

Research on Innovative Models and Practical Paths of Empowering Education Management with Artificial Intelligence

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Abstract: With the rapid development of artificial intelligence technology, its application in the field of education has gradually become a key force in promoting educational management reform. This article aims to explore how artificial intelligence can empower educational management, analyze its innovative models and practical paths. Through in-depth research on the application of artificial intelligence in school management, teaching resource allocation, personalized learning, and subject teaching, this article summarizes the potential of artificial intelligence in improving educational management efficiency, optimizing resource allocation, and promoting educational equity. Research has shown that artificial intelligence can not only improve the accuracy and intelligence level of education management, but also help education managers optimize the decision-making process through data analysis and intelligent decision support. In addition, the auxiliary role of artificial intelligence makes personalized learning and teaching more precise, which helps to achieve the intelligent and personalized transformation of education.

Keywords: artificial intelligence, educational management, intelligent education

1. Introduction

In the global education field, with the continuous development of information technology, education management is facing increasingly severe challenges. The traditional education management model often relies on manual labor and experience, lacking data support, resulting in uneven allocation of educational resources, low management efficiency, and difficulties in evaluating and monitoring educational quality. In this context, artificial intelligence (AI), as an emerging technology, is gradually being applied in educational management. Its powerful data processing ability, adaptive learning ability, and decision support ability bring new possibilities for educational management.

In recent years, the application of artificial intelligence in the field of education has gradually expanded, from intelligent teaching and personalized learning to educational data analysis and intelligent decision support systems, gradually changing all aspects of education[1]. Especially in education management, artificial intelligence technology provides innovative solutions for education management through data-driven, intelligent decision-making, personalized services, and other means. Through artificial intelligence technology, education managers can achieve more precise allocation of educational resources, more efficient decision support systems, more flexible personalized education arrangements, and more scientific evaluation of educational quality. However, despite the enormous potential of artificial intelligence in educational management, the current field of educational management still faces many challenges in the process of AI empowerment. How to solve the problems of data privacy protection, ensure educational equity, overcome technological adaptability issues, and improve policy and regulatory support are all key issues that urgently need to be addressed. Therefore, how to build an innovative education management model that can fully leverage the advantages of artificial intelligence has become an important topic in the current field of education management research.

This study aims to explore innovative models and practical paths for empowering educational management with artificial intelligence. Through in-depth analysis of the current application status, development trends, and challenges faced by artificial intelligence technology in educational management, practical innovative models and implementation paths are proposed to explore effective paths for innovation in educational management systems. Through this study, it is expected to provide

theoretical support and practical guidance for policy makers, education managers, and educational technology practitioners, and promote the modernization and intelligence of education management.

2. Theoretical basis of artificial intelligence and educational management

With the rapid development of information technology and artificial intelligence, the theoretical basis of educational management is also constantly changing [2]. Artificial intelligence is not only a revolutionary technology in the field of education management, but also provides a new perspective and practical path for the theoretical system of education management. In order to gain a deeper understanding of how artificial intelligence empowers educational management, it is necessary to start with the basic concepts of artificial intelligence and educational management, and explore the intersection and theoretical background of the two.

2.1 Basic concepts and development history of artificial intelligence

Artificial Intelligence (AI) refers to computer systems or programs that simulate and extend human intelligence. It not only possesses abilities such as perception, reasoning, learning, understanding, decision-making, and natural language processing, but also can self adjust and optimize based on data and environment. The basic concepts of artificial intelligence include machine learning, deep learning, natural language processing, computer vision, and other technologies. These technologies enable computer systems to mimic human cognitive processes and make intelligent decisions in various complex environments.

The development process of artificial intelligence can be divided into several main stages. Early exploration (1940s-1950s) was the initial stage of artificial intelligence research, mainly focusing on the Turing test and the basic theory of intelligent machines. Alan Turing's "Turing test" became the fundamental concept of artificial intelligence. Next, semiotics and rule-based systems (1960s-1970s) became the focus of research, emphasizing symbol based reasoning and rule-based systems, expert systems, and knowledge bases as typical achievements of this period, making decisions through reasoning rules. Entering the 1980s-1990s, with the improvement of computing power, artificial intelligence research turned to statistical methods, and machine learning gradually became mainstream. The emergence of algorithms such as support vector machines and decision trees marked the rise of statistical learning. Since the 2000s, breakthroughs in deep learning and neural networks have led to the rapid development of artificial intelligence. The training of massive amounts of data has enabled deep neural networks to achieve significant results in fields such as image recognition and natural language processing. The development of cloud computing and big data technology has further promoted the popularization of artificial intelligence in various industries, and education management has also begun to integrate into this trend. The continuous development of artificial intelligence provides unlimited possibilities for innovation in educational management, expanding it from data processing and analysis to fields such as personalized learning and intelligent decision-making.

