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The impact of entrepreneurial course instructors' abilities on students' learning outcomes and the mediating role of students' self-efficacy: A case study of schools in China

Yi Zhang[1], Cheng-Jui Tseng[2*]

[1,2]*Rattanakosin International College of Creative Entrepreneurship, Rajamangala University of Technology, Thailand.*

Corresponding author: Cheng-Jui Tseng (*Email: juicheng.tseng@rmutr.ac.th*)

Abstract

This study aims to examine the impact of entrepreneurial course instructors' abilities on students' learning outcomes and the mediating role of students' self-efficacy in China. A survey was conducted among 395 university students in China with 358 valid responses to investigate the relationship between entrepreneurial course instructors' abilities and students' learning outcomes. The statistical results reveal a significant relationship between entrepreneurial course instructors' abilities and students' learning outcomes. Students' acquisition of entrepreneurship-related knowledge and abilities can be improved through entrepreneurship education. Students' perception of the quality of teachers in entrepreneurship education highlights the need for institutions to address the quality of instructors to better support students' learning in entrepreneurship education. The findings suggest that investing in the development and training of entrepreneurship course instructors can have a positive impact on students' learning outcomes in entrepreneurship education. This study contributes to the existing literature by highlighting the significance of entrepreneurial course instructors' abilities and students' self-efficacy in shaping learning outcomes in entrepreneurship education particularly in the context of China.

Keywords: Entrepreneurship education, Instructor abilities, Learning outcomes, Self-efficacy.

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1. Introduction

1.1. Background

Entrepreneurship education is also constantly developing with the advancement of technology and time. The teaching strategies and subject matter of this discipline have not yet been agreed upon by the academic community [1]. Currently, the academic entrepreneurship community has come to the conclusion that entrepreneurial activities may increase wealth, foster job possibilities and aid in the economic growth of underdeveloped nations [2].

Educational institutions must inspire students to pursue their own businesses and give them the information necessary to succeed in a knowledge-based economy. Education is seen as a means of reducing poverty while entrepreneurship is seen as an element of economic development. Students also need to be able to recognize possibilities and comprehend information and skills due to the increase in small and medium-sized businesses. [3]. The Global Entrepreneurship Monitor model (GEM) proposed by Reynolds, et al. [4] also indicates a strong relationship between entrepreneurship and economic development [3]. Additionally, Jaafar and Rashid Abdul Aziz [5] research also confirms that education has an impact on students' inclination towards entrepreneurship [5, 6]. Entrepreneurship education programs provide students with the content and background to learn and apply skills and behaviors aimed at creating value for entrepreneurial ventures. In addition, entrepreneurship education is seen as a means to address the more complex, interconnected and rapidly changing problems facing today's youth [7]. Through such courses, students can connect various points of knowledge, increase their opportunity alertness by focusing on new trends and information including new skills and market preferences and identify patterns in these changes [8]. Therefore, participating in such courses can teach students about entrepreneurship and create greater awareness of its different components in their minds. The goal of entrepreneurship education is to create value and a positive impact for students who pursue organizational and market employment or become future entrepreneurs. Such programs have been shown to have a positive impact on individual entrepreneurial passion and motivation as well as entrepreneurial intention [9]. Recently, it has become widely accepted in Chinese society to incorporate education in innovation and entrepreneurship into the process of developing talent in higher education. Major universities and colleges are actively engaged in inclusive and universal innovation and entrepreneurship education activities with an emphasis on "innovation and entrepreneurship". The idea to improve the quality, efficiency and deep development of innovation and entrepreneurship education has gained significant support. Entrepreneurship education is a multi-dimensional ecosystem with different education levels, types and forms. Chinese universities and colleges should focus on exploring a path of "innovation and entrepreneurship" development.

1.2. Research Questions

The purpose of this study is to investigate the important teacher competencies that are necessary for instructors teaching entrepreneurship courses in Chinese universities. This study also aims to explore students' perceptions of teacher competencies and their performance in entrepreneurship courses. Furthermore, the study examines whether students' self-efficacy plays a moderating and facilitating role between teacher competencies and learning performance. Therefore, the research questions are as follows:

1. How do the competencies of the entrepreneurship course affect students' learning performance?
2. What decisive role do students' internal qualities play in their success in learning entrepreneurship courses?

1.3. Research Objectives

This study has the following three research objectives based on the research background and questions:

1. To understand the relationship between the competencies of entrepreneurship course teachers and student learning outcomes.
2. To use statistical regression analysis to explore the mediating role of student self-efficacy between teacher competencies and student learning performance.

1.4. Research Significance

1.4.1. Theoretical Significance

Theoretically, over the past 20 years, many studies have explored the content, importance, effectiveness and impact of entrepreneurship education on learners' self-efficacy [10]. Currently, there is little research on entrepreneurship education from the perspective of teachers abilities. This is a research gap that deserves further exploration and discussion.

1.4.2. Practical Significance

In recent years, the Chinese government has actively promoted the "targeted poverty alleviation" plan. Local universities in China have also focused on and tried their best to connect with the targeted poverty alleviation strategy. This strategy has also guided the development and reform of innovation and entrepreneurship education. Innovation and entrepreneurship education must serve the values of targeted poverty alleviation. Teacher abilities should also meet the needs of students, making contributions to the improvement of social and economic conditions and targeted poverty alleviation.

