

การปรับปรุงโปรแกรมการศึกษาสำหรับรูปแบบนวัตกรรมและผู้ประกอบการ ในวิทยาลัยอาชีวศึกษาเอกชน ณ นครฉงชิ่ง สาธารณรัฐประชาชนจีน*

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บทคัดย่อ

การศึกษานี้ วิจัยถึงสถานการณ์ปัจจุบัน ปัจจัยที่มีอิทธิพล และการพัฒนาแบบจำลองการจัดการศึกษาด้านนวัตกรรมและผู้ประกอบการ (I&E) ในวิทยาลัยอาชีวศึกษาเอกชน ณ นครฉงชิ่ง โดยใช้ระเบียบวิธีวิจัยแบบผสมผสานเชิงอธิบายเพื่อเก็บข้อมูลเชิงปริมาณจากนักศึกษาจำนวน 384 คน จากสถาบัน 4 แห่ง และข้อมูลเชิงคุณภาพจากผู้เชี่ยวชาญและบุคลากรทางการศึกษา 13 ท่าน ผลการศึกษาพบว่าแม้ในภาพรวมนักศึกษาจะมีทัศนคติต่อโครงสร้างการศึกษาด้านนวัตกรรมและผู้ประกอบการในเชิงบวกด้วยค่าเฉลี่ย 3.81 แต่ยังคงมีความเหลื่อมล้ำอย่างมีนัยสำคัญในหลายมิติ โดยพบว่าความสามารถด้านนวัตกรรม ทักษะการบริหารธุรกิจขั้นสูง การเข้าถึงแหล่งทุน และการเข้าร่วมแข่งขันในระดับต่าง ๆ มีความเกี่ยวข้องกันอย่างมีนัยสำคัญ นอกจากนี้ ผลการวิเคราะห์การถดถอยยังระบุว่าโครงการแลกเปลี่ยนระหว่างประเทศเป็นตัวแปรพยากรณ์ที่สำคัญที่สุดในการพัฒนาทักษะการแก้ปัญหา การมองเห็นโอกาสทางตลาด และความเข้าใจในหลักการเป็นผู้ประกอบการแบบลีน เนื่องจากช่วยให้นักศึกษา มีประสบการณ์ในแนวปฏิบัติที่เป็นสากล เข้าใจวัฒนธรรมที่หลากหลาย มีความสามารถในการปรับตัว และตระหนักถึงการเปลี่ยนแปลงของตลาดโลก จากข้อค้นพบดังกล่าว ผู้วิจัยได้พัฒนาแบบจำลองการพัฒนาการศึกษา I&E ที่ประกอบด้วย 5 องค์ประกอบหลัก ได้แก่ การบูรณาการหลักสูตรข้ามศาสตร์ การสร้างโอกาสในการเรียนรู้ภาคปฏิบัติ การเรียนรู้ผ่านประสบการณ์ ระบบที่ปรึกษาที่เข้มแข็ง และการมีส่วนร่วมของชุมชน ซึ่งผลการประเมินจากผู้เชี่ยวชาญยืนยันว่าแบบจำลองนี้มีความถูกต้องตามหลักวิชาการ มีความเหมาะสมในการนำไปใช้ร้อยละ 87.69 มีความเป็นนวัตกรรมร้อยละ 90.00 และมีความสามารถในการนำไปปฏิบัติจริงร้อยละ 92.31 งานวิจัยชิ้นนี้จึงถือเป็นกรอบแนวทางที่เป็นประโยชน์ต่อทั้งในระดับนโยบายและระดับปฏิบัติ เพื่อบ่มเพาะบุคลากรและเสริมสร้างระบบนิเวศด้านนวัตกรรมและผู้ประกอบการในพื้นที่ภาคตะวันตกของประเทศไทยให้เข้มแข็งยิ่งขึ้น

