Asia Pacific Science Press

Journal of Educational Theory and Practice
ISSN(O):3005-9313
ISSN(P):3005-9305
Vol. 2 No.3 (2025)

Research on Innovation Ability Index and Training Path of College Students from the Perspective of Micro Certification

Pei Chen*

Shanghai University of Finance and Economics, Zhejiang College, Jinhua Zhejiang, 321000, China

Corresponding author: Pei Chen, cpmini5@163.com

Abstract: In the era of digitalization and the knowledge economy, micro-certification, as an innovative educational certification model, offers a new approach for the precise evaluation and efficient development of college students innovation capabilities. By exploring the essence, characteristics, and unique value of micro-certification in fostering innovation, this study constructs a multi-dimensional innovation capability index system and proposes targeted cultivation paths and implementation strategies. The research not only highlights the current status and challenges of micro-certification in higher educations innovation education but also provides valuable insights for optimizing educational models and enhancing support mechanisms. This contributes to the comprehensive improvement of college students in knowledge integration, practical application, and innovative thinking, thereby injecting new momentum into the cultivation of innovative talents.

Keywords: Micro Certification; College Students; Innovation Ability; Index System; Training Path

Published: Aug 27, 2025

DOI: https://doi.org/10.62177/jetp.v2i3.576

0.foreword

As global technological competition intensifies, innovation capability has become a key factor in assessing the competitiveness of nations and talents. College students, as the backbone of the countrys future development, have their innovation capabilities crucially important to cultivate. Traditional education models have many limitations when it comes to fostering innovation capabilities. Micro-certification, an emerging educational certification method, offers new ideas and approaches for cultivating college students innovation capabilities due to its flexibility, precision, and adaptability[1]. This article will explore the indicator system and cultivation paths for college students innovation capabilities from the perspective of micro-certification, aiming to provide valuable insights for the reform of innovative education in higher education institutions, helping college students stand out in the knowledge economy era.

1.The relationship between micro certification and college students innovation ability

1.1 Definition, characteristics and the role of micro certification in cultivating innovation ability

Micro-certification is a new form of educational certification that leverages digital technology to accurately assess and certify learners achievements in specific fields or skills. It is characterized by its high flexibility, strong relevance, and short certification cycle, making it suitable for the diverse learning needs of learners at various stages. Compared to traditional certification methods, micro-certification places greater emphasis on the immediacy and practicality of learning outcomes, better aligning with the rapidly evolving social demands and knowledge updates.

Micro-certification offers a new perspective and tool for fostering college students innovative capabilities. By setting clear standards for innovation skills, micro-certification encourages students to actively learn and apply innovative knowledge, thereby stimulating their intrinsic motivation and creativity. Moreover, the flexibility of micro-certification allows students to choose innovative learning paths that align with their interests and professional backgrounds, promoting personalized development. Additionally, micro-certification provides timely feedback and encouragement, helping students understand their strengths and weaknesses in innovation, which in turn enables them to adjust their learning strategies and enhance their innovative abilities.

1.2 Comparison between micro authentication and traditional authentication methods

Traditional certification methods primarily focus on academic credentials, emphasizing the systematic acquisition of knowledge by learners. However, they tend to overlook the assessment of innovative capabilities. In contrast, micro-certification focuses on the precise certification of specific skills or knowledge in learners, making it particularly suitable for evaluating innovative abilities[2]. It breaks down innovative capabilities into multiple specific skill points or knowledge modules and certifies each module independently, thus providing a more comprehensive and detailed reflection of students performance in innovative capabilities.

2.The construction of innovation ability index system for college students

2.1 Knowledge integration ability index

The ability to integrate knowledge is the foundation of innovation, enabling students to effectively combine knowledge from various disciplines to form a comprehensive interdisciplinary knowledge system. When establishing indicators for this integration ability, three aspects should be considered: breadth, depth, and relevance. The breadth indicator assesses the range of knowledge areas students have mastered, including whether they cover multidisciplinary knowledge related to the innovation theme. The depth indicator evaluates the extent to which students understand and master each knowledge area, focusing on their ability to delve into core concepts and principles. The relevance indicator assesses whether students can organically link knowledge from different disciplines to develop collaborative problem-solving skills.

2.2 Practical application ability index

Practical application ability is a key indicator of innovation capability, reflecting students ability to apply their knowledge and skills to solve real-world problems. When developing practical application ability indicators, the focus can be on three main areas: problem-solving, practical operation, and project management. The problem-solving indicator assesses students analytical, judgmental, and problem-solving skills in complex situations, evaluating whether they can use innovative thinking to find effective solutions. The practical operation indicator evaluates the proficiency and standardization of students skills during actual operations, assessing whether they can efficiently complete tasks. The project management indicator evaluates students organizational coordination, time management, and resource allocation skills in team projects, ensuring the smooth implementation of projects.

