Improving innovation and entrepreneurship education in higher institutions: the impact of “Mass Entrepreneurship and Innovation” education on undergraduates’ entrepreneurial intentions

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Abstract: The exploration of the way "mass entrepreneurship and innovation" (MEI) education influences students' aspirations to become entrepreneurs has grown into an important area of analysis in studies related to higher education. This research intends to examine the consequences of MEI education on students' tendency towards entrepreneurship, and to put forward methods for augmenting the teaching of innovation and entrepreneurship in private higher educational establishments.To achieve this objective, questionnaires and semi-structured interviews were employed in the study, which involved a total of 197 students and five education experts. The statistical analysis of the questionnaire data revealed that MEI education was positively related to students' entrepreneurial intentions, and that both entrepreneurial experience and family entrepreneurial background played moderating roles in this relationship. The interview findings indicated that private universities could enhance educational reforms by designing talent training programs, developing diversified curricula, and developing more professional entrepreneurial platforms to encourage students' entrepreneurial intentions. This study offers fresh insights for improving and perfecting the mechanism of innovation and entrepreneurship education in private universities.

Keywords: Private universities, Mass Entrepreneurship and Innovation, MEI education, entrepreneurial intention

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1 Introduction

From 2010 onwards, consistent growth has been observed in the population of undergraduate students graduating from Chinese colleges and universities, culminating in a total of 11.58 million as of June 2023. However, according to the 2021-2022survey on the career paths of Chinese college graduates , the percentage of students landing corporate jobs in 2022 dipped by seven percentage points compared to the previous year. On the other hand, the fraction of students opting to continue their education at the postgraduate level has seen a steady incline, hitting 40.78% in 2022(The date was compiled by Huatu.com and Intelligence Research Group). A slight increase has also been noted in the number of graduates deciding to establish their own businesses. The difficulties in finding employment have prompted a sharp increase in the desire to own a business or become an individual entrepreneur (One and Ho, 2020). These statistics imply that the issue of employment challenges continues to persist, although it has been somewhat mitigated by an increased number of graduates opting for postgraduate studies, thereby reducing the pressure on job market.

In the modern world, the primary agents of innovation predominantly lie within colleges and universities (Yu, 2019). Entrepreneurial intention refers to an individual's desire or aspiration to start a business and become an entrepreneur. Before initiating any entrepreneurial activity, one should first establish their entrepreneurial intention (Wishwadari, 2021). Identifying the determining factors that influence this entrepreneurial intention can be seen as the first step toward developing entrepreneurial behavior or initiatives (Bui et al, 2020). University students are the main driving force behind a nation's development, particularly in the post-pandemic era. Thus, augmenting their desire to become entrepreneurs is crucial for the nation's economic recovery (Wang and Huang, 2022).

Going back to 2015, the "Guidance Opinions on Guiding Some Local Ordinary Undergraduate Colleges and Universities to Transform into Application-oriented" directive was jointly issued by the Ministry of Education, the National Development and Reform Commission, and the Ministry of Finance. This guideline urged that institutions with a focus on application-oriented higher education should promptly align with regional economic and societal progress, incorporating innovative models of talent development that emphasize application-oriented skills and technical proficiency. However, obstacles remain in the domain of "mass entrepreneurship and innovation" (MEI) education in private higher educational institutions. Chen et al. (2022), for instance, pointed out that these institutions struggle with challenges such as inadequate teaching expertise in innovation and entrepreneurship education, a dearth of diverse educational methodologies, and a lack of practical experience in the field of innovation and entrepreneurship education. Similarly, An et al. (2020) noted that undergraduate students have limited opportunities to engage with platforms dedicated to innovation and entrepreneurship education in private institutions. This situation is further worsened by a scarcity of resources and considerable difficulties in accessing pertinent funding and securing appropriate venues.

The effectiveness of MEI education in private universities in terms of aptly steering students' entrepreneurial aspirations and effectively nurturing their entrepreneurial activities is a topic under investigation. Various scholars, both in China and globally, have delved into the determinants that influence entrepreneurial intention, encompassing family background, self-efficacy, entrepreneurial experience, institutional innovation and entrepreneurship education, and gender (Yan and Song, 2022). Nevertheless, there is a scarcity of research examining if MEI education programs and

innovation and entrepreneurship competitions for undergraduates, facilitated by private universities, can ignite students' entrepreneurial intentions. In this research, MEI education in private higher education institutions is considered as the independent variable, students' entrepreneurial ambitions as the dependent variable, and family background along with entrepreneurial experience as contributory variables, to scrutinize the effect of MEI education on students' entrepreneurial intention. The study then suggests measures to boost the effectiveness of MEI education in private universities.