คำสำคัญ: การศึกษาด้านนวัตกรรมและผู้ประกอบการ, วิทยาลัยอาชีวศึกษาเอกชน, นครฉงชิ่ง, การปรับปรุงรูปแบบการศึกษา

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The Educational Program Improvement for Innovation and Entrepreneurship Model in Private Vocational Colleges in Chongqing, The People's Republic of China*

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Abstract

This study investigated the current situation, influencing factors, and model development for innovation and entrepreneurship education (I&E) in private vocational colleges in Chongqing. Employing an explanatory sequential mixed-methods design, the research collected quantitative data from 384 students across four institutions and qualitative insights from 13 experts and educational personnel. The findings revealed that although students overall perceived the I&E framework positively (mean = 3.81), significant disparities remained across several dimensions. Innovation and entrepreneurship capabilities, advanced business execution skills, access to innovation funding, and participation in innovation and entrepreneurship competitions were significantly correlated. Furthermore, regression analysis identified international exchange programs as the most consistent predictor of improved problem-solving abilities, market opportunity identification, and mastery of lean entrepreneurship principles, as these programs provided students with broader exposure to entrepreneurial practices, diverse cultural perspectives, adaptability, and greater awareness of global markets dynamics. Based on these findings, an I&E improvement model comprising five core elements was developed: interdisciplinary curriculum integration, practical learning opportunities, experiential learning, a robust mentorship system, and community engagement. Expert validation confirmed the model's high scientific rigor, applicability (87.69%), innovativeness (90.00%), and operability (92.31%). This study provides a useful framework for policy and practice to cultivate innovation and entrepreneurship talents and strengthen the innovation and entrepreneurship ecosystem in western China.

Keywords: Innovation and Entrepreneurship Education, Private Vocational Colleges, Chongqing, Educational Model Improvement

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Introduction

Innovation and entrepreneurship education (I&E) have become an important educational strategy for preparing learners to respond to rapid economic, technological, and social change. Rather than focusing only on business start-up skills, I&E is increasingly viewed as a broader educational process that develops creativity, problem-solving ability, adaptability, and value creation. In China, I&E has expanded continuously through policy support, curriculum development, and practical initiatives, and has become closely linked to graduate employability, innovation capacity, and national development goals (Schumpeter, 1934; Drucker, 1985; Kuratko & Morris, 2018).

The need to strengthen I&E is particularly evident in private vocational colleges in Chongqing. According to the thesis, these institutions face several interconnected constraints, including insufficient investment and resources, a shortage of high-quality faculty, diverse student backgrounds, limited alignment between curriculum and practice, and weak coordination among government, enterprises, and schools. Together, these issues reduce the effectiveness of existing educational arrangements and hinder the development of students' innovation and entrepreneurship potential. The situation therefore calls for a more systematic and context-appropriate educational model for private vocational colleges in Chongqing.

The conceptual foundation of this study is grounded in multiple theoretical perspectives discussed in the thesis. Innovation and entrepreneurship education theory emphasizes the development of innovative spirit and entrepreneurial competence; constructivist learning theory highlights active learning and knowledge construction; human capital theory supports the development of skills and competencies as long-term educational investment; entrepreneurial ecosystem theory stresses the role of external support systems; experiential learning theory underlines learning through direct practice; and school–enterprise cooperation theory reinforces the importance of collaboration between education and industry. Recent studies have also confirmed that entrepreneurship education is more effective when it integrates experiential learning, competency development, institutional support, and ecosystem-based collaboration. For example, Martínez-Gregorio et al. (2021) reported that entrepreneurship education can positively influence students' entrepreneurial outcomes when the learning process is systematically designed and evaluated. Similarly, Nájera-Sánchez et al. (2023) emphasized that entrepreneurship education is closely connected with entrepreneurial intention and should be supported by a broader educational and entrepreneurial ecosystem. Taken together, these perspectives suggest that effective I&E should be interdisciplinary, learner-centered,

practice-oriented, and supported by a collaborative ecosystem (Bandura, 1977; Gibb, 2002; Rogers, 1995; Neck & Greene, 2011).

