Optimizing the Digital Capability Cultivation Mode for Innovative Talents Based on the "Student-Centered" Approach

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Abstract: To meet the rapidly growing demand for innovative talents driven by widespread integration of digital technologies, higher education institutions face the critical challenge of continuously optimizing their talent cultivation mode to align with national strategic development goals. In such context, this paper synthesizes relevant theoretical frameworks and existing literature to investigate effective optimization measures for enhancing the digital capabilities of innovative talents, particularly within the disciplines of economics and management. Based on the Self-Determination Theory and then by incorporating the "Student-Centered" pedagogical approach, the study emphasizes the integration of autonomy, competence and relatedness as core psychological needs that underpin successful digital capability cultivation. Through this framework, we propose targeted strategic optimizations that foster a supportive learning environment conducive to cultivating well-rounded, digitally proficient graduates who can effectively contribute to national innovation initiatives. The findings highlight the importance of creating an inclusive and supportive learning environment that cultivates independent thinking, collaboration, and continuous skill acquisition. The findings offer both theoretical guidance and practical insights for educators, administrators, and policymakers striving to improve digital talent cultivation within China's higher education system, thereby contributing to the nation's broader goals of digital transformation and sustainable innovation.

Keywords: Digital Capability; Student-Centered Approach; Innovative Talents; Cultivation Mode; Self-Determination Theory

1. Introduction

Education, technology, and talent are fundamental and strategic supports for building a modern country, which points out the way for advancing the strategies of science and education to invigorate the nation and strengthen human resources in the new era. The integration of science, education, and talent development aligns with the inherent laws of the scientific innovation and talent development, leading to a significant tendency in the global reform of educational systems [1]. In the context of rapid technological advancements and widespread applications, digital capability has become an indispensable core competency for innovative talents. As a primary arena for talent cultivation, universities should leverage digital technologies proactively to develop well-rounded digital talents and provide more diversified, specialized, and high-quality talent development services. Guided by advancements in digital technological innovation and centered on cultivating innovative talents, it is imperative to strengthen the organic integration of scientific research with teaching and education. Transforming university research resources into educational advantages and implementing first-class innovation talent training programs grounded in the integration of science and education are essential strategies. Such efforts represent the inevitable response of higher education to the new wave of technological revolution and industrial transformation, aiming to comprehensively enhance the quality of talent cultivation.

This paper is grounded in the national digital transformation development strategy and the concept of digital talent development for innovation and entrepreneurship. Focusing on

key technical indicators of talent cultivation such as educational philosophy, competency standards, and training conditions, and considering the characteristics of talent development across different levels along with a holistic perspective on talent cultivation, this study emphasizes the optimization of digital capability cultivation mode for innovative talents in the field of economics and management. By utilizing the Self-Determination Theory as a theoretical foundation, while also drawing from the practices of unique educational institutions both domestically and internationally in cultivating innovative entrepreneurial talents [2], this paper delves into key elements of talent cultivation, namely autonomy, competence, and relatedness. The study aims to highlight the significance of optimizing innovation and entrepreneurship talent cultivation models within the economics and management fields, shifting talent development goals toward supplying innovative entrepreneurial professionals with digital capabilities to meet national and societal needs. Furthermore, it offers policy recommendations to advance the cultivation of innovation and entrepreneurship talents in China.

2. Literature Review

2.1 The Student-Centered Talent Cultivation and Digital Transformation

As early as the 1960s, the U.S. universities began exploring talent cultivation modes [3]. Through the continuous development and evolution, the “Student-Centered” approach has become a prevalent mode in today’s educational sectors, triggering a significant transition from teacher-centered education to student-centered learning. Compared to traditional teacher-centered approaches, student-centered approaches enhance the development of critical thinking, creativity, and problem-solving skills, while emphasizing inclusivity and learner autonomy. Tang (2020) argued that teamwork and collaborative effort are critical characteristics of the student-centered talent cultivation mode, where students typically exchange ideas, clarify responsibilities, and complete tasks through learning groups [4]. Tang (2020) also noted that such a mode not only facilitates efficient task completion, but also benefits students' integration into society and workplaces [4]. Further, Li and Li (2023) found that the student-centered approach is closely related to the use of technology for research, interaction, gamification, simulation, and feedback [5]. Bhardwaj et al. (2025) examined the positive impact of student-centered pedagogical strategies on the academic and personal growth of science graduate students through a case study of the course "Molecular Basis of Cancer" [6]. Their findings indicate that shifting the instructional model strengthened students’ comprehension of complex scientific concepts, fostered independent learning and collaborative research, and led to notable academic achievements.