This study offers valuable theoretical insights and practical guidance for boosting entrepreneurial aspirations among students in China's private higher education institutions and driving the evolution of their innovation and entrepreneurship education. It plays a crucial role in comprehending the elements influencing students' entrepreneurial intentions, refining the educational system related to innovation and entrepreneurship in private institutions, and leading the exploration and real-world application of relevant reforms.

2 Literature review

2.1 Entrepreneurial Intentions of Undergraduates

Entrepreneurial intention refers to an individual's conviction about establishing a new business and the deliberate planning to actualize it at a specific point in the future (Thompson, 2009). A plethora of research conducted domestically in China and globally has scrutinized the determinants influencing undergraduate students' entrepreneurial intentions (Luc, 2021; An et al., 2020). Findings from these studies illustrate that, primarily, the caliber of innovation and entrepreneurship education delivered by institutions, and the extent of structured innovation and entrepreneurship education absorbed by students, considerably sway students' entrepreneurial intentions. For instance, Lu et al. (2021) unveiled that entrepreneurial backing positively impacts undergraduate students' entrepreneurial aspirations and entrepreneurial zeal, with the latter serving as an intermediary in the influence of entrepreneurial support on entrepreneurial intentions. Similarly, Jia et al. (2022) pointed out that innovation and entrepreneurship education facilitate students in converting creativity into the requisite skills and mindset for entrepreneurship. Meanwhile, Yang (2022) observed that the more intense the entrepreneurial environment in the school as perceived by students, the higher the propensity for them to engage in entrepreneurship post-graduation.

Secondly, students who actively participate in work-study initiatives, corporate internships, and innovation and entrepreneurship competition projects throughout their academic tenure are more likely to foster entrepreneurial aspirations after graduation. Xue et al. (2021) asserted that students equipped with entrepreneurial experience, including engagement in entrepreneurship contests, are more predisposed to have positive intentions toward initiating such ventures after graduation. Wang (2020) found that university students with prior work or internship experience before enrolling in entrepreneurship education displayed significantly enhanced entrepreneurial self-assurance and entrepreneurial intentions compared to their counterparts without such experiences.

University students with previous entrepreneurial experience exhibited higher entrepreneurial intentions compared to those without such experience. This prior experience not only shaped personal entrepreneurial intentions but also fostered the accumulation of skills and knowledge for future entrepreneurial endeavors (Uddin et al., 2017). Additionally, according to Tang (2015), the Ministry of Education's emphasis on undergraduate entrepreneurship has led universities to actively involve students in various entrepreneurship competitions, which further influences students' entrepreneurial intentions.

Thirdly, the entrepreneurial background of a

student's family also plays a pivotal role, particularly if one or both parents have been self-employed or have prior entrepreneurial experience, as this can influence the student's entrepreneurial intentions. Akinbode et al.(2018) investigated the impact of family business background on college students' entrepreneurial intentions, while Carlo et al. (2018) proposed that students' exposure to previous family businesses significantly influences their entrepreneurial intentions. Chaudhary (2017) found that a self-employed family background positively correlates with their children's entrepreneurial intentions. Similarly, Yan and Song (2022) suggested that if a student's parents have engaged in entrepreneurship, this significantly affects their children's entrepreneurial aspirations, with students more likely to harbor entrepreneurial ambitions if their parents have launched their own businesses. Escolar et al. (2019) claimed that individuals from self-employed families tend to have higher entrepreneurial intentions, while those from families without self-employment tend to have lower levels of such intentions. Salami (2019) further substantiated this, indicating a strong correlation and significant relationship between a student's family background and entrepreneurial intentions.

Moreover, numerous studies suggest that diverse elements such as entrepreneurial policies, self-belief, entrepreneurship, and attitudes also hold a pivotal role in molding the entrepreneurial intentions of undergraduate students (Xue et al., 2021).

2.2 Theories of MEI education

According to Zhang (2020), innovation involves the process of developing or crafting unique items, methods, components, routes, and environments that yield specific advantages either by offering perspectives that diverge from traditional or common thought patterns steered by ingrained thinking paradigms or by leveraging extant knowledge and resources in a distinct context aimed at satisfying ideal needs or addressing societal demands. In contrast, entrepreneurship represents a complex procedure whereby individuals discern and exploit opportunities, eventually creating novel products or services that actualize their potential value. This procedure encapsulates the entire progression from the nascent stage of individuals' entrepreneurial consciousness to the expansion of their enterprises. Entrepreneurship education is typically considered a platform for students to acquire formal knowledge and skills pertaining to entrepreneurship (Cera,2020). Ierapetritis (2019) pointed out that the teaching methods employed in entrepreneurship courses can affect the level of entrepreneurial intention.

