The Predicament of Chinese Innovation and Entrepreneurship Education: Perspective of Students of foreign languages

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Abstract

Entrepreneurship education has emerged as a vital aspect of higher education in China, including for students majoring in foreign languages. Particularly at the nation's transition towards high-quality economic development. This paper examines the implementation and impact of entrepreneurship courses among university students in China, aiming to provide insights for optimizing such educational initiatives. Through comprehensive survey analysis, it was found that most courses align with mandatory requirements, predominantly last for one semester, and are conducted offline with practical components. Students primarily participate in these courses to fulfill credit requirements and meet school mandates, while fewer engage specifically for entrepreneurship purposes. Preferences lean towards instructors with entrepreneurial experience, while school assistance primarily includes guidance and financial support. Gender was found to have no significant influence, but grade level and school policies impacted student participation. The study concludes by offering recommendations to enhance curriculum design, strengthen practical components, improve teacher quality, and provide better policy guidance and support for students. These findings provide valuable insights for the optimization of entrepreneurship education among university students in China.

Keywords: Innovation, Entrepreneurship, Educational Innovation, Student Attitudes

1. Introduction

Against the backdrop of the new era, China's economic development has transitioned from a phase of high-speed growth to one of high-quality development. Consequently, implementing entrepreneurship education in ordinary universities has been considered a measure to address the challenges of employment stemming from economic restructuring (Yi, 2022) and a key initiative to accelerate the transformation of the economic development model (Jiang, 2022; Zhu et al., 2017; Dong, 2022; Yu et al., 2022).

Entrepreneurship education in China resembles vocational education, aimed at fostering students' innovation awareness, thinking, and capabilities to engage them in the entrepreneurial process (Dong, 2022). As an education initiative targeting all students, Wang (2023) suggests that entrepreneurship education in China can steer societal changes towards a more positive direction. Wang (2023) proposes three fundamental principles guiding entrepreneurship education in China: alignment with societal development needs, scientific grounding in meeting the developmental needs of university students, and leveraging teacher initiative and intrinsic motivation as the basis.

Since Tsinghua University first introduced courses in innovation and entrepreneurship in 1997, entrepreneurship education in Chinese universities has undergone four developmental stages: autonomous exploration by universities (1997.2–2002.4), diverse explorations guided by educational authorities (2002.4–2010.4), comprehensive promotion guided by educational authorities (2010.4–2015.5), and in-depth promotion under unified national leadership (2015.5–present) (Wang, 2016).

Gu et al. (2023) posit that entrepreneurship education is a method of guiding significance aimed at cultivating students' innovative cognition, entrepreneurial spirit, and pragmatism, thereby promoting their personal growth and societal progress through independent entrepreneurship. Entrepreneurship education is considered advantageous in enhancing students' capabilities. For instance, Wang (2023) suggests that it can cultivate students' innovative thinking and entrepreneurial abilities to spark their interest in learning and unlock their potential, thereby facilitating their overall development (Gu et al., 2023; Dong, 2022).

Given the apparent economic and social benefits, the reform of entrepreneurship education in China is appropriate, urgent, and practical. It aims to improve the quality of higher education, enhance students' innovative capabilities, and elevate their employability and job quality. Government policies promoting entrepreneurial spirit are increasingly gaining momentum (Zhu et al., 2017).

Foreign language majors are tasked with cultivating talents possessing international, cross-cultural, and multilingual capabilities. They emphasize not only the cultivation of basic language knowledge and skills but also the study

of foreign languages, foreign literature, foreign culture, and cross-cultural communication (Li, 2023). However, traditional education in foreign language colleges primarily adopts a single-discipline model of "language + literature" (Wang, 2022). With economic development and deepening globalization, there is a societal demand for diversified foreign language talents. Therefore, it is necessary to incorporate more courses aimed at fostering students' creativity and self-learning abilities within the curriculum of foreign language colleges (Wang, 2022). Entrepreneurship education, as a course encouraging practical experience, can effectively address the shortcomings of the curriculum in foreign language departments. Thus, Gui (2019) suggests the need to address the lack of close integration between entrepreneurship courses and majors while helping students leverage their foreign language proficiency to expand their knowledge base.

However, the current entrepreneurship education curriculum in China still faces numerous challenges. These include uneven allocation of educational resources (Wang, 2023), disconnect between the content and methods of entrepreneurship education and actual industry demands, overall weak faculty strength (Wang & Liao, 2023), and neglect of "practice" in the curriculum (Yang, 2023). Additionally, although foreign language majors submit an adequate number of applications for annual entrepreneurship competitions, their proposals often lack depth in market research and feasibility analysis. Furthermore, most topics chosen are outside their majors (Li, 2023). Moreover, Wang (2022) suggests that students are the main body of teaching, and while female students in foreign language majors possess a broad international perspective, they often prioritize stability, potentially leading to differences in enthusiasm and determination for entrepreneurship compared to male students.

Therefore, this paper aims to evaluate the implementation status of entrepreneurship education for students in foreign language colleges in China. It begins by discussing the overall development of entrepreneurship education in China and its curriculum framework. Subsequently, it collects data through survey questionnaires, examining and analyzing aspects such as curriculum content, practical content, teacher proficiency, and student perspectives. Finally, it concludes that gender is not a factor influencing student entrepreneurship and that most students prefer more flexible course types combined with practical elements. Thus, this paper can provide important reference for the reform and optimization of entrepreneurship education for college students and lay the foundation for future research.

2. Context

2.1. Historical policy development

As of 2024, innovation and entrepreneurship education in China has been developed for 27 years. Wang (2016) identified four stages of development in Chinese higher education innovation and entrepreneurship education since Tsinghua University first offered courses in this area in 1997:

- Stage 1: Autonomous exploration of curriculum content by universities (February 1997 - April 2002) (Chen, 2022).
- Stage 2: Pilot courses initiated by the Ministry of Education (April 2002 - April 2010) (Yang, 2023).
- Stage 3: Guidance from the Ministry of Education, with universities nationwide fully implementing courses (April 2010 - May 2015).
- Stage 4: Convergence of innovation and entrepreneurship education curriculum and objectives nationwide (May 2015 - present).

Specifically, the issuance of innovation and entrepreneurship education policies in China began in 1998. It can be argued that the "Action Plan for Education Revitalization in the 21st Century" issued by the state in 1998 marked the inception of this new educational field (Yang, 2023).

From the explicit call in the 1999 "Decision of the Central Committee of the Communist Party of China and the State Council on Deepening Educational Reform and Comprehensively Promoting Quality Education" to prioritize the cultivation of college students' innovative ability, practical ability, and innovative spirit, to the Ministry of Education designating Tsinghua University, Renmin University, and other nine universities to pilot innovation and entrepreneurship education in 2002, to the State Council's issuance of the "Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Higher Education Institutions" in May 2015, innovation and entrepreneurship education reform was highly active during that period (Chen, 2010; Yang, 2023).

