systems need to take into account the effectiveness and comparability of different learning paths and learning resources in order to fairly assess student learning outcomes.

2.1.5. Faced with Data Privacy and Security Issues

In the era of artificial intelligence, vocational education evaluation needs to collect and analyze a large number of student data, and many personal data are collected, stored and used to provide personalized evaluation and guidance. However, with the continuous development of the Internet, the data used to promote personal development has brought unlimited business value, but also produced more and more data security risks, such as hacker attacks, technical vulnerabilities, data abuse, etc.[8] If these data are not well protected and security controlled, they will be maliciously used by criminals. Therefore, the vocational education evaluation system must ensure the protection of student data privacy and take measures to prevent data leakage and abuse.

2.2. Artificial Intelligence Provides Opportunities for Vocational Education Evaluation Systems

The rapid application of artificial intelligence in the field of vocational education has brought rapid development to vocational education. The emergence and transformation of emerging technologies have promoted the subversive innovation reform in the vocational education system, broken the existing rules and regulations, reformed the traditional education model, and promoted the innovative development of the vocational education evaluation system, always echoing the needs of the times.

2.2.1. Innovate the Vocational Education Evaluation System

The traditional vocational education evaluation system tends to use standardized tests and scores, and focuses too much on knowledge quantification. The standardized evaluation method may not be able to comprehensively evaluate students' comprehensive ability, practical application ability and innovation ability, especially for vocational education, ignoring non-cognitive evaluation such as skills, attitudes and values. With the development of artificial intelligence technology and the deep integration of vocational education evaluation system, the traditional vocational education evaluation system will undergo fundamental changes. The platform built by artificial intelligence technology will not be limited by space and time, but can help the existing vocational education evaluation system to innovate and upgrade and establish a more targeted, diversified and comprehensive education evaluation mechanism[9]. To evaluate individuals by standardized scores, this "standardization" often fails to provide personalized evaluation and guidance. Each individual has different learning characteristics and development needs, yet

the existing evaluation methods are often one-size-fits-all and cannot meet the differentiated needs of individuals. The vocational education evaluation system assisted by artificial intelligence will choose different evaluation methods according to the needs, scientifically cultivating technical, skilled, innovative, and all-rounded talents.

2.2.2. Promote the Reform of Vocational Education

The emerging technologies brought by artificial intelligence have a certain impact on the talents cultivated by existing vocational education, "skills that are easily taught and tested are or will be digitized, so there is no point in memorizing too many skills."[10] Vocational education, closely tied to industry, risks becoming disconnected from the times if it fails to grasp the transformations brought about by the AI era. Particularly, if the vocational education evaluation system fails to fully connect with the needs of the actual industry, and the evaluation standards and methods may be too theoretical to truly reflect the actual work requirements and skill needs of the industry, and even some majors are not suitable for the realistic development needs. Without the participation of the industry, the evaluation system lacks effectiveness and adaptability. Therefore, the use of artificial intelligence to promote the innovation of the evaluation system to promote the reform of vocational education, so that vocational education teachers, education content, teaching mode, etc. and the actual needs of the combination, help vocational education to better meet the social needs, return to the fundamental purpose of improving the quality of talent training, cultivate talents suitable for future career needs, to achieve high-quality development of vocational education.

3. Path Selection of Artificial Intelligence Innovation Vocational Education Evaluation System

The vocational education evaluation system in the era of artificial intelligence should be more objective, scientific and reasonable to understand and judge the development of vocational education, and more importantly, promote vocational education to deliver effective strength in the high-quality development of the new era and promote the healthy, efficient and high-quality development of the economy. At the same time, it should respond to the clear requirements of "improving result evaluation, strengthening process evaluation, exploring value-added evaluation and improving comprehensive evaluation", "making use of modern information technology innovation evaluation tools such as artificial intelligence and big data" and "improving the scientific, professional and objective of educational evaluation" proposed in the Overall Plan for Deepening the reform of educational evaluation in the New Era[11]. This requires building a complete and clear path.

3.1. Promote the Participation of Multiple Subjects and Build Scientific Evaluation Indicators

In 2014, the "Modern Vocational Education System Construction Plan (2014-2020)" proposed: "Pay attention to the role of the industry, support industry associations to carry out quality assessment of vocational college talent training, and improve the quality of talent training and the matching degree between institutions and industry needs." Enterprises and employers are encouraged to evaluate the employment quality and satisfaction of graduates. We will actively support third-party organizations such as professional organizations in conducting quality assessments."[12] The vocational education evaluation system cannot only rely on vocational colleges to determine students' ability. Relying on artificial intelligence technology and combining the close relationship between vocational education and market economy, a comprehensive and robust vocational education evaluation mechanism should be constructed. And evaluation subjects from different industries and fields should be involved in the evaluation, so that the industry has a deeper understanding of the needs and actual conditions of vocational education. The more critical their participation and feedback will be in evaluating the effectiveness and adaptability of the system. The existing educational methods suffer from issues such as being monolithic and rigid, overemphasizing quantitative assessments, and having a narrow evaluation function with a prominent screening function[13], which leads to weak guidance of evaluation indicators, weak data compatibility, and incomplete collection. The construction of evaluation indicators needs to combine school's distinctive features and the quality elements of talent training, and the participation of multiple subjects makes the evaluation indicators closer to the needs of the industry and more reasonable and scientific.