The research framework for innovation and entrepreneurship education draws upon the University-wide Innovation and Entrepreneurship Education model introduced by Wang (2015). This model embodies a fresh pedagogical approach that underscores the tenets of "involving all students," "fusing with vocational education," and "incorporating the complete talent cultivation process." The goal of innovation and entrepreneurship education is not to mandate that every student embarks on entrepreneurial ventures, but instead to cultivate an entrepreneurial mindset among undergraduates and provide them with the necessary entrepreneurial competencies, attitudes, and values that empower them to pursue entrepreneurial actions when opportunities present themselves (Li, 2020).

The United States was the trailblazer in initiating innovation and entrepreneurship education, with Stanford University standing as a notable representation. Stanford University's educational creed of "pragmatism" emphasizes production and application, aiming to establish an effective nexus between pedagogy and production (Xu and Huo, 2022). Additionally, Germany has been a forerunner of innovation and entrepreneurship education in Europe, exemplified by the Technical University of Munich's "Management +" training initiative - a preeminent

European program in innovation and entrepreneurship training, constructed to cultivate innovative and entrepreneurial leaders among university students (Li and Huo, 2021). In Japan, premier universities accord significant importance to the applicative aspects of innovation and entrepreneurship education. The Kochi University of Technology, established in the 1990s with the objective of leading the transformation of Japan's university landscape, positions innovation and entrepreneurship education at the forefront, by assimilating entrepreneurial engineering disciplines and instituting interdisciplinary programs that advocate for resource amalgamation and offer courses tailored to prospective entrepreneurs (Ma et al., 2019).

Since 2002, China's Ministry of Education set in motion a pilot project centered on entrepreneurship education across nine universities, which includes institutions like Tsinghua University, Beihang University, Renmin University of China, Shanghai Jiao Tong University, and Xi'an Jiaotong University. Tsinghua University's approach to entrepreneurship education concentrates on nurturing innovation-oriented personalities, thought processes, and abilities among undergraduates (Ma and Bai, 2016). Wuhan University advocates the "three-creative education" concept (Luo, 2012), integrating entrepreneurship, creativity, and innovation within its educational framework. Concurrently, Nanjing University of Finance and Economics upholds the ethos of nurturing professional managers who can amplify employment prospects within the society (Wu, 2017).

Despite the increasing attention towards innovation and entrepreneurship education in private higher education institutions, there is a dearth of research examining the efficacy of its implementation and its impact on enhancing students' innovation mindset and entrepreneurial capabilities. Building upon prior studies, this paper puts forth three hypotheses that take into account the distinctive attributes of private colleges and universities, which prioritize hands-on instruction, foster application-oriented talents, and place significant emphasis on students' employability. The hypotheses are as follows:

H1: MEI education in private universities is significantly and positively related to students' entrepreneurial intention;

H2: Students' internship experience and participation in competitions are significantly and positively related to entrepreneurial intention;

H3: Parents' entrepreneurial experience is significantly and positively related to their children's entrepreneurial intentions.

3 Research methods

3.1 Sample and sampling method

To examine the entrepreneurial intentions of students, a combination of snowball sampling and criterion sampling methods was employed among undergraduate students at three prestigious private universities located in Jinan, Shandong Province. A total of 197 students took part in the survey, representing different majors from freshman to senior year, including STEM disciplines, business and management, humanities and social sciences, arts, and early childhood education. Among the participants, 53% were female and 47% were male, ensuring a relatively balanced gender ratio. These students have been exposed to innovation and entrepreneurship education since their first year of enrollment, gradually getting involved in school-level or provincial-level innovation and entrepreneurship competition projects starting from their sophomore year. Some students have received awards at the school or provincial level. As the university has implemented credits for innovation and entrepreneurship practice, all senior students are required to participate in innovation and entrepreneurship competitions, and this credit is included in the assessment criteria for graduation requirements.

Moreover, to gain insights into the approach of MEI education in private higher education institutions,

the author conducted interviews with five experts affiliated with private colleges in Jinan, Shandong Province. These experts consisted of leaders from the Innovation and Entrepreneurship Education Center for Undergraduates, as well as other leaders at various levels with diverse professional backgrounds (refer to Table 1). The interviewed experts possessed extensive work experience, with Expert 1 having previously taught at other two universities, Expert 2 having prior experience in a corporate setting, Expert 3 being a retired military officer in a higher institution, and Experts 4 and 5 currently owning their own businesses.