Against this background, this study focuses on private vocational colleges in Chongqing, where innovation and entrepreneurship education has developed under varied institutional conditions. The study aims to examine the current situation of I&E in private colleges in Chongqing, identify the factors influencing its implementation, and develop an appropriate improvement model for this educational context. Specifically, the study seeks to: (1) investigate the current situation of innovation and entrepreneurship education in private colleges in Chongqing, China; (2) develop an innovation and entrepreneurship education model for private colleges in Chongqing, China; and (3) evaluate the appropriateness of the developed model.

Research Objectives

1. To study the Current situation of innovation and entrepreneurship education for Private colleges in Chongqing, China.
2. To create the innovation and entrepreneurship education model for Private colleges in Chongqing, China.
3. To evaluate the model of innovation and entrepreneurship education for Private colleges in Chongqing, China.

Methodology

1. Research Design

This study adopts an explanatory sequential mixed-methods design, which prioritizes quantitative data collection and analysis in the first phase, followed by qualitative data collection and analysis in the second phase to explain and elaborate on the quantitative results. This design is theoretically grounded in the pragmatist paradigm, which emphasizes that the choice of methods should be guided by research questions (Creswell & Clark, 2017).

Phase 1: Current Situation Analysis

This phase involves a comprehensive assessment of innovation and entrepreneurship education in Chongqing's private colleges through surveys targeting students, educators, and administrators, as well as a review of institutional policies and curriculum materials. The goal is to identify existing strengths, weaknesses, and gaps in the current system.

Phase 2: Model Creation

Building on Phase 1, this phase focuses on designing an improved education model tailored to Chongqing's private colleges. Leveraging insights from interviews with experts and comparative studies of successful models elsewhere, the aim is to develop a framework that enhances practical training, industry collaboration, and policy alignment.

Phase 3: Model Validation & Recommendations

The final phase tests the proposed model's feasibility through pilot implementations in selected colleges, with outcomes evaluated via the Delphi method and stakeholder feedback. Actionable recommendations for policy and curriculum adjustments will be provided to support broader adoption and long-term sustainability.

2. Population and sample

2.1 Object of study

The study employed a multi-stage stratified sampling method to ensure the representativeness and validity of the data collection. The study focused on two key groups within Chongqing's private higher education institutions: students, teachers responsible for relevant courses.

In the quantitative research, a proportional allocation method was used among 4 selected Chongqing private universities in Chongqing, based on their enrollment size and regional distribution. Using Cochran's formula (95% confidence level, 5% margin of error), considering the potential non-response rate, a sample size of at least 384 students was determined. Student participants were stratified by academic year (From freshman year to junior year) and discipline (STEM and humanities), reflecting different levels of exposure to entrepreneurship education. Teacher sampling prioritized lecturers with at least two years of experience in teaching innovation-related courses.

For qualitative research, 13 participants were selected through purposive sampling for in-depth interviews, including 10 educators and 3 industry mentors from the university's entrepreneurship incubator. The case study focused on three innovation and entrepreneurship experimental or incubation bases recognized by the Chongqing Education Commission, which have excelled in the development of the entrepreneurship ecosystem. Ethical protection measures, including informed consent forms and the anonymization of sensitive information, were implemented during data collection. To reduce sampling bias, cross-verification was conducted by comparing survey results with interview records and institutional

policy documents, ensuring multi-angle validation. The sampling framework not only captures the quantitative patterns of educational outcomes, but also provides qualitative insights into the systemic challenges identified in national innovative education assessments (such as curriculum fragmentation and industry-university-research disconnection) to meet the research objectives.