Subsequently, in 2004, innovation and entrepreneurship education pilot experiments were conducted by 37

universities, with the core theme of StartYourBusiness (SYB). Wang (2016) regarded these pilot explorations as the beginning of the national exploration of innovation and entrepreneurship education, marking the initial practical measures to examine the teachability of such courses and officially heralding the beginning of China's innovation and entrepreneurship education teaching practice exploration.

In 2007, key terms such as "entrepreneurial education teaching objectives" and "entrepreneurial teaching content" officially appeared in documents. The Ministry of Education issued the "Teaching Requirements for Career Development and Employment Guidance Courses for College Students," listing a series of important measures including strengthening the construction of teaching staff to enhance the level of employment and entrepreneurship guidance services in universities (Yang, 2023). The following year, the Chinese Ministry of Finance and the Ministry of Education established the Basic Research Fund for Colleges and Universities directly under the Ministry of Education, to support young teachers and full-time equivalent strong research potential to carry out independent research projects at these universities.

Five years later, in 2012, the Chinese Ministry of Education and seven other ministries jointly issued further regulations to strengthen experiential education. Proposals regarding support for students' exploratory learning, innovative experiments, business plans, and business simulation activities received strong support from governments at all levels (Zhu et al., 2017). In the same year, the "Basic Requirements for Entrepreneurship Education in Ordinary Undergraduate Schools (Trial)" issued by the Ministry of Education specified the organization, objectives, content, principles, and methods of entrepreneurship education (MOE, 2012), indicating the importance of implementing entrepreneurship education in ordinary universities. This was an important measure to deepen and accelerate the transformation of the economic development mode, as well as to serve the national construction of an innovative country and talent cultivation (Jiang, 2022; Zhu et al., 2017).

Subsequently, in December 2014 and May 2015, the Chinese Ministry of Education issued further entrepreneurship-related documents. Among them, it proposed that universities should implement a flexible education system (Zhu et al., 2017), such as allowing undergraduate students to start businesses, while maintaining their status and course credits during the adjustment process, and suggested that universities should establish a scholarship system for innovation and entrepreneurship.

In 2017, the China Medium and Long-term Youth Development Plan (2016-2025) was comprehensively launched, emphasizing the establishment and improvement of an innovation and entrepreneurship education system, the integration of teaching and practice, and the combination of innovation and entrepreneurship education with vocational education requirements (Zhu et al., 2017).

2.2. Innovation and entrepreneurship education

In recent years, significant progress has been made in innovation and entrepreneurship education in universities. Traditionally, entrepreneurship education was primarily conducted by scholars, who imparted theoretical knowledge, while entrepreneurs, internship supervisors, and industry experts acted as practical mentors, forming the education mentor team (Yang, 2023). In order to focus on students and enhance their comprehensive qualities and innovation capabilities, universities have universally set up innovation and entrepreneurship education courses and established practical platforms tailored to students' learning characteristics (Qiu, 2018).

The system construction of entrepreneurship education is mainly achieved through cultivating students' entrepreneurial qualities, establishing specialized courses, organizing thematic lectures, and competitions. Wang (2015) proposed four types of innovation and entrepreneurship education, including general knowledge type, embedded type, vocational type, and professional type. Additionally, many universities and vocational education institutions have incorporated innovation and entrepreneurship-related courses into their curriculum systems, such as "entrepreneurship management" and "startup". Aiming to impart foundational knowledge and skills required for innovation and entrepreneurship to students. These courses typically employ teaching techniques such as case studies and teamwork, which have been proven to effectively stimulate students' enthusiasm for innovation and entrepreneurship (Li et al., 2022).

Consequently, the importance of innovation and entrepreneurship education in universities has gradually been widely recognized. This education aims to cultivate students' entrepreneurial awareness and innovative capabilities to promote their employment and socio-economic development (Liu, 2022; Yang et al., 2015).

Firstly, by fostering entrepreneurial concepts, students gradually recognize the importance of entrepreneurship and cultivate corresponding quality structures in practice (Chen, 2022). These qualities include innovation spirit, innovative consciousness, and entrepreneurial abilities (Zhang, 2022). The innovation spirit enables students to maintain a high level of questioning while learning new theories and knowledge, fostering a rigorous scientific attitude and enabling them to propose new methods and measures proactively when solving problems. Innovative

consciousness can continuously strengthen students' business awareness, risk awareness, and dedication. Entrepreneurial abilities can cultivate students' market identification and analysis capabilities, enabling them to accurately grasp market dynamics, fully integrate existing resources, and formulate practical plans.

Secondly, faced with increasing employment pressure, innovation and entrepreneurship education has become one of the ways to alleviate this problem. Currently, China's economy is in a key period of transition and innovative talents are more welcomed by enterprises (Liu, 2022; Yang et al., 2015). Under this circumstance, higher education faces new tasks and requirements, needing to deliver more innovative and entrepreneurial talents to society (Liu, 2022). Therefore, in response to market demand, universities actively promote innovation and entrepreneurship education, reforming the practice system to cultivate more innovative talents, thereby contributing to local economic development (Dong, 2022). These innovative talents can start businesses and create more job opportunities through innovation and entrepreneurship, alleviating the intermittent expansion of employment pressure.

Moreover, innovation and entrepreneurship education also promote the transformation of research results, enabling students' creativity to be translated into practical benefits and promoting the reform of school teaching models (Chen, 2022). As the main executor of research projects, universities, through innovation and entrepreneurship education, can better transform research results into practical products and services, injecting new vitality into social and economic development. The ultimate goal is to cultivate a talent team full of innovation and entrepreneurship enthusiasm, providing support for economic expansion and social development (Gu et al., 2023).

Therefore, the reform of innovation and entrepreneurship education is of great significance for enhancing students' abilities, promoting the healthy development of universities, and facilitating high-quality development of social economy.

2.3 Existing Problems

In China, innovation and entrepreneurship education started relatively late, with many universities considering it merely as auxiliary vocational training. There is a significant emphasis on the outcomes obtained by university students after starting their own businesses, with little attention paid to the entrepreneurial process. Moreover, there is a neglect of the transformation of students' thinking and the enhancement of their abilities during the entrepreneurial process (Dong, 2022).

According to researchers, the current innovation and entrepreneurship curriculum system in China still faces several issues.