3.2 Research instruments

To examine the influence of MEI education, students' entrepreneurial experience, and family entrepreneurial background on students' entrepreneurial intentions in private universities, this research utilized questionnaires as the primary data collection method. Well-established scales from domestic and international doctoral dissertations were adopted to ensure the questionnaire's reliability and validity. Specifically, the scale for innovation and entrepreneurship education employed in this study was primarily derived from Li's (2020) article titled "Research on the mechanism and path of innovation and entrepreneurship education on students' entrepreneurial intention." This scale consisted of seven questions aimed at investigating the impact of university teachers in innovation and entrepreneurship education on students' entrepreneurial intentions. Li distributed a total of 3,728 questionnaires to undergraduate students across 228 colleges and universities in China, ensuring a wide-ranging sample distribution and generalizability of the findings. The innovation and entrepreneurship education scale developed in Li's study included items such as "school innovation and entrepreneurship education enhanced my interest in entrepreneurship," "school innovation and entrepreneurship education improved my understanding of business plans," and "the school had exceptional innovation and entrepreneurship instructors (including external instructors)." Following data collection and analysis, Cronbach's Alpha coefficient was found to be 0.907, and the KMO value was 0.898, indicating the scale's favorable reliability and validity.

The scale for measuring entrepreneurial intention employed in this study was primarily adapted from Liu's (2018) research titled "Research on the influence of entrepreneurial support on graduate students' entrepreneurial intention." Liu's scale consisted of six questions and underwent reliability and validity analysis in the original paper. The reliability of the scale was assessed using Cronbach's Alpha coefficient, which yielded a value of 0.895, indicating satisfactory internal consistency. The validity of the scale was examined through the AVE comparison method, which demonstrated that the root mean square of realistic AVE (0.845) exceeded the correlation coefficient

Table 1. Information table of experts in a private university

	Age	Employment since	Position	Education
Expert 1	40	2008	Director of Innovation and Entrepreneurship Education Center for Undergraduates	Masters
Expert 2	38	2010	Deputy Director of Innovation and Entrepreneurship Education Center for Undergraduates	Masters
Expert 3	40	2007	Dean of College of Preschool Education	Ph.D
Expert 4	39	2009	Associate Dean of Teaching of the College of Business	Masters
Expert 5	42	2006	Deputy Director of Student Work Office	Masters

between variables, suggesting good discriminant validity among the variables. In addition to the entrepreneurial intention scale, the questionnaire utilized in this study also included demographic descriptive statistics, encompassing variables such as gender, major, grade level, entrepreneurial experience, and family entrepreneurial background, as influential factors.

To explore methods for enhancing the entrepreneurial intention of undergraduate students in private colleges and universities, this research employed the expert interview method involving five leaders from various positions within college and university settings. The experts were presented with three key questions: "How can we improve students' entrepreneurial intention?", "What are the strengths and weaknesses of MEI education in our institution?", and "In what ways should we further enhance MEI education in our institution?". The interviews, which lasted approximately 20 minutes each, were conducted with the consent of the participating experts and recorded for accurate documentation. Subsequently, the interview recordings were transcribed and subjected to thematic analysis, enabling a comprehensive examination and detailed analysis of the results.

3.3 Research Ethics

This study upheld ethical principles to safeguard the rights and privacy of the participants. Prior to the survey, participants were informed about the study's objectives and their voluntary participation, with the assurance that they could withdraw at any point without consequences. The questionnaire employed in the study avoided any inquiries that could compromise the participants' identity. Both online and offline participants provided their informed consent, and measures were in place to protect their privacy and the confidentiality of their responses. Similarly, the five interviewees were fully informed about the study's purpose and their right to withdraw at any stage, and their consent was obtained through email correspondence. The interview process was recorded with the explicit permission of the interviewees, ensuring transparency and adherence to ethical guidelines.

4 Questionnaire results and discussion

The study employed the Wenjuanxing (wjx.cn) platform to distribute and collect online questionnaires. A total of 185 valid responses were gathered from undergraduate students at three private universities. Among the participants, 84 were male, accounting for 45.11% of the total sample, while 101 were female, representing 54.89%. In terms of field of study, 26.63% were from science and engineering disciplines, 47.28% from economics and management, 4.89% from arts and history, 8.15% from art-related fields, and 13.04% from other fields. Among the respondents, 23.37% were freshmen, 38.04% were sophomores, 23.91% were juniors, and 14.67% were seniors. Regarding entrepreneurial experience, which encompassed internships and participation in entrepreneurship competitions, 52.72% of the respondents reported having such experience, while 47.28% did not. Finally, based on the survey data concerning the entrepreneurial experience of the students' parents, it was found that 31.52% of families had entrepreneurial experience, while 68.48% did not.