2.2 Study sample

The study employed a mixed-method sampling approach to ensure comprehensive data collection and triangulation. For the quantitative phase, the sample was drawn from four selected private vocational colleges in Chongqing using stratified sampling based on enrollment scale and institutional characteristics. The student sample was proportionally allocated across the four institutions. Using Cochran's formula ($Z = 1.96$, $e = 5\%$, $p = 0.5$), the minimum required sample size was calculated as 384 students. Considering potential non-response rates (estimated at 15% based on pilot surveys), final quotas were set at 384 students.

Table 1: Student Population and Sample

Categories	Population Ratio	Sample Size	Sample Rationale
Freshmen	30%	115	Representing initial exposure to entrepreneurship education
Sophomores	40%	154	With basic curriculum experience
Juniors	30%	115	Possessing practical training experience
Total	100%	384	

Freshmen (30%): Representing initial exposure to entrepreneurship education; Sophomores (40%): With basic curriculum experience; Juniors (30%): Possessing practical training experience.

Disciplinary balance was maintained through 55% STEM majors and 45% humanities majors, reflecting industry demand patterns identified in Chongqing's regional economic reports.

The qualitative component utilized purposive sampling to select 13 information-rich participants:

Industry mentors (n = 5): Chongqing Municipal Education Bureau, Human Resources and Social Security Bureau, Science and Technology Bureau and other relevant innovation and entrepreneurship authorities' managers

Educator cohort (n = 8): Educator team (n = 8): including 5 theoretical lecturers (all with national entrepreneurship instructor certification) and 3 practical mentors from university incubators, enterprises, etc.

Results

This study embarked on a systematic investigation to enhance the innovation and entrepreneurship educational program within private vocational colleges in Chongqing, China. Driven by the national strategic emphasis on fostering an innovative economy and addressing the unique role of vocational education in supplying skilled, entrepreneurial talent, the research sought to diagnose the current state, design a contextualized model, and rigorously evaluate its potential efficacy. The study was guided by three sequential objectives: first, to assess the current situation of I&E education; second, to create a tailored I&E education model; and third, to evaluate the proposed model's validity and impact.

1. The Result of the Current Situation of Innovation and Entrepreneurship Education in Chongqing's Private Colleges

The current perception of I&E education among students is generally positive but reveals clear priorities and areas for enhancement. The overall high mean score (3.81) across all dimensions indicates satisfaction with institutional efforts. Students rated entrepreneurship competitions highest (3.98), recognizing their value as practical, engaging platforms. Similarly, interdisciplinary collaboration (3.95) and accessible alumni networks (3.94) were highly valued, pointing to student appreciation for collaborative learning and real-world connections.

However, a nuanced analysis shows relative weaknesses in the core Curriculum Foundation. While still rated "High," items like sufficiency of courses (3.61), alignment with real-world needs (3.65), and teacher practical experience (3.62) scored lower than institutional support elements. This suggests that while the environment for entrepreneurship (competitions, networks) is well-regarded, the core instructional delivery (curriculum depth, teacher expertise) requires strengthening to match student expectations and market demands.

Student engagement data further clarifies this picture. Formal engagement (course participation, competitions) was high (3.73), but utilization of campus innovation labs/incubators was the lowest (3.55) among tracked activities. This indicates a potential gap between the provision of physical resources and their effective, accessible integration into the student learning journey. Conversely, informal, self-initiated engagement (seeking external resources, cross-major collaboration) was strong (3.68), demonstrating student proactivity that institutions can better harness.

2. The Result of Creating the innovation and entrepreneurship education model in private colleges in Chongqing, China

The creation of the innovation and entrepreneurship education model for private vocational colleges in Chongqing is the central outcome of this study, synthesized from comprehensive stakeholder interviews, literature review, and an analysis of local educational and economic contexts. The proposed model is a holistic, ecosystem-driven framework designed to move beyond theoretical instruction towards cultivating practical, market-ready entrepreneurial capabilities. It is structured around five interdependent pillars: Curriculum Integration, Practical & Experiential Learning, Institutional Support, Community & Ecosystem Engagement, and Mentorship & Guidance Systems.

