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Research on the Cultivation Model of Management Innovation and Entrepreneurship Talents under the Integration of Academic Majors and Project Mentorship

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Abstract

This research focuses on enhancing the training model for undergraduate management talents within the context of "specialty integration," delving into the practical mechanism of merging the "project mentor system" with professional education. It aims to improve students' innovation abilities by addressing disciplinary barriers and conceptual differences in the coordinated development of professional education and innovation and entrepreneurship education, based on the educational concept of "all staff, all process, all-round" nurturing. By systematically organizing the main line of professional courses, the research explores the essence of "specialized integration," integrating classroom teaching, scientific research training, and extracurricular practice to build an integrated training system that combines theoretical learning, innovative practice, and entrepreneurial training. The research is grounded in the school-enterprise cooperation platform and international cutting-edge academic resources, aligning with industry development trends and employing heuristic, discussion-based, and participatory teaching methods to enhance teaching interaction and practicality. Additionally, it aims to strengthen the construction of the innovation and entrepreneurship teacher team, establish a diverse evaluation system, and focus on a comprehensive assessment of knowledge mastery, innovative thinking, and practical abilities. Utilizing the five-stage teaching model of "attracting-exploring-explaining-transferring-evaluating," the research concentrates on nurturing students' foundational thinking skills and comprehensive competitiveness, driving collaborative innovation between teachers and students, and ultimately enhancing the overall quality of talent development.

Keyword:

Cultivation Model, Innovation and Entrepreneurship Talents, Academic Majors, Project Mentorship

Introduction

In the context of deepening global economic integration and the accelerating knowledge economy, innovation and entrepreneurship have emerged as pivotal drivers of economic and social development (Audretsch, 2014). Higher education, as both a hub of knowledge creation and a catalyst for economic transformation, is increasingly expected to cultivate talents equipped with interdisciplinary thinking, digital competence, and

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problem-solving abilities (Kong et al., 2022; Solow, 1956). However, despite growing recognition of its strategic role, existing innovation and entrepreneurship education (IEE) often remains fragmented, constrained by time conflicts with professional curricula, disconnected from industry practices, and hindered by weak integration mechanisms between professional and entrepreneurial education (Chen et al., 2024; Li et al., 2023). These challenges compromise the ability of universities to produce graduates capable of transforming theoretical knowledge into actionable innovation.

To address these limitations, this study proposes a composite cultivation model that integrates academic majors with project-based mentorship. Grounded in the dual logic of curricular reform and experiential learning, the model combines in-class professional instruction with out-of-class project engagement, forming a full-cycle talent development mechanism (Xu et al., 2023; Chan & Tung, 2022). It seeks to build a sustainable system for embedding IEE across disciplines, fostering the synergy of knowledge, skills, and attitudes. By leveraging research projects, academic competitions, and digital platforms, the model aims to improve students' self-regulation, digital literacy, and interdisciplinary collaboration. Theoretically, this study expands the framework linking higher education to innovation-driven development; practically, it offers a scalable and operational paradigm for training new-era management talents with innovation capabilities and real-world adaptability (Wu, 2022; Zhang & Feng, 2023).

Literature review

Theoretical Evolution of Innovation and Entrepreneurship Education (IEE)

Innovation and entrepreneurship education (IEE), a pivotal pillar of contemporary higher education reform, finds its theoretical foundation in Schumpeter's (1934) innovation theory, which posits innovation as the engine of economic growth. As the knowledge economy took shape, Etzkowitz and Leydesdorff's (2000) "Triple Helix" model provided a conceptual framework for understanding the synergistic interaction among universities, industry, and government in fostering innovation ecosystems—thereby offering theoretical support for the institutionalization of IEE in higher education. Audretsch (2014) further emphasized the instrumental role of higher education in nurturing innovation and entrepreneurship, although the internal mechanisms remain underexplored. Solow (1956) was among the first to examine how universities evolved from mere knowledge repositories into critical engines of economic progress. This paradigm shift has prompted scholars to re-evaluate the university's role in advancing innovation-driven development.

Since 2015, China has successively issued policy documents such as the Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Higher Education Institutions, officially elevating IEE to the level of national strategic priority. Kong et al. (2022) concluded that these policy efforts have contributed to a "comprehensive, all-encompassing, and holistic" IEE system. However, persistent challenges remain. A noticeable disconnect still exists between IEE and disciplinary education (Abulibdeh et al., 2024; Biasi & Ma, 2022), often manifested in fragmented curricular structures (Lazari & Matsoukas, 2025; So, 2024) and misalignment between teaching content and industry demands (Wiederhold, 2020; Ilori & Ajagunna, 2020).