4.1 Reliability and validity analysis of the Innovation and Entrepreneurship Education Scale

The reliability analysis of the innovation and entrepreneurship education scale was performed using SPSSAU software. The results of the analysis are presented in Table 2 and Table 3 below.

Table 2 illustrates that the reliability coefficient value is 0.963, surpassing the minimum threshold of 0.7 and even exceeding 0.9. This indicates a high level of reliability in the study's data and demonstrates strong internal consistency among the variables and their respective dimensions within the scale.

Table 3 reveals that the independent variable,

innovation and entrepreneurship education, possesses a KMO value of 0.891, surpassing the recommended threshold of 0.7 for satisfactory factor analysis. Moreover, all factor loading coefficients exceed 0.500, and the cumulative variance explained surpasses 60%, indicating robust validity. These results affirm the good reliability and validity of the innovation and entrepreneurship education scale employed in this study.

4.2 Reliability and validity analysis of the Entrepreneurial Intention Scale

The reliability and validity of the entrepreneurial intention scale were assessed using SPSS 2.0 software, and the findings are presented in Tables 4 and 5. The results reported in Table 4 reveal that the reliability coefficient value is 0.961, exceeding the threshold of 0.9 and significantly surpassing the minimum reliability value of 0.7. This suggests that the data exhibits high reliability, indicating strong internal consistency among the variables and their respective dimensions within the scale.

Table 5 presents the findings related to the independent variable of innovation and entrepreneurship education. It shows that the KMO value is 0.886, surpassing the recommended threshold of 0.7, indicating satisfactory factor analysis. Furthermore, the factor loading coefficients are greater than 0.500, and the cumulative variance explained exceeds 60%, indicating robust validity. These results confirm that the entrepreneurial intention scale exhibits both reliable and valid properties.

4.3 Correlation Analysis

Correlation analysis was employed in this study to examine the strength and direction of the relationship between the variables. It allowed for an assessment of the current relationship between the variables that impact undergraduate students' entrepreneurial intentions. The results of the correlation analysis for each variable are presented in Table 6, providing insights into the associations between these variables.

Table 6 displays the correlation analysis conducted to examine the relationship between entrepreneurial intention and various variables, including innovation and entrepreneurship education, gender, major, grade, entrepreneurial experience, and family entrepreneurial background. The strength of the correlation is measured by the Pearson correlation coefficient (PCC). The results indicate significant positive correlations between entrepreneurial intention and innovation and entrepreneurship education, with a correlation coefficient of 0.527 and a significance level of 0.01. Additionally, a significant positive correlation is observed between entrepreneurial

Table 2. Cronbach reliability analysis of innovation and entrepreneurship education scale

Theme	Correction Item Total Correlation (CITC)	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
School innovation and entrepreneurship education has stimulated my interest in entrepreneurship	0.840	0.960	0.963
School innovation and entrepreneurship education has improved my knowledge of business plans	0.884	0.956	
School innovation and entrepreneurship education has improved my understanding of business opportunities	0.913	0.954	
I think that school education on innovation and entrepreneurship has improved my business management skills	0.860	0.958	
The school has a well-developed entrepreneurial base or guidance organization	0.851	0.959	
The school has a good innovation atmosphere	0.876	0.957	
The school has excellent innovation and entrepreneurship instructors (including external)	0.868	0.958	

Table 3. Results of validity analysis of the innovation and entrepreneurship education scale

Theme	Factor loading coefficient	Commonality (common factor variance)
School innovation and entrepreneurship education stimulate my interest in entrepreneurship	0.883	0.780
School education on innovation and entrepreneurship has improved my knowledge of business plans	0.918	0.843
School innovation and entrepreneurship education have improved my understanding of business opportunities	0.939	0.881
I think that school education on innovation and entrepreneurship has improved my business management skills	0.899	0.808
The school has a well-developed entrepreneurial base or guidance organization	0.889	0.791
The school has a good innovation atmosphere	0.909	0.825
The school has excellent innovation and entrepreneurship instructors (including external)	0.902	0.814
Eigenroot value (before rotation)	5.743	-
Explanation of variance % (before rotation)	82.038%	-
Cumulative variance explained % (before rotation)	82.038%	-
Eigenroot value (after rotation)	5.743	-
Variance Explanation % (after rotation)	82.038%	-
Cumulative variance explained % (after rotation)	82.038%	-
KMO value	0.891	-
Barth spherical value	407.016	-
df	21	-
p-value	0.000	-