The model's foundation is a curriculum deeply integrated with real-world entrepreneurial needs. It advocates for an interdisciplinary approach that blends business fundamentals with digital literacy (e.g., AI, data analysis) and sector-specific knowledge. Crucially, it emphasizes a pedagogical shift from pure theory to hands-on, project-based learning, where students develop viable business models, master lean startup methodologies, and engage in problem-solving through actual or simulated ventures. Teacher competency is also addressed, stressing the importance of instructors with practical entrepreneurship experience to bridge the academia-industry gap.

A key innovation of the model is its multi-stakeholder collaborative framework. It positions the college not as an isolated educator but as the central hub of a vibrant entrepreneurial ecosystem. This involves forging active partnerships with local industries for internships and live projects; leveraging alumni networks for mentorship and funding; collaborating with government bodies for policy and resource support; and engaging with incubators and service centers. This ecosystem approach ensures that learning is contextualized, resources are amplified, and student ventures have clear pathways to market validation and support.

Furthermore, the model institutionalizes support mechanisms essential for entrepreneurial activities. This includes establishing and promoting accessible on-campus innovation labs and incubators, providing dedicated seed funding for student projects, and organizing well-structured entrepreneurship competitions. These components are designed to lower the barrier to entry for student entrepreneurs, providing them with the physical space, initial capital, and motivational platforms to experiment and iterate their ideas safely.

Finally, the model embeds a continuous feedback and assessment loop. Instead of relying solely on traditional exams, student evaluation is based on project deliverables, pitch performances, and real-world application of skills. The model itself is subject to ongoing evaluation through stakeholder

feedback (students, teachers, industry, administrators) and key performance indicators, ensuring it remains dynamic and responsive to the evolving demands of the regional economy. In essence, the created model is a pragmatic blueprint for transforming Chongqing's private vocational colleges into engines of applied innovation, aiming to produce not just job-seekers, but job-creators equipped with the confidence, competencies, and connections to contribute to local economic development.

3. The Result of Evaluating the Innovation and Entrepreneurship Education Model

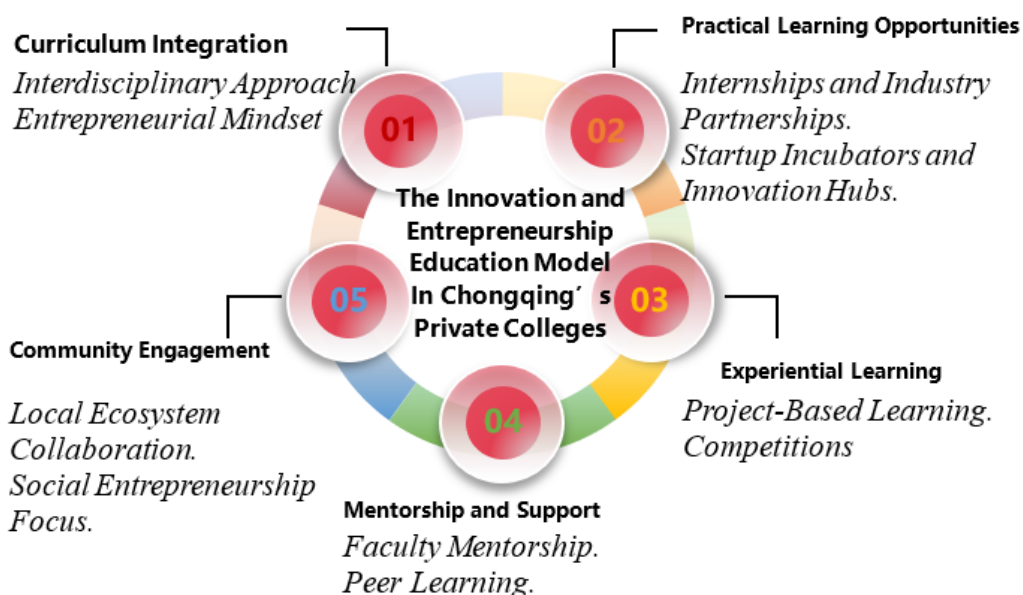


Figure 1: The Innovation and Entrepreneurship Education Model in Chongqing's Private Colleges

