# A Study on the Challenges and Necessary Reforms for Innovation and Entrepreneurship Education in the Artificial Intelligence Era

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**Abstract:** ***This article aims to explore how graduate education should be reformed to meet the demands of future society in the context of the rapid advancement of artificial intelligence. As artificial intelligence technologies become increasingly widespread, traditional graduate programs and pedagogical approaches urgently require adjustment to cultivate high-level professionals who are better aligned with the requirements of the contemporary era.***

**Keywords:** Artificial intelligence, Entrepreneurship and innovation, High-level professional talents.

## 1. INTRODUCTION

In the late 1990s, China began preliminary research and application of artificial intelligence.At that time, it was mainly concentrated in some universities and research institutions, focusing on applications in fields such as national defense and aerospace.In the 21st century, the Chinese government gradually recognized the strategic importance of artificial intelligence and launched the "Intelligent Manufacturing" project in the "863 Program" in 2006. This was the first time that the Chinese government promoted artificial intelligence as a national level strategy.At the same time, funds began to be invested on a large scale, attracting the attention of enterprises and entrepreneurs.In 2013, Baidu established the Deep Learning Research Institute and began researching in the field of deep learning. In 2017, the Ministry of Education passed the "Guidelines for Research and Practice Projects in New Engineering", which clearly stated: "Starting from new technologies such as artificial intelligence and intelligent manufacturing, explore new fields and directions on the basis of existing engineering majors, and form a new curriculum system." The State Council issued the "Development Plan for the New Generation of Artificial Intelligence", which clarified that artificial intelligence is a national strategy and proposed that the scale of the artificial intelligence industry should exceed 150 billion yuan by 2020. In 2018, China proposed the "Action Plan for Artificial Intelligence Innovation in Higher Education Institutions", which stated that universities are a platform for the combination of technology, talent, and innovation, and should continuously promote the integration of artificial intelligence and higher education. The sentence is:,Not only has it brought about a new round of global technological revolution, but it has also posed new challenges to higher education, which has the mission of knowledge innovation and talent cultivation.

With the adjustment of economic structure and the transformation of development momentum in recent years, innovation driven development has become an important aspect of national strategy.Under this major environmental change, there have been new changes in the social demand for talent and the working conditions of university graduates, which has endowed higher education institutions with more urgent ability requirements to meet.The students cultivated by these institutions should have a profound professional foundation in theory and skills, so that they can participate in academic or scientific research work. At the same time, they should also possess strong qualities of innovation and entrepreneurship spirit, innovation and entrepreneurship strength, practical operation ability, and comprehensive application ability.In the "Several Opinions on Promoting Discipline Integration and Accelerating the Cultivation of Graduate Students in the Field of Artificial Intelligence in Double First Class Construction Universities" released in 2020, it was clearly stated that the use of artificial intelligence technology can promote the transition of disciplinary knowledge and the upgrading of innovation and entrepreneurship capabilities, and achieve mutual promotion between artificial intelligence and graduate innovation and entrepreneurship education.So, it is worth exploring in depth how to apply the advantages of the great development of artificial intelligence to enhance the innovation and entrepreneurship abilities of college students. Tang et al. [1] focused on the design and optimization of shallow-angle grating couplers for vertical emission from indium phosphide devices. Sun [2] explored AI-assisted UI design to enhance efficiency and creativity through generative tools. Wu et al. [3] developed a multi-level transfer learning approach for small-sample object detection of surface cracks in concrete structures of high-rise buildings. In large-scale data

processing, Yang et al. [4] presented HUGE, an efficient and scalable subgraph enumeration system, while Ukey et al. [5] addressed efficient k-nearest neighbor (kNN) join over dynamic high-dimensional data. Deng and Yang [6] proposed multi-layer defense strategies and privacy-preserving enhancements against membership reasoning attacks in a federated learning framework. Yi [7] designed a real-time fair-exposure ad allocation system for small and medium-sized businesses (SMBs) and underserved creators via contextual bandits-with-knapsacks. Yang et al. [8] developed a full-cycle intelligent risk control system for pre-loan, mid-loan, and post-loan lending, emphasizing AI-driven closed-loop management of online credit security. Shen et al. [9] applied the whale optimization algorithm to financial payment fraud detection. Tian et al. [10] improved U-Net brain tumor image segmentation using a GSConv module and an ECA attention mechanism. Zhou [11] proposed a digital precision distribution strategy for social media content on private domain platforms in the automotive industry, employing a collaborative filtering model based on user behavior. Wensi [12] investigated AI-assisted marketing content generation for non-standard industrial automation solutions, while Li [13] optimized AI-driven bid pricing models for non-standard automation projects by leveraging historical financial data and machine learning algorithms. Ren [14] introduced a novel approach for role-oriented dialogue summarization by balancing role contributions. Ximeng and Yiming [15] applied offline conservative reinforcement learning for transaction authorization to balance fraud risk and customer friction. Zhao et al. [16] developed a CNN-Bi-GRU model for short and long-term renewable electricity demand forecasting. Finally, Liu et al. [17] proposed MiM-UNet, an efficient building image segmentation network integrating state space models.