2.2 Connotation and objectives of educational management

Educational management refers to the systematic activities of planning, organizing, leading, controlling, and evaluating educational activities, resources, policies, and development. Its goal is to improve the quality of education, optimize the allocation of educational resources, and promote educational equity and sustainable development through effective management.

The connotation of educational management covers multiple aspects. Firstly, it is the setting and achievement of educational goals. Managers need to determine educational goals and promote their realization through rational allocation of resources, organizational coordination, and process management. These goals not only include the improvement of academic achievements, but also involve the comprehensive development of students and the cultivation of innovative abilities. Secondly, optimizing the allocation of educational resources is crucial, and managers should allocate resources such as teachers, teaching equipment, and teaching materials reasonably based on the actual situation of the school to ensure the efficient conduct of educational activities. At the same time, the supervision and evaluation of the educational process is also an important function of management, involving real-time monitoring and evaluation of teaching quality, student learning progress, and teacher performance. In addition, education management should focus on educational equity and sustainable development, ensure fair distribution of resources, narrow the education gap between

regions and groups, and develop long-term plans to ensure the sustainability of the education system. Ultimately, the goals of educational management include improving the quality of education, achieving educational equity, optimizing resource allocation, and enhancing efficiency. In this process, with the development of information technology, education management is gradually transforming towards intelligence and dataization, and artificial intelligence, as an emerging technology, is playing an increasingly important role.

2.3 Integration theory of artificial intelligence and educational management

The integration of artificial intelligence and educational management mainly plays a role in the allocation of educational resources, evaluation of educational quality, and intelligent teaching through data-driven, intelligent analysis, personalized decision-making, and other methods [3]. The integration of the two involves the continuous development of artificial intelligence technology and changes in educational management needs, thus giving rise to a series of fusion theories and application models.

The application of artificial intelligence in educational management has promoted innovation in educational decision-making theory, resource allocation, personalized learning, and quality assessment. Through big data analysis and deep learning, AI can extract valuable information from massive educational data, helping education managers make accurate decisions. For example, based on students' academic performance, behavioral data, and psychological state, managers can adjust teaching plans and methods to ensure the provision of personalized educational services. At the same time, AI can intelligently allocate educational resources based on the actual needs of schools, and improve the efficiency and accuracy of resource allocation by analyzing student progress and teacher teaching effectiveness. In addition, the application of artificial intelligence in personalized learning can tailor learning plans for each student, helping them make progress on the best learning path, especially in disadvantaged groups and remote areas, and promoting educational equity. AI also evaluates and monitors the quality of education by analyzing homework, exams, and classroom performance. It not only focuses on academic performance, but also combines emotional and behavioral analysis to assess students' mental health and social adaptability. In short, the continuous development of artificial intelligence not only promotes the enrichment and improvement of educational management theory, but also lays the foundation for the intelligent and precise development of educational management.

Through the analysis of the theoretical foundation above, it can be seen that artificial intelligence not only provides strong technical support for educational management, but also provides new ideas for the innovation and development of its theoretical system. In the future, artificial intelligence will play a greater role in various aspects of education management, promoting education management towards a more scientific, intelligent, and personalized direction.

3. Innovative models empowered by artificial intelligence for educational management

With the rapid development of artificial intelligence technology, the field of education management has also undergone revolutionary changes. AI not only plays an important role in teaching content and methods, but also demonstrates strong potential in various aspects of educational management.

3.1 Intelligent decision support system

Intelligent decision support system is one of the important applications of artificial intelligence in educational management. By analyzing a large amount of educational data, AI systems can provide scientific decision-making basis, helping education managers make more accurate and efficient decisions. AI can integrate students' academic performance, behavioral data, psychological status, and teaching resources to generate comprehensive analysis reports, providing data support for schools in developing teaching plans, adjusting curriculum arrangements, resource allocation, and other aspects. The intelligent decision support system can not only monitor the operation status of schools in real time, but also predict the future needs and development direction of schools based on historical data and trends, thereby improving the foresight and scientificity of decision-making.