2. Literature Review

This study aims to explore the relationship between teacher competence and student learning performance in entrepreneurship education with student self-efficacy as the mediating variable. The following section will discuss relevant theoretical literature.

2.1. Entrepreneurship and Entrepreneurship Education

Entrepreneurship is defined as a transformation with economic or other values above the risks experienced in the entrepreneurial process [11]. Entrepreneurship usually refers to the creation or investment in one or more businesses which must assume great risks and enjoy substantial returns. The process of establishing a business is called entrepreneurship and entrepreneurs are often seen as the core sources of innovation, new ideas, products, services and businesses [12].

Entrepreneurship education started with Shigeru Fiji at Kobe University in Japan in 1938 when he began teaching in this field. Courses related to small business management appeared in 1940 and the first entrepreneurship course at Harvard Business School started in 1947 [13]. According to the study by Vesper and Gartner [14], only ten universities offered entrepreneurship courses in 1967 but by 1994, 383 universities from nine countries offered such courses. This indicates that entrepreneurship education was a flourishing field in the past. The previous educational system frequently helped students build their professional abilities to start their own business strategies [15, 16].

Many scholars argue that there is no universally accepted definition of entrepreneurship. Entrepreneurship takes on several meanings depending on the time and spatial situation. According to Zamberi Ahmad [17] and Knight [18], entrepreneurship as the ability to successfully predict the future. Schumpeter [19] defined entrepreneurship as the creation of new product combinations. Cole [20] defined entrepreneurship as purposeful action aimed at starting, maintaining and developing a venture. According to Kirzner [21], entrepreneurship is the capacity to foresee the subsequent market flaws and imbalances. Leibenstein [22] defined it as working smarter than competitors. Low and Ian [23] pointed out that entrepreneurship is driven by seeing opportunities rather than manipulating existing resources [23].

Entrepreneurship education (EE) is a discipline that exists to address the needs of existing and potential entrepreneurs to develop and stimulate the entrepreneurial process, providing all the tools needed for entrepreneurship such as new ventures both inside and outside the organization Postigo and Tamborini [15]. Garavan and Barra [24] clarified that previous research often treated entrepreneurship and business education as alternative options indicating that the former fosters a self-reliant attitude while the latter cultivates a personality that seeks opportunities.

Katz [25] research also illustrates the core differences between business, management and entrepreneurship education. The first two focus on managing businesses while the latter focus on entrepreneurship and creation. The focus of entrepreneurship education in Finland is on firm ownership and entrepreneurship with a preference for conventional concepts of entrepreneurship. According to the UK and Ireland's perspectives, entrepreneurship education is a business education with academic content focusing on building personal competencies such as entrepreneurial traits Yusoff [26]. According to Jones and English's [27] research, business education and entrepreneurship education are both viable alternatives that provide people with the capacity to find business possibilities and develop their knowledge, self-esteem, and action abilities [1]. The importance of entrepreneurship in society is demonstrated by entrepreneurship education. Academics and business professionals have different perspectives on entrepreneurship education. Some people believe that entrepreneurship is an innate ability that cannot be taught [13]. However, most scholars agree that entrepreneurship is not just driven by hereditary factors but can also be taught [28].

Initially, entrepreneurial courses were supply-oriented traditional business education but later shifted to demand-oriented in order to understand how entrepreneurs learn and acquire entrepreneurial skills [2].

Most entrepreneurial courses and training programs focus on the scientific aspects of entrepreneurial spirit but entrepreneurs and educators realize that entrepreneurship education can help stimulate art, creativity and intuition [13].

Entrepreneurship education includes different learners, objectives, content and teaching methods [13]. This study is only limited to university students. The objectives, content and teaching methods are discussed in this study. Fayolle [29] believes that the motivation for entrepreneurship education is generally to inspire participants who already have entrepreneurial intentions to find opportunities. Therefore, Gibb [30] proposed that entrepreneurship education should not be limited to the pre-entrepreneurial stage but should also include the post-entrepreneurial stage.

In addition to basic entrepreneurship knowledge, the content of entrepreneurship education also includes entrepreneurial awareness, the role and direction of entrepreneurship, problems faced in entrepreneurship, the importance of discovering all the abilities of entrepreneurs, guiding students on how to develop these abilities, demonstrating skills and the successful milestones in the development stages of new startups and companies [29].

The themes of entrepreneurship education can be roughly divided into three categories: The first category is about entrepreneurship courses aimed at raising awareness of entrepreneurship and encouraging students to consider entrepreneurship as a potential career choice and self-employment option. The second category is practice-oriented courses designed to encourage and motivate students to become future entrepreneurs. The third category is aimed at cultivating entrepreneurship by providing education and support for new business creation and developing the skills, knowledge, attitudes and behaviors necessary for successful entrepreneurial activities [2].Thus, it can be seen that research on entrepreneurship education can be divided into two groups based on its purpose: one group focuses on helping educators develop entrepreneurship teaching methods and curricula while the other group studies real-life entrepreneurial activities as a learning process [31]. "Targeted poverty alleviation" is an important strategy developed by the Chinese government to achieve the objective of a prosperous society worldwide in which education is an important factor. We can only increase the talents and capacities of the poor by educating them which will also transform their perspective and broaden their cultural knowledge. The transformation from poverty alleviation to self-reliance will fundamentally consolidate the foundation for people in poverty-stricken areas to get rid of poverty and become better off.