## 2. PROBLEMS IN THE CURRENT CULTIVATION OF INNOVATIVE AND ENTREPRENEURIAL TALENTS IN UNIVERSITIES

Although universities have made some progress in cultivating innovative and entrepreneurial talents, there are still some problems and challenges that may affect students' preparation and success in the fields of entrepreneurship and innovation.Here are some common questions:

### 2.1 There are significant differences between the cultivation of target talents and the actual needs of society:

There is a significant mismatch between the current target talent education and the social reality needs: although the government actively advocates the spirit of "national entrepreneurship and comprehensive innovation" and promotes the development strategy of scientific and technological innovation, and various higher education institutions are also strengthening their emphasis on the education of innovative talents, the talent cultivation programs of most universities at present are seriously detached from the current needs of society.This is mainly due to certain deficiencies in the training process of the school, such as limitations in course content that do not fully reflect the cutting-edge dynamics of science and technology, and insufficient consideration of practical factors in enterprise production.This situation results in a lack of ability for graduates to apply theory to practical operations.

### 2.2 Unequal allocation of resources:

In recent years, many universities, governments, and enterprises have formulated multiple preferential policies for innovation and entrepreneurship of college students, providing them with many superior resources.However, some schools have the problem of uneven resources in innovation and entrepreneurship compared to others.The imbalance in this regard is reflected in multiple aspects such as funding, research facilities, talent cultivation, and entrepreneurial culture.Some schools can provide more comprehensive innovation and entrepreneurship education, including entrepreneurship mentors, internship opportunities, etc., while other schools may lack resources in this area.Most local university teachers are responsible for innovation and entrepreneurship education for college students.In this process, teachers not only need to impart basic knowledge to students, but also guide them in innovative and entrepreneurial activities, which puts high demands on teachers.They need to possess both disciplinary expertise and rich practical experience in innovation and entrepreneurship.However, most university teachers are unable to meet this requirement.In addition, some universities may lack an international educational perspective, leading to insufficient understanding of international markets and innovation trends among students.

### 2.3 Disciplinary and Professional Barriers:

Sometimes, barriers between disciplines and majors may hinder students from innovating in interdisciplinary fields.For example, in the field of artificial intelligence, knowledge from multiple disciplines such as computer science, mathematics, and engineering is required, but the division between disciplines may make it difficult for

students to acquire comprehensive skills;Disciplinary and professional barriers may lead to barriers between different disciplinary fields, making it difficult for innovation and entrepreneurship teams to engage in effective interdisciplinary collaboration.However, innovation often requires the integration of knowledge and skills from different fields.Most innovation and entrepreneurship projects require students not only to master knowledge within their own field of study, but also to have a certain understanding of other disciplines.

## 3. THE ADVANTAGES OF ARTIFICIAL INTELLIGENCE PLATFORMS

The deep integration of artificial intelligence and the cultivation of entrepreneurial talents can provide effective solutions to the above-mentioned problems, promote the construction of an open education ecosystem, advance the national innovation driven development strategy, and serve as an important way to promote the reform and development of innovation and entrepreneurship education in universities.At present, some universities are comprehensively and deeply integrating artificial intelligence education into the specific action of "innovation and entrepreneurship" talent cultivation, building an innovation and entrepreneurship oriented curriculum system, and effectively improving the success rate of college students' innovation and entrepreneurship. Compared with the traditional "innovation and entrepreneurship" talent cultivation method, the cultivation method that integrates artificial intelligence has many advantages and characteristics, which can help students achieve better results, mainly manifested in the following aspects.

### 3.1 The excellent platform provided by artificial intelligence for students

The platform built on the basis of artificial intelligence has a large amount of educational materials, which can effectively and quickly process a large amount of information data, and achieve comprehensive analysis of multiple databases through artificial intelligence technology.This platform can set plans based on the characteristics of each task and students' abilities, and provide them with the best learning material suggestions.In this way, students can accurately acquire the necessary knowledge of innovation and entrepreneurship, while also gaining a deeper understanding of the current progress of society. Based on this, they can develop innovation and entrepreneurship strategies that are in line with their personal characteristics and abilities, and arrange work processes and time management reasonably.

