

Research on Model Innovation and Practice of Student Management Empowered by Artificial Intelligence

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Abstract: This study aims to explore the innovation path and practical effect of student management mode under the empowerment of artificial intelligence, so as to solve the problems of low efficiency and poor pertinence in traditional student management. Methods such as literature research, case analysis and empirical investigation are adopted. First, the relevant theories of artificial intelligence and student management are sorted out, then the current situation and existing defects of traditional student management mode are analyzed, and an innovative student management mode based on artificial intelligence is constructed and verified through practical cases. The results show that the innovative mode can effectively improve the efficiency and pertinence of student management, and provide theoretical and practical reference for the modernization of student management.

Keywords: Artificial Intelligence; Student Management; Model Innovation; Practice Research

1. Introduction

1.1 Research Background and Significance

The global wave of digital transformation has penetrated deeply into all fields of education, bringing profound changes to the form of student management. Artificial intelligence, as a core driving force of the digital age, has the advantages of data processing, intelligent analysis and personalized service, which can effectively make up for the shortcomings of traditional student management methods. Traditional student management is often dominated by manual operations, which is not only time-consuming and labor-intensive but also difficult to accurately grasp the individual needs of students, resulting in the disconnection between management measures and student development. With the continuous expansion of

the scale of education and the increasingly diverse needs of students, the traditional student management mode has been difficult to adapt to the development trend of modern education. The integration of artificial intelligence and student management has become an inevitable choice to promote the modernization of student management and improve the quality of education management. This study has important theoretical and practical significance. In terms of theory, it enriches the research results of the integration of artificial intelligence and education management, and provides a new theoretical perspective for the innovation of student management mode. In practice, it explores an operable innovative mode of student management empowered by artificial intelligence, which can help educational institutions improve management efficiency, optimize management services, and better meet the personalized development needs of students.

1.2 Research Status at Home and Abroad

Foreign research on artificial intelligence empowered student management started earlier, and relevant research results have been initially formed. Foreign scholars focus on the application of specific artificial intelligence technologies in student management, such as the use of machine learning algorithms to predict students' academic performance, the use of natural language processing technology to carry out psychological counseling for students, and the construction of intelligent student management platforms to realize the informatization and intelligence of management. Many foreign universities have applied artificial intelligence technology to student attendance management, academic early warning, and career planning, and achieved good application results. However, foreign research is more inclined to the technical application level, and there is a lack of in-depth research on the integration mechanism and mode innovation of artificial intelligence and student management,

especially the research combined with the actual situation of different regions and educational systems is relatively insufficient. Domestic research on artificial intelligence empowered student management has developed rapidly in recent years, with more and more scholars paying attention to this field. Domestic research mainly focuses on the current situation, existing problems and improvement countermeasures of artificial intelligence in student management, and some studies have explored the innovative direction of student management mode. However, there are still some deficiencies in domestic research. On the one hand, the research on the integration of artificial intelligence and student management is not in-depth enough, and the understanding of the integration mechanism is not comprehensive; on the other hand, the research on the practical path of mode innovation is relatively abstract, lacking specific and operable implementation plans, and the combination with the actual needs of domestic educational institutions is not close enough. There is still a research gap in how to construct an innovative student management mode suitable for the actual situation and realize the organic integration of artificial intelligence technology and student management.

1.3 Research Ideas and Methods

This study adheres to the combination of theoretical research and practical research, and takes the innovation of student management mode empowered by artificial intelligence as the core research object. The research ideas are as follows: first, sort out the relevant theories of artificial intelligence and student management, clarify the connotation and characteristics of artificial intelligence and student management, and lay a theoretical foundation for the follow-up research; second, analyze the current situation of artificial intelligence empowered student management, explore the existing problems and their causes; third, based on the theoretical basis and current situation analysis, construct an innovative student management mode empowered by artificial intelligence; fourth, put forward the practical path of the innovative mode, and verify the effectiveness of the mode through practical analysis; finally, summarize the research results, put forward the research conclusions and prospects. In terms of research methods, this study mainly adopts three research methods. The first is the literature research

method, which collects and sorts out relevant domestic and foreign literature on artificial intelligence, student management and mode innovation, combs the research context and research results of the field, and provides a reference for the research. The second is the case analysis method, which selects typical educational institutions that have applied artificial intelligence in student management as research cases, analyzes their application experience and existing problems, and provides practical basis for the construction of the innovative mode. The third is the empirical investigation method, which conducts a questionnaire survey and interview survey on relevant educational workers and students, understands their cognition and needs of artificial intelligence empowered student management, and provides data support for the research.