The urgent task of innovation and entrepreneurship education in Chinese universities in the new era is to figure out how to incorporate the university's system of innovation and entrepreneurship education into educational poverty alleviation practices, develop entrepreneurial awareness, entrepreneurial consciousness and entrepreneurial skills and serve targeted poverty alleviation to achieve two-way efforts. Teaching and learning are mutually helpful in the process of reducing targeted poverty and instructors and students can be empowered. Production, teaching, scientific research, discipline skills competitions and innovation and entrepreneurship can all be fully combined through the close collaboration of industry, education and research competitions thereby improving the teaching and research levels of

teachers and enhancing the practical innovation and entrepreneurship capabilities of students, greatly increasing their perception of ideological and political education in innovation and entrepreneurship courses.

2.2. Teacher Competence

"Teacher competence" refers to the professional work capabilities and related personal qualities required for teaching. There are many different definitions of "competence" in the literature but McClelland and Watson [32] are recognised for providing the first traceable description. They first noted that people use traits of typical behaviours in an organization to determine if they fulfil certain qualification requirements. McLagan [33] believes that "competence" is the potential knowledge and traits that exist in efficient work. In addition, Molyneux and Thornton [34] also pointed out that "competence" is a combination or behavior of the same aspect related to job performance. Spencer and Spencer [35] defined "competence" as an individual's potential and explicit traits. They pointed out that the term "competence" can usually be divided into three functional groups: "core competencies," "management competencies," and "professional competencies." These characteristics are not only related to job content and titles but can also be used to understand actual or expected responses in the job. Scholars have three concepts of "competence": first, "competence" includes aspects such as knowledge, skills, attitudes and values. Secondly, "competence" is a behavior type characteristic related to job performance. Finally, "competence" also includes potential and implicit qualities which encompass all potential or undeveloped aspects [36]. Spencer and Spencer [35] used the "iceberg model theory" to compare personality with an iceberg, dividing it into above and below sea level. "External competence" refers to knowledge and abilities that are visible while "internal competence," includes qualities, motivation and self-concept.

According to Aracil and der Velden [37], "ability" can be used as the basis for assigning job tasks according to "task theory". More complex tasks require better "ability" while simpler tasks require less "ability". However, it is insufficient to focus just on "ability" at the surface level. Companies believe that some fundamental skills that are hard to uncover are crucial and have an influence on forecasting future job achievement. Most of these "underlying abilities" are innate or accumulated through experience and practice during the learning and growth process. Knowledge and skills can be acquired through learning, imitation, or training. "Underlying abilities" cannot be discovered through a person's resume but are worth pondering and are advantageous for predicting a person's future job performance. Huntly [38] believes that "teacher ability" is the special ability needed for teaching jobs in education. Relevant organizations can find suitable job candidates through ability analysis and more accurately judge the future job perfomance of job candidates. Therefore, understanding "teacher ability" and related factors in entrepreneurship education is an important issue to improve the professional education ability of entrepreneurship education workers and hopes to achieve the ideal of educational reform to meet the needs of the times. This article will continue to use Spencer and Spencer [35] iceberg model to divide teachers' abilities into four dimensions: explicit knowledge and skills as well as implicit attitudes and traits.

2.3. Student Self-Efficacy

Self-efficacy is a concept proposed by psychologist Bandura [39] based on the social learning theory which suggests that a person's development is shaped by the interaction of individual, behavior and environment. Self-efficacy refers to a person's belief in their ability to perform an action plan under expected circumstances. In simple terms, self-efficacy is a person's belief in their ability to succeed in specific situations [39]. Therefore, individuals with low self-efficacy tend to retreat and hesitate when faced with difficulties while those with high self-efficacy will actively participate, persist in positive thinking and never give up. Schunk [40] pointed out that self-efficacy is the learner's conviction that they possess the confidence to execute at the required level. According to Goodenow [41], self-efficacy is a person's perception of their own learning capacity which influences their behavioral performance, tolerance for problem-solving and capacity for overcoming challenges. It is a key signal for predicting learning entrance behaviour. Artino [42] views self-efficacy as confidence, a learner's subjective belief, referring to the personal self-assessment of the student's learning process and ability to meet specific standards. This belief significantly affects a learner's motivation or attitude when facing learning challenges in the future. Artino [42] believes that self-efficacy has the following three dimensions: self-affirmation, persistent effort and task completion.

2.4. Learning Performance

The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines learning performance as the content that learners should know, understand and demonstrate within an hour, a lesson or a learning period during the learning process. When students evaluate their knowledge and abilities after learning, they reflect on their direct learning performance. However, if they can apply what they have learned, this is indirect learning effectiveness.

Catwright, et al. [43] believe that learning performance refers to the outcomes that teachers hope to achieve in teaching and the goals that teachers expect learners to reach. The Joint Committee on Standards for Educational Evaluation in the United States points out that learning performance of students refers to the development and performance in a specific learning process, namely the knowledge and skills that students learn after completing a course or degree. In schools, all students learning performance is the sum of the learning results that they have obtained through the education process as well as the sum of their abilities. Catwright, et al. [43] point out that student learning performance includes three stages: the first stage refers to the important objectives that students can learn after the learning experience. The second stage is the evaluation stage which refers to the degree to which students actually achieve important learning objectives. The final stage is the application stage which refers to the impact of the evaluation results on improving student curriculum planning and design, teacher instruction and student learning experiences. Therefore, after learning and training in a specific field,

the changes in learners' knowledge, skills and attitudes are referred to as learning performance through objective measurement or subjective judgment. Learning performance is the result of the learning behavior that learners present through the teaching and learning process.