### 3.2 Artificial intelligence provides guidance and feedback for students

AI technology can develop intelligent mentorship systems that utilize technologies such as natural language processing and machine learning to provide personalized innovation and entrepreneurship guidance for students.This system can provide relevant knowledge, resources, practical experience, and successful cases based on students' needs and backgrounds, helping students solve problems and develop entrepreneurial strategies.It is also possible to create a virtual entrepreneurship simulation environment for students to test and validate their creativity through simulation experiments.This system can evaluate the feasibility, risks, and potential benefits of entrepreneurial projects, helping students make more informed decisions.Artificial intelligence technology provides personalized support, guidance, and feedback to students, helping them achieve better results in their innovation and entrepreneurship journey.The excellent analytical and learning abilities of AI enable students to gain insights from rich data and receive customized advice and guidance, improving their innovation ability and practical effectiveness.

### 3.3 Artificial intelligence breaks down disciplinary and professional barriers for students

Students can participate in interdisciplinary projects that typically involve knowledge and skills from different fields, such as bioinformatics, health sciences, environmental sciences, etc.Artificial intelligence technology can serve as a bridge connecting these disciplines and promoting interdisciplinary collaboration.Platforms such as Coursera, edX, and Udacity offer courses from top universities and companies around the world to help students enhance their skills and knowledge.At the same time, many academic institutions have interdisciplinary innovation laboratories and centers dedicated to solving complex social problems.Students can participate in projects at these centers and collaborate with classmates from other majors to study the application of artificial intelligence in different fields.

## 4. STRATEGIES FOR CULTIVATING INNOVATIVE AND ENTREPRENEURIAL TALENTS UNDER THE BACKGROUND OF ARTIFICIAL INTELLIGENCE

### 4.1 Interdisciplinary Curriculum Design:

Artificial intelligence is an interdisciplinary field that is based on computer science and integrates multiple disciplines such as mathematics, psychology, engineering, and economics.The characteristics of this discipline determine that in order to cultivate innovative and entrepreneurial talents in the context of artificial intelligence, interdisciplinary and cross college training is necessary. These courses should combine theory and practice, cultivate students' technical abilities in the field of AI, and focus on training in business, law, and ethics;Integrating high-quality resources from across the university and breaking down barriers between colleges and disciplines, as stated by the Carleton University Science Education Resource Center, interdisciplinary education "requires the use and integration of methods and analytical frameworks from multiple disciplines to study a topic, issue, problem, or theme.

### 4.2 Practical Projects and Internship Opportunities:

For the discipline of artificial intelligence, simply imparting basic knowledge and theories to students is far from enough. It is an application-oriented discipline that must establish cooperation with enterprises, research institutions, and governments to jointly cultivate students in the field of artificial intelligence, covering knowledge, skills, practical operations, and research and development capabilities. For example, Alibaba has partnered with Tsinghua University to establish an artificial intelligence laboratory dedicated to in-depth research in natural language processing, computer vision, machine learning, and other fields.This laboratory aims to promote the combination of academic research and industrial innovation, and accelerate the application of artificial intelligence technology in business. Microsoft Research Asia and Shanghai Jiaotong University jointly launched the "Microsoft Research Asia and Shanghai Jiaotong University Artificial Intelligence Academic Cooperation Project", which aims to promote academic exchanges and research cooperation in the field of artificial intelligence.Researchers and students can participate in projects together to promote the transformation of academic achievements;These projects enable students to apply AI technology in real-life scenarios and understand business applications and industry needs.This experience can cultivate their problem-solving skills.Encourage students to participate in international AI competitions, seminars, and exchange programs, broaden their horizons, and learn the best practices in AI innovation from different countries and regions.

### 4.3 Support from experienced mentors and industry mentors

They can guide students, share practical experience and industry insights, and help students better understand the application of AI technology in business innovation.Compared with the teaching staff of top universities abroad, although some of China's top universities have strong teaching teams in the field of artificial intelligence, overall, there are still shortcomings in the teaching staff of Chinese universities in this field, especially in terms of high-level leaders and innovative teams.Therefore, domestic universities need to increase their efforts to introduce outstanding professionals and leaders in the field of artificial intelligence from abroad.At the same time, efforts should be made to cultivate outstanding talents in the field of artificial intelligence in China and include them in the teaching staff.

## 5. CONCLUSION

Artificial intelligence technology has transformed into a global new economic driving force, and is also a key driving force for China's industrial upgrading and transformation.The utilization and promotion of artificial intelligence technology may not only provide opportunities for innovation and entrepreneurship education, but will also become a core part of future innovation and entrepreneurship education for college students.In the future, this field will receive more attention and investment, which will help promote the deep integration of innovation and entrepreneurship with artificial intelligence, and contribute to the sustainable development of the future economy and society.

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