

The Mode of Digital Capability Cultivation for Innovative Talents from the Perspective of CDIO Educational Concept

Fei Liu^{1,a}, Tiansen Liu^{1,b,*}, Xiangyin Kong^{1,c}, Wei Pan^{1,d}

¹*School of Economics and Management, Harbin Engineering University, Harbin, China*

^a*f.liu@hrbeu.edu.cn*, ^b*tiansen0328@hrbeu.edu.cn*, ^c*kong_xiangyin0623@163.com*,

^d*panwei@hrbeu.edu.cn*

**Corresponding author: tiansen0328@hrbeu.edu.cn*

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Abstract: To meet the demand for innovative talents within the digital economy era, higher education institutions need to continually explore effective cultivation modes. In such context, this article combines relevant theories and literature to explore the optimized ways of digital capability cultivation targeting at the innovative talents. Drawing inspirations from the conceive, design, implement, and operate (CDIO) educational concept, this article integrates the dimensions of CDIO with cultivating objectives, cultivating process, and cultivating evaluation to put forward an optimized mode for cultivating digital talents. Our analysis exercises some theoretical and practical implications for the cultivation of digital talents in China's higher education system.

1. Introduction

Since the 21st century, innovative technologies led by digital technologies such as the big data, artificial intelligence, and block chain have experienced a rapid development, bringing about the unprecedented digital transformation. Such change has not only had a tremendous impact on the economic development and industrial structure of society, but has also altered people's lifestyles and ways of thinking. Digital technologies facilitate information exchange and liberate the data transmission from spatial and temporal constraints. The dividends of digital era have brought both opportunities and challenges to various industries. In the face of the digital wave, cultivating innovative talents with digital capabilities is the key to digital transformation. As main pioneers in cultivating innovative talents, universities and colleges should proactively leverage digital technologies to foster comprehensive digital talents and provide diversified, specialized, and high-quality talent cultivation services.

With the continuous advancement of industrial digitization, the success of digital transformation mainly relies on the talents with digital capabilities. Digital talents possess data-driven thinking and can manage, integrate, and flexibly utilize diverse massive data. Digital talents always use their skills to determine the derived value of data assets and ensure the implementation and management of digital strategies and organizations. This article concentrates on cultivating digital capabilities in

innovative talents and is motivated by the conceive, design, implement, and operate (CDIO) educational concept. It revolves around key technical indicators for talent cultivation such as cultivating objectives, processes, and evaluations. Based on the national strategy for digital transformation and development in China, this article explores the significance of optimizing the cultivation mode for innovative talent in the economic and management fields, driven by the CDIO educational concept. Accordingly, the goal of talent cultivation will shift toward providing the nation and society with innovative talents who could possess digital capabilities. Finally, this article offers some important policy recommendations for cultivating innovative talents in China.

2. Literature Review

2.1. Digital Transformation and The Cultivation of Innovative Talents

Digital transformation refers to the development environment of digital technologies and supports some capabilities to establish a dynamic digital business mode ^[1]. The disruptive innovation brought about by digitization requires organizations to undergo digital transformation. In the era of digitization, organizations in various industrial sectors will face more uncertainties and complexities ^[2], while new technologies facilitate information connectivity and enable the real-time data presentation. However, this shift also highlights the instability of systems, making it possible for the relevant organizations to innovate and alter existing rules. In the context of digitalization, the cultivation of innovative talents has become a focal point among scholars and educators. In general, innovative talents primarily encompass a multidimensional and open knowledge composition, a comprehensive and innovative skill set, and a multidimensional and flexible thinking composition ^[3]. Extensive literature has been developed targeting at various industrial sectors based on the backdrop of digital transformation, particularly in cultivating innovative talents.

