

Exploration of the Path of AI-Empowered Innovation and Entrepreneurship Education in Colleges and Universities

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Abstract: Currently, we have entered the AI era, against which college and university innovation and entrepreneurship education have also ushered in new opportunities for reform. In this regard, this paper conducts an in-depth analysis of AI-empowered innovation and entrepreneurship education in colleges and universities. By dissecting the internal mechanism of AI empowering college and university innovation and entrepreneurship education, it sorts out in detail the dilemmas faced in the previous process of college and university innovation and entrepreneurship education. Finally, it puts forward targeted and effective implementation paths, aiming to provide some references for the reform of college and university innovation and entrepreneurship education.

Keywords: Artificial intelligence (AI); Colleges and universities; Innovation and entrepreneurship education

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1. Introduction

Against the backdrop of the AI era, science and technology are developing at a rapid pace and penetrating various fields at an unprecedented speed, bringing profound changes to people's lifestyles and production methods^[1]. As an important base for cultivating professional talents in China, colleges and universities undertake the important task of providing innovative talents for society and the country. Nowadays, innovation and entrepreneurship education has become an important part of college and university teaching, playing a crucial role in cultivating students' innovative ability, practical ability, and entrepreneurial awareness. However, there are many problems in the previous innovation and entrepreneurship education in colleges and universities, which have seriously affected the improvement of students' innovative ability. In this regard, under the background of the AI era, colleges, universities, and teachers should keep up with the development trend of the times, make full use of the powerful functions of AI to improve the effect and quality of innovation and entrepreneurship education, and cultivate students into high-quality innovative talents needed for the

development of society and the country.

2. The internal mechanism of artificial intelligence empowering innovation and entrepreneurship education in universities

2.1. Data-driven precision education

Artificial intelligence (AI) possesses robust data collection and analysis capabilities, enabling the collection and analysis of various types of student data ^[2]. Based on this, teachers can accurately understand the diverse needs of students and provide them with targeted education and guidance, thereby laying a foundation for enhancing the effectiveness of innovation and entrepreneurship education.

2.2. Intelligent interactive immersive learning experience

AI encompasses technologies such as virtual reality (VR) and augmented reality (AR). When applied to innovation and entrepreneurship education, these technologies can create a variety of virtual learning environments for students, allowing them to gain a profound understanding of the innovation and entrepreneurship process and enrich their practical experience ^[3]. Meanwhile, intelligent interactive systems can also realize real-time interaction between students and virtual characters, bringing students an immersive learning experience. This effectively stimulates students' interest in participation and mobilizes their enthusiasm.

2.3. Intelligently assisted decision support

In the process of innovation and entrepreneurship, scientific and sound decision-making is crucial. Against the backdrop of the AI era, AI's powerful functions can be utilized to analyze and process large volumes of market data, industry trends, and practical cases, thereby providing guidance for entrepreneurs in making decisions ^[4]. Introducing AI decision-making systems into university innovation and entrepreneurship education can cultivate students' decision-making thinking, strengthen their innovation awareness, and improve their decision-making capabilities, laying a foundation for their future participation in innovation and entrepreneurship activities.

2.4. Optimization of resource integration and sharing

AI can also realize the integration and sharing of resources. Due to various factors such as geography, environment, transportation, and economy, there are certain disparities in innovation and entrepreneurship education resources among different universities, which leads to differences in the educational services available to students from different universities ^[5]. However, in the context of AI, an intelligent educational resource platform can be built to integrate and share internal and external innovation and entrepreneurship resources. This not only greatly improves resource utilization efficiency but also significantly enhances educational equity, laying a foundation for students' all-round development in the future.

3. Difficulties in innovation and entrepreneurship education in colleges and universities in the past

3.1. Unbalanced allocation of resources

Affected by various factors such as geography, economy, and environment, there exists a phenomenon of unbalanced allocation of innovation and entrepreneurship education resources among colleges and

universities of different levels and different majors ^[6]. Specifically, some key universities or “Double First-Class” universities are often able to obtain more resource support, such as financial appropriations, corporate sponsorships, and alumni donations. In contrast, ordinary undergraduate universities, especially newly established ones, often face problems such as insufficient funds, outdated equipment, and limited venues, which affect the improvement of the effectiveness of innovation and entrepreneurship education. This unbalanced resource allocation directly leads to inequality among students from different universities and majors in receiving innovation and entrepreneurship education, thereby affecting the enhancement of students’ innovation and entrepreneurship capabilities.