Externally

Although China's development policies for innovation and entrepreneurship education are unified, there are disparities in the allocation of educational resources (Wang, 2023). Many universities generally lack funding support (Liu, 2022), suffer from inadequate management mechanisms (Guo & Wang, 2022), insufficient financial investment (Li et al., 2022), and unimplemented planned funds (Yang, 2023). Regarding the execution of policies issued by relevant departments, research by Yang (2023) and Ji (2022) points out that some policies are overly macroscopic and lack relevant guidance, resulting in universities struggling with handling details and weak implementation. This also leads to some students not knowing where to go or how to find policies, and even having difficulty understanding policy content (Ji, 2022). Additionally, there are instances where some university graduates cannot effectively enjoy national tax preferential policies during actual entrepreneurial processes (Chen, 2022; Pan, 2022). Some universities lack substantial cooperation and communication with enterprises, or their communication remains superficial (Hua, 2023; Ji, 2022), and the courses lack local characteristics (Shen, 2020). This results in a disconnect between the content and methods of innovation and entrepreneurship education and actual industrial demands, causing both students to lack an understanding of practical industries and enterprises to lack trust in university students, leading to a vicious cycle (Hua, 2023).

Internally

On the one hand, the overall faculty strength in innovation and entrepreneurship education is weak (Wang & Liao, 2023; Hua, 2023), with some teachers having a single knowledge structure (Lu, 2011) and lacking practical skills (Jiang, 2022), or even lacking professional capabilities (Dong, 2022). Some university teachers cannot become the main body of innovation and entrepreneurship activities and lack teaching capabilities in entrepreneurship (Wang, 2023). Although relevant departments have conducted training, it is still insufficient (Wang & Liao, 2023; Hua, 2023). Furthermore, some universities have not included the construction of innovation and entrepreneurship

education faculty teams in the overall planning of the university (Jiang, 2022; Hua, 2023). Currently, there is a significant shortage of innovation and entrepreneurship course teachers in China (Jiang, 2022). On the other hand, there is inadequate coordination among various departments in universities, making it difficult to coordinate related work (Liu, 2022; Li et al., 2022). Moreover, there are problems with assessment feedback and reward mechanisms (Jiang, 2022; Pan, 2022; Hua, 2023; Dong, 2022).

Terms of curriculum systems

Furthermore, in terms of curriculum systems, universities' innovation and entrepreneurship education concepts are outdated (Liu, 2022; Li et al., 2022). The richness of connotation and the innovation of forms are still not sufficiently comprehensive, with limited appeal to the majority of students (Jiang, 2022). There is a lack of overall design in curriculum design, with a focus on the narrow idea of allowing students to start their own businesses (Yang, 2023). Some universities adhere to traditional education models in the field of innovation and entrepreneurship education, overly emphasizing knowledge segmentation and neglecting the cultivation of students' innovative spirit and practical abilities (Gu et al., 2023). Some students believe that the school's investment in innovation and entrepreneurship is insufficient, there is a lack of innovation and entrepreneurship courses, the courses are theoretical with insufficient practicality, and the school lacks professional entrepreneurship mentors (Guo & Wang, 2022). Curriculum design overly emphasizes theoretical knowledge itself, neglecting the importance of "practical participation" (Yang, 2023; Hua, 2023; Gu et al., 2023). Courses in a certain university have been severely compressed, theoretical courses have not effectively paved the way for practical courses, and there are serious gaps between courses (Yang, 2023). Curriculum construction lacks systematicness and pertinence (Liu, 2022; Guo & Wang, 2022). Furthermore, students' feedback indicates that the content of innovation and entrepreneurship courses is poorly related to the trends and their majors (Liu, 2022; Chen, 2022).

Students themselves

Finally, regarding students themselves, some students believe that such education is only for obtaining more money (Lu, 2011). There are issues with students' lack of entrepreneurial motivation, limited understanding of entrepreneurial knowledge and related policies, and poor enthusiasm (Ji, 2022).

Therefore, further analysis of the problems in the innovation and entrepreneurship curriculum system is needed (Yi, 2022). As students are important participants and primary recipients of education, their perspectives are crucial for analyzing the current situation of innovation and entrepreneurship education in China. Additionally, according to the research by Wang & Liao (2023), currently, Chinese universities mainly evaluate the three subsystems of curriculum, teachers, and students. Among them, curriculum evaluation often focuses less on curriculum goals, effects, quality, and planning rationality. Therefore, this study will deeply analyze the current situation of such education from the perspective of students, mainly by proposing suggestions for the future development of education courses based on students' feedback and needs.

3. Methodology

Objectives

The aim of this study is to evaluate the implementation status of innovation and entrepreneurship courses among Chinese university students.

Specifically, this research aims to explore the following three sub-objectives:

(1) Analyze the specific implementation status of the courses.

(2) Analyze students' feedback and expectations.

(3) Analyze the specific situation of student characteristics as influencing factors.

Sample

Surveys were distributed to first to fourth-year students or graduates of the Spanish departments of four universities in China. These universities are Heilongjiang University, Pingdingshan University, Jilin International Studies University, and Harbin Normal University. All four universities offer Spanish majors and have innovation and entrepreneurship courses. The survey results indicated a total of 83 participants, with 48 completions and 35 non-completions. Table 1 below describes their demographic characteristics.

Table 1

Descriptive statistics of the samples

Variable		Frequency
Gender	Woman	70.83%
	Man	25%
	Don't want to tell	4.17%
Grade	1st year	16.67%
	2nd year	22.92%
	3rd year	2.08%
	4th year	18.75%
	Undergraduate	39.58%
Subject	Language Spanish	97.92%
	Language German	2.08%
Situation of ever taken the innovation and entrepreneurship course	Have attended or are attending	68.75%
	Never attended	31.25%
Situation of ever started a business	Is starting a business	4.17%
	Start a business or have given up	4.17%
	I haven't started a business	91.67%
Situation of know the relevant policies and regulations on college students' entrepreneurship	Very familiar with	0
	Basic understanding	33.33%
	Do not understand	66.67%

Process

In the construction of the questionnaire, to ensure its validity and reliability, the researchers referenced previous articles related to the research topic (Peña et al., 2023; Chen, 2022; Dong, 2022; Araya Pizarro, 2021).

The survey questionnaire has been evaluated by three experts, and the evaluation results are satisfactory, indicating that data collection can proceed. The scoring section of the questionnaire uses a Likert scale rating system, with response options ranging from 1 (completely disagree) to 5 (completely agree).

The specific content of the questionnaire is mainly based on the classification of difficulties encountered in innovation and entrepreneurship education derived from the literature review. The survey questionnaire consists of three parts: personal information collection, course evaluation, and course expectations, totaling 30 questions. The course evaluation part includes aspects of course design, practical aspects, course content, and student evaluation of teachers. The course expectations part is based on the literature review, asking respondents about their expectations for such courses.

In summary, questions 1-8 are related to personal information collection. Subsequently, based on the response to whether the respondent has attended innovation and entrepreneurship courses, different sections of the questionnaire are answered. Participants who have attended such courses answer questions 9-22 related to course evaluation, while those who have not attend such courses answer questions 23-29 related to course expectations. Question 30 is an open-ended question aimed at soliciting respondents' evaluations or expectations regarding innovation and entrepreneurship courses.