3.2 Intelligent learning analysis and evaluation system

The intelligent learning analysis and evaluation system uses artificial intelligence technology to track students' learning progress and quality in real time, and comprehensively analyze students'

performance in the learning process. AI can evaluate students' learning status and timely identify problems and bottlenecks in learning by analyzing multidimensional data such as homework, exam scores, classroom interactions, and learning behaviors. This system is not limited to academic performance evaluation, but can also combine factors such as students' emotional analysis, learning interests, and behavioral habits to help teachers understand students' personalized needs and provide targeted educational support. In addition, intelligent learning analytics can generate personalized learning reports, provide detailed learning feedback for students and parents, promote home school interaction, and improve learning outcomes.

3.3 Intelligent teaching resources and platform management

In educational management, intelligent teaching resources and platform management have become the key to improving teaching efficiency and quality. AI can intelligently allocate teaching resources based on students' learning needs and teachers' teaching objectives. For example, AI can intelligently recommend and allocate teaching materials, video courses, online tutoring, and other resources based on the difficulty of the subject, the focus of the teaching content, and the learning status of the students. At the same time, educational platforms can dynamically adjust the presentation and pace of learning content based on teaching progress and feedback. In addition, AI can intelligently operate and manage online learning platforms, ensuring the stability and smoothness of the platform, and providing better user experience for students and teachers.

3.4 Intelligent campus management and security monitoring

Intelligent campus management and security monitoring are important components to ensure the normal operation of schools and the safety of students. AI achieves comprehensive monitoring of the campus environment by integrating various monitoring devices, sensors, intelligent cameras, and other technologies. For example, AI can use facial recognition technology to identify individuals entering and leaving the campus, ensuring the security of the campus. At the same time, intelligent monitoring systems can monitor students' behavior in real time, preventing the occurrence of campus violence, bullying and other adverse events. In terms of environmental management, AI can also monitor the energy consumption, air quality, temperature and humidity of schools in real time, optimize the use of campus resources, improve energy efficiency, and create a more suitable learning environment.

Overall, the innovative model of empowering education management with artificial intelligence not only improves the efficiency and accuracy of education management, but also provides strong technical support for the intelligent transformation of the education system. With the continuous maturity of AI technology, these innovative models will be further deeply integrated into various levels of education management, injecting new vitality into the future development of education.

4. Practical path of empowering education management with artificial intelligence

With the continuous development of artificial intelligence (AI) technology, its application in the field of education management is gradually deepening. Artificial intelligence can not only improve the efficiency and accuracy of educational management, but also promote innovation and change in educational methods. The following will explore in detail the practical path of artificial intelligence in education management, covering its applications in school management, educational resource allocation, teaching collaboration, and other aspects.

4.1 Application case analysis of artificial intelligence in school management

The application of artificial intelligence in school management has achieved some successful cases, especially in improving management efficiency, optimizing resource allocation, and enhancing safety management. For example, in student attendance management, many schools have adopted intelligent attendance systems based on facial recognition. This system not only improves the accuracy of attendance, but also greatly saves labor costs and avoids the situation of students using proxy attendance.

Artificial intelligence has also shown great potential in academic performance and behavioral analysis. Some schools use AI to analyze students' historical grades, classroom performance, mental health status, and other data, timely identify students' learning difficulties and psychological problems,

and provide personalized intervention suggestions for teachers. For example, through students' learning behavior data, AI can provide early warning to students who may experience learning difficulties, helping teachers and parents intervene early.

In addition, the intelligent campus security system is also a typical application of AI in school management. Through intelligent cameras and behavior recognition technology, schools can monitor abnormal behavior on campus in real time and promptly address potential safety hazards. These systems not only enhance campus security, but also provide timely information feedback and decision support for educational administrators.

4.2 Collaborative working mode between education management personnel and artificial intelligence

Although artificial intelligence can significantly improve the efficiency of education management, the role of education administrators is still indispensable. The application of AI should form a collaborative work mode with educational management personnel, leveraging the respective advantages of humans and machines. Education management personnel can use AI to provide data analysis, decision support, and other functions to optimize management processes, and focus more on humanized work such as strategic planning, maintaining teacher-student relationships, and building campus culture. For example, education administrators can use student learning analysis reports generated by AI systems to understand the learning progress and weak links of each class and individual students, and take corresponding teaching intervention measures. In addition, AI can assist education management personnel in course scheduling and teacher allocation, and use big data analysis to find the best way to allocate teaching resources, thereby improving the efficiency of educational resource utilization.