The model evaluation was conducted through expert validation rather than full field implementation. Thirteen experts and stakeholders from education, government, and industry reviewed the proposed model in terms of scientific basis, applicability, innovation, and operability. Their feedback was used to refine the model components and confirm its feasibility for future implementation. Although this process supports the practical relevance of the model, a full-scale field try-out with students and colleges should be conducted in future research to further verify its actual effectiveness.

The evaluation of the proposed innovation and entrepreneurship education model, conducted through quantitative surveys ($n = 384$), expert assessments ($n = 13$), and statistical analysis, yields strongly positive and nuanced results, confirming its overall validity, relevance, and potential for impact.

Empirical data from students reveals a high level of perceived effectiveness and engagement. The overall mean scores across all evaluated dimensions—Current Perception (3.81), Student Engagement (3.71), and Educational Effectiveness (3.98) are consistently in the "High" range. Students report significant improvements in core entrepreneurial competencies, most notably in identifying market opportunities (mean = 4.00), developing business models (3.99), and understanding intellectual property (3.99). This indicates that the model's focus on practical, skills-based outcomes resonates with and benefits the learner. Engagement data shows active participation in formal activities like courses and competitions, though it points to a need for further promotion of informal resources like innovation labs.

Statistical analyses (One-Way ANOVA) provide deeper insights into factors influencing success. A significant finding is the positive correlation between resource access and competency development. Students with higher levels of innovation funding and those who participate more frequently in entrepreneurship competitions demonstrate statistically significantly higher scores in both foundational and advanced business skills. This empirically validates the model's emphasis on providing concrete financial support and competitive practical platforms. Furthermore, regression analysis identifies international exchange programs as a particularly potent intervention, showing a significant positive influence on problem-solving, market identification, business model development, lean startup mastery, and intellectual property literacy. This underscores the importance of global perspectives within the model.

The expert evaluation offers robust external validation. Thirteen experts from government, industry, and academia rated the model highly across four criteria: Scientific Basis, Applicability, Innovation, and Operability. The majority issued ratings of "Agree" or "Strongly Agree," resulting in a high average endorsement. Experts particularly commended the model's practical applicability and innovative integration of ecosystem elements, confirming its alignment with regional development needs and educational best practices.

However, the evaluation also identifies areas for targeted improvement. While overall scores are high, some specific items, such as the perceived sufficiency of course offerings and the utilization of campus incubators, received relatively lower ratings. Demographic and ANOVA analyses reveal that freshmen and students with low funding or competition participation are at a developmental disadvantage, suggesting the need for enhanced introductory programs and more equitable access to resources. In conclusion, the evaluation results robustly support the proposed model as a scientifically sound, applicable, and effective framework. The evidence confirms that its core components integrated practical curriculum, institutional support mechanisms, and deep ecosystem engagement effectively enhance entrepreneurial

competencies. The findings also provide a clear roadmap for optimization, emphasizing the need to strengthen resource accessibility, expand internationalization efforts, and ensure inclusive support for all student cohorts to maximize the model's transformative potential in Chongqing's private vocational education sector.

Discussion

1. Implications for Vocational Education Policy

Chongqing's private vocational colleges face a major opportunity, as strong student interest in entrepreneurship contrasts with limited prior exposure and support. Policy should institutionalize entrepreneurship education as a credit-bearing interdisciplinary core, expand seed funding and private-sector incentives, strengthen faculty through industry-linked development, formalize ecosystem collaboration with mentors and international exchange, and provide targeted support for female students and those without entrepreneurial family backgrounds.