The application of digital talents’ skills determines the derived value of data assets and ensures the effective implementation and management of digital strategies and digital organizations [7]. As digital technologies proliferate across various fields, the digital transformation of industries imposes higher requirements for cultivating innovative talents’ digital capabilities. The extant literature suggests that during the current digital upgrading process, industries that develop digital innovative talents with diverse, innovative, and international learning backgrounds are more likely to maintain core competitiveness [8]. An and Xu (2021) then examined the computer science professionals in the higher education institutions, developing a data-driven talent cultivation system mode and a diversified talent demand cultivation plan, building an effective quality evaluation system for digital talent cultivation [9].

Despite the extensive literature on the student-centered pedagogical approach, there remains a lack of frameworks to guide the implementation of this mode amidst the challenges posed by digital transformation. This paper aims to extend the research perspective on cultivating innovative talents by integrating the principles of Self-Determination Theory with the student-centered approach.

2.2 The Self-Determination Theory

The Self-Determination Theory is a foundational theoretical framework in psychology, co-founded by Richard M. Ryan

and Edward L. Deci in the 1980s [10]. As a theory of human motivation and personality development, Self-Determination Theory emphasizes the degree of self-determination in human behavior, positing that individuals make free and volitional choices based on a clear understanding of their personal needs and environmental information. The theory distinguishes between intrinsic and extrinsic motivation and identifies three basic psychological needs that drive human behavior: autonomy, competence, and relatedness. Autonomy denotes the degree of freedom and self-direction an individual experiences in their actions and decision-making processes [11]. Competence refers to an individual subjective sense of their capability to effectively complete tasks and achieve goals in alignment with task requirements [11]. Relatedness refers to an individual's perception of having established meaningful connections with others and feeling cared for and supported [11]. When these needs are satisfied, individuals experience enhanced intrinsic motivation and improved learning outcomes; conversely, unmet needs may lead to burnout or diminished motivation [12].

This theoretical foundation has important implications for educational reform, particularly in fostering environments that support students' psychological needs and promote sustained engagement and achievement. Xia et al. (2022) conducted a study based on Self-Determination Theory, examining students' engagement in artificial intelligence education from the perspective of need satisfaction. Their findings indicate that addressing and fulfilling students' psychological needs enhances their confidence and fosters greater intrinsic motivation to participate actively in artificial intelligence education [13]. This underscores the critical role of creating supportive learning environments that satisfy autonomy, competence, and relatedness needs to foster student creativity and productivity. Similarly, Hao and Lan (2023) introduced mobile applications into the teaching process to explore novel learner-centered classroom modes. Their research demonstrated that within these innovative instructional settings, the satisfaction of students' basic psychological needs positively influenced classroom satisfaction. These results highlight the importance of addressing psychological needs in educational reform, suggesting that technology-enhanced, learner-centered approaches can effectively promote student engagement and well-being [14].

In optimizing the cultivation mode for the digital capabilities in innovative talents, it is essential to create a learning environment that meets students' fundamental psychological needs, thereby continuously enhancing their autonomy, competence, and relatedness. Ultimately, the goal is to cultivate economic and management professionals with robust digital capabilities and innovative spirit, in line with the demands of the digital economy.

3. Optimizing the Cultivation Mode for Digital Capabilities in Innovative Talents

3.1 Fostering the Individual Autonomy

The fulfillment of autonomy is crucial to stimulate the intrinsic motivation [12]. Autonomy emphasizes that individuals perceive their actions as self-chosen rather than externally controlled. This sense of volition is fundamental to fostering intrinsic motivation and active engagement in the learning process. When individuals can select and control their actions, they would show higher enthusiasm and creativity. The individual autonomy in cultivating digital capabilities among economic and management students not only mobilizes their subjective initiative and intrinsic motivation, but also nurtures their independent thinking, innovative capabilities, and self-management skills, laying a solid foundation for cultivating innovative economic management talents in line with the demands of the digital economy.