2.3 Innovation thinking ability index

Innovative thinking ability is the core of innovation capability, referring to students ability to break through traditional thinking patterns and propose novel and unique ideas and solutions. When designing indicators for innovative thinking ability, three aspects can be considered: flexibility, divergent thinking, and critical thinking[3]. The flexibility indicator assesses students ability to switch between different thought processes when faced with various problems, whether they can quickly adapt to different thinking models; the divergent thinking indicator focuses on whether students can propose multiple solutions when solving problems, demonstrating rich imagination and creativity; the critical thinking indicator evaluates students ability to question existing knowledge and viewpoints, assessing their capacity for independent thought and the ability to present their own insights.

3.Analysis of the current situation of innovation ability cultivation from the perspective of micro certification

3.1 The current situation of cultivating innovation ability in colleges and universities

Currently, universities have made some progress in fostering the innovative capabilities of college students, but several issues remain. On one hand, while universities generally emphasize innovation education and offer relevant courses and practical activities, there are still shortcomings in the design of the curriculum. The course content is not closely aligned with the actual needs for innovation capabilities, lacking systematicness and coherence. On the other hand, although universities have invested heavily in building innovation practice platforms, the utilization rate and effectiveness of these platforms need improvement. Some students show low participation in innovation activities, lacking initiative and enthusiasm.

Micro-certification, as a new form of educational certification, is still in its early stages of application in fostering innovation capabilities in higher education. Currently, some universities have started to incorporate micro-certification into the realm of innovative education by setting up micro-certification courses and projects to certify students learning outcomes in innovation. However, the scope of micro-certification remains relatively limited, primarily focusing on popular majors or fields such as computer science, engineering technology, and art design. There is a lack of unified standards and guidelines for setting certification criteria, leading to significant differences in micro-certification standards among different universities, which in turn results in poor mutual recognition of certification outcomes.

3.2 The shortcomings and limitations of traditional education models

The current model for fostering college students innovation capabilities faces several key issues: Firstly, the training objectives are not clearly defined, lacking a precise focus on innovation and a tiered approach to development, which results in unsatisfactory outcomes. Secondly, the training methods are overly reliant on classroom instruction, with practical training components being relatively weak, failing to meet the diverse learning needs of students. Thirdly, the evaluation system is inadequate, primarily relying on traditional examination and assessment methods, which do not provide a comprehensive evaluation of the innovation process and its outcomes. Lastly, there is a lack of effective incentive mechanisms, which fails to fully motivate students enthusiasm and initiative in the cultivation of innovation capabilities, thereby hindering the enhancement of these skills.

4.The cultivation path of college students innovation ability based on micro certification

4.1 Combination of curriculum system optimization and micro certification

Optimizing the curriculum system is crucial for enhancing college students innovation capabilities. Universities should redesign course content to meet micro-certification requirements, integrating innovation capability development throughout the curriculum. Firstly, increase the proportion of interdisciplinary and innovative thinking courses to break down disciplinary barriers and foster students ability to integrate knowledge. For example, introduce an Interdisciplinary Innovation Design course that encourages students to explore innovation in the intersection of different disciplines[4]. Secondly, link course content with real-world innovation projects, using project-driven methods to enhance students innovation skills through practical experience.

4.2 Integration of practice platform construction and micro certification

Practice platforms are crucial for fostering the innovative capabilities of college students. Universities should establish a variety of practice platforms to offer students a wealth of opportunities for innovation and practical experience. Firstly, they should set up on-campus innovation labs and practice bases equipped with advanced experimental equipment and tools, providing excellent conditions for students to conduct innovative experiments and research projects. For instance, establishing a College Student Innovation and Entrepreneurship Lab where students can develop and test various innovative projects. Secondly, universities should strengthen cooperation with enterprises and research institutions by setting up off-campus practice bases, allowing students to participate in real-world enterprise innovation projects and gain insights into market demands and industry trends. Additionally, micro-certification programs should be integrated into these practice platforms, certifying students based on their performance and achievements, thereby providing proof of their practical skills and enhancing their employability.

5.Implementation strategies of micro certification in cultivating innovation ability

5.1 Formulation and improvement of micro certification standards

Formulating scientific and reasonable micro-certification standards is crucial for the implementation of micro-certification. Universities should organize expert teams to develop detailed micro-certification standards based on the indicators of college students innovation capabilities. These standards should clearly define the specific requirements and evaluation methods for each innovation capability indicator, ensuring the objectivity and fairness of the certification process. For instance, in the certification standard for knowledge integration ability, it can specify the specific requirements for the scope of knowledge areas, depth of knowledge, and relevance of knowledge that students need to master. Additionally, it is essential to continuously refine the micro-certification standards, adjusting and updating them in a timely manner according to social needs and changes in academic disciplines, to ensure they remain consistent with the goals of fostering innovation capabilities.

5.2 Supervision and evaluation of micro certification process

The supervision and evaluation of the micro-certification process are crucial for ensuring certification quality. Universities should establish a robust supervision mechanism to strictly oversee the entire micro-certification process. Firstly, they should enhance the management of the certification platform to ensure the security and stability of the certification process, preventing cheating and other violations. For example, facial recognition technology can be used to monitor the certification process, ensuring that only the students themselves participate in the certification. Secondly, a diversified evaluation system should be established to comprehensively assess students innovative abilities. In addition to traditional exams and assessments, methods such as project reviews, work presentations, and peer evaluations can be employed to fully evaluate students innovative capabilities[5]. Additionally, timely feedback on the evaluation results should be provided to help students understand their strengths and weaknesses, thereby promoting their overall development.