In summary, learning performance refers to the degree of behavioral change exhibited by learners through absorption, understanding and application during the learning process. Student learning performance refers to the knowledge, skills or emotions gained by students in a specific field after learning or training. Learning outcomes are mainly based on the students' performance, including cognitive, affective and skill-based learning outcomes, as well as students' positive feelings towards learning activities and outcomes [44]. Brown [45] pointed out that achievement is the knowledge, understanding and skills obtained through special educational experiences such as curriculum and instructional design. Therefore, in addition to individual growth, learning also involves the process of various experiences that cause long-term changes in individual abilities, change their learning attitudes set learning outcome goals and complete tasks within a certain time. The connotation of learning performance includes three items: spontaneous behavior: students' self-learning ability and self-demands to complete assignments and a positive attitude and performance in learning attitudes and behaviors. From a multi-class perspective, students' learning outcomes can be divided into basic knowledge, executive abilities (such as reading, writing, speaking, critical thinking, problem-solving, etc.) and personal responsibilities (such as moral attribution, cross-cultural understanding, interpersonal collaboration, etc.) [44]. Learning performance mainly depends on students' responses, including cognitive, affective and skill-based learning outcomes, as well as their positive feelings towards learning activities and outcomes. Students learning performance is also often used as an indicator of teacher performance [44].

This study adopts Rhodes [44] argument and defines the learning outcomes of entrepreneurship education courses from the perspectives of cognitive, affective and skill-based aspects.

2.5. Entrepreneurship Education Teacher's Ability and Student Performance

According to Howard, et al. [46], developing digital capabilities is an important component of initial teacher training. However, this is a complex process that involves various strategies. Their research findings revealed four different clusters of related strategies. Specifically, multidirectional and dynamic relationship strategies are needed to improve the experience of developing digital capabilities for novice teachers.

The Caballero and Llorent [47] study aimed to evaluate the effectiveness of teacher training program by enhancing three key competencies of high school students: reading, mathematics and social-emotional and moral abilities. The results showed significant effects on reading, mathematics, and empathy (social and emotional domains) between the experimental and control groups.

There should be a significant relationship between entrepreneurship education teacher's ability and student learning performance. Therefore, the following hypotheses can be proposed:

H1: Entrepreneurship education teachers knowledge has a significant and positive impact on student learning outcomes.

H2: Entrepreneurship education teachers skills have a significant and positive impact on student learning outcomes.

H3: Entrepreneurship education teachers attitude has a significant and positive impact on student learning outcomes.

H4: Entrepreneurship education teachers traits have a significant and positive impact on student learning outcomes.

H5: Entrepreneurship education teachers ability has a significant and positive impact on student learning performance.

2.6. Mediating Effect of Student Self-Efficacy

Learners' fluency experience predicts their interest in virtual reality learning and usage anxiety. According to Supervia, et al. [48], some students lack the knowledge and skills required to manage their academic demands throughout the learning process. Their study demonstrated the mediating effect of self-efficacy in the relationship between resilience and academic achievement.

Emotions play an important role in academic and personal development during adolescence.

Based on the above studies, student self-efficacy is expected to have a significant mediating effect on the relationship between an entrepreneurial education teacher's ability and student learning outcomes. Therefore, the following hypothesis can be established:

H6: Student self-efficacy has a significant and positive moderating effect on the relationship between entrepreneurial education teacher's ability and student learning performance.

3. Research Methodology

This study will conduct three papers to achieve the research objectives. This study aims to address the research questions and describe what the three papers will be about.

3.1. Research Model

Okolie, et al. [49] study found that students' participation in entrepreneurship education was positively related to five out of thirteen entrepreneurial competencies (ECs), including opportunity identification, opportunity evaluation, creative problem-solving, self-efficacy and networking.

Therefore, this study constructs the following research model. Figure 1 illustrates our research model.