With the assistance of artificial intelligence, educational administrators can more accurately grasp the actual situation of school operations, reduce subjective biases in management, and enhance the transparency and scientificity of school management. AI technology helps education managers make more forward-looking decisions and promote the continuous optimization of the school education environment.

4.3 Intelligent education resource allocation and optimization path

Optimizing the allocation of educational resources is one of the core issues in improving the quality of education. With the development of artificial intelligence technology, the path of intelligent education resource allocation is gradually being explored and applied in practice. AI technology can intelligently recommend the most suitable resource allocation plan by analyzing students' learning needs, teachers' teaching needs, and the school's resource situation, thereby improving the efficiency of educational resource utilization.

Firstly, artificial intelligence can play an important role in the selection of course content and teaching methods. AI recommends personalized learning materials and instructional videos by analyzing students' learning preferences, progress, and comprehension abilities. For example, AI can use algorithms to select exercises and instructional videos of appropriate difficulty levels based on students' mathematical foundations, enabling students to learn within the appropriate difficulty range and improve learning efficiency. Secondly, AI can also optimize the allocation of resources and workload for teachers. By analyzing teachers' teaching styles and student feedback, AI can help schools arrange teachers' teaching time and class allocation reasonably. For example, AI can identify which teachers are good at a certain subject and which teachers can better handle students with learning difficulties in the classroom, thereby optimizing course arrangements and improving teaching effectiveness. Finally, AI can also optimize the configuration of hardware resources. For example, AI can monitor the usage of various equipment in schools, evaluate their utilization rate, detect equipment failures and overuse in advance, and promptly repair or replace them to ensure the smooth progress of teaching activities.

4.4 The auxiliary role of artificial intelligence in subject teaching

The auxiliary role of artificial intelligence in subject teaching cannot be underestimated. AI can assist teachers in better classroom management and instructional design through personalized learning, intelligent assessment, sentiment analysis, and other methods, while providing students with tailored

learning experiences.

AI can help students achieve personalized learning. By analyzing students' learning data, AI can evaluate their strengths and weaknesses in learning and recommend customized learning paths. For example, for English learners, AI can recommend suitable learning materials based on students' vocabulary, grammar mastery, etc., and track students' learning progress in real time, providing timely feedback. Artificial intelligence can assist teachers in automated evaluation and reduce their workload. AI systems can quickly correct students' homework, tests, and generate grade reports, and even provide immediate feedback to students, helping teachers save a lot of time and focus on classroom teaching and student interaction. In addition, the application of AI in sentiment analysis cannot be ignored. AI can identify students' emotional states by analyzing their facial expressions, language, and interactions in the classroom. This is very helpful for helping teachers understand students' emotional changes and adjust teaching strategies in a timely manner. For example, AI can detect that some students feel anxious or confused in the classroom and remind teachers to provide individual tutoring in a timely manner.

5. Conclusion

With the rapid development of artificial intelligence technology, the application prospects of artificial intelligence in the field of education management are broad. By exploring the innovative models and practical paths of empowering education management with artificial intelligence, it can be clarified that it has great potential in improving education management efficiency, optimizing educational resource allocation, and promoting personalized education.

Firstly, the application of artificial intelligence in school management not only improves the accuracy and efficiency of management, but also provides more intelligent solutions in safety management, student behavior analysis, and teaching resource allocation. AI systems help education managers manage and supervise more effectively through data-driven decision-making, thereby improving the overall management level of schools. Secondly, the collaborative work mode between education management personnel and artificial intelligence will become the mainstream of future education management. Artificial intelligence is not replacing the role of managers, but rather enhancing their decision support through automated and intelligent functions, freeing up their energy and allowing them to focus more on strategic planning and maintaining teacher-student relationships, promoting the construction of school culture. In terms of educational resource allocation, artificial intelligence provides a new path for educational managers. Through intelligent recommendation systems, personalized learning resources can be pushed, teacher resources can be reasonably allocated, and hardware facilities can be optimally used, thereby improving the efficiency of educational resource utilization and teaching effectiveness. Finally, the auxiliary role of artificial intelligence in subject teaching is of great significance. Through personalized learning, automated assessment, sentiment analysis, and other means, AI can help teachers achieve precise teaching and timely intervention, improve students' learning experience, and provide technical support for the intelligent transformation of future education.

In summary, the innovative models and practical paths of empowering education management with artificial intelligence have demonstrated significant advantages at multiple levels. With the continuous advancement of technology, artificial intelligence will further penetrate into various aspects of education management, promoting the intelligent, personalized, and scientific development of education management, and bringing profound changes to the education system.

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