These findings are consistent with recent studies emphasizing that entrepreneurship education should not be limited to theoretical instruction but should be embedded in interdisciplinary curricula, experiential learning activities, mentoring systems, and institutional entrepreneurial ecosystems. Recent systematic reviews and empirical studies also highlight the importance of practical learning, ecosystem support, and university–industry collaboration in strengthening students' entrepreneurial mindset, competencies, and intentions (Anubhav, Dwivedi, & Aashish, 2024; Villegas-Mateos & Amann, 2025). Therefore, the proposed model is not only supported by the empirical results of this study but is also aligned with recent trends in entrepreneurship education and vocational education development.

2. Impact on Industry and Employment

An enhanced entrepreneurship education model can improve graduate quality by strengthening problem-solving, market opportunity identification, digital skills, and interdisciplinary collaboration. It can also support SME innovation, encourage startup creation, promote social and sustainable entrepreneurship, diversify employment pathways, and deepen industry-academia collaboration through projects, mentorship, and curriculum alignment.

3. Future Trends and Challenges

Although the model provides a strong foundation, its long-term effectiveness will depend on the ability of institutions to adapt to rapid changes in entrepreneurship, technology, and education. Sustained impact therefore requires continuous policy adjustment, flexible curriculum development, and strong collaboration among colleges, industry, and the broader entrepreneurial ecosystem.

4. Limitations of the Study

This study has some limitations. First, the data were collected using a cross-sectional design; therefore, the findings reflect students' perceptions and institutional conditions at a particular point in time. Longitudinal research would be useful for examining changes in students' entrepreneurial competencies after participating in the proposed model over a longer period. Second, although the model was validated by experts and stakeholders, it has not yet been fully implemented in a real institutional setting. Therefore, future studies should conduct a field try-out or pilot implementation to examine the practical effectiveness, feasibility, and sustainability of the model in private vocational colleges.

Conclusion

This research contributes a contextual body of knowledge on innovation and entrepreneurship education in private vocational colleges in Chongqing, China. The study shows that effective innovation and entrepreneurship education should be developed as an integrated system rather than limited to classroom teaching alone. Its success depends on the alignment of interdisciplinary curriculum design, practical and experiential learning, institutional support, mentorship, and collaboration with external stakeholders. The findings further indicate that these elements work together to strengthen students' problem-solving ability, market opportunity identification, entrepreneurial thinking, and readiness for innovation-driven careers. Therefore, the main achievement of this research is the development of a concise improvement model that can be used as a practical framework for educational planning, curriculum enhancement, and ecosystem development in private vocational education.

ข้อเสนอแนะ

Based on the comprehensive data analysis and findings from your study on the Innovation and Entrepreneurship (I&E) Education Model in Chongqing's Private Vocational Colleges, here are detailed, evidence-based recommendations for the three key stakeholder groups.

1. Recommendations for College Administrators & Educators To capitalize

on strong student interest (94% interested) and address gaps in practical experience, curriculum, and resources: Deepen Curriculum: Develop a mandatory, credit-bearing I&E core module for freshmen (targeting low foundational competencies, Mean = 3.84) and integrate "I&E threads" into major courses (reinforcing interdisciplinary collaboration, Mean = 3.95). Enhance faculty via a "Dual-Teacher" system (pairing academics with industry practitioners) and fund industry sabbaticals to boost practical experience

(current score: Mean = 3.62). Transform Support: Bridge funding-awareness gaps with a tiered "Student Innovation Fund" (micro-grants to seed funding) and simplify applications. Activate underutilized labs/incubators (lowest engagement, Mean = 3.55) via dedicated managers and hackathons. Structure alumni engagement through mentorship programs and case studies (high alumni value, Mean = 3.94). Foster Engagement: Incentivize competition participation (Mean = 3.98) with academic credit and recognition. Cultivate peer networks via I&E clubs and collaboration platforms (supporting self-initiated learning, Mean = 3.68). Track competencies via a progressive portfolio to enable personalized mentoring. Leverage Data: Conduct annual audits using baseline metrics (e.g., business model viability, Mean = 3.99) and co-create curricula with industry to ensure relevance (Mean = 3.90). Target "moderately engaged" students with low-commitment workshops to drive competency gains.