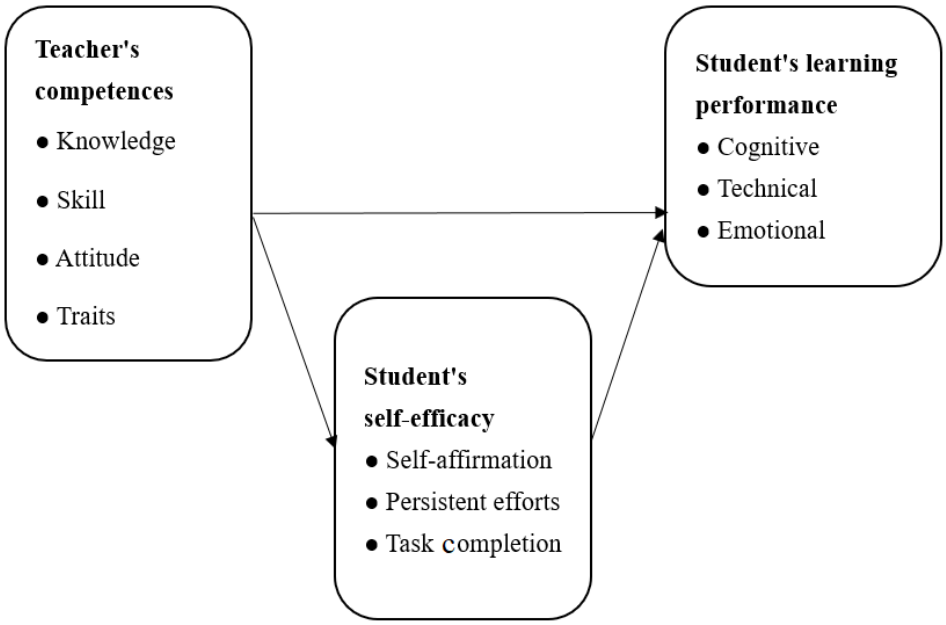

Figure 1.
Research model.

3.2. Questionnaire Design

The questionnaire's goal is to gather data on the effects of entrepreneurship education teacher competence on Chinese business school students' learning performance. The questionnaire was written in Chinese because the participants were entirely Chinese and to assure their understanding. The questionnaire consists of four parts: demographic information, entrepreneurship education teacher competence (18 items), student learning performance (13 items) and student self-efficacy (15 items). The questionnaire items are measured using a 5-point Likert scale. The degree of agreement among respondents is measured on a scale of 1 to 5 where 1 represents strongly disagree and 5 represents strongly agree. The content of the questionnaire is mostly adapted and modified from relevant studies. The questionnaire source and content are shown below.

3.2.1. Measurement Dimension

3.2.1.1. Entrepreneurship Education Teacher Competence

Entrepreneurship education teacher competence is composed of four dimensions, measured using an 18-item scale and evaluated using a 5-point Likert scale with scores ranging from 1 (strongly disagree) to 5 (strongly agree). Table 1 presents questionnaire items on entrepreneurship education teachers' competences.

Table 1.
Questionnaire items about entrepreneurship education teachers' competences.

Dimension	Measurement items	Source
Knowledge	1. My entrepreneurship teacher has a lot of business knowledge. 2. My entrepreneurship teacher has a lot of management knowledge. 3. My entrepreneurship teacher has a lot of industrial knowledge. 4. My entrepreneurship teacher has a lot of environmental knowledge.	Spencer and Spencer [35]; Mwasalwiba [1]; Rahim, et al. [50] and Farrokhnia, et al. [6]
Skill	1.My entrepreneurship teacher has strong communication skills. 2.My entrepreneurship teacher has strong management skills. 3. My entrepreneurship teacher has strong educational cooperation skills. 4. My entrepreneurship teacher has strong teaching ability. 5. My entrepreneurship teacher has strong program designing abilities.	Spencer and Spencer [35]; Rahim, et al. [50] and Weng, et al. [51]
Attitude	1. My entrepreneurship teacher likes to interact with others. 2. My entrepreneurship teacher has strong intentions to innovate. 3. My entrepreneurship teacher is very rational. 4. My entrepreneurship teacher is always striving for financial support. 5.。 My entrepreneurship teacher likes to run the incubarion centre.	Spencer and Spencer [35]; Okolie, et al. [49] and Weng, et al. [51]
Traits	1. My entrepreneurship teacher is extremely knowledgeable and competent. 2. My entrepreneurship teacher is very optimistic. 3. My entrepreneurship teacher is very persistent. 4. My entrepreneurship teacher has experience in businesses.	Spencer and Spencer [35]; Howard, et al. [46] and Farrokhnia, et al. [6]

3.2.1.2. Students' Learning Performance

The students' learning performance is constructed in three dimensions and measured with a 13 item scale on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Table 2 presents questionnaire items about students' learning performance.

Table 2.
Questionnaire items about students' learning performance.

Dimension	Measurement items	Source
Cognitive	1. My intellectual curiosity can be satisfied by what I have studied in the entrepreneurship course. 2. My expertise has increased as a result of taking the entrepreneurship course. 3. I have developed a greater interest in the study of professional knowledge after taking the entrepreneurship course. 4. I feel confident in my ability to learn after taking the entrepreneurship course. 5. I can comprehend the present position of the entrepreneurial situation better after taking the entrepreneurship course.	Rhodes [44] and Tai, et al. [52]
Technical	1. I gained better knowledge about various entrepreneurial abilities after attending the entrepreneurship course. 2. After attending the entrepreneurship course, I feel more confident about launching a business. 3. I have learned the skills needed to launch a business after completing the entrepreneurship course. 4. My capacity to think creatively and critically has improved after completing the entrepreneurship course.	Rhodes [44] and Tai, et al. [52]
Emotional	1. I can now more easily relate to the business culture after completing the entrepreneurship course. 2. I have a greater awareness of proactive caring and empathy as a result of completing the entrepreneurship course. 3. I am more perceptive and adaptive after taking the entrepreneurship course. 4. I learned more proactively after taking the entrepreneurship course.	Rhodes [44]

3.2.1.3. Self-Efficacy

Student self-efficacy is measured in three dimensions using a 15-item scale and a 5-point Likert scale with scores ranging from 1 (completely disagree) to 5 (strongly agree). Table 3 presents the questionnaire items on students' self-efficacy.

Table 3.
Questionnaire items about students' self-efficacy.