Table 4. Cronbach's reliability analysis of the entrepreneurial intention scale

Theme	Correction item total correlation (CITC)	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
I am willing to work hard to become an entrepreneur	0.810	0.960	0.961
My career goal is to become an entrepreneur	0.909	0.950	
I will try to start my own business	0.815	0.960	
I plan to start my own business in the future	0.930	0.947	
I have seriously considered starting a business	0.879	0.953	
I have a strong desire to start a business	0.913	0.949	

Table 5. Results of validity analysis of the entrepreneurial intention scale

Theme	Factor loading coefficient	Commonality (common factor variance)
I am willing to work hard to become an entrepreneur	0.864	0.747
My career goal is to become an entrepreneur	0.938	0.880
I will try to start my own business	0.869	0.756
I plan to start my own business in the future	0.954	0.909
I have seriously considered starting a business	0.918	0.843
I have a strong desire to start a business	0.943	0.890
Eigenroot value (before rotation)	5.024	-
Explanation of variance % (before rotation)	83.733%	-
Cumulative variance explained % (before rotation)	83.733%	-
Eigenroot value (after rotation)	5.024	-
Variance Explanation % (after rotation)	83.733%	-
Cumulative variance explained % (after rotation)	83.733%	-
KMO value	0.886	-
Barth spherical value	355.707	-
df	15	-
p-value	0.000	-

Table 6. Pearson correlation-standard format

	Entrepreneurial intention
Innovation and entrepreneurship education	0.527**
Gender	0.294**
Major	0.007
Grade	0.118
Entrepreneurial experience	0.121**
Family entrepreneurial background	0.249**

Note: **p<0.01

intention and entrepreneurial experience, with a correlation coefficient of 0.121 and a significance level of 0.01. Moreover, there is a significant positive correlation between entrepreneurial intention and family entrepreneurial background, with a correlation coefficient of 0.249 and a significance level of 0.01.

4.4 Regression analysis

Based on the results of the correlation analysis,

the variables included in the regression analysis model are as follows: innovation and entrepreneurship education as the independent variable, undergraduates' entrepreneurial intention as the dependent variable, and the control variables of entrepreneurial experience and family entrepreneurial background. These variables were selected based on their significant correlations observed in the correlation analysis. The regression analysis model and its results are presented in Table 7.

From Table 7 it can be seen that:

● The regression coefficient value of innovation and entrepreneurship education is 0.603 (t=8.358, p=0.000<0.01), implying that innovation and entrepreneurship education will have a significant positive influence on entrepreneurial intention,H1 is verified by the study of Kowang et al (2021);

● The regression coefficient value of entrepreneurial experience is 0.255 (t=3.656, p=0.000<0.01), implying that entrepreneurial experience will have a significant positive influence on entrepreneurial intention,H2 is verified,this result is supported by Wu et al. (2022);

● The regression coefficient value of the family entrepreneurial background is 0.294 (t=3.846, p=0.000<0.01), which means that family entrepreneurial background will have a positive influence on entrepreneurial intention; H3 is verified by the previous studies of Salami (2019) and the recent study of One,& Ho(2020).

5 Interview results and discussion

To gain insights into strategies for promoting undergraduates' entrepreneurial intentions and fostering their entrepreneurial ventures, the researchers conducted interviews with a panel of five experienced experts. The experts were assigned anonymous numerical codes, with Experts 1 and 2 serving as leaders of the Innovation and Entrepreneurship Education Center for undergraduates at a private university. The remaining experts included the dean of the College of Preschool Education (Expert 3), the vice-dean of teaching in the College of Business (Expert 4), and the deputy director of the Student Work Department (Expert 5). The interviews were recorded and transcribed, and thematic analysis was carried out by two Ph.D. students who assigned pseudonyms to maintain participant confidentiality. The findings from the interviews are presented in the subsequent section.