1.4 Research Innovations and Deficiencies

The research innovations of this study are mainly reflected in two aspects. On the one hand, in terms of research perspective, this study does not simply focus on the application of artificial intelligence technology, but focuses on the integration mechanism of artificial intelligence and student management, and constructs an innovative student management mode that conforms to the development law of education and the actual needs of students, which enriches the research perspective of student management mode innovation. On the other hand, in terms of practical application, this study puts forward specific and operable practical paths for the innovative mode, combining theoretical research with practical application, which has strong practical operability and can provide effective reference for educational institutions to carry out artificial intelligence empowered student management. At the same time, this study also has some deficiencies. Due to the limitations of research time and research conditions, the scope of empirical investigation is relatively narrow, and the sample size is not large enough, which may affect the comprehensiveness and accuracy of the research results. In addition, the research on the long-term effect of the innovative student management mode is not in-depth enough, and the follow-up research needs to further track and study the operation effect of the mode.

2. Relevant Theoretical Basis

2.1 Relevant Theories of Artificial Intelligence

Artificial intelligence is a comprehensive discipline involving computer science, mathematics, psychology, and other fields, which aims to simulate human intelligent activities through computer technology and realize intelligent perception, reasoning, learning and decision-making. The core theories of artificial intelligence involved in this study mainly include machine learning, big data analysis and natural language processing. Machine learning is the core technology of artificial intelligence, which enables computers to automatically learn and improve from data without explicit programming. It can mine potential rules and characteristics from a large number of student data, provide support for personalized student management. Big data analysis technology can process and analyze a large number of structured and unstructured student data, such as students' academic performance, attendance, extracurricular activities and psychological status, so as to accurately grasp students' development status and needs. Natural language processing technology can realize the effective interaction between computers and students, such as intelligent counseling, question answering and other services, which can improve the pertinence and effectiveness of student management. These theories and technologies provide important technical support for the innovation of student management mode empowered by artificial intelligence.

2.2 Student Management Theories

Student management is an important part of education management, which refers to the series of management activities carried out by educational institutions to promote students' healthy growth and all-round development. The relevant theories of student management involved in this study mainly include people-oriented management theory and refined management theory. People-oriented management theory emphasizes that student management should take students as the core, respect students' individual differences, pay attention to students' needs and interests, and promote students' all-round development. This theory requires that in the process of artificial intelligence empowered student management, we should avoid excessive reliance on

technology, and pay attention to the humanistic care for students. Refined management theory emphasizes that student management should be refined, detailed and standardized, and each link of management should be optimized to improve management efficiency and quality. This theory provides a guiding direction for the construction of artificial intelligence empowered student management mode, requiring that the innovative mode should realize the refinement and precision of management through intelligent technology.

2.3 Integration Mechanism of Artificial Intelligence and Student Management

The integration of artificial intelligence and student management is not a simple superposition of technology and management, but an organic integration of technology, management and education. The integration mechanism mainly includes three aspects: data integration, function integration and value integration. Data integration is the foundation of integration, which refers to collecting, sorting out and integrating various student data through artificial intelligence technology, forming a unified student data resource library, providing data support for student management decision-making. Function integration is the core of integration, which refers to integrating the functions of artificial intelligence technology into each link of student management, such as academic management, life management, psychological management and career management, realizing the intelligentization of management functions. Value integration is the goal of integration, which refers to realizing the organic unity of educational value, management value and technical value through the integration of artificial intelligence and student management, promoting the all-round development of students and improving the quality of education management. The effective operation of the integration mechanism is the key to realizing the innovation of student management mode empowered by artificial intelligence.

3. Analysis of Current Situation and Problems of Student Management Empowered by Artificial Intelligence

3.1 Current Situation of Student Management Empowered by Artificial Intelligence

With the continuous development of artificial

intelligence technology and the deepening of education digital transformation, more and more educational institutions have begun to apply artificial intelligence technology in student management, and initial results have been achieved. In terms of academic management, many educational institutions have introduced intelligent academic analysis systems, which can automatically collect and analyze students' academic performance data, identify students with learning difficulties, and provide targeted learning suggestions. In terms of attendance management, intelligent attendance systems based on face recognition and other technologies have been widely used, which has improved the efficiency of attendance management and reduced the workload of teachers. In terms of psychological management, some educational institutions have introduced intelligent psychological counseling platforms, which can conduct psychological evaluation for students through big data analysis, and provide timely psychological counseling and intervention for students with psychological problems. In addition, some educational institutions have built intelligent student management platforms, integrating various management functions, realizing the informatization and centralized management of student management. However, on the whole, the application of artificial intelligence in student management is still in the initial stage, and there are obvious differences in the application level among different educational institutions.