3.2. Use Data-Driven Evaluation to Improve the Objectivity and Fairness of Evaluation

At present, the evaluation system of vocational education mostly regards "result" as "conclusion" and ignores the process. With the help of artificial intelligence technology, we can collect and analyze a large amount of learning data and shift from the "outcome perspective" to the "process perspective"[14] to achieve a more objective and accurate evaluation. Artificial intelligence technology is used to collect the educational data of the evaluated objects in different environments. Through data analysis of the educational behaviors and educational outcomes of the evaluated objects, the educational level, educational progress and personal characteristics of the evaluated objects can be evaluated, and more targeted teaching suggestions can be provided for teachers to improve the efficiency and accuracy of teachers' teaching evaluation. Customize more efficient learning methods and plans for the evaluated objects to achieve objectivity and justice for the evaluated objects.

3.3. Enhance Interdisciplinary Competence Assessment and Cultivate Talents in All Aspects

The biggest feature of vocational education does not stay in the knowledge points of the major, but pays more attention to the integration and application of knowledge with reality and other disciplines, which cannot be achieved without the participation of different industries. The traditional evaluation system means can only use manual experience and observation, and the data source is relatively single. Artificial intelligence breaks this law. Artificial intelligence not only enhances the methods, means and tools of evaluation, but also provides a new technical platform for personnel training in vocational education, enriching the content and needs of human development[15]. It is not limited to a single professional knowledge, but moves towards multi-dimensional and all-round interdisciplinary learning ability. It lays the foundation for cultivating the comprehensive talents needed in the future.

4. Establish the Path Guarantee of Innovative Vocational Education Evaluation System in the Era of Artificial Intelligence

The era of artificial intelligence has put forward new requirements and new tests for the development of education. The potential of artificial intelligence in promoting the high-quality development of education in the new era and promoting the development process of education is worth further exploring. We should do a good job in top-level design, teaching reform, environmental construction, quality improvement, personnel training, resource construction, and risk response. It will provide an effective path for the deep integration of artificial intelligence and education[16].

4.1. Establish Policies and Regulations to Provide Legal Protection for the Path

Policies and regulations are the basis and basis, it is necessary to formulate and improve relevant laws and regulations, policy documents and norms at the national level, clarify the goals, content and basis of the construction of vocational education evaluation system in the era of artificial intelligence, and form a systematic framework to provide policy and regulatory support for the vocational education system in the era of artificial intelligence. With the emergence of educational big data and the intelligence of machines, educational alienation and data privacy disclosure have become unavoidable ethical security issues in the process of intelligent technology to improve the quality of education development. In this regard, the establishment and improvement of artificial intelligence application guarantee mechanism is the basis to ensure data security, and strengthening management measures is the means to protect data security, in order to eliminate and avoid the risk of educational alienation caused by technology application.

4.2. Strengthen Evaluation Tools to Provide Practical Guarantee for the Path

Evaluation tool is the basic guarantee of evaluation quality. Tool innovation is not only the application of new tools, but also the improvement and evaluation of tools. Artificial intelligence enables evaluation, and new tools and new means continue to emerge, but traditional evaluation tools are not rapidly disappearing. The key to the selection and use of tools lies in their suitability for the purpose of evaluation. In the face of changes in the requirements of vocational education classrooms and students' literacy caused by artificial intelligence, tools are also constantly adjusting. Therefore, we should be good at using good tools to make them effective, rational and scientific, to help teachers and students develop.

4.3. Improve the Multiple Evaluation Mechanism to Provide Standard Guarantee for the Path

Educational evaluation is a complex system project, especially in the era of artificial intelligence, social factors are more easily involved through convenient information technology. More than ever, an open and scientific evaluation system requires the collaborative participation of students, teachers, schools, governments and society. In the educational evaluation system, each participant is not only the evaluation subject, but also the evaluation object. The development of new generation information technology such as artificial intelligence has blurred the boundary between human and machine, making human-computer interactive evaluation a reality. Therefore, it is necessary to give full play to the roles of different evaluation subjects such as teachers, students, parents, society and third-party organizations, and jointly build a comprehensive evaluation system of education[17].

4.4. Enhance Social Recognition and Certification to Provide a Stable Guarantee for the Path

In the era of artificial intelligence, traditional academic certification is no longer enough, and more flexible and diversified certification methods need to be introduced. Under traditional learning concepts in China, vocational education holds a lower status compared to general education, with lower social recognition and accreditation, and the level of emphasis placed on it cannot be compared to that in some European countries. Promote the establishment of a state-led, industry-involved and socially recognized vocational skills certification system, authenticate students in innovative vocational education, and enhance the authority of vocational skills certification to improve their competitiveness in the job market.

4.5. Promote the Integration and Sharing of Resources to Provide Guarantee for the Improvement of the Path

The research of innovative vocational education evaluation system needs the help of interdisciplinary research team and multi-party cooperation. Educational institutions, scientific research institutions and enterprises can be encouraged to participate in the research and construction of the evaluation system, share resources and experience, promote the national vocational education evaluation system database, and vocational skills certification mutual communication, the establishment of digital resource database, and promote the development of innovative vocational education evaluation system.

5. Conclusion

The innovative vocational education evaluation system in the era of artificial intelligence is an inevitable choice to conform to the development of the times, and a necessary requirement for national strategic development. The rapid development of artificial intelligence will inevitably impact the development of traditional vocational education, but the emerging artificial intelligence technology also brings new opportunities and challenges. With the rapid development of artificial intelligence, the path study of vocational education evaluation system in this paper is a process of continuous exploration and improvement. It is necessary to firmly grasp the development of artificial intelligence, constantly improve the vocational education evaluation system, promote the high-quality development of vocational education, and lay a solid foundation for training high-quality technical and technical talents needed by the country and society.

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