5.1 Refine the MEI education program in the talent cultivation plan of private universities

In order to effectively enhance undergraduates' entrepreneurial consciousness through MEI education in private universities, it is essential to make necessary adjustments to talent training programs, offer increased support for innovation and entrepreneurship

Table 7. Results of linear regression analysis (n=185)

	Unstandardized coefficient		Standardized coefficient	t	p	VIF	R 2	Adjust R 2	F
	B	Standard error	Beta						
Constant	0.365	0.201	-	1.821	0.070	-	0.385	0.371	F (4,180)=28.146, p=0.000
Innovation and entrepreneurship education	0.603	0.072	0.494	8.358	0.000**	1.020			
Entrepreneurial experience	0.255	0.070	0.219	3.656	0.000**	1.055			
Family entrepreneurial background	0.294	0.076	0.237	3.846	0.000**	1.111			

Note: **p<0.01

education, and consistently improve the educational content. These recommendations are derived from an analysis of the existing state of MEI education implementation in private universities (Yu et al., 2020). Expert 1 stated:

"At present, the direction and focus of education in our university are still focused on professional knowledge training, and the supporting programs for innovation and entrepreneurship education still need to be improved. Innovation and entrepreneurship education should be carried out in various forms, and innovation and entrepreneurship education courses should be conducted at the early stage of undergraduates' studies, in a gradual manner, and staggered with the time of undergraduates' job seeking."

According to expert 2:

"The course of innovation and entrepreneurship education should be extended in our university. Innovation and entrepreneurship education as a key direction of student employment in the new era must cover all students, and should not be limited to students with innovative and entrepreneurial ideas, but be carried out as a compulsory course in order to fully enhance students' innovative and entrepreneurial awareness, and to discover their innovative and entrepreneurial potential."

This suggests that the curriculum of private colleges and universities should be based on the developmental stages of students and be appropriate to their development.

5.2 Cultivate students' innovative and entrepreneurial consciousness and ability, and enhance their interest

Dai (2022) suggested that universities should employ diverse strategies to motivate students and enhance their innovation and entrepreneurial capabilities. This approach aims to cultivate innovative talents who can effectively contribute to the needs of both society and the country. Expert 3 recommended that:

"First of all, in terms of curriculum, private colleges and universities should change the main focus on theoretical learning to the main focus on practice. At present, the learning of our undergraduates still focuses on theoretical knowledge learning and examination, neglecting the improvement of practical ability, which leads to insufficient practical ability and lack of social experience."

Expert 5 suggested that:

"Universities can invite successful entrepreneurs and distinguished alumni to give speeches to stimulate students' enthusiasm for innovation and entrepreneurship; schools can join hands with

Table 8. Summary of experts' opinions and recommendations on MEI education

Theme	Experts' Opinions
Ways to increase students' entrepreneurial intentions	● Raising awareness of innovation and entrepreneurship is a prerequisite. ● Strengthen innovation and entrepreneurship education. ● Guide participation in innovation and entrepreneurship competitions for undergraduates. ● Encourage participation in practical activities such as internships and practical training.
Current status of MEI education	● The goal of training talents for MEI education is not clear. ● There is a disconnection between MEI education and professional education. ● Few school-enterprise cooperation platforms. ● Insufficient construction of faculty.
Improvement paths of MEI education	● Increase the weight of MEI education in the talent training program. ● Through discussions with successful entrepreneurs and business owners, we can stimulate students' passion for entrepreneurship. ● Establish on-campus incubation bases and improve school-enterprise cooperation platforms. ● Integrate professional education and MEI education.

enterprises to create campus incubation bases while seeking start-up funds for innovative entrepreneurial projects with good development prospects. Thus, universities can both provide enough venues for students with innovative and entrepreneurial ideas to carry out their projects, and create a strong atmosphere for innovation and entrepreneurship to stimulate students' entrepreneurial enthusiasm."

5.3 Rationalize curricular objectives and develop diversified curricula

Through the MEI education program, universities can improve students' practical skills and entrepreneurial intentions, and at the same time develop innovative talents with application and competitiveness (Tu and Chen,2021). According to Expert 4:

"Firstly, in formulating the curriculum objectives, universities should focus on cultivating students' innovative and entrepreneurial consciousness and spirit, transforming the inertia of students' employment upon graduation and helping students to establish the ideological value system of innovation and entrepreneurship. Secondly, the concept of innovation and entrepreneurship can be integrated into the existing curriculum to promote the combination of innovation and entrepreneurship with professional education, which not only adds new elements to the existing curriculum of universities but also finds new elements for innovation and entrepreneurship education. Thirdly, the innovation and entrepreneurship concept can be integrated into the existing curriculum to promote the combination of innovation and entrepreneurship with professional education, which not only adds new elements to the existing curriculum of colleges and universities but is also a good medium for innovation and entrepreneurship education and improves students' professional innovation."

Expert 1 recommended that:

"In terms of curriculum development, universities can offer integrated innovation and entrepreneurship courses from different perspectives; set up course objectives in terms of knowledge structure, educational approach, and course type; offer theoretical and practical courses based on module themes and educational priorities, and enhance the courses according to logical development levels."