Therefore, it can be considered that this study adopts a mixed research method, with a relatively low proportion of qualitative research. In the data analysis part, quantitative data will be analyzed using SPSS, employing descriptive statistics and cross-analysis to reflect the research results.

After the data collection phase, the collected data from the questionnaire survey will be imported into SPSS for reliability and validity analysis. The obtained Kaiser-Meyer-Olkin (KMO) value is 0.829, with a P-value < 0.05, indicating that there is correlation between the variables of the items, making it suitable for factor analysis. Moreover, the Cronbach's α coefficient value is 0.891, indicating good reliability of the questionnaire.

4. Results

The analysis of students who have participated in the courses provides insights into four aspects: course content, course selection, types of instructors, and external support (provided by the university), as visualized by the data.

In terms of course content (see Figures 1, 2, and 3), it is observed that the majority of courses have a duration of one semester, typically spanning around 4-5 months. Most of these courses are mandatory as per the university curriculum requirements. While some courses combine online and offline components, the majority are conducted offline. Additionally, most courses include practical components, although some students opt out of participating in these.

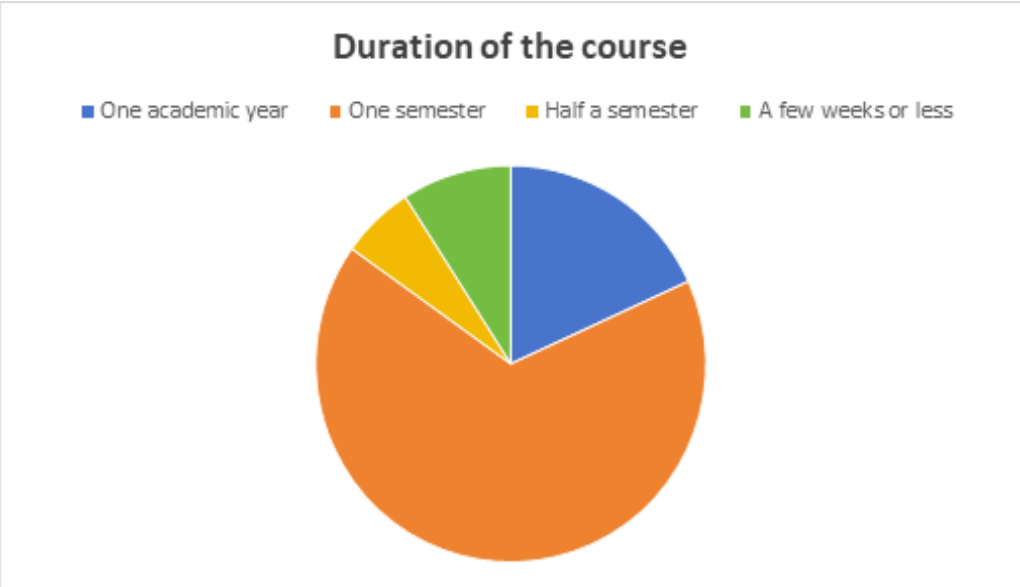

Figure 1
Duration of Courses

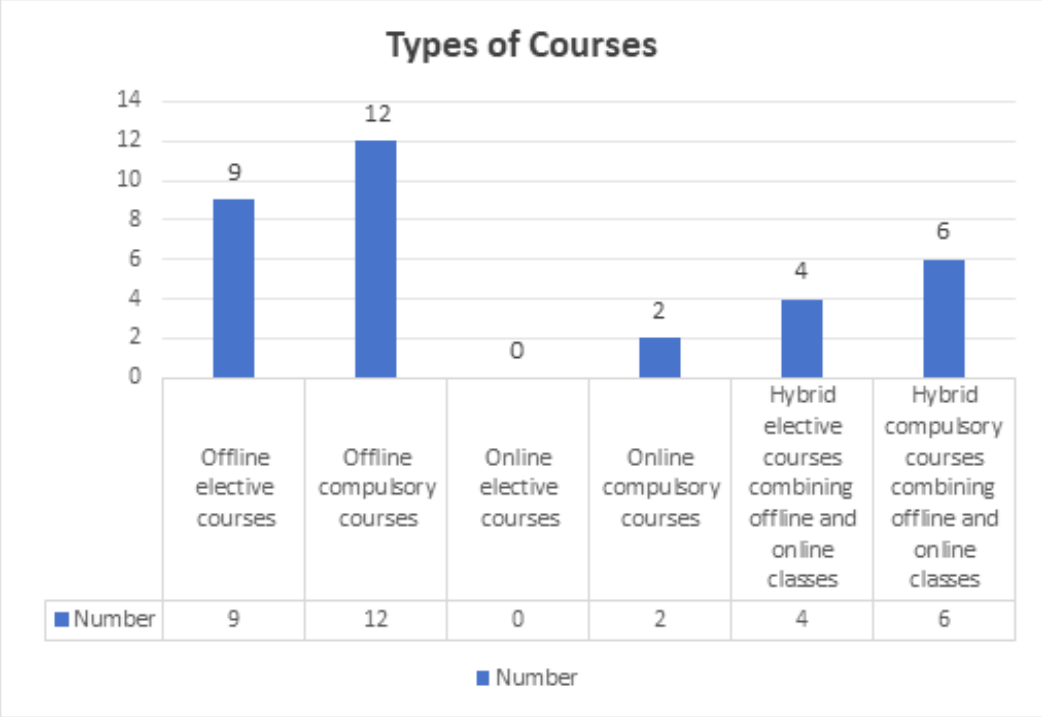

