Research on Teaching Quality Assurance and Evaluation of Vocational Undergraduate Education Based on Big Data

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Abstract

With the rapid development of information technology, big data has become an important driving force for innovation and development in various industries. In the field of education, the application of big data technology has brought unprecedented opportunities and challenges to teaching quality assurance and evaluation. Vocational undergraduate education, as an important component of higher education, has a direct impact on students' career development and social needs. Therefore, how to use big data technology to ensure and evaluate the teaching quality of vocational undergraduate education has become an urgent problem to be solved. This article will focus on the application of big data technology in teaching quality assurance and evaluation of vocational undergraduate education, discussing its current situation, problems, influencing factors, as well as the construction and empirical research of the assurance and evaluation model.

Keywords

Big data; Vocational undergraduate; Teaching quality assurance and evaluation.

1. Application Status and Problems of Big Data Technology in Teaching Quality Assurance and Evaluation of Vocational Undergraduate Education

With the development of information technology, big data has been widely used in many fields. In the field of vocational undergraduate education, the application of big data technology is gradually becoming popular. Currently, many colleges and universities have begun to use big data technology to ensure and evaluate teaching quality. These technologies include data mining, machine learning, artificial intelligence, etc. By collecting and analyzing various data in the teaching process, real-time monitoring and scientific evaluation of teaching quality can be achieved. However, in practical applications, there are still some problems in the application of big data technology in teaching quality assurance and evaluation of vocational undergraduate education.

Firstly, the diversity and complexity of data sources. In vocational undergraduate education, the source of big data is very extensive, including student information, course information, teacher information, teaching facilities and equipment, etc. These data are diverse and complex, requiring effective integration and analysis to provide comprehensive and accurate teaching quality assurance and evaluation.

Secondly, the difficulty of data processing and analysis. Due to the particularity of vocational undergraduate education, teaching quality assurance and evaluation require processing and analyzing a large amount of data, including structured and unstructured data. This requires the use of efficient and accurate data processing and analysis techniques to extract useful information to support teaching quality assurance and evaluation.

Thirdly, data security and privacy protection. When applying big data technology to teaching quality assurance and evaluation, a large amount of sensitive information needs to be collected, such as student personal information, teacher teaching information, etc. The security and privacy protection of these information is an important issue that requires effective measures to protect data security and privacy.

Fourthly, lack of professional talent and technical support. The application of big data technology requires professional technical talents and teams for development and maintenance. However, currently there is a lack of sufficient professional talent and technical support in vocational undergraduate colleges, which limits the application of big data technology in teaching quality assurance and evaluation.

Fifthly, standardization and normalization of teaching quality assurance and evaluation. Although the application of big data technology provides new means and methods for teaching quality assurance and evaluation, there is currently no unified standard and specification, leading to differences in teaching quality assurance and evaluation among different colleges and lack comparability reliability.

In conclusion, the application of big data technology in teaching quality assurance and evaluation of vocational undergraduate education is still in its infancy, and further exploration and practice are needed. Currently, the problems mainly focus on the diversity of data sources, the difficulty of data processing and analysis, data security and privacy protection, professional talent and technical support, as well as the standardization and normalization of teaching quality assurance and evaluation.

2. Factors Affecting the Teaching Quality of Vocational Undergraduate Education

Teaching quality is the core of vocational undergraduate education, and the factors that affect teaching quality are diverse. The following five factors are mainly influential.

Teacher factors: Teachers are the leaders in the teaching process, and their educational philosophy, teaching ability, professional literacy, etc., will have a direct impact on teaching quality. If teachers lack advanced educational philosophy, inadequate teaching ability, or insufficient professional literacy, it will lead to a decline in teaching quality. Additionally, teachers' teaching attitude and sense of responsibility will also affect teaching quality. If teachers do not take teaching seriously and lack a sense of responsibility, then teaching quality cannot be guaranteed.

Student factors: Students are the main body of the teaching process, and their learning attitude, learning ability, and learning outcomes will also affect teaching quality. If students have improper learning attitudes, weak learning abilities, or poor learning outcomes, it will lead to a decline in teaching quality. Therefore, vocational undergraduate colleges should focus on cultivating students' autonomous learning ability and practical operation ability, improve students' learning outcomes, thereby improving teaching quality.

Curriculum and teaching content: Curriculum and teaching content are important factors that affect teaching quality. If the curriculum is not well designed and the teaching content is outdated and not practical, it will lead to a decline in teaching quality. Therefore, vocational undergraduate colleges should constantly update their curriculum and teaching content based on industry development and market demand, focus on combining theory with practice, and improve students' practical operation ability and employment competitiveness.

Teaching facilities and resources: Teaching facilities and resources are the basic conditions for ensuring teaching quality. If the teaching facilities are not complete and the teaching resources are insufficient, it will lead to a decline in teaching quality. Therefore, vocational undergraduate

colleges should focus on the construction and development of teaching facilities and resources, improve the quantity and quality of teaching facilities and resources, and provide students with better learning conditions.