Dimension	Measurement items	Source
Self-affirmation	1. I believe my academic performance is good. 2. I think my test scores could be improved. 3. I am actively involved in learning activities in the class. 4. I like to learn new knowledge to improve my abilities. 5. I think that working hard in class is the best method to enhance my homework. 6. I will actively participate when giving comments in class.	Artino [42] and Backer, et al. [53]
Persistent efforts	1. I will try my best to complete the study plan. 2. I consider myself a hard worker. 3. I will keep studying even if there are challenges. 4. I like challenging learning. 5. After school, I will review what was taught in class.	Artino [42] and Backer, et al. [53]
Task completion	1. Most of my assignment reports will be submitted on time. 2. I will complete the homework given by the teacher. 3. I still attempt to complete my work, even though I don't particularly enjoy it . 4. I think doing additional schoolwork will benefit me.	Artino [42] and Backer, et al. [53]

3.2.2. Participants

Participants in this study were recruited through online surveys. The main criteria for selecting participants were third- and fourth-year university students. We expected to have over 300 valid questionnaires from students to complete all stages of the study.

Participants came from various universities in Wuhan. Students who volunteered were randomly selected to participate in the study. We will sample students during entrepreneurship course instruction and shorten the time for questionnaire collection through snowball sampling.

3.2.3. Data Analysis

Data analysis included descriptive analysis, independent sample t-test analysis, correlation analysis, independent sample analysis of variance (ANOVA) and multiple linear regressions (MLR). International Business Machines Corporation Statistical Package for the Social Sciences statistics version 22.0 was used for statistical analysis.

(1) Descriptive analysis was used to examine all variables while removing all invalid questionnaires.

(2) Independent sample t-test analysis was used to study whether there were significant differences in the means of participants.

(3) Analysis of variance (ANOVA) was used to compare whether the differences between variables were significant.

(4) Pearson correlation analysis was used to analyze whether there was a relationship between variables.

(5) Multiple linear regression (MLR) was used to determine the relationship between variables and explain the variation of the dependent variable. A set of variables explained the dependent variable.

(6) Durbin Watson (DW) statistic was used in statistics to detect autocorrelation in the residuals from a regression analysis.

4. Results

This study will organize and analyze the collected questionnaires to further verify the research hypotheses. Therefore, this chapter will be divided into four sections to describe the results. The first section will describe the sampling process and basic sample information such as the sampling process and descriptive statistics of the sample to understand the distribution of the sample. The second section will present descriptive statistics for each construct to explore its basic status and information. The third section will conduct a reliability analysis using Cronbach's alpha coefficient. The fourth section will perform multiple regression analyses based on the research model to verify the research hypotheses.

4.1. Sampling Process and Basic Sample Information

4.1.1. Sampling Process

This study mainly explores the relationship between the entrepreneurial course teacher's ability and students' learning performance in China as well as the mediating effect of students' self-efficacy. The online survey was conducted using a convenience sampling method and a total of 395 data were collected. However, some data were excluded such as those from non-entrepreneurship course students, incomplete answers and students whose age did not match the study requirements. In total, 37 questionnaires were excluded as invalid and a total of 358 valid questionnaires were collected with an effective questionnaire recovery rate of 90.63%.

Table 4.
Descriptive statistics of sample.

Variable	Frequency distribution	Percentage%
Gender		
Male	106	29.6%
Female	252	70.4%
Age		
Under 18 years old	45	12.6%
18-25 years old	313	87.4%
Grade		
Freshman	177	49.4%
Sophomore	102	28.5%
Junior	61	17.0%
Senior	18	5.0%
Major		
Business	62	17.3%
Finance and management	151	42.2%
Science and technology	59	16.5%
Liberal arts	24	6.7%
Other	62	17.3%
School location		
Wuhan	267	74.6%
Other	91	25.4%
Work experience		
Yes	160	44.7%
No	198	55.3%
Entrepreneurial experience		
Yes	21	5.9%
No	337	94.1%

4.1.2. Basic Information for the Sample

A total of 358 valid samples were collected in this study and their descriptive statistics are shown in Table 4.

4.2. Descriptive Statistics Analysis of Study Constructs

4.2.1. Descriptive Statistics of Each Study Construct

In this study, factor analysis was first used to streamline the questionnaire items for each construct (see Table 5).

Table 5.
Descriptive statistics of each research construct.

