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**THE ROLE OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN
ENHANCING HIGHER EDUCATION QUALITY AND THEIR IMPACT ON
ECONOMIC COMPETITIVENESS**

Abstract: Based on the background of the rapid development and wide application of artificial intelligence technology, this paper delves into its important role in improving the quality of higher education and economic competitiveness. The study aims to analyze the current status of the application of AI technology in higher education, the challenges it faces and the strategies to deal with them, as well as to assess its impact on economic competitiveness. The article points out that AI technology not only facilitates personalized teaching, teaching quality assessment and feedback optimization in higher education, but also promotes the optimal sharing of learning resources and research innovation. In addition, the article also emphasizes the key role of AI technology in promoting the match between talent cultivation and the job market, industrial upgrading and transformation, and the construction of the innovation ecosystem. The scientific novelty of this article lies in the fact that it not only systematically summarizes the results of the application of AI technology in the field of higher education and economy, but also looks forward to its future development prospects and potential impacts, which provides useful references for the research and practice in related fields.

Keywords: artificial intelligence technology, higher education quality, economic competitiveness, personalized teaching, industrial upgrading, innovation ecosystems

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РОЛЬ ТЕХНОЛОГИЙ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ПОВЫШЕНИИ КАЧЕСТВА ВЫСШЕГО ОБРАЗОВАНИЯ И ИХ ВЛИЯНИЕ НА ЭКОНОМИЧЕСКУЮ КОНКУРЕНТОСПОСОБНОСТЬ

Аннотация : На фоне быстрого развития и широкого применения технологии искусственного интеллекта в данной статье рассматривается ее важная роль в повышении качества высшего образования и экономической конкурентоспособности. Цель исследования - проанализировать текущее состояние применения технологии искусственного интеллекта в высшем образовании, проблемы, с которыми оно сталкивается, и стратегии их решения, а также оценить его влияние на экономическую конкурентоспособность. В статье отмечается, что технология ИИ не только способствует персонализации преподавания, оценке качества преподавания и оптимизации обратной связи в высшем образовании, но и способствует оптимальному совместному использованию учебных ресурсов и исследовательских инноваций. Кроме того, в статье подчеркивается ключевая роль технологии искусственного интеллекта в обеспечении соответствия между выращиванием талантов и рынком труда, модернизацией и трансформацией промышленности, а также созданием инновационной экосистемы. Научная новизна данной статьи заключается в том, что в ней не только систематически обобщаются результаты применения технологии ИИ в сфере высшего образования и экономики, но и рассматриваются перспективы ее будущего развития и потенциальные последствия, что дает полезные ориентиры для исследований и практики в смежных областях.

Ключевые слова: Технология Искусственного Интеллекта, Качество Высшего Образования, Экономическая Конкурентоспособность, Персонализированное Обучение, Модернизация Промышленности, Инновационные Экосистемы

Introduction

In recent years, artificial intelligence (AI) technology has become an important force for social progress with its amazing speed and wide range of application fields.

From smart manufacturing to smart cities, from healthcare to financial services, AI technology is everywhere, profoundly changing the way people live and work. In this context, the field of education, especially higher education, has also ushered in the profound impact of AI technology. [1] The application of AI technology in higher education is studied not only because of the advanced and innovative nature of the technology itself, but also because higher education, as an important position for cultivating the future pillars of the country, has a direct relationship between its quality and efficiency and the country's economic competitiveness and social progress. With the intensification of global competition, improving the quality of higher education has become an urgent task shared by governments and educational institutions.

The purpose of this paper is to explore in depth how artificial intelligence can enhance the quality of higher education and further analyze the impact of such enhancement on economic competitiveness. By systematically sorting out and analyzing the current status of the application of AI technology in higher education, it is possible to better understand how it can contribute to the innovation of teaching modes, the optimization of learning resources, and the improvement of scientific research. This paper will also explore how these changes provide strong support for the enhancement of economic competitiveness, providing useful references and insights for higher education institutions and policy makers.

Current status of the application of artificial intelligence technology in higher education

The application of artificial intelligence technology in the field of higher education has begun to bear fruit, bringing profound changes to the teaching mode and learning experience. Intelligent teaching systems use machine learning algorithms that can dynamically adjust the content and difficulty of teaching according to students' learning progress and feedback, realizing personalized teaching. These systems not only provide instant learning tutoring, but also provide targeted learning advice for teachers and students through predictive analysis. Online learning platforms, on the other hand, make use of artificial intelligence technology

to optimize the distribution and sharing of learning resources. Through the intelligent recommendation system, students can easily access resources and courses that match their learning needs, greatly improving learning efficiency. [2] At the same time, these platforms can also track students' learning status in real time through learning data analysis, provide teachers with teaching feedback, and help teachers adjust their teaching strategies in a timely manner.

