

Research on the Practical Pathways of Artificial Intelligence Technology Empowering Innovation and Entrepreneurship Education in Universities

Jiacheng Wang

(Suzhou Vocational University, Suzhou 215104, China)

Abstract: The rise of artificial intelligence technology provides both theoretical support and practical tools for the development of innovation and entrepreneurship education in universities. As bases for cultivating talents, universities should actively apply artificial intelligence technology, continuously explore new paths for innovation and entrepreneurship education, study the laws of development and the mechanisms of quality cultivation of innovation and entrepreneurship education under the new technological environment, enrich the theoretical system, promote scientific and technological research, and support theoretical innovation in instructional design. By applying artificial intelligence technology to teaching management, course resources, teaching evaluation and project incubation—adopting intelligent timetable management, academic reminder systems, intelligent recommendation systems and knowledge graph technology—this paper demonstrates how artificial intelligence technology promotes the innovation and optimization of educational models and drives the high-quality development of innovation and entrepreneurship education.

Keywords: artificial intelligence; innovation and entrepreneurship education; universities; cultivation of innovative talents; knowledge graph; intelligent management technology

1 Introduction

Foreign scholars paid early attention to research on the application of artificial intelligence in the field of education. From the 1950s to the 1970s, artificial intelligence technology was applied to the research and development of personalized teaching systems and other fields. In recent years, with the development of big data, cloud computing and other technologies, foreign research has been more extensive in intelligent teaching systems, smart classrooms and online learning. Some universities use artificial intelligence technology to enrich innovation and entrepreneurship course resources, improve learners' participation, build an artificial intelligence-driven innovation and entrepreneurship education environment, and provide students with personalized learning experiences.

Research on the application of artificial intelligence technology in education in China started relatively late but has developed rapidly. In terms of policy, the New Generation Artificial Intelligence Development Plan and other documents propose the development of smart education. In terms of theoretical research, analyses and discussions have been carried out on the impact of artificial intelligence technology on teaching and learning, teacher development and school management. In terms of applied research, practices have been conducted in smart classrooms, intelligent learning systems, and educational data collection and analysis systems. However, research on the application of artificial intelligence technology in innovation and entrepreneurship education in universities is still relatively limited.

2 Current Status of Artificial Intelligence Technology Development and Innovation and Entrepreneurship Education in Universities

2.1 Current Status of Artificial Intelligence Technology Development

Artificial intelligence has made considerable progress in basic intelligence fields such as information recognition

and machine learning, but its development remains limited in fields involving deep-level cognitive abilities, such as abstract concepts and complex decision-making [3].

The research field of artificial intelligence is extremely broad and constitutes a complex, multi-disciplinary and multi-level domain. It requires users to have a deep understanding of basic theories while also continuously exploring and making breakthroughs in technical practice and application innovation. Artificial intelligence technology has been widely integrated into numerous industries, including unmanned vehicles, high-tech healthcare, modern retail, educational intelligence and intelligent financial services [4]. With the continuous development of fifth-generation mobile communication technology, the interconnection between devices has become faster and more convenient, greatly promoting the further application of artificial intelligence technology.

2.2 Opportunities and Support Brought by Artificial Intelligence Technology to Innovation and Entrepreneurship Education in Universities

2.2.1 Enriching Teaching Resources

Artificial intelligence technology has greatly enriched the teaching resources of innovation and entrepreneurship education. Traditional teaching models mainly rely on teachers preparing teaching materials and conducting classroom teaching, whereas artificial intelligence technology uses advanced technologies such as big data and cloud computing to provide students with personalized and precisely targeted learning materials [5].

2.2.2 Improving Students' Innovative Thinking and Entrepreneurial Ability

Artificial intelligence technology provides students with a powerful platform that can enhance their innovative thinking and entrepreneurial skills. By using machine learning algorithms, the system can analyze students' learning behavior and preferences, thereby recommending teaching content and activities suitable for their personal development. At the same time, artificial intelligence technology can also create simulated business environments that allow students to experience the whole process of entrepreneurship, which not only enhances students' practical operational ability but also improves their confidence and adaptability when facing real business challenges [6].

2.2.3 Supporting Entrepreneurship Incubation

Advanced data analysis technology can help students gain deep insights into market dynamics and trends, so that they can grasp business opportunities more accurately. Meanwhile, an intelligent decision support system built with artificial intelligence can assist students in making scientific and reasonable decisions during the entrepreneurial process, effectively avoiding risks and improving the success rate of entrepreneurial projects [7].

3 Practical Paths of Artificial Intelligence Technology in Innovation and Entrepreneurship Education in Universities

3.1 Path of Artificial Intelligence Technology Empowering Teaching Management

3.1.1 Intelligent Course Scheduling Management

The intelligent course scheduling management system applies artificial intelligence technology and adopts heuristic algorithms, genetic algorithms or multi-objective optimization algorithms to optimize the scheduling process so as to achieve more reasonable course arrangements. The system collects information on the available time of teachers, students and classrooms as well as relevant course information, and seeks the optimal or near-optimal scheduling scheme under the premise of satisfying the constraints.