Bughin et al (2018) explored the impact of digital transformation on organizational training and how to adapt the training to some new changes. This study also examined how different departments cultivate new innovative talents to cope with the challenges of digital transformation. Their findings revealed the significance of organizational training and cross-department collaboration in effectively addressing the changes brought about by new technologies in the digital transformation era ^[4]. At the same time, Guinan et al (2019) argued that cultivating an innovative digital project team is a crucial factor in driving organizational digital transformation. Their research emphasized that one of the necessary conditions for successful digital transformation is to cultivate a team with innovation capabilities and digital technology expertise ^[5]. Existing literature has extensively studied the cultivation of innovative talents; however, there is limited research on integrating the CDIO concept to enhance the digital capabilities of innovative talents. Therefore, this article aims to introduce the CDIO concept and expand the research perspective on cultivating innovative talents.

2.2. The CDIO Educational Concept

The CDIO concept is a practice-driven talents-cultivation mode, which enables individuals to flexibly acquire and apply practical skills, fostering their comprehensive capabilities and qualities ^[6]. Shen et al (2020) examined the combination of computer technology production and education and found that the application of the CDIO concept can help establish an optimal talents training mode ^[7]. Such findings further indicated that integrating the CDIO project-based teaching mode into physics education enhances students' learning and the application of professional courses and knowledge by completing projects, thereby cultivating students' capabilities in independent learning, teamwork, communication, and problem-solving ^[8]. In general, the current literature aims

to explore how the CDIO educational concept can be utilized to optimize the innovative talents-cultivation mode for both economic and management fields in the context of digital transformation. Motivated by it, this article focuses on talent-development objectives, processes, and evaluation in the CDIO project-driven approach.

3. The Optimization of Digital Capability Cultivation Mode for Innovative Talents

Under the guidance of the CDIO educational concept, a framework for optimizing the cultivation mode of innovative talents within economics and management fields can be constructed from three aspects that are cultivating objectives, cultivating process, and cultivating evaluation (see Figure 1).

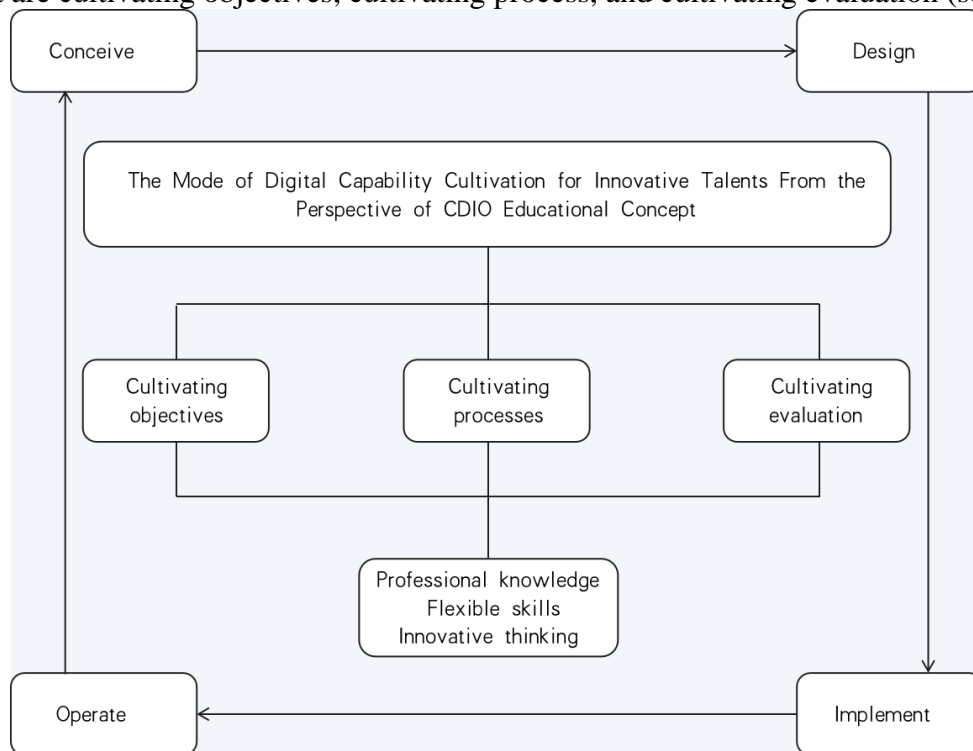


Figure 1: The optimization of the digital capability cultivation mode for innovative talents.