However, despite the promising application of AI technology in higher education, it still faces many challenges in its practical application. Data privacy is an issue that cannot be ignored. During the learning process, students' personal information and learning data may be collected and analyzed, and how to ensure the security and privacy of these data has become an urgent issue. Technology adaptability is also an important challenge. There are differences in the learning styles and abilities of different students, and how to make AI technology better adapt to these differences and achieve truly personalized teaching still requires further exploration and research. The application of AI technology in higher education has initially changed the teaching mode and learning experience, but its development still faces many challenges. In the future, it is necessary to continue to pay attention to these issues, promote the deep integration of AI technology and higher education, and contribute to the cultivation of more talents with innovative spirit and practical ability.

The role of artificial intelligence technology in improving the quality of higher education

The application of artificial intelligence technology in higher education has opened up a new path to improve the quality of education. Personalized teaching is one of its core contributions. Through deep learning and big data analysis, AI technology is able to accurately capture students' learning behaviors and preferences and achieve personalized customization of teaching content. Such customized learning solutions not only meet students' individual needs, but also significantly improve learning efficiency and interest, making learning more active and efficient. AI technology also plays an important role in teaching quality assessment and feedback. Intelligent classroom observation system can monitor students' learning

status in real time and provide teachers with instant teaching feedback. [3] The Student Learning Effectiveness Evaluation System provides teachers with comprehensive student learning reports through data analysis, helping teachers pinpoint teaching difficulties and optimize teaching strategies. These assessment tools not only promote the continuous improvement of teaching methods, but also enhance teachers' teaching ability and professionalism.

Artificial intelligence technology also shows great potential in the construction, management and sharing of learning resources. Through intelligent algorithms, we can efficiently integrate and optimize learning resources, and achieve accurate matching and personalized recommendation of resources. In addition, AI technology can break the geographical limitations and realize the global sharing and balanced distribution of high-quality educational resources, providing more students with fair and high-quality educational opportunities. In the field of scientific research, the application of AI technology is equally impressive. Data analysis, simulation experiments and other AI technologies have not only accelerated the scientific research process, but also improved the accuracy and reliability of research results. These technologies promote research innovation and international cooperation, and push the research level of higher education to new heights.

Artificial intelligence technology plays an indispensable role in improving the quality of higher education. It not only realizes personalized teaching and optimizes the teaching quality assessment and feedback mechanism, but also promotes the optimization and sharing of learning resources, as well as scientific research innovation and international cooperation. In the future, with the continuous development and improvement of artificial intelligence technology, we have reason to believe that higher education will usher in a better tomorrow.

The Impact of Artificial Intelligence Technology on Economic Competitiveness

Under the dual waves of globalization and digitization, AI technologies are reshaping the economic landscape at an unprecedented rate, and in particular play a crucial role in enhancing national economic competitiveness. This impact is

particularly significant in higher education and the job market, industrial upgrading, and the construction of innovation ecosystems.

Artificial intelligence technology plays a bridging role in the interface between talent cultivation and the job market. Through big data analysis, higher education institutions are able to more accurately grasp the dynamic needs of the job market, so that they can make timely adjustments to their specialties and curricula, and ensure that the content of education is highly compatible with market demand. This will not only help reduce structural unemployment, but also cultivate more composite talents in line with future career trends. [4] Artificial intelligence technology enhances students' practical operation ability and innovation ability through intelligent teaching and practice platforms, making them more competitive in the job market. This transformation of the talent cultivation mode lays a solid talent foundation for the improvement of economic competitiveness. Artificial intelligence technology is a key driver for industrial upgrading and transformation. The deep integration of higher education and the industrial sector has benefited from the wide application of AI technology, which has enabled the rapid transformation of scientific research results into productivity and accelerated the transformation and upgrading of traditional industries. For example, the rapid development of intelligent manufacturing, intelligent logistics and other fields is the result of the deep involvement of artificial intelligence technology. This integration not only promotes the optimization and upgrading of industrial structure, but also drives the rise of new industries and injects new vitality into economic growth. More importantly, the application of AI technology promotes collaborative innovation in the upstream and downstream of the industrial chain, enhances the resilience and competitiveness of the industrial chain, and provides strong support for sustainable economic development.

Artificial intelligence technology plays a central role in building an innovation ecosystem. With higher education institutions as the core, AI technology promotes the deep integration of industry, academia, research and utilization, forming a good ecosystem of open sharing and collaborative innovation. In this ecosystem, multiple parties, including higher education institutions, research institutions, enterprises and

the government, work closely together to promote technological innovation and transformation of results. This innovation model not only accelerates the research and development and application of new technologies, but also gives rise to a large number of innovative enterprises, which provides a continuous impetus for economic growth and job creation. In addition, the construction of the innovation ecosystem also promotes the prosperity of the entrepreneurial culture, stimulates the innovation vitality of the whole society, and provides an inexhaustible source for the continuous improvement of economic competitiveness.