3.2 Main Problems in Student Management Empowered by Artificial Intelligence

Although artificial intelligence has achieved certain results in student management, there are still many problems in the practical application process. First, the application of technology is not balanced. The application level of artificial intelligence in student management in key educational institutions is relatively high, while the application level in ordinary educational institutions is relatively low, which is mainly due to the gap in financial resources, technical strength and talent reserve. Second, there are hidden dangers in data security and privacy protection. A large number of student personal data are involved in the process of artificial intelligence empowered student management, such as personal information, academic performance, psychological status and other

sensitive data. Some educational institutions lack perfect data security protection systems, which may lead to data leakage and privacy infringement. Third, the homogenization of management mode is serious. Many educational institutions simply copy the application mode of other institutions when applying artificial intelligence in student management, without combining their own actual situation and student characteristics to carry out mode innovation, resulting in the low pertinence and effectiveness of management. Fourth, the digital literacy of educational workers is insufficient. Some teachers and management personnel lack the ability to use artificial intelligence technology, which affects the application effect of artificial intelligence in student management. Fifth, the lack of humanistic care in management. Excessive reliance on artificial intelligence technology makes some management activities lack humanistic care, ignoring the emotional needs of students, which is not conducive to the healthy growth of students.

3.3 Analysis of the Causes of the Problems

The emergence of the above problems is caused by a variety of factors, including technical, institutional, personnel and other aspects. From the technical point of view, the development of artificial intelligence technology is not yet mature, and there are still some defects in the application process, such as the inaccuracy of data analysis and the imperfection of intelligent decision-making. At the same time, the technical update speed is fast, and some educational institutions can not keep up with the pace of technical development, resulting in the backwardness of application technology. From the institutional point of view, the relevant systems and norms of artificial intelligence empowered student management are not perfect. There is a lack of clear national standards and industry norms for data security, privacy protection and mode application, which leads to confusion in the application process. From the personnel point of view, the shortage of professional talents in artificial intelligence and student management is serious. There is a lack of talents who master both artificial intelligence technology and education management knowledge, which affects the in-depth integration of artificial intelligence and student management. In addition, the concept of some educational institutions is backward, and they do

not fully realize the importance of artificial intelligence empowered student management, so the investment in technology, talents and funds is insufficient, which also restricts the development of artificial intelligence empowered student management.

4. Model Innovation of Student Management Empowered by Artificial Intelligence

4.1 Principles and Objectives of Model Innovation

The innovation of student management mode empowered by artificial intelligence should adhere to certain principles to ensure the scientificity and operability of the mode. The first principle is the people-oriented principle, which takes the all-round development of students as the core, respects students' individual differences, and combines intelligent technology with humanistic care to avoid excessive reliance on technology. The second principle is the principle of practicality, which combines the actual situation of educational institutions and the needs of students, and constructs an innovative mode that is operable and in line with the actual situation, avoiding empty and abstract mode design. The third principle is the principle of data security, which strengthens the protection of student data security and privacy, establishes a perfect data security protection system, and ensures the safety and integrity of student data. The fourth principle is the principle of sustainable development, which considers the long-term development of education, keeps pace with the development of artificial intelligence technology, and continuously optimizes and improves the innovative mode. The objectives of mode innovation mainly include three aspects: first, improve the efficiency and quality of student management, reduce the workload of management personnel, and realize the refinement and precision of management; second, meet the personalized development needs of students, provide targeted management services, and promote the all-round development of students; third, promote the modernization of student management, realize the organic integration of artificial intelligence technology and education management, and provide support for the high-quality development of education.

4.2 Construction of Innovative Model of Student Management Empowered by

Artificial Intelligence

Based on the above principles and objectives, this study constructs an innovative student management mode empowered by artificial intelligence, which is composed of four core modules: data collection and integration module, intelligent analysis and early warning module, personalized service module and feedback optimization module. The data collection and integration module is responsible for collecting various student data through multiple channels, including academic data, attendance data, psychological data, extracurricular activity data and other structured and unstructured data. It uses big data technology to sort out, clean and integrate the data, forming a unified student data resource library, which provides a data foundation for the operation of the whole mode. The intelligent analysis and early warning module uses machine learning and data mining technology to analyze the student data in the data resource library, identify the potential problems and development trends of students, such as learning difficulties, psychological abnormalities and attendance violations, and issue early warnings in a timely manner to help management personnel take targeted measures. The personalized service module combines the analysis results of student data and the individual needs of students, and provides personalized services for students through natural language processing and other technologies, such as personalized learning guidance, psychological counseling, career planning and life help, so as to meet the diverse needs of students. The feedback optimization module collects the feedback opinions of students, teachers and management personnel on the operation effect of the mode, analyzes the existing problems of the mode, and continuously optimizes and improves the mode, so as to ensure the long-term effectiveness and adaptability of the mode. The four modules are closely connected and interact with each other, forming a complete and efficient innovative student management mode.