Teaching management: Teaching management is an important means to ensure teaching quality. If the teaching management is not standardized and scientific, it will lead to a decline in teaching quality. Therefore, vocational undergraduate colleges should establish a sound teaching management system, formulate scientific teaching management regulations, strengthen quality monitoring and management of the teaching process, and improve teaching quality.

There are also interactions between these factors. For example, teacher factors affect the selection and implementation of curriculum and teaching content, while student factors affect teachers' teaching methods and teaching effectiveness. Curriculum and teaching content also affect students' learning attitudes and effectiveness. Therefore, improving the quality of vocational undergraduate education requires comprehensive consideration of the impact of these factors and their mechanisms, as well as systematic improvement and optimization. At the same time, it is also necessary to strengthen coordination and cooperation among various factors to create a favorable teaching environment and promote the continuous improvement of teaching quality.

3. The Construction of The Teaching Quality Guarantee and Evaluation Model for Vocational Undergraduates Based on Big Data

The construction of the teaching quality guarantee and evaluation model for vocational undergraduates based on big data is a systematic and complex project that involves multiple aspects. Relying on the integration platform of teaching and management, focusing on the core requirements of professional construction, connecting teaching evaluation with intelligent teaching systems, and constructing a systematic teaching quality monitoring system from four perspectives: data collection, data analysis, problem diagnosis, and intelligent decision-making, to achieve multi-dimensional real-time teaching evaluation.

3.1. Data collection

Data collection is the foundation of the entire model construction, and its purpose is to obtain comprehensive and accurate data on teaching quality. In the process of data collection, data needs to be collected from multiple dimensions and perspectives, including but not limited to teacher information, student information, curriculum settings, teaching resources, teaching management, etc. Specifically, data can be collected through the following ways:

Academic management system: obtain basic information such as teachers, students, and courses, as well as teaching plans and course schedules from the academic management system.

Teaching quality monitoring system: collect data on teacher teaching quality evaluation, student feedback, peer evaluation, etc. through the teaching quality monitoring system.

Student management system: obtain data on student performance, attendance rates, learning status, etc. from the student management system.

Industry surveys and feedback: understand graduate employment situation, industry needs and feedback on teaching quality through industry surveys and school-enterprise cooperation.

Network public opinion analysis: use network public opinion analysis tools to analyze and mine comments and feedback on the school's teaching quality on the internet.

3.2. Data analysis

Data analysis is a key part of model construction, and its purpose is to extract useful information from a large amount of data and discover the factors that affect teaching quality and their

mechanisms. In the data analysis stage, some data analysis methods and tools can be used, such as descriptive statistics, clustering analysis, association rule mining, decision tree classification, etc., to conduct in-depth analysis of teaching quality-related data. By refining and analyzing teaching evaluation data, important data that reflect teaching laws can be derived, and then teaching experience can be mined from important data to guide teachers' teaching work, thus having a crucial impact on improving teaching quality and efficiency. Through data analysis, potential problems and laws can be discovered, providing scientific evidence for teaching quality and evaluation.

3.3. Result feedback

Result feedback is the last part of model construction, and its purpose is to timely feedback the results of data analysis to relevant personnel to achieve in-depth analysis of learning conditions so as to adjust teaching strategies and improve teaching quality in a timely manner. Implement scientific educational diagnosis, provide dynamic decision-making management, and improve the school's educational informationization level and teaching management refinement level. Typically, promptly reflecting the teaching laws contained in teaching evaluation results plays an important role in promoting the smooth development of teaching evaluation work. In the process of publishing teaching evaluation results, it is necessary to pay attention to using statistical methods such as charts and tables to visually present the teaching evaluation results so that teachers can timely and accurately obtain the teaching evaluation results. It is also necessary to formulate corresponding improvement measures and plans based on the feedback results, and supervise their implementation and execution. Through result feedback and implementation of improvement measures, the teaching quality of vocational undergraduate colleges can be gradually improved.

In conclusion, the construction of the teaching quality guarantee and evaluation model for vocational undergraduates based on big data is a complex and systematic project that requires comprehensive consideration of multiple factors and links. By constructing a scientific and reasonable model, the teaching quality of vocational undergraduate colleges can be improved, promoting their sustainable development. At the same time, it is also necessary to pay attention to issues such as data security and privacy protection to ensure the compliance and legality of the research process.

4. Conclusion

This article conducts an in-depth discussion on the application of big data technology in the quality assurance and evaluation of vocational undergraduate education, and finds that big data technology has important value and potential in teaching quality assurance and evaluation. However, there are still some problems that need to be addressed in practical applications. At the same time, there are various factors that affect the quality of vocational undergraduate education, and it is necessary to comprehensively consider the interaction of various factors. The construction and empirical research results of the big data-based vocational undergraduate teaching quality assurance and evaluation model indicate that the model is feasible and effective, and can provide strong support for improving the teaching quality of vocational undergraduate education. Therefore, in the future, we should further deepen the research and practical exploration of big data technology in the quality assurance and evaluation of vocational undergraduate education, in order to improve the quality of vocational undergraduate talent training.

Acknowledgments

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