Figure 2
Types of Courses

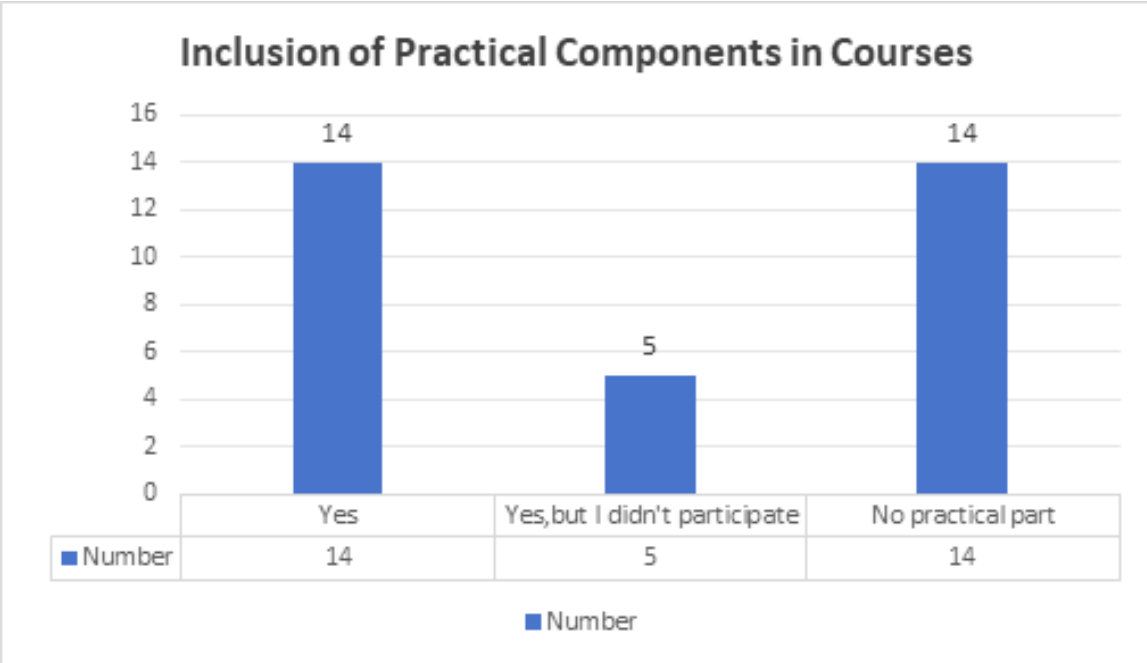

Figure 3

Inclusion of Practical Components in Courses

Regarding personal objectives (Figure 4), a high proportion of students take these courses to fulfill credit requirements for graduation or due to mandatory university regulations. Fewer students enroll solely to gain knowledge or improve their job prospects, and there are relatively fewer students who specifically enroll for entrepreneurial purposes.

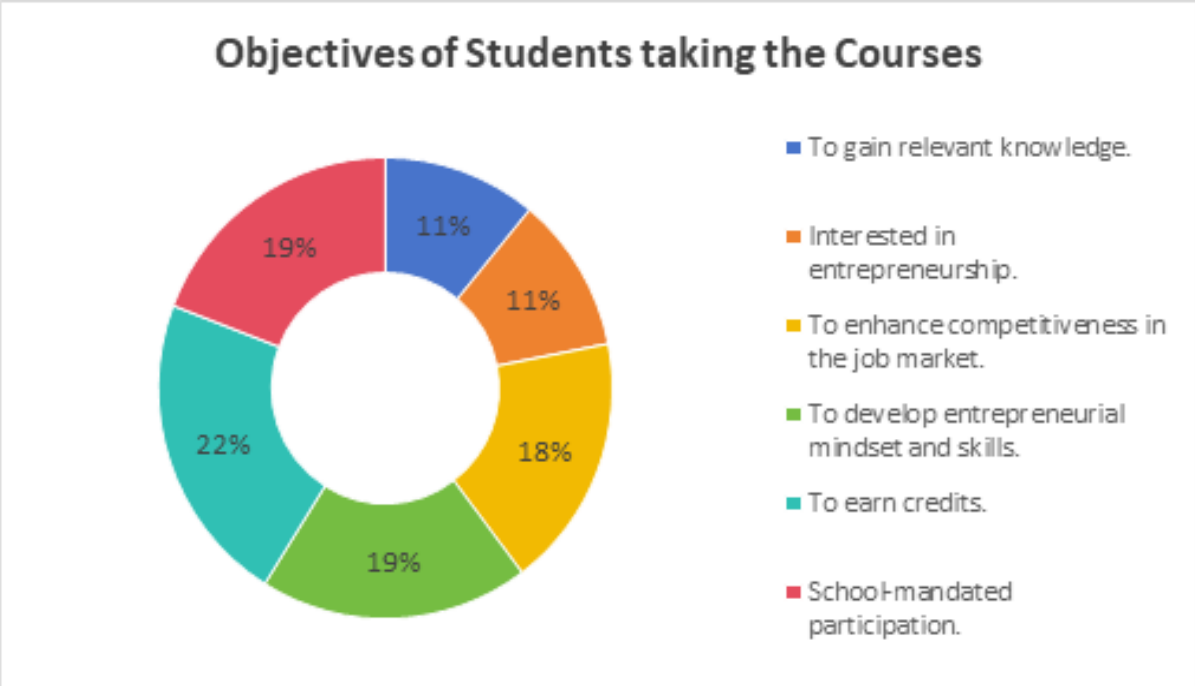

Figure 4

Objectives of Students taking the Courses

In terms of the support provided by the university (Figure 5), guidance and internal pilot programs are prevalent, with some schools providing financial support. However, there are cases where no support is provided. Additionally, these universities offer opportunities for students to access entrepreneurship platforms and visit companies for observation and learning, fostering habits of self-learning and self-improvement among students.

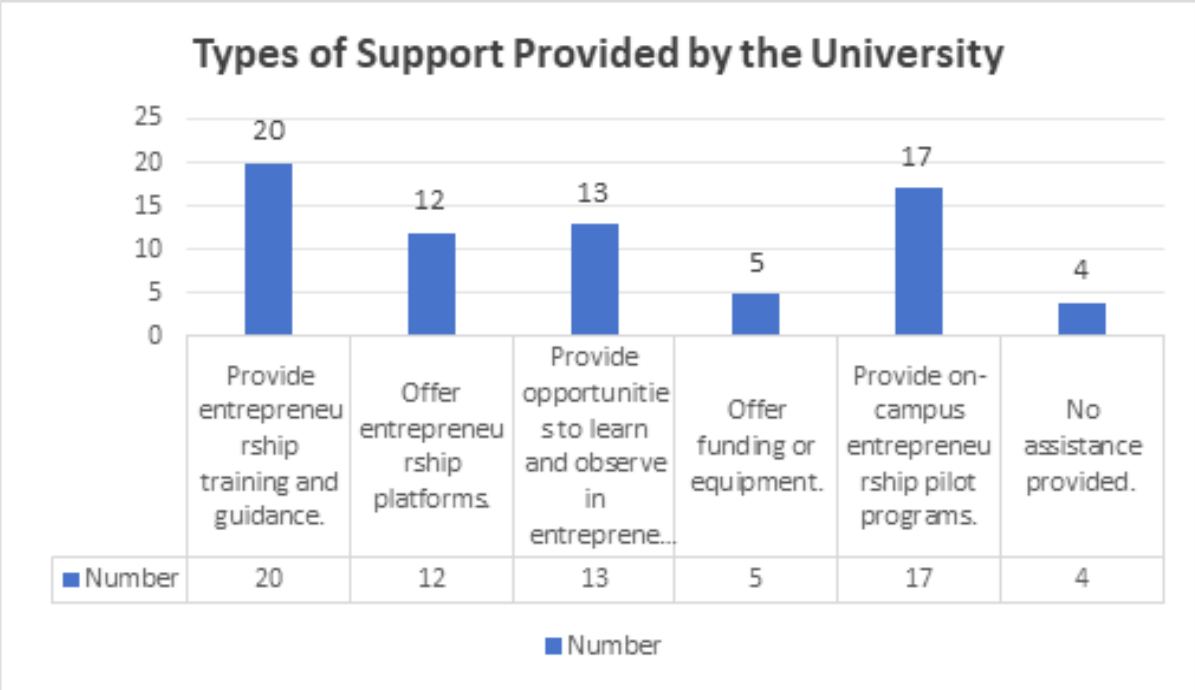

Figure 5

Types of Support Provided by the University

For students who have not participated in the courses, their reasons for non-participation (Table 2) mainly include a lack of personal interest, information asymmetry, and a lack of understanding of how to engage in entrepreneurship. This indicates that despite the government's efforts to promote entrepreneurship education and entrepreneurship among university students, there are still individuals who are not familiar with this field.