3.2. Monotonous teaching methods

At present, some colleges and universities still adopt traditional and monotonous teaching models for innovation and entrepreneurship education, focusing on classroom lectures. Under this teaching model, students often remain in a state of passive acceptance; their enthusiasm and initiative can hardly be fully aroused, and there is a lack of interaction between teachers and students. The classroom atmosphere is dull and oppressive, which seriously affects the improvement of the effectiveness and quality of innovation and entrepreneurship teaching. In this regard, in the era of artificial intelligence, colleges and universities should keep up with the development trend of the times, promptly optimize and innovate teaching models, and adopt various methods and means to stimulate students’ interest in learning and more effectively cultivate students’ innovation and entrepreneurship capabilities.

3.3. Lack of practical guidance

Essentially, innovation and entrepreneurship education is a highly practical and operational educational activity that requires providing students with sufficient practical platforms and opportunities ^[7]. However, in reality, some colleges and universities have the phenomenon of “emphasizing theory over practice” when carrying out innovation and entrepreneurship education. They do not attach importance to practical teaching and neglect the cultivation of students’ practical abilities. On the one hand, some teachers in colleges and universities lack entrepreneurial experience and cannot provide students with scientific and reasonable practical guidance; on the other hand, the construction of on-campus innovation and entrepreneurship practice bases is lagging, and university-enterprise cooperation remains superficial. This lack of practical guidance makes innovation and entrepreneurship education a mere formality, thus seriously affecting the improvement of students’ practical abilities and innovative capabilities.

3.4. Lagging development of faculty teams

Teachers are not only important participants and organizers of curriculum teaching but also key factors in ensuring the quality of innovation and entrepreneurship education ^[8]. However, the development of faculty teams in some colleges and universities is relatively lagging, which seriously affects the improvement of the quality of innovation and entrepreneurship education. First, the number of teachers specializing in innovation and entrepreneurship is insufficient, which cannot meet the needs of carrying out innovation and entrepreneurship education in colleges and universities. Second, teachers lack practical experience in innovation and entrepreneurship, and also lack access to specialized training opportunities, resulting in their low level of practical teaching and difficulty in effectively improving the effect of practical teaching. Finally, the structure of

the faculty team is unreasonable, with a low proportion of interdisciplinary and compound teachers. In addition, the incentive mechanism is imperfect, leading to low enthusiasm among teachers. This lag in the development of faculty teams directly affects the professional level and teaching quality of innovation and entrepreneurship education and has become a bottleneck restricting the development of innovation and entrepreneurship education.

4. Implementation paths for artificial intelligence empowering innovation and entrepreneurship education in universities

4.1. Building an intelligent education platform

4.1.1. Integrating educational resources

Against the backdrop of the artificial intelligence era, universities should fully leverage the advantages of AI to build an innovation and entrepreneurship education platform that integrates multiple functions such as curriculum teaching, case analysis, and practical guidance^[9]. By integrating and sharing high-quality internal and external innovation and entrepreneurship resources, the platform can provide teachers and students with high-quality and diverse learning resources, thereby laying a foundation for enhancing the effectiveness of innovation and entrepreneurship education. For instance, it can integrate innovation and entrepreneurship courses from well-known domestic and foreign universities, entrepreneurs' experience sharing on entrepreneurship, classic cases, and more. This allows students to access high-quality innovation and entrepreneurship education simply by logging into the platform, exposing themselves to cutting-edge knowledge and concepts, strengthening their cognition, and ultimately improving the effectiveness of innovation and entrepreneurship education.

4.1.2. Providing personalized services

Intelligent education platforms possess powerful data processing and analysis capabilities. They can comprehensively collect and analyze students' learning data, and provide personalized learning services based on the analysis results^[10]. The platform can intelligently push learning materials (such as teaching videos and cases) to students according to their interests, level of knowledge mastery, and aspirations. Meanwhile, the platform can also offer intelligent learning guidance and support to help students solve various problems encountered in the learning process.

4.1.3. Creating a virtual practical environment

Additionally, the powerful functions of the intelligent education platform can be utilized to create virtual practical scenarios. This enables students to conduct practical operations and training in virtual and realistic environments, thereby effectively cultivating their practical abilities. For example, students can carry out activities such as market research, product promotion, and business plan formulation in the virtual environment, which helps to effectively develop their innovation and entrepreneurship capabilities.

4.2. Innovating teaching models

Against the backdrop of the artificial intelligence era, traditional innovation and entrepreneurship education models can hardly meet the needs of students' development. In response, teachers need to innovate and optimize these models.