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Theoretical Basis and Practice of "Specialty-Entrepreneurship Integration"

The concept of "specialty-entrepreneurship integration" aims to unify disciplinary education with IEE in a cohesive and mutually reinforcing model. Bond et al. (2018) emphasized that perceptual differences between teachers and students toward digital tools may impede effective educational implementation, highlighting one of the key cognitive barriers in such integration. Similarly, Butler et al. (2018) stressed the need for reconfiguring education to prioritize learner needs and system-level support—a core principle aligned with the philosophy of "all-staff, all-process, all-round" educational reform.

Methodological tools such as CiteSpace (Chen, 2006) and bibliometric analysis (Muñoz-Leiva et al., 2012; Rojas-Lamorena et al., 2022) have been widely employed to map research trends in the "specialty-entrepreneurship fusion" domain. In response to the digital transformation accelerated by the COVID-19 pandemic, Marks et al. (2021) highlighted emerging opportunities for integrating digital tools and pedagogy. These evolving conditions further underscore the importance of flexible and systemic models of integration in higher education.

Origins and Evolution of the Project-Based Mentorship System

The concept of project-based mentorship finds its roots in the Oxford tutorial system (Neumann, 1992), later evolving into a modern educational model emphasizing collaborative learning and guided practice. Within the context of IEE, Pittaway et al. (2015) defined the mentor's role as that of knowledge transmitter, network facilitator, and psychological supporter. The foundational theory of "scaffolding" proposed by Wood et al. (1976) laid the groundwork for this model, positing that learners require guided support when encountering unfamiliar tasks. He (1997) and Larkin (2001) expanded on this with structured stages and conditions for effective scaffolding, providing a pedagogical blueprint for implementing project-based mentorship.

Empirical evidence further validates the approach: Padmadewi and Artini (2019) demonstrated that varied scaffolding strategies not only improved students' academic output but also enhanced their motivation and engagement. This aligns with Vygotsky's (1978) "zone of proximal development" theory, which emphasizes personalized instructional support just beyond the learner's current abilities, providing a theoretical justification for tailored mentorship in IEE.

Evaluation Systems and Digital Literacy in IEE

A robust and multidimensional evaluation framework is critical to ensuring the quality and impact of innovation and entrepreneurship education (Mızıkaçı, 2006; Ahmed & Sorour, 2024). Traditional assessments, which often emphasize standardized testing, are insufficient in measuring competencies such as creativity, problem-solving, and teamwork (Bryan & Clegg, 2006; Albino et al., 2008). To address this, recent studies have advocated for integrative evaluation models combining formative and summative assessment dimensions (Beerepoot, 2023; Yıldırım et al., 2023). These models typically assess knowledge acquisition, innovation capability, practical skills, and collaborative performance (Bayhantopçu & Ojea, 2023; Swartz et al., 2024).

Digital technology plays a transformative role in this context. Its contributions to IEE include expanded

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learning access via ubiquitous platforms (Shah et al., 2022), enriched experiential learning through virtual simulations (Brown & Wyatt, 2010; Whewell et al., 2022), and en

Design and implementation of curriculum system

Curriculum design

Higher education curriculum design should prioritize the cultivation of high-order thinking skills through systematic restructuring of disciplinary and course frameworks. This involves strengthening the integration of innovation and entrepreneurship education with ideological and political education, with an emphasis on fostering students' capacity for active deep learning and lifelong learning awareness—exemplified in courses such as "Hotel Management." Instructional content must encompass analytical, synthetic, critical thinking, problem-solving, creative, and evaluative cognitive abilities, incorporating multi-faceted and multi-layered complex problem scenarios to enhance students' holistic competence in addressing challenging situations. Design principles should account for the synergistic development of knowledge, skills, and attributes, grounded in students' cognitive levels, motivation, and instructional material characteristics. Content and assessment methods should be selected scientifically, with emphasis placed on relevance and cutting-edge knowledge. By designing inquiry-based scenarios and structured interactions supported by feedback mechanisms, collaborative knowledge construction and experiential exchange between instructors and students can be facilitated. Assessment should align clearly with learning objectives, integrating both formative and summative evaluation to ensure instructional and evaluative coherence.

Teaching implementation innovation

Building on advanced research and practical platforms, this model deeply integrates digital teaching tools and embeds the concept of "innovative thinking" across personalized, project-based talent development processes. This significantly improves the efficiency and quality of collaborative teacher–student learning. Based on a ubiquitous learning paradigm, the approach uses digital environments to support personalized knowledge construction and strengthens interaction and knowledge sharing within and beyond the classroom.