5.4 Create more professional entrepreneurial bases and platforms

Cui (2022) proposed that successful initiatives to foster undergraduate entrepreneurship should involve collaborative efforts between educational institutions and enterprises. This collaboration would facilitate the establishment of on-campus and off-campus business incubation centers and platforms, providing students with practical opportunities for innovation and entrepreneurship. Expert 5 emphasized this point:

"First of all, private universities can establish on-campus incubation bases to provide initial incubation sites for undergraduates' innovative entrepreneurial projects, establish sound supporting measures, improve the science and technology level of the incubation bases, and provide scientific and technological support for the successful incubation and development of innovative entrepreneurial projects."

The objective of this proposal is to leverage the technological resources present in the incubation base to facilitate hands-on activities aligned with students' innovation and entrepreneurship courses. By doing so, students can gain a new perspective and find inspiration for innovation and entrepreneurship, leading to the enhancement of their practical skills in these domains (Ghafar, 2020). As Expert 5 further explained:

"Secondly, private universities can unite external forces to carry out various activities and help the development of innovation and entrepreneurship. They can join other universities and well-known enterprises to hold innovation and entrepreneurship competitions, invite experts and successful entrepreneurs to form a

jury to screen and discover projects with development potential, and set up prizes according to the competition format."

Engaging in innovation and entrepreneurship competitions not only provides financial support for undergraduate projects but also offers valuable opportunities for networking and communication. Through participation in these competitions, undergraduates can enhance their innovation and entrepreneurial abilities while benefiting from the diverse perspectives and ideas of their peers. Ultimately, the aim of promoting innovation and learning through competitions is fulfilled, as students gain valuable experiences and knowledge in the process.

6 Conclusion and future study

This study aims to explore the relationship between MEI education, students' entrepreneurial experience, parents' entrepreneurial experience, and students' entrepreneurial intentions in private universities. The findings support the hypotheses that education in private universities, students' internship experience and participation in competitions, and parents' entrepreneurial experience significantly and positively influence students' entrepreneurial intentions. The study also highlights the importance of innovation and entrepreneurship education in shaping entrepreneurial intentions and emphasizes the role of family background and practical experiences. These findings contribute to our understanding of the factors influencing undergraduates' entrepreneurial intentions and provide insights for the development and improvement of MEI education in private universities.

Moreover, creating a supportive entrepreneurial environment can effectively stimulate entrepreneurial behavior, leading to increased entrepreneurial success. During the interviews, the experts provided recommendations for enhancing MEI education in private universities, which include the following suggestions. Firstly, universities should prioritize the cultivation of application-oriented undergraduate talents by improving talent development programs and enhancing the integration of theoretical knowledge with practical experience. Secondly, to foster students' entrepreneurial enthusiasm, universities can invite accomplished entrepreneurs and successful graduates to deliver speeches and establish partnerships with enterprises, providing students with more opportunities for practical experience. Thirdly, universities should develop a diverse range of courses and incorporate innovation and entrepreneurship modules into existing curricula. Lastly, universities are encouraged to establish specialized entrepreneurial centers and platforms, seek support from the government and industry, and assist undergraduates in their actual entrepreneurial endeavors by providing technological and financial resources.

This study highlights the importance of individual achievement and social recognition in shaping entrepreneurial intentions. It suggests redesigning the curriculum, particularly through specialized entrepreneurship courses, and creating an environment conducive to innovation and entrepreneurship. The research provides valuable insights for improving innovation and entrepreneurship education in private universities, with a focus on understanding the factors influencing students' intentions and enhancing their entrepreneurial mindset.

However, there are limitations to consider in this study. Firstly, the sample size was small, consisting of less than 200 completed questionnaires from a single private university, limiting generalizability. Future research should include a larger and more diverse sample from various institutions. Secondly, the study focused on selected factors, neglecting the complex interactions between them. Further investigation is needed to provide more precise recommendations for MEI education in private universities.

This study has limitations including a small sample size and a focus on specific factors,

necessitating further research with larger and more diverse samples to explore complex interactions. Future studies aim to expand the sample and conduct expert interviews, enabling a comprehensive analysis of how innovation and entrepreneurship education influence undergraduates' entrepreneurial intentions and behaviors. This will lead to more effective reform strategies for private university education. Additionally, integrating entrepreneurship education with professional education through specialized courses and industry-academia collaboration can enhance students' entrepreneurial intentions and capabilities, addressing employment pressures.

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