Table 2

Reasons for Non-Participation in the Courses

Reasons for not taking the course	Number
The school does not provide	1
Individuals have no intention to participate	11
Other, please indicate	3

According to the expected course type in Figure 6 and the expected school help type in Figure 7 . The majority express more enthusiasm for elective courses over mandatory ones and anticipate more flexible forms of learning such as lectures, seminars, or entrepreneurial competitions. Moreover, students have high expectations for university support, with the most popular being visits to companies for observation and learning. This requires collaboration between universities and enterprises to transform knowledge-based courses into practical ones, facilitating tripartite cooperation among schools, students, and enterprises. Furthermore, students express a preference for instructors with entrepreneurial experience to teach these courses.

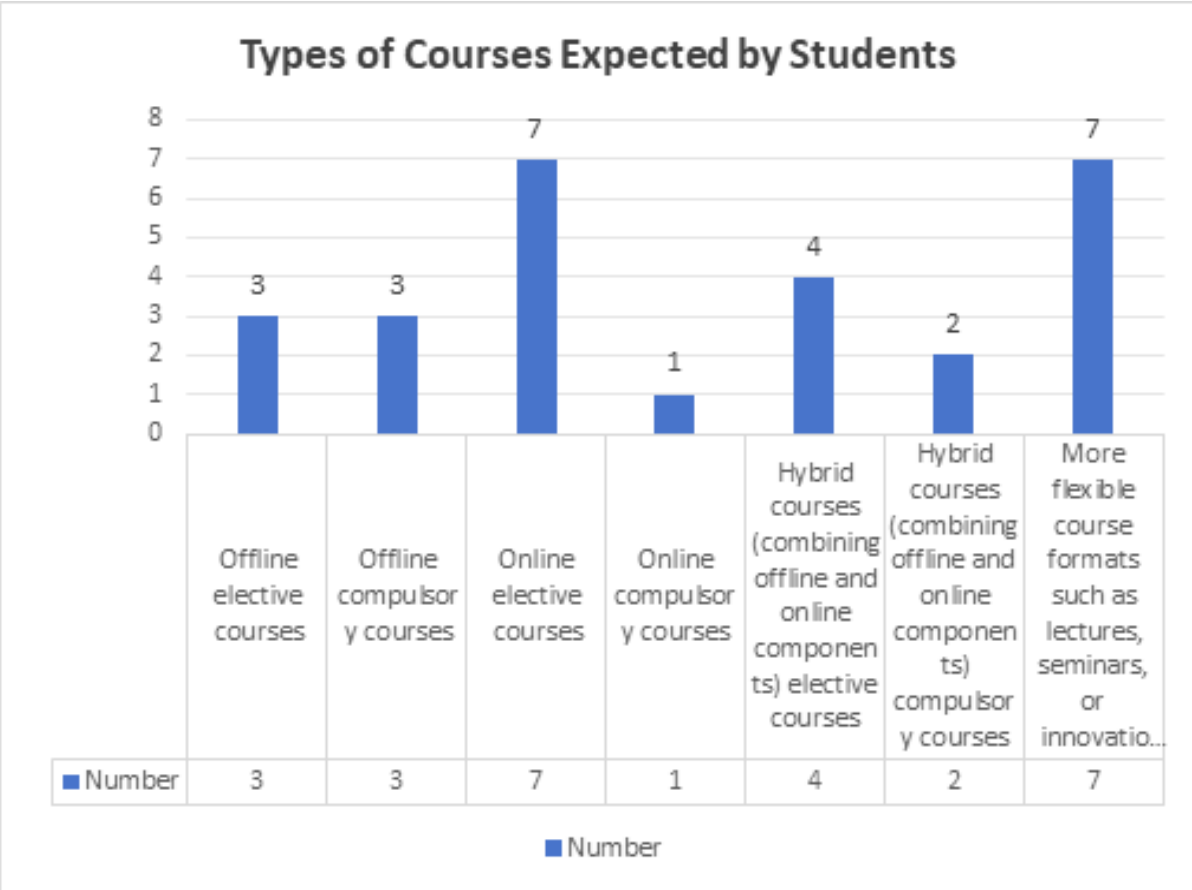

Figure 6

Types of Courses Expected by Students

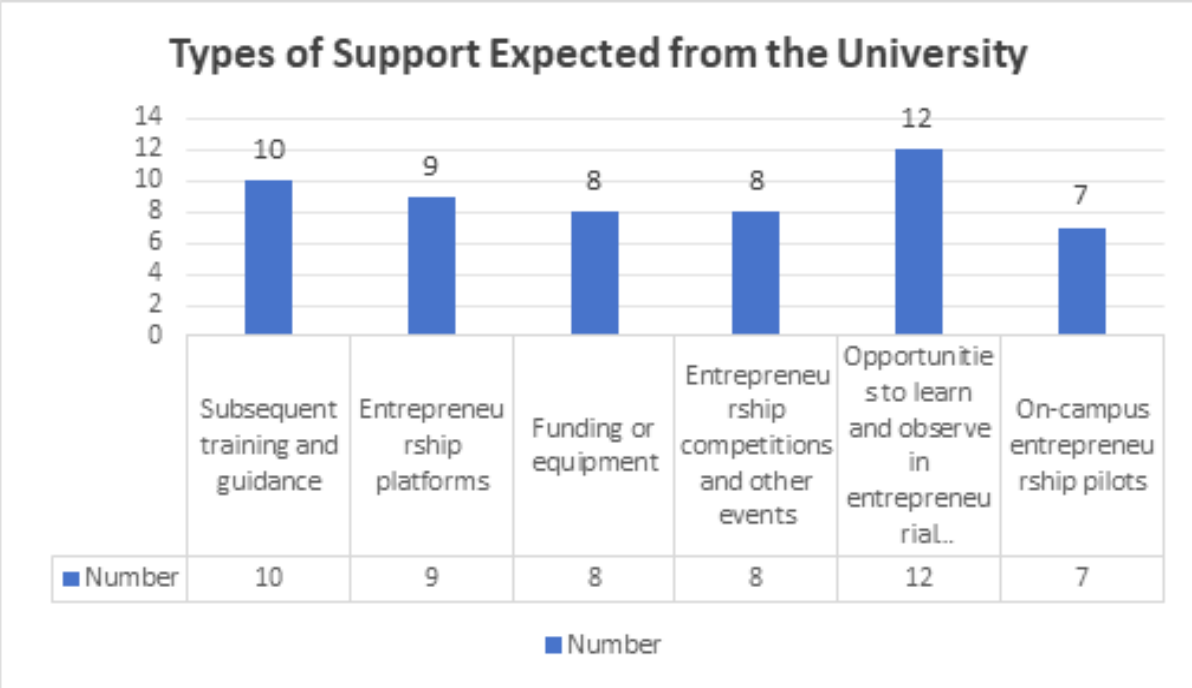

Figure 7

Types of Support Expected from the University

Next, a summary analysis is conducted.