Artificial intelligence technology has had a profound impact on the enhancement of economic competitiveness in the areas of talent cultivation and job market docking, industrial upgrading and transformation, as well as the construction of innovation ecosystems. In the future, with the continuous development and improvement of AI technology, its application in the economic field will be more extensive and in-depth, contributing to the construction of a more prosperous and sustainable economic system.

Challenges and Countermeasures

The application of AI technology in higher education, although promising, still faces many challenges. The maturity of technology is a key factor that restricts its wide application. Currently, some AI technologies are still in the research and development stage, and their stability and reliability need to be improved, making it difficult to apply them directly to teaching practice. The issue of data security should not be ignored. In the process of collecting and analyzing students' learning data, how to ensure the privacy and security of the data and avoid data leakage and misuse is an urgent problem to be solved. In addition, the ethical issues of AI technology have also aroused widespread concern. How to ensure the fairness, transparency and traceability of the technology and avoid algorithmic bias and discrimination are challenges that higher education institutions must face when applying AI technology.

In response to these challenges, the following strategies and recommendations are proposed. Strengthen technological research and development to improve the maturity and stability of AI technology. Promote technological innovations and

breakthroughs by increasing investment in scientific research and introducing outstanding talents to provide solid technical support for the application of AI technology in higher education. Improve laws and regulations to protect data security and personal privacy. The government should introduce relevant laws and regulations to clarify the standards and requirements for data collection, use and protection, and strengthen the supervision and punishment of data security, so as to provide legal protection for the application of AI technology. Higher education institutions should also strengthen their internal management and establish a sound data security protection mechanism to ensure the security and privacy of student data.

In addition, ethical education should be strengthened to improve the ethical literacy of AI technology. In higher education, ethical education should be incorporated into the curriculum system to cultivate students' ethical awareness and sense of responsibility so that they can follow ethical principles and avoid algorithmic bias and discrimination when using AI technology. [5] Higher education institutions should also strengthen ethical training for teachers, improve their ethical literacy and sense of responsibility, and ensure that the application of AI technology in education meets ethical requirements.

In the face of the challenges in the application of AI technology in higher education, we need to strengthen the research and development of technology, improve laws and regulations, and strengthen ethical education and other efforts to promote the deep integration of AI technology and higher education, so as to contribute to the cultivation of more excellent talents and the improvement of economic competitiveness.

Conclusion

In this paper, the important role of artificial intelligence technology in improving the quality of higher education and economic competitiveness has been deeply explored. Through detailed analysis, it is found that AI technology not only promotes personalized teaching, optimizes the teaching quality assessment and feedback mechanism, but also promotes the optimization and sharing of learning resources, as well as scientific research innovation and international cooperation. These changes

not only significantly improve the quality and efficiency of higher education, but also provide strong support for students' competitiveness in employment and innovation. Further, the key role of AI technology in the enhancement of economic competitiveness was emphasized. By facilitating the interface between talent training and the job market, promoting industrial upgrading and transformation, and building innovation ecosystems, AI technologies have injected new impetus for economic growth and sustainable development. These impacts are not only reflected in the current economic landscape, but also herald new trends and opportunities for future economic development.

In the future, the application of AI technology in higher education is promising. With the continuous development and improvement of technology, it is reasonable to believe that artificial intelligence will be more deeply integrated into all aspects of higher education and promote profound changes in the education model. At the same time, the application of AI technology in the economic field will also be more extensive and in-depth, contributing to the construction of a more prosperous and sustainable economic system. Therefore, we should pay continuous attention to the development of AI technology and strengthen technology research and development and application exploration to better cope with the challenges and opportunities in the future.

References

1. Adigwe C. S., Olaniyi O. O., Olabanji S. O., et al. Forecasting the future: The interplay of artificial intelligence, innovation, and competitiveness and its effect on the global economy // *Asian Journal of Economics, Business and Accounting*. – 2024. – Vol. 24, No. 4. – С. 126–146.

2. Mohamed Hashim M. A., Tlemsani I., Matthews R. Higher education strategy in digital transformation // *Education and Information Technologies*. – 2022. – Vol. 27, No. 3. – С. 3171–3195.

3. Жуковская И. Е. Основные тренды совершенствования деятельности высшего учебного заведения в условиях цифровой трансформации // *Открытое образование*. – 2021. – Т. 25, № 3. – С. 15–25.

4. Савич Ю. А. Цифровая трансформация и влияние её на конкурентоспособность промышленных предприятий // Экономинфо. – 2018. – № 4. – С. 44–48.

5. Пороховский А. А. Цифровизация и искусственный интеллект: перспективы и вызовы // Экономика. Налоги. Право. – 2020. – Т. 13, № 2. – С. 84–91.