Implementation Path of Project Mentor System

Centered on cultural guidance and teacher–student co-creation, the system encompasses classroom learning, self-directed learning, mentoring, and practical application. A two-way selection mechanism is established based on students' professional interests and development needs, mentors' research expertise and project resources, as well as program-specific training objectives. Mentors may assume roles individually or in teams, and students can opt for single or multiple mentors within a project group. They may also engage in different tiers of mentorship according to project phase requirements. Through guided support, autonomous learning, hands-on practice, and teacher–student collaboration, a five-phase cycle of "Attraction—Exploration—Explanation—Transfer—Evaluation" is established. This fosters students' foundational cognitive skills and sustains a human-centered, continuously innovative educational process.

Project mentorship system

The mentorship system is project-driven, facilitating the application of curricular knowledge to real-world

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problem-solving through authentic scenarios. Mentors design challenging objectives derived from their research projects, industry collaborations, or student-initiated proposals. In interdisciplinary fields such as digital tourism—spanning information technology, data analysis, marketing, and user experience—it is essential for students to select topics with both practical relevance and research depth. Accordingly, theme-based project options are structured to support scientific inquiry and innovation venture practices. This approach encourages students to autonomously define learning tasks, develop project proposals, plan execution, and implement designs, thereby stimulating intellectual curiosity and critical thinking and enabling the translation of knowledge into practical skills.

Guidance on content and form

To enhance the effectiveness of innovation and entrepreneurship education, a systematic management framework must be established. This includes implementing procedures for project selection, execution, and evaluation, and fostering regular communication between mentors and students to facilitate information exchange and collaborative problem-solving. Mentors provide subject-matter guidance and monitor progress, while students execute tasks and submit regular reports. Roles and responsibilities are clearly delineated: mentors hold supervisory and evaluative authority, students are entitled to receive support, and both share accountability for project outcomes. A balanced evaluation system emphasizing both process and results is implemented, assessing criteria such as innovation and completeness. High performers receive recognition, while those falling short are provided with feedback and support. A structured project timeline with key milestones and periodic reviews enables timely issue identification and strategic refinement. Dynamic feedback and adjustment mechanisms ensure that the educational model remains responsive to market needs, thereby enhancing the quality of talent cultivation in innovation and entrepreneurship.

Construction of a diversified evaluation system

Deepening the integration of specialized and innovative education requires its embedding within an all-member, all-process, and all-around education system, forming an educational ecosystem that combines communities of practice, integrated models, and collaborative platforms. With clearly defined talent development goals and a focus on project quality, a multidimensional and dynamic evaluation system is established. Student assessment emphasizes process-oriented evaluation, tracking development in intellectual demeanor, academic performance, research capability, and exploratory spirit before and after joining project groups. Mentor evaluation incorporates access and exit mechanisms, accounting both for advisory performance and educational outcomes. Outstanding students receive preferential consideration in awards and employment recommendations; exceptional mentors are recognized via workload accounting, performance incentives, professional promotion, and student recruitment quotas. Underperforming project teams are subject to dynamic elimination. By integrating self-directed inquiry with real-world problem solving, the model enhances innovative thinking, knowledge transfer, and teamwork among participants while promoting students' self-awareness and value actualization. The evaluation system incorporates self-assessment, peer review, instructor evaluation, and competition outcomes, offering a comprehensive view of students' knowledge integration and competency development.

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Enhancing Efficacy and Digital Literacy Among Teachers and Students

To elevate the comprehensive competencies of teachers and students in digital settings, teaching, research, and innovation-entrepreneurship activities should be systematically integrated within a developmental framework that combines digital skill acquisition and value-based guidance. Widespread adoption of digital tools—such as data analysis software and online collaboration platforms—will deepen the application of information technology in education, improving information processing, collaborative competence, and digital literacy. Regularly conducted blended online-offline digital workshops will strengthen practical skills and reinforce technical foundations. Interdisciplinary project-based courses should be established to guide students in solving real-world problems with digital tools, nurturing innovative thinking and collaborative abilities, while immersion in research projects keeps them abreast of technological advancements. An anonymous feedback mechanism will collect input on participants' digital experiences and challenges, encouraging critical reflection on digital ethics, cybersecurity, and privacy protection. Simultaneously, exemplary cases of digital technology enabling social value will be systematically documented and promoted to strengthen a sense of responsibility and mission in technology application. Participation in public-service digital projects—such as developing public service platforms or applying data analysis to social governance—will be encouraged, fostering the integration of technological innovation with social well-being and advancing both individual growth and societal progress.