Regarding in terms of expectations towards teachers.From the data in Table 3, students who have not attended courses tend to prefer interacting with teachers who have entrepreneurial experience (6 individuals), followed by those who have a better understanding of students' professional courses and dedicated teachers in innovation and entrepreneurship (4 individuals each).

As for students who have attended courses, they have the highest expectations for interaction with successful entrepreneurs (11 individuals) and teachers with entrepreneurial experience (11 individuals), followed by dedicated teachers in innovation and entrepreneurship (5 individuals) and those who have a better understanding of students' professional courses (6 individuals).These data indicate that students are more inclined to interact with teachers who have practical experience and entrepreneurial background. This may be because they believe these teachers can provide practical knowledge and experience that directly assist in their future entrepreneurial or career development.

At the same time, students also have certain expectations for teachers who have a better understanding of professional courses, perhaps because they believe these teachers can provide more in-depth support in their academic subjects. Overall, students in innovation and entrepreneurship education have a dual demand for practical experience and academic knowledge.

Table 3

Expectations towards teachers

	Expectations towards teachers			
Student type	Teachers who know more about the students' professional courses	Successful entrepreneurs.	Teachers with entrepreneurial experience.	Dedicated teachers in innovation and entrepreneurship.
Have not attended the course	4	1	6	4
Have participated in or are participating in the course	6	11	11	5

Table 4 presents the data of quantitative variables and their results. It is observed that among students who have participated in the courses, most consider the relevance of these courses to their major subjects to be average, with moderate practicality, but acknowledge their potential to enhance their skills. The instructors are generally deemed to be competent, and the teaching methods satisfactory, while the difficulty level of the course content is perceived to be moderate, resulting in an overall positive evaluation of the courses. The positive response to innovation and entrepreneurship courses among these students indicates the effectiveness of government efforts and university initiatives in promoting and improving the overall quality of such courses.

For students who have not participated in the courses, there is a greater desire for stronger integration between these courses and their major subjects, along with additional practical components. Hence, it is necessary for universities to select instructors or external individuals with relevant experience to teach these courses based on the characteristics of each major.

Table 4

Analysis Results of Quantitative Variables

Student type	Problem introduction		Likert scale					
			1	2	3	4	5	
			Number of selections					
Have participated in or are participating in the course.	Course content and professional course content contact situation	Q16	7	6	10	8	2	
	The impact of course content on ability improvement	Q17	4	3	15	8	3	
	Practical degree of the course content	Q18	3	0	18	9	3	
	Curriculum teacher level	Q19	1	1	12	10	9	
	Evaluation of the overall course content	Q20	2	0	15	10	6	
	The difficulty of the course content	Q21	0	3	18	7	5	
	Whether the teaching method meets the expectations	Q22	1	0	19	7	6	
Have not attended the course.	Expected the course content to be connected with the professional course content	Q26	3	0	6	3	3	
	Practice degree of expectations	Q27	2	0	6	4	3	

On one hand, with table 5. For students who have participated in or are currently participating in innovation and entrepreneurship courses, regarding personal interest, the mean of Q3 is 3.062 with a standard deviation of 1.137. This indicates that overall interest in the course is at a moderate level, but there is some degree of dispersion.

In terms of course content, the mean of Q16 is 2.758 with a standard deviation of 1.226. This suggests that the degree of connection between course content and professional courses is overall at a moderate level. The mean of Q17 is 3.091 with a standard deviation of 1.1, indicating that students believe the course can enhance their entrepreneurial ability to a certain extent.

Moreover, the mean of Q18 is 3.273 with a standard deviation of 0.977. Most people consider the course content to be highly practical. Meanwhile, the mean of Q20 is 3.545 with a standard deviation of 1.003, indicating that most people perceive the quality of course content to be high. The mean of Q21 is 3.424 with a standard deviation of 0.867, indicating that most people find the difficulty level of the course to be moderate.

With a mean of 3.515 and a standard deviation of 0.906 for Q22, it suggests that most people hold a high opinion of the teaching method of the course. Regarding teachers, the mean of Q19 is 3.758 with a standard deviation of 1.001 and a median of 4, indicating that most people hold a high opinion of the teachers' level.

On the other hand, for students who have not participated in such courses, the means, standard deviations, and coefficients of variation for Q26 and Q27 are relatively high. This indicates that there are significant differences in expectations within this group of students regarding these two aspects.

Table 6

Quantitative variable results

Variable name	Mean	Standard deviation	Median	Coefficient of variation (CV)
Q3. Interest situation	3.062	1.137	3	0.371
Q16. The degree of connection between courses and specialized courses	2.758	1.226	3	0.444
Q17. Ability improvement degree	3.091	1.1	3	0.356
Q18. Practicality of content	3.273	0.977	3	0.299
Q19. Teacher level	3.758	1.001	4	0.266
Q20. Content quality	3.545	1.003	3	0.283
Q21. Difficulties of the content	3.424	0.867	3	0.253

Q22. Situation of the teaching method meets the expectations	3.515	0.906	3	0.258
Q26. Situation of expect a professional course to be associated with this course content	3.2	1.373	3	0.429
Q27. Expected in the practice section	3.4	1.242	3	0.365

Finally, the chi-square test was conducted. Firstly, gender was taken as the independent variable, while participation in courses, current entrepreneurship status, understanding of relevant policies and regulations, and purpose of course participation were considered as dependent variables. The Pearson chi-square test results between gender (Q1) and other variables all showed extremely high levels of significance (P-values greater than 0.05). This indicates that no statistically significant differences were found among these variables. In other words, based on gender differences, the other variables in the sample (such as course participation, entrepreneurship status, understanding of relevant policies and regulations, etc.) did not exhibit significant differences in this survey. Therefore, it can be concluded that gender does not have a significant impact on these factors.