2. Recommendations for Chongqing Municipal Government & Education

Authorities To catalyze systemic improvement and scalability: Policy & Funding: Establish a performance-based "Chongqing Private Vocational College I&E Development Fund" (matching college investments in seed funding/labs) and a municipal I&E competency standard. Offer tax incentives for business internships/mentorship and simplify student venture registration. Ecosystem Partnerships: Launch a digital "Chongqing Industry-Education Integration Platform" connecting colleges, SMEs, and investors. Host an annual "Chongqing Vocational Innovation Challenge" and facilitate cross-college resource sharing (e.g., labs, instructors). Faculty & Research: Fund "Dual-Teacher" certification (industry practitioners as part-time instructors) and faculty industry sabbaticals. Recognize I&E excellence via municipal awards and integrate industry collaboration into evaluation metrics. Internationalization: Subsidize longitudinal tracking studies (5–10-year graduate trajectories) and strategic international exchanges (key for skills like market identification) with global innovation hubs (e.g., Germany, Singapore).

3. Recommendations for Industry Partners To drive mutual value through deep engagement: Embedded Collaboration: Replace one-off lectures with semester-long "live project modules" (real business challenges) and "Innovation Immersion" internships (project-based roles in R&D/process improvement). Structured Mentorship: Develop corporate mentor programs (regular coaching, pitch panels) and sponsor "Entrepreneur-in-Residence" fellowships (incubator-based advisors). Resource Access: Provide in-kind grants (software, testing facilities) and integrate student competitions into R&D/CSR (pilot winning solutions). Strategic Engagement: Shape curricula via advisory boards, scout talent through projects/competitions, and advocate for supportive policies (e.g., tax incentives for collaboration).

References

- Anubhav, K., Dwivedi, A. K. and Aashish, K. (2024). Entrepreneurship education in higher education (2002–2022): A technology-empowered systematic literature review. *The International Journal of Management Education*, 22(3), 100993. <https://doi.org/10.1016/j.ijme.2024.100993>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215.
- Creswell, J. W. and Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Thousand Oaks, CA: SAGE.
- Drucker, P. F. (1985). *Innovation and entrepreneurship: Practice and principles*. New York: Harper & Row.
- Gibb, A. (2002). In pursuit of a new “enterprise” and “entrepreneurship” paradigm for learning: Creative destruction, new values, new ways of doing things and new combinations of knowledge. *International Journal of Management Reviews*, 4(3), 233–269.
- Kuratko, D. F. and Morris, M. H. (2018). Examining the future trajectory of entrepreneurship. *Journal of Small Business Management*, 56(1), 11–23.
- Martínez-Gregorio, S., Badenes-Ribera, L. and Oliver, A. (2021). Effect of entrepreneurship education on entrepreneurship intention and related outcomes in educational contexts: A meta-analysis. *The International Journal of Management Education*, 19(3), 100545.
- Nájera-Sánchez, J. J., Pérez-Pérez, C. and González-Torres, T. (2023). Exploring the knowledge structure of entrepreneurship education and entrepreneurial intention. *International Entrepreneurship and Management Journal*, 19, 563–597. <https://doi.org/10.1007/s11365-022-00814-5>
- Neck, H. M., & Greene, P. G. (2011). Entrepreneurship education: Known worlds and new frontiers. *Journal of Small Business Management*, 49(1), 55–70.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.
- Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. New York : Oxford University Press.
- Villegas-Mateos, A. and Amann, W. (2025). The impact of university-based entrepreneurial ecosystems on students’ entrepreneurial intentions. *International Journal of Entrepreneurship*, 29(S2), 1-14.