First, demand analysis is conducted by communicating with teachers, students and administrative staff to understand their specific needs and preferences regarding timetables; second, all relevant data are collected, including the available time of teachers and students, course requirements and classroom capacity; finally, according to the analysis results, the most suitable algorithm is selected for scheduling optimization [7]. The system is tested in a small-scale environment, feedback is collected and necessary adjustments are made, and after successful testing the system is extended to the whole university.

3.1.2 Academic Reminder System

The academic reminder system uses artificial intelligence and automation technology to send timely reminders about teaching activities to students and teachers so as to improve teaching efficiency and student satisfaction [8].

The development of the academic reminder system needs to consider the following aspects: first, user interface design, including designing an intuitive and easy-to-use user interface to ensure that students and teachers can easily set and manage reminder information; second, automation logic, developing logic that can automatically detect teaching activities and send reminders; third, customization options, allowing users to customize the content, time and manner of reminders according to personal preferences.

Through natural language processing technology, the academic reminder system analyzes teaching activity data and automatically generates personalized reminders. Students and teachers can customize reminder content and, according to their own schedules and preferences, set reminders about courses, examinations and deadlines, effectively reducing the risk of missing key teaching activities [9].

3.1.3 Teaching Calendar Management

Teaching calendar management involves the planning and tracking of course arrangements, examination times, holidays and other important academic activities.

Teaching calendar management can coordinate resources and ensure that teaching resources such as classrooms and laboratories are effectively allocated and used; improve transparency by providing students and teachers with a clear view of teaching activities [10]; and reduce time conflicts among courses, examinations and activities, helping students and teachers plan their time and activities in advance.

3.2 Path of Artificial Intelligence Technology Empowering Course Teaching

3.2.1 Intelligent Recommendation System

The intelligent recommendation system is an innovative application of artificial intelligence technology in the field of education. It provides personalized learning resources and paths by analyzing students' behavior and preferences. The core of this system lies in its ability to understand the unique needs of each student, thereby recommending the course content, teaching methods and learning materials that best suit them.

The intelligent recommendation system can also dynamically adjust recommended content according to students' progress and feedback [11]. By analyzing students' behavior and preferences and providing personalized learning resources and paths, it not only improves students' learning efficiency but also enhances their learning motivation and participation, which is of great significance for cultivating students' innovation and entrepreneurship abilities.

3.2.2 Knowledge Graph Technology

Knowledge graph technology is another important application of artificial intelligence technology in the field of education. By constructing a structured network of knowledge points, it shows the relationships among different knowledge points, enabling students to understand the entire knowledge system more systematically.

In innovation and entrepreneurship education, knowledge graphs can help students identify the connections between different fields, such as the interaction between technology and the market, or the relationship between product design and user experience. Using knowledge graphs, artificial intelligence systems can intelligently recommend the next learning content according to students' mastery of a certain knowledge point and guide them to explore in depth along the knowledge network [12]. This method not only deepens students' understanding of individual knowledge points but also promotes the formation of their interdisciplinary thinking, which is particularly important for innovation and entrepreneurship education.

3.3 Path of Artificial Intelligence Technology Empowering Teaching Evaluation

3.3.1 Collecting Data to Realize Dynamic Evaluation

By collecting data on students' online learning behavior and project practice, artificial intelligence technology can realize dynamic evaluation of students' innovation and entrepreneurship abilities. This evaluation method is not

limited to a single examination score or teachers' subjective evaluation, but comprehensively evaluates students' innovation and entrepreneurship abilities by analyzing various interactions, participation and ability to solve practical problems in the learning process.

The system can track students' contribution in team projects, the display of innovative thinking, and how they use the knowledge they have learned to solve practical problems [13]. Such data collection and analysis provide educators with a multi-dimensional evaluation perspective.

3.3.2 Using Artificial Intelligence Tools for Quality Evaluation

The comprehensive use of artificial intelligence tools provides a new way to evaluate students' innovation and entrepreneurship qualities. The system can analyze students' learning status and outputs and evaluate key qualities such as innovative thinking, risk management ability, teamwork spirit and market insight [14].

The above qualities are crucial for innovation and entrepreneurship but are often difficult to measure accurately through traditional evaluation methods. The application of artificial intelligence technology makes the evaluation of these qualities more scientific and objective. In addition, the artificial intelligence system can also provide educators with real-time feedback and suggestions based on the evaluation results, helping them adjust teaching strategies in a timely manner, while also promoting students' self-reflection and improvement.

4 Conclusion

With the continuous development of artificial intelligence technology, its application in innovation and entrepreneurship education in universities is becoming increasingly extensive and in-depth. Through the analysis, it can be seen that the application prospects of artificial intelligence technology in innovation and entrepreneurship education in universities are broad, while challenges also exist. Continuous exploration and innovation are needed to ensure that artificial intelligence technology achieves good application results in innovation and entrepreneurship education.

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