Secondly, the students' grade levels were taken as the independent variable, while participation in courses, current entrepreneurship status, understanding of relevant policies and regulations, and purpose of course participation were considered as dependent variables for chi-square tests. The Pearson chi-square test analysis results, as shown in Table 7, were conducted to examine the relationship between Q2. grade level and other factors in detail. The analysis results indicated the correlation of each factor with grade level and whether significant differences existed.

Firstly, the analysis based on grade level and participation in courses (Q5) showed a P-value of 0.008***, indicating statistical significance. Therefore, the null hypothesis was rejected, suggesting a significant difference between grade level and participation in courses (Q5). This implies that such courses are offered differently across different grade levels in the four universities. Such courses may be more popular in the second or fourth year.

Furthermore, the tests for Q8 and Q11, regarding mandatory school participation, also showed P-values less than 0.05. This indicates that differences in grade level result in varying levels of understanding of relevant policies and regulations among students. There is a higher number of students in the second year who have a better understanding of such regulations, suggesting that understanding of recent entrepreneurship laws and regulations has become more accessible in recent years, or local governments are increasing support for university student entrepreneurship. Additionally, more students in the fourth year are opting for courses that the school mandates, indicating a possible change in course format due to annual or policy-related factors.

However, for other factors such as current entrepreneurship status (Q7) and different purpose-related variables (Q11), except for mandatory school participation (Q11), the chi-square test results showed P-values greater than 0.05, indicating no statistical significance. Thus, the null hypothesis was accepted, indicating no significant differences between grade level and these factors. This suggests that grade level differences are not a factor affecting student entrepreneurship and course participation purposes.

Table 7

Results of Chi-Square Test-Independent Variable Grade Level

Questionnaire	Option	Q2. Grade					Total	Pearson Chi-square test	
		1st year	2nd year	3rd year	4th year	Under-graduate		X^2	P
Q5. Have you participated in this type of course	Never attended	6	3	1	0	5	15		
	Have attended or are participating	2	8	0	9	14	33	13.714	0.008***
Total		8	11	1	9	19	48		
Q7. Current entrepreneurial situation	I haven't started a business	8	8	1	9	18	44	8.759	0.363
	Is starting a business	0	2	0	0	0	2		
	Start a business or have given up	0	1	0	0	1	2		
Total		8	11	1	9	19	48		

Questionnaire	Option	Q2. Grade					Total	Pearson Chi-square test	
		1st year	2nd year	3rd year	4th year	Under-graduate		X^2	P
Q8. Knowledge of relevant policies and regulations	Basically understand	0	9	0	5	2	16		
	Do not understand	8	2	1	4	17	32	22.584	0.000***
Total		8	11	1	9	19	48		
Q11. Purpose _ To know about the relevant knowledge	Selected	0	3	0	3	2	8		
	Unselected	8	8	1	6	17	40	5.007	0.287
Total		8	11	1	9	19	48		
Q11. Purpose _ Interested in entrepreneurship	Selected	1	3	0	2	2	8		
	Unselected	7	8	1	7	17	40	1.907	0.753
Total		8	11	1	9	19	48		
Q11. Purpose _ To gain stronger competitiveness in the workplace	Selected	2	3	0	4	4	13		
	Unselected	6	8	1	5	15	35	2.113	0.715
Total		8	11	1	9	19	48		
Q11. Purpose _ To exercise my entrepreneurial ideas and skills	Selected	2	3	0	3	6	14		
	Unselected	6	8	1	6	13	34	0.627	0.960
Total		8	11	1	9	19	48		
Q11. Purpose _ To study the credits	Selected	1	4	0	4	7	16		
	Unselected	7	7	1	5	12	32	2.713	0.607
Total		8	11	1	9	19	48		
Q11. Objective _ Compulsory school participation	Selected	0	2	0	6	6	14		
	Unselected	8	9	1	3	13	34	10.528	0.032**
Total		8	11	1	9	19	48		

Note: * * *, * * and * represent the significance levels of 1%, 5% and 10%, respectively

Conclusion

In summary, entrepreneurship education has become a crucial component of higher education in China, aligning with the country's transition towards high-quality economic development (Yu et al., 2022). It represents a strategic response to the challenges posed by economic restructuring, fostering innovation, and promoting a more dynamic entrepreneurial ecosystem. The development of entrepreneurship education in China has undergone significant transformation, transitioning from autonomous exploration to comprehensive promotion under unified national leadership.

Entrepreneurship education in China, resembling vocational education, aims to cultivate students' innovation awareness, thinking, and capabilities, thereby creating an enabling environment for entrepreneurship.

This study conducted a comprehensive investigation and analysis of the implementation and effectiveness of entrepreneurship courses among university students. Analysis of student responses revealed that the majority of courses align with mandatory requirements, typically last for one semester, are predominantly conducted offline, and include practical components. Students primarily participate in these courses to fulfill credit requirements and meet school mandates, with fewer students engaging specifically for entrepreneurship purposes. Regarding faculty, students express a preference for individuals with entrepreneurial experience, while the expectation for full-time entrepreneurship faculty is relatively low. School assistance primarily includes guidance, financial support, and entrepreneurship platforms.

For students who did not participate in these courses, the majority expressed a lack of willingness, citing personal reasons and information asymmetry. In terms of student feedback and expectations, participants generally perceive course content to have moderate relevance to their major, high practicality, good teaching quality, and overall positive evaluations. However, non-participants desire tighter integration of course content with their major and an increase in practical components. Most students hold high expectations for school assistance, particularly opportunities for business observation and learning. Additionally, students prefer instructors with entrepreneurial experience to teach relevant knowledge.

Factor analysis indicates that gender does not significantly influence student participation in courses or understanding of entrepreneurship-related policies and regulations. However, grade level and school policies have some impact on student participation in courses and understanding of entrepreneurship-related policies and regulations.

In conclusion, this study provides important references for improving entrepreneurship courses among university students. Recommendations include enhancing curriculum design to increase relevance to major courses, strengthening practical components, and providing more opportunities for collaboration with enterprises. Additionally, efforts should be made to enhance teacher training and selection, inviting more professionals with entrepreneurial experience to teach, to improve the effectiveness and attractiveness of courses.

5. Implications

Based on the results and conclusions of this study, several transfer suggestions are proposed:

(1) Schools can reassess curriculum design to ensure close alignment between course content and major courses, enhancing the practicality and attractiveness of courses.

(2) Encourage schools to collaborate with enterprises to provide more practical opportunities and entrepreneurial platforms, helping students apply theoretical knowledge to practice.

(3) Strengthen teacher training and selection, encouraging the invitation of professionals with entrepreneurial experience to teach, to improve teaching quality and student motivation.

(4) Enhance schools' policy guidance and support for students, helping them understand entrepreneurship-related policies and regulations to improve the feasibility and success rate of entrepreneurship.

(5) Further research on the impact of grade level and other factors on students' willingness to innovate and start a business can provide schools with more targeted policies and services.

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