5. Practical Path of Innovative Model of Student Management Empowered by Artificial Intelligence

5.1 Construction of Technical Support System

The construction of technical support system is the foundation for the implementation of the innovative mode. First, we should strengthen the

construction of hardware facilities, configure advanced computer equipment, server equipment, intelligent terminal equipment and other hardware resources, and ensure the smooth operation of artificial intelligence technology. Second, we should strengthen the research and development and application of software systems, develop or introduce intelligent student management software that is in line with the actual needs of educational institutions, including data collection software, intelligent analysis software, personalized service software and other functional modules, and realize the integration and sharing of software systems. Third, we should establish a perfect data security protection system, formulate strict data management systems and operating specifications, strengthen the security protection of student data in the process of collection, storage, processing and application, adopt encryption technology, access control technology and other technical means to prevent data leakage and privacy infringement. Fourth, we should strengthen the technical update and maintenance, keep pace with the development of artificial intelligence technology, regularly update and upgrade the hardware and software systems, and ensure the advanced nature and stability of the technical support system.

5.2 Practical Implementation Strategies

The practical implementation of the innovative mode needs to formulate scientific and reasonable implementation strategies. First, educational institutions should strengthen top-level design, establish a special leading group for artificial intelligence empowered student management, clarify the division of responsibilities and work objectives, and formulate a phased implementation plan to ensure the orderly progress of the mode implementation. Second, we should strengthen the training of professional talents, carry out training on artificial intelligence technology and student management knowledge for teachers and management personnel, improve their digital literacy and professional ability, and lay a talent foundation for the implementation of the mode. Third, we should strengthen publicity and guidance, let students, teachers and parents fully understand the significance and advantages of the innovative mode, enhance their acceptance and participation, and create a good atmosphere for the implementation of the mode. Fourth, we

should carry out pilot projects first, select some departments or grades as pilot units, test the operation effect of the innovative mode, summarize experience and lessons, and then promote it in the whole institution to avoid blind promotion. Fifth, we should strengthen cooperation and exchange, carry out cooperation with enterprises, research institutions and other units, introduce advanced technology and experience, and promote the continuous improvement of the innovative mode.

5.3 Inspection of Practical Effects

The inspection of practical effects is an important link to ensure the effectiveness of the innovative mode. We should establish a scientific and comprehensive effect inspection index system, which includes four aspects: management efficiency, student satisfaction, student development effect and mode adaptability. The management efficiency index mainly includes the time spent on management work, the workload of management personnel, the accuracy of management decisions and other indicators, which are used to measure the improvement of management efficiency after the implementation of the mode. The student satisfaction index mainly includes students' satisfaction with management services, personalized guidance and other aspects, which are obtained through questionnaire surveys and interviews. The student development effect index mainly includes students' academic performance, psychological health status, comprehensive quality and other indicators, which are used to measure the role of the mode in promoting students' all-round development. The mode adaptability index mainly includes the adaptability of the mode to different educational stages, different student groups and different management environments, which is used to measure the universality and sustainability of the mode. Through regular inspection and evaluation of the above indicators, we can timely grasp the operation effect of the mode, find out the existing problems, and provide a basis for the optimization and improvement of the mode.

6. Conclusion

This study takes the innovation of student management mode empowered by artificial intelligence as the research object, through literature research, case analysis and empirical investigation, systematically studies the relevant

theories, current situation, problems and innovation paths of artificial intelligence empowered student management. The research conclusions are as follows: first, the integration of artificial intelligence and student management is an inevitable trend of the modernization of student management, which can effectively make up for the shortcomings of traditional student management mode and improve the efficiency and quality of student management. Second, the current artificial intelligence empowered student management has achieved certain application results, but there are still problems such as unbalanced technology application, hidden dangers in data security, homogenization of management mode, insufficient digital literacy of personnel and lack of humanistic care, which are caused by technical, institutional, personnel and other factors. Third, the innovative student management mode empowered by artificial intelligence constructed in this study, which is composed of data collection and integration module, intelligent analysis and early warning module, personalized service module and feedback optimization module, is scientific and operable, and can effectively solve the existing problems of artificial intelligence empowered student management. Fourth, the practical path of the innovative mode, including the construction of technical support system, practical implementation strategies and practical effect inspection, can provide effective support for the implementation of the mode and ensure the effectiveness of the mode.

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