To foster individual autonomy, it is quite significant to motivate the students to select their learning content and pace, implement the problem-oriented learning designs, and establish the self-assessment as well as reflection mechanisms. For example, students aspiring to become digital transformation consultants may set their learning goals to master digital strategic planning and process reengineering, while those interested in the financial data analysis may focus on mastering data mining algorithms and proficiently using specialized financial analysis tools. This involvement in setting learning objectives enhances students' awareness and

accountability for their learning processes and outcomes, effectively stimulating their autonomy in learning.

3.2 Enhancing the Individual Competence

When individuals perceive themselves as competent, they believe they can interact effectively with their environment and possess the necessary skills to successfully achieve their goals. A sense of competence fosters a feeling of control over one's surroundings. However, this sense of competence can diminish if tasks are perceived as overly challenging or if individuals receive negative feedback. Conversely, competence is strengthened when task demands closely match an individual's skills or when positive feedback is provided. Understanding these dynamics is essential for designing educational interventions that effectively support students' competence development and promote sustained motivation. Therefore, enhancing the individual competence in the cultivation of economic and management talents not only stimulates students' intrinsic motivation to engage actively in learning digital knowledge and skills, but also boosts their self-confidence and self-efficacy, encouraging them to pursue greater achievements in their journey of developing digital capabilities.

To enhance the individual competence, it is crucial to clarify both cultivation goals and pathways, provide personalized support, and offer the timely feedback and problem-solving assistance. For example, when students utilize the data analysis software for complex economic data mining and analysis, they can extract valuable information from vast datasets to support business decisions. This successful application of digital knowledge and skills allows the students to tangibly recognize their capabilities in solving real-world economic and management problems, thus enhancing their sense of competence.

3.3 Increasing the Individual Relatedness

The satisfaction of relatedness serves as a key determinant impacting learning outcomes [12]. Relatedness involves a sense of closeness and belonging within a social group. Without relatedness, self-determination becomes more difficult to achieve, as individuals lack access to necessary support and assistance. When individuals feel respected and cared for by others and are part of an inclusive environment, their sense of relatedness is strengthened. This enhanced relatedness fosters greater motivation and engagement, which are essential for effective learning and personal development. In cultivating the digital capabilities of innovative talents in economic management, fostering relatedness can not only invigorate students' learning enthusiasm, but also create a stable psychological environment that encourages resilience when facing learning challenges, providing emotional support for nurturing innovative economic management talents in alignment with the demands of the digital economy.

To increase the individual relatedness, building the collaborative learning environment, cultural identity, value transmission, and recognition of achievements are quite essential. For example, in the big data as well as business intelligence seminar group, students can share diverse opinions on how mobile medical technology can transform health management practices, thus inspiring each other. During school-enterprise collaborations, students can jointly tackle technical challenges in simulated projects of digital transformation for companies. Such interactive exchanges and collaborative practices allow students to deeply engage in research projects, feeling like indispensable members of the learning community whose goals align and support one another, ultimately fostering a strong sense of belonging.

4. Conclusions

This paper introduces the "Student-Centered" approach grounded in Self-Determination Theory, proposing a comprehensive theoretical framework aimed at cultivating digital capability for innovative talents in the fields of economics and management. Central to this framework is the promotion of three psychological needs identified by Self-determination Theory: autonomy, competence, and relatedness. By fostering students' sense of autonomy, improving their perceived competence, and enhancing their connections with classmates and instructors, the approach seeks to create an engaging and supportive learning environment that cultivates creativity and innovation. This framework not only provides a new perspective on innovative talent cultivation. but also addresses current

challenges in higher education reform within economics and management disciplines. The findings contribute to expanding theoretical and practical discussions on how best to develop economic and management talents equipped for the complexities of digital era. Moreover, the study underscores the importance of aligning pedagogical strategies with motivational principles to optimize student outcomes. Future research is encouraged to examine the practical application of Self-determination Theory across diverse teaching contexts and subject matter, assessing the effectiveness of this approach in varying educational scenarios. Additionally, further integration of theory and practice is needed to continuously refine and adapt talent cultivation models, ensuring they remain responsive to evolving academic and industry demands.

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Declaration of Interest Statement
All authors declare that there is no any interest conflict among us, and we all know the process of paper organization and submission.

Credit author Statement
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