Discussion and Conclusion

Innovation in practice and empirical outcomes

Adopting a problem-solving orientation, this study integrates moral education with innovation and entrepreneurship training and undergraduate research, establishing a "project mentorship system" for talent development centered on management disciplines. This model has yielded a series of innovative theoretical and practical outcomes. By systematically reviewing domestic and international research and incorporating the evolving demands for managerial talent in the new era, this study has undertaken in-depth exploration of educational concepts, training mode restructuring, and teaching reform, offering valuable insights for cultivating innovation and entrepreneurship talent in higher education.

Theoretical innovations of this work include bridging the conventional gap between professional education and research training, fostering systematic thinking, and constructing a developmental framework structured around five interconnected phases: attraction, exploration, explanation, transfer, and evaluation. This framework emphasizes situated learning and project-driven pedagogy to facilitate knowledge transfer and skill transformation, enhancing students' foundational cognitive abilities and innovative mindset. Furthermore, an integrated approach combining "teaching, learning, research, and competition" was proposed, effectively merging ideological and political education with specialized and innovation entrepreneurship education to achieve synergistic development in value formation, competency cultivation, and knowledge acquisition.

In terms of practical outcomes, over four years of teaching reform have produced significant results. Academically, four co-authored pedagogical papers were published—including a bibliometric analysis of high-quality international education research—providing theoretical support for localized implementation.

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In talent development, students secured more than 20 awards in national and provincial disciplinary competitions, initiated six innovation and entrepreneurship training projects, co-authored two research papers, and had three papers indexed in CPCI. Notably, students demonstrated marked improvement in problem-solving, teamwork, and innovative thinking, with thesis quality and employment competitiveness surpassing those of their peers. The successful operation of the "Zero Hour Micro School" startup project further validates the practical efficacy of the training model.

This study also established a multi-stakeholder evaluation system involving experts, instructors, industry professionals, and students, forming a comprehensive, multi-dimensional quality monitoring mechanism. Evaluation results indicate that the model significantly enhances students' self-efficacy and learning motivation, particularly in strengthening national community consciousness and supporting strategic national needs. The co-created project repository and authentic scenario-based teaching designs provide students with extensive practical opportunities, enabling deep integration of theoretical knowledge and industry practice.

Future prospects and shortcomings

The study also identified several pressing challenges. Management students often exhibit limited foundational knowledge in science, technology, and data analysis, constraining further training outcomes due underdeveloped scientific and analytical thinking. Inadequate facilities and limited English proficiency also restrict students' engagement in cutting-edge research and international exchanges. These issues reflect broader shortcomings in interdisciplinary education and equitable resource allocation within higher education.

Future research should focus on the following areas:

- Deepening university-industry collaboration through strategic partnerships with leading enterprises to provide high-quality practical platforms. The research team plans to collaborate with companies such as Gansu Public Aviation Travel and Yellow River Cultural Tourism in co-developing courses that incorporate contemporary industry practices.

- Expanding research domains, particularly in areas aligned with national strategic needs such as fostering a sense of national community and promoting integrated cultural and tourism development.

- Establishing a cohesive innovation and entrepreneurship education system spanning primary, secondary, and tertiary education to enable continuous talent development through curricular articulation and project cooperation.

At the methodological level, future studies should combine quantitative and qualitative approaches—such as large-scale surveys and in-depth interviews—to precisely analyze the internal mechanisms of the training model. International comparative studies should be strengthened to incorporate innovative practices from world-class universities and enhance the global relevance of the model. Moreover, strategies for achieving high-level academic publications warrant further exploration. Initiatives such as forming academic mentoring teams and hosting specialized workshops are recommended to elevate students' research capabilities and scholarly communication skills.

The educational practices presented herein demonstrate that cultivating management talent in the new era

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requires transcending traditional models to establish open and collaborative developmental systems. The successful implementation of the project mentorship system underscores the importance of teacher-student co-creation and industry-education integration. Moving forward, amid rapid digital advancement and industrial transformation, universities must continually innovate educational philosophies and methodologies to develop management talents who possess national commitment, innovative capacity, and practical competence.

The ultimate aim of education lies in promoting holistic personal development and societal progress. Through systematic and innovative training approaches, this study not only enhances students' professional and innovative competencies but, more importantly, fosters their social responsibility and lifelong learning capabilities. These attributes will support students' future career development, laying a solid foundation for personal growth and societal contribution. Thus, the value of this research is reflected not only in tangible educational outcomes but also in its profound exploration of the essence of education and innovative practice.

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