Construct	Question items	Mean	Standard deviation
Teacher competence knowledge (K)	1. My entrepreneurship course instructor has extensive business knowledge.	2.92	1.079
	2. My entrepreneurship course instructor has extensive management knowledge.	2.89	1.139
	3. My entrepreneurship course instructor has extensive industry knowledge.	2.78	1.168
	4. My entrepreneurship course instructor has extensive environmental knowledge.	2.86	1.121
Teacher competence skills (S)	1. My entrepreneurship course instructor has strong communication skills.	2.80	1.149
	2. My entrepreneurship course instructor has strong team management skills.	2.96	1.092
	3. My entrepreneurship course instructor has strong collaboration skills.	2.90	1.142
	4. My entrepreneurship course instructor has strong teaching skills.	2.73	1.197
	5. My entrepreneurship course instructor has strong curriculum design skills.	3.02	1.100
Teacher competence attitude (A)	1. My entrepreneurship course instructor enjoys interacting with others.	2.54	1.280
	2. My entrepreneurship course instructor has a strong innovative spirit.	3.04	1.178
	3. My entrepreneurship course instructor is very rational.	2.78	1.138
	4. My entrepreneurship course instructor is good at obtaining financial resources.	3.18	1.110
	5. My entrepreneurship course instructor enjoys operating incubation centers.	3.24	1.102
Teacher competence traits (T)	1. My entrepreneurship course instructor has a professional image.	2.92	1.160
	2. My entrepreneurship course instructor is optimistic.	2.49	1.192
	3. My entrepreneurship course instructor is persevering.	2.62	1.228
	4. My entrepreneurship course instructor has rich experience in business management.	3.04	1.150
Cognitive effectiveness	1. Learning in the entrepreneurship course satisfies my thirst for knowledge.	3.05	1.140
	2. Learning in the entrepreneurship course has expanded my professional knowledge.	2.98	1.109
	3. Learning in the entrepreneurship course has increased my interest in entrepreneurship-related knowledge.	3.10	1.170
	4. 4. I feel more confident in my ability to learn after taking the entrepreneurship course.	3.21	1.135
	5. Learning in the entrepreneurship course has provided me with a better understanding of the current entrepreneurial environment.	2.83	1.179
Skill effectiveness	1. Learning in the entrepreneurship course has taught me various entrepreneurial skills.	3.05	1.185
	2. Learning in the entrepreneurship course has increased my confidence in entrepreneurship.	3.44	1.165

Construct	Question items	Mean	Standard deviation
	3. Learning in the entrepreneurship course has helped me understand the abilities required for entrepreneurship.	2.89	1.163
	4. Learning in the entrepreneurship course has enhanced my creativity and thinking abilities.	2.89	1.157
Affective effectiveness	1. My understanding of the entrepreneurial culture has increased as a result of the entrepreneurship course.	2.83	1.151
	2. Learning in the entrepreneurship course has helped me become more empathetic and observant.	2.84	1.206
	3. Learning in the entrepreneurship course has given me better observation and adaptability skills.	2.96	1.194
	4. Learning in the entrepreneurship course has made me more proactive in my learning.	3.06	1.169
Self-affirmation	1. I believe that my academic performance is good.	3.08	1.110
	2. I think I can improve even more in my academic achievement.	2.50	1.142
	3. I actively participate in learning activities in class.	3.07	1.162
	4. I enjoy learning new knowledge to improve my abilities.	2.66	1.138
	5. I believe that the best way to improve my academic performance is through hard work.	2.39	1.203
	6. I actively participate in class discussions.	3.17	1.128
Perseverance	1. I try my best to complete the learning plan I have set for myself.	2.72	1.147
	2. I consider myself to be a hardworking learner.	3.14	1.209
	3. I continue studying even in the face of obstacles.	2.84	1.102
	4. I enjoy challenging tasks that push me out of my comfort zone.	3.05	1.186
	5. I am willing to seek help from others when facing learning difficulties.	3.47	1.119
Task completion	1. I will submit most of the assignments and reports on time.	2.13	1.156
	2. I will complete most of the assignments assigned by the teacher.	2.06	1.130
	3. I always do my best to finish assignments even those I don't particularly enjoy.	2.39	1.146
	4. I think that extra tasks and materials can make learning easier for me.	2.71	1.197

From the above descriptive statistics, students in China think that their entrepreneurship education course still needs to increase the calibre of their teaching staff. Similarly, the scores were not high in terms of learning effectiveness which may be due to the fact that students do not think that entrepreneurial teaching staff have excellent teaching abilities. This will be further explored in the subsequent regression analysis. In addition, in terms of self-efficacy, students in China generally scored low in the task completion dimension which also reflects that many students may need to improve and adjust their attitudes towards tasks and other self-efficacy dimensions also need to be strengthened.

4.3. Reliability and Validity Analysis

4.3.1. Reliability

In this study, the homogeneity of the responses in each dimension was measured using Cronbach's alpha coefficient analysis. The higher the Cronbach's alpha value, the greater the homogeneity suggesting that the internal consistency of the respondents' answers is higher. This study considered dimensions with Cronbach's alpha > 0.7 to have acceptable reliability. The reliability analysis results of each dimension in this study are shown in Table 6 and the Cronbach's alpha values of each dimension are all in line with the standard of Cronbach's alpha > 0.7 indicating that the measurement variables for all variables in this study have high internal consistency and good reliability.

Table 6.
Reliability analysis of each construct.

Research construct	Measurement items number	Cronbach's α
Entrepreneurship course teacher competence: Knowledge	4	0.852
Entrepreneurship course teacher competence: Skills	5	0.875
Entrepreneurship course teacher competence: Attitude	5	0.841
Entrepreneurship course teacher competence: Traits	4	0.830
Student learning outcomes: Cognitive effectiveness	5	0.838
Student learning outcomes: Skill effectiveness	4	0.845
Student learning outcomes: Affective effectiveness	4	0.847
Student self-efficacy: Self-confirmation	6	0.821
Student self-efficacy: Persistence	5	0.844
Student self-efficacy: Task completion	4	0.830

4.4. Correlation Coefficient and Regression Analysis

Pearson's product-moment correlation coefficient was used in this study to calculate the correlation coefficients between each construct. The results of the correlation analysis between each construct are presented in Table 7.