4.2.1. Blended teaching

Teachers can closely integrate information technology with innovation and entrepreneurship education, and adopt a blended teaching model to stimulate students' interest in learning and enhance the effectiveness of innovation and entrepreneurship education. In online teaching, teachers can leverage the advantages of intelligent education platforms to provide students with rich learning resources, enabling them to conduct independent learning and preview. In the offline phase, teachers can use methods such as group cooperation and case analysis to help students understand and master knowledge more deeply, and promote the development of their innovative awareness.

4.2.2. Project-based teaching

Teachers can also apply the project-based teaching method to innovation and entrepreneurship education. Based on students' academic performance and combined with teaching content, they can design challenging and practical project tasks (e.g., analyzing the flower market) to cultivate students' innovation and entrepreneurship capabilities. In specific practice, teachers can guide students to conduct on-site research in the flower market, communicate in-depth with market owners to obtain first-hand information, and analyze flower sales data from various sales platforms, thereby formulating more feasible business plans for flower-related entrepreneurship. The application of this teaching model can effectively cultivate students' practical abilities and their ability to solve problems independently, laying a solid foundation for their all-around development in the future.

4.3. Strengthening practical guidance

4.3.1. Building a practical mentor database

Colleges and universities can carry out in-depth cooperation with enterprises, industries, and social organizations, and invite outstanding entrepreneurs and industry elites to serve as practical guidance teachers in the schools, thereby building a practical mentor database. With rich practical experience, these practical mentors can provide students with comprehensive and realistic entrepreneurship guidance, helping them solve various problems encountered in the entrepreneurial process.

4.3.2. Conducting innovation and entrepreneurship practical activities

Colleges and universities can cooperate in-depth with enterprises and industrial parks to organize and carry out various types of entrepreneurial practical activities, and guide students to participate in them to cultivate their practical abilities. For example, they can organize students to participate in entrepreneurship competitions, entrepreneurial internships, and entrepreneurship incubation camps, providing sufficient opportunities for students to practice. During practice, students can apply the knowledge and skills they have learned to real scenarios, accumulate entrepreneurial experience, and effectively improve their own innovation and entrepreneurship capabilities.

4.3.3. Establishing entrepreneurship incubation bases

In addition, colleges and universities can integrate resources and actively establish entrepreneurship incubation bases to provide sufficient platforms and opportunities for students' practice. These incubation bases can offer students one-stop services such as facilities and equipment, financial support, and office spaces, helping them reduce entrepreneurial costs and improve the success rate of entrepreneurship. At the same time, the incubation bases can introduce professional entrepreneurial service institutions to provide students with services in aspects

such as law, finance, and marketing, thereby supporting students' successful entrepreneurship.

4.4. Strengthening faculty team development

4.4.1. Improving the faculty training mechanism

Colleges and universities should keep pace with the times and continuously improve their faculty training mechanisms. They can regularly organize teachers to participate in specialized training programs on innovation and entrepreneurship education. The training content includes, but is not limited to, teaching methods, theoretical knowledge of innovation and entrepreneurship, and practical guidance. Through such initiatives, teachers' concepts can be updated and their practical teaching capabilities enhanced.

4.4.2. Refining the incentive mechanism

Colleges and universities should also establish and improve an incentive mechanism to motivate teachers to actively participate in innovation and entrepreneurship education activities. For example, appropriate rewards (such as bonuses and certificates) can be given to teachers who have achieved certain results in innovation and entrepreneurship education; policy preferences can be provided in aspects like award selection and evaluation, as well as professional title assessment; and more support for scientific research and project funds can be offered to teachers.

4.4.3. Enhancing talent recruitment efforts

Colleges and universities should also formulate and improve talent recruitment plans, and actively introduce outstanding talents with rich entrepreneurial experience and profound industry backgrounds to serve as teachers in innovation and entrepreneurship education. This will help optimize the structure of the faculty team and elevate the overall quality of the teaching staff.

5. Conclusion

In summary, against the backdrop of the artificial intelligence era, innovation and entrepreneurship education in colleges and universities has also ushered in new opportunities for reform. In this context, colleges and universities should conduct an in-depth analysis of the internal mechanisms through which artificial intelligence empowers innovation and entrepreneurship education. Based on their actual conditions and in alignment with future development goals, they should adopt various methods and measures to improve the effectiveness of innovation and entrepreneurship education, cultivate students' innovative capabilities and adaptability, and enable them to become interdisciplinary talents who meet the needs of social and national development in the future.

Disclosure statement

The author declares no conflict of interest.

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