6.Guarantee mechanism for cultivating innovation ability from the perspective of micro certification

6.1 Policy support and institutional guarantee

Policy support and institutional guarantees are the foundation for the implementation of micro-certification. Universities should establish relevant policies to provide institutional support for micro-certification. Firstly, they should introduce management measures for micro-certification, clearly defining the procedures, standards, and requirements for issuing certificates, ensuring the standardization and institutionalization of micro-certification. For example, they should specify the format and validity period of micro-certification certificates, as well as the rights and benefits students enjoy after obtaining these certificates. Secondly, they should establish incentive mechanisms to reward teachers and students who actively participate in micro-certification. For example, teachers who guide students to obtain micro-certification certificates should receive teaching achievement awards, and students who obtain micro-certification certificates should be given scholarships or honorary titles, thereby stimulating the enthusiasm of both teachers and students for participating in micro-certification.

6.2 Construction and training of teaching staff

The faculty is crucial for the implementation of micro-certification. Universities should enhance their faculty teams to boost teachers innovation capabilities and guidance skills in micro-certification. Firstly, they should recruit high-level talents with innovative abilities and experience in micro-certification to enrich the teaching staff. For instance, hiring teachers with experience in corporate innovation projects can provide students with practical innovation cases. Secondly, existing teachers should be trained through specialized micro-certification training sessions and academic exchanges, to improve their understanding and application of micro-certification. For example, inviting micro-certification experts to explain the standards and evaluation methods can help teachers better guide students in participating in micro-certification.

7.Challenges and Prospects of Innovation Ability Cultivation from the Perspective of Micro certification

7.1 Challenges and Problems

Despite its numerous advantages in fostering the innovative capabilities of college students, micro-certification still faces several challenges and issues in practical applications. Firstly, the promotion of micro-certification is challenging, as some

students and teachers have limited understanding of it, lacking sufficient awareness of its value and significance, which results in low participation. Secondly, the formulation and standardization of micro-certification standards are difficult, with significant differences among different universities, leading to poor mutual recognition of certification results, which hinders the widespread adoption of micro-certification. Additionally, the technical platform for micro-certification is not yet fully developed, with issues such as poor system stability and user experience, which hinder its promotion and development.

7.2 Future development trend and direction

In the future, the application of micro-certification in fostering college students innovative capabilities will exhibit the following trends: Firstly, the integration of micro-certification with emerging technologies such as artificial intelligence and big data will become more integrated. By leveraging technological means, the certification process will become smarter and more personalized, thereby enhancing both efficiency and quality. For instance, AI algorithms can be used to analyze students learning behaviors and innovative abilities, providing them with personalized learning suggestions and certification plans. Secondly, micro-certification will place greater emphasis on aligning with societal needs. Through collaboration with businesses and industries, real-world demands will be incorporated into micro-certification standards and course content, aiming to cultivate talents with stronger practical skills and a spirit of innovation. Thirdly, the internationalization of micro-certification is expected to grow. As global educational exchanges continue to strengthen, micro-certification is poised to achieve mutual recognition internationally, supporting the international development of college students.

8.Conclusion

In the digital age, micro-certification offers new opportunities and challenges for fostering college students innovative capabilities. By establishing a scientific and reasonable system of innovation indicators and integrating the implementation strategies of micro-certification, it can effectively enhance college students innovative abilities. However, the promotion of micro-certification still faces numerous challenges, necessitating collaborative efforts from universities, governments, and society to refine policies, optimize resource allocation, and strengthen technical infrastructure, thereby promoting the widespread adoption of micro-certification. In the future, as technology advances and social needs evolve, micro-certification will play an increasingly significant role in cultivating college students innovative capabilities, providing robust support for nurturing innovative talents that meet the demands of the times.

Funding

no

Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

Reference

[1] Jin, J. (2024). A brief discussion on the construction of comprehensive evaluation index system for innovation and entrepreneurship ability of Sichuan higher vocational college students. Education Examination and Evaluation, (02), 50–55.

[2] Jia, Y. (2024). Evaluation of college students' innovation and entrepreneurship ability from the perspective of ubiquitous learning. Heilongjiang Education (Theory and Practice), (08), 44–48.

[3] Zhang, L., Wang, H., Yang, N., et al. (2024). Construction of the core competency index system for college students' innovation and entrepreneurship under the background of specialization and innovation integration. Educational Science Exploration, 42(05), 47–54.

[4] Zhang, L., Qiao, R., & Hua, Y. (2025). Research on the construction of evaluation index system for innovation and entrepreneurship ability of college students in architecture. Theory and Practice of Innovation and Entrepreneurship, 8(05), 4–7.

[5] Li, X., & Meng, S. (2025). Construction of evaluation index system and improvement strategies for college students' innovation and entrepreneurship ability. Journal of Shaanxi University of Technology (Social Sciences Edition), 43(02), 99–108.