3.1. The Optimization of Cultivating Objectives

In the context of digital transformation, based on the CDIO educational concept and combined with a survey on talent cultivation in the field of economics and management, the traditional mode of “knowledge imparting” as the cultivating objective needs to be changed. By making scientific and reasonable cultivating objectives and plans, students can obtain professional knowledge, flexible skills, and innovative thinking. Therefore, this article explored the optimization of cultivating objectives, cultivating processes, and cultivating evaluations for innovative talents at different levels in the economics and management fields. It aims to provide some theoretical implications for the development of high-quality talent cultivation in China’s universities and colleges against the backdrop of digital transformation and to promote the reform process of higher education in the “14th Five-Year Plan”. It also offers policy recommendations for establishing a strong country through talent.

3.2. The Optimization of Cultivating Processes

First, to cultivate innovative talents in economics and management, the curriculum construction concept focuses on the cultivation of digital capabilities. With a rapid development of information technology, digital capabilities have become essential core competencies for innovative talents. Through the CDIO cultivation mode, students are able to achieve a comprehensive understanding of the application of digital technology, master methods of data analysis and processing, and develop skills in using digital tools and platforms. Second, the design of the curriculum should balance theoretical knowledge and practical application. In addition to imparting relevant theoretical knowledge in the fields of economics and management, teaching methods such as project-based learning, case analysis, teamwork, and field visits should be adopted. For example, collaborating with firms to carry out projects allows students to be exposed to real business environments and practical management issues while enhancing their problem-solving and innovation abilities. Finally, the cultivation of innovative talents in economics and management requires interdisciplinary knowledge and skills. The curriculum system can incorporate interdisciplinary collaboration and linkages with other fields of study, breaking down disciplinary barriers and nurturing students' comprehensive capabilities. For instance, inviting more and more students from engineering, design, or information technology disciplines to involve in innovative projects can facilitate interdisciplinary collaboration and innovation.

3.3. The Optimization of Cultivating Evaluation

Based on the CDIO educational concept, the assessment and evaluation system for cultivating innovative talents in the field of economics and management should be diversified and comprehensive, concentrating on the development of students' innovation capability, teamwork ability, problem-solving ability, and engineering practice in order to help optimize the effectiveness of such cultivation efforts. The evaluation system mainly includes: (1) diversified evaluation methods: Adopting various evaluation methods such as project reports, presentations, assignments, examinations, and practical achievements to comprehensively understand the development of students' capabilities in the fields of economics and management without relying exclusively on traditional written examinations, but also emphasizing the assessment of students' practical and teamwork abilities; (2) project-oriented evaluation: Encouraging students in economics and management to participate in projects with practical application scenarios, practicing various aspects of CDIO in the projects, and evaluating students' performance in the projects; such evaluation can include project planning, requirements' analysis, design schemes, implementation processes, and project outcomes; (3) individualized evaluation: Providing personalized evaluation and guidance based on students' interests and strengths as different students may demonstrate different strengths and development directions in the CDIO process. Therefore, the evaluation should reflect individual differences and provide targeted cultivating suggestions for students; and (4) industry and social demand orientation: The evaluation system should be combined with industry and social demands, emphasizing students' capability to address practical problems and adaptability. Industry experts can be invited to participate in the evaluation process, drawing on their experiences and opinions to ensure the cultivation of innovative talents that meet industry and social needs.

4. Conclusions

This article develops a systematic theoretical framework targeting at the cultivation of innovative talents in the fields of economics and management based on the CDIO educational concept,

providing a new perspective for innovative talent cultivation. In addition to possessing theoretical knowledge and practical skills in management, economics and management professionals need to acquire digital capabilities to adapt to the current era of digital technology-driven innovation and transformation. This article can effectively expand the thinking on talent cultivation in economics and management and provide support for the reform of higher education in economics and management. Ultimately, a comprehensive and in-depth analysis is required to enhance the cultivation of innovative talents in the field of economics and management in China, concentrating on optimizing the cultivating objectives, processes, and evaluation methods.

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Credit author statement

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