Table 7.
Correlation coefficient analysis of each construct.

Construct	Entrepreneurship course teacher competence				Student learning outcomes			Student self-efficacy		
	Knowledge	Skills	Attitude	Traits	Cognitive	Skill	Affective	Self-confirmation	Persistence	Task completion
Knowledge	-									
Skills	0.835**	-								
Attitude	0.741**	0.822**	-							
Traits	0.716**	0.758**	0.791**	-						
Cognitive	0.657**	0.676**	0.690**	0.680**	-					
Skill	0.595**	0.646**	0.642**	0.618**	0.797**	-				
Affective	0.556**	0.570**	0.621**	0.624**	0.742**	0.779**	-			
Self-confirmation	0.420**	0.463**	0.510**	0.480**	0.600**	0.615**	0.661**	-		
Persistence	0.315**	0.334**	0.385**	0.341**	0.483**	0.528**	0.521**	0.749**	-	
Task completion	0.260**	0.267**	0.291**	0.333**	0.329**	0.342**	0.419**	0.569**	0.479**	-
Mean	2.86	2.88	2.95	2.77	3.04	3.07	2.92	2.81	3.04	2.32
Standard deviation	0.938	0.927	0.909	0.963	0.893	0.965	0.977	0.834	0.905	0.942

Note: P<0.01**, the main diagonal represents the square root of the AVE values (0.824).

This study conducted multiple regression analysis to examine the relationship between the entrepreneurial teacher's abilities and student learning performance and added a mediator variable for analysis. The results of the analysis are as follows:

(1) The relationship between the entrepreneurial teacher's abilities and student learning performance.

Table 8 shows that the F-value reached a significant level (P<0.01) indicating that the regression model is significant and the adjusted R-squared is 56.2%. In terms of the entrepreneurial teacher's abilities, knowledge (β= 0.145**, P<0.05), skills (β= 0.125+, P<0.1), attitude (β= 0.275***, P<0.01) and characteristics (β= 0.278***, P<0.01) all have significant positive effects on student learning performance (β= 0.138**, P<0.05). Therefore, H1, H2, H3 and H4 are all supported.

Table 8.
Regression analysis of entrepreneurial teachers abilities and student learning performance.

Variables	Dependent variable: Business performance
	Model 1
Independent variable	
Teacher ability: Knowledge	0.145**
Teacher ability: Skills	0.125+
Teacher ability: Attitude	0.275***
Teacher ability: Characteristics	0.278***
Mediating variable	
F value	115.668***
R^2	0.567
Adj R^2	0.562
DW value	1.796

Note: P^{+}<0.1^{+}, P<0.01**, P<0.001***.

(2) The study examines the mediating effect of student self-efficacy between entrepreneurship course teacher competence and student learning performance.

Model 1 represents the results without considering the mediating variable while model 2 represents the statistical results after adding student self-efficacy as a mediating variable (see Table 9). Both models achieved significant levels of testing ($P < 0.01$) indicating that the regression model reached a significant level. Model 1 confirmed a significant positive relationship between entrepreneurship course teacher competence and student learning performance ($\beta = 0.749$***, $P < 0.01$) while model 2 confirmed the partial mediating effect of self-efficacy ($\beta = 0.359$***, $P < 0.01$). Therefore, H5 and H6 are both supported.

Table 9.
Mediating effect regression analysis of entrepreneurship course teacher competence and student learning performance.

Variables	Dependent variable: Business performance	
	Model 1	Model 2
Independent variable		
Teacher ability	0.749***	0.582***
Student self-efficacy	-	0.359***
F value	456.037***	105.907***
R^2	0.562	0.662
Adj R^2	0.560	0.660
Durbin–Watson value	1.901	

Note: $P<0.1^{*}$, $P<0.001$***.

5. Conclusion and Suggestions

5.1. Theoretical and Practical Implications

First, this study theoretically confirms that the dimensions of knowledge, skills, attitudes and characteristics in entrepreneurship teaching all have a positive impact on students' learning outcomes which highlights the findings of Caballero and Llorent [47] and extends the empirical evidence to the effectiveness of entrepreneurship education. Additionally, this study investigates the mediating effect of self-efficacy based on a sample of Chinese entrepreneurship course students. The data confirms that students' self-efficacy mediates the relationship between entrepreneurship teaching abilities and students' learning outcomes which is consistent with the findings of Supervia, et al. [48]. This study finds that the teaching abilities of entrepreneurship educators in China still need improvement in terms of practical implications. Chinese students generally perceive the abilities of entrepreneurship faculty and their own self-efficacy as relatively low. Improving these aspects could greatly help students achieve better learning outcomes.

5.2. Research Limitations

There are certain limitations related to the relationship between teaching abilities, students' self-efficacy and learning performance in entrepreneurship education in Chinese university business schools such as:

(1) The research sample is limited to undergraduate students in their first to fourth years which may limit the interpretation of research on other types of students.

(2) The research sample is limited to Chinese participants. Therefore, the results cannot be generalized to the views and behaviors of students from other countries.

(3) The survey method is not considered flawless. Participants in this study were purposively sampled which may result in negative or biased results. Moreover, it is important to emphasize that the problems in the research design limit our interpretation.

(4) In practice, it is difficult for schools to screen students' self-efficacy before enrolling them in entrepreneurship courses.

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