ingegneria sismica
International Journal of Earthquake Engineering
Anno XLIII - Num. 1 - 2026

Promotion of Graduates' Employability by Innovative and Entrepreneurial Practical Activities in Universities

Daoxin Wang[1,*]

[1] College of Teacher Education, Xinyang Normal University, Xinyang, Henan, 464000, China

SUMMARY: *Innovation and entrepreneurship practices increasingly play a pivotal role in enhancing college students' comprehensive qualities and employment competitiveness. Deepening the understanding of their relationship is crucial for advancing higher education and addressing graduate employment challenges. Based on the Theory of Planned Behavior, the following research hypotheses are formulated, and a conceptual model was built employing Pearson correlation coefficients and multiple linear regression. With regard to this theory, the research explores the impact of innovations and entrepreneurial initiatives on graduates' employability on a multidimensional basis. It turns out that gender, academic performance, and major are significantly correlated with graduate employability and its various components. Furthermore, innovation and entrepreneurship activities prove to exert a significant positive influence on graduate employability and its components at the 0.01 significance level. This confirms that such activities promote graduate employability, thereby validating the research hypotheses.*

KEYWORDS: *Pearson correlation coefficient; multiple linear regression; innovation and entrepreneurship practice; employability*

1 Introduction

In light of the widespread adoption of contemporary information technologies like the internet and artificial intelligence, new economic trends, new technology, and new industries experienced rapid growth. This has led to swift transformations in traditional employment systems, methods, and concepts, shifting employment models from a single employment-based system to more flexible and loosely organized worker employment models [1-3]. Leveraging advanced technologies like the internet and big data, new economic sectors such as e-commerce, the sharing economy, and platform economy have also experienced explosive growth. These emerging employment forms and shifts demand that college graduates—the primary workforce—rapidly adapt their mindset and cultivate employment competencies including innovative thinking, information literacy, and comprehensive skills [4, 5]. It was noted in the 2024 Survey Report on the Employment Competitiveness of College Graduates that China's graduation number of the year reached 11.79 million, which increased by 210,000 over the past year. The increase brought about fiercer competition in the field of employment and added employment pressure. As such, not only colleges and universities but also the whole society started paying great attention to the employment of graduates [6].

In the new period of development of China's economy, issues associated with labor shortage and structural imbalance have become more acute than before. Under the background of mass

*wdx806@xynu.edu.cn
https://doi.org/10.65102/is2026430
Published: 30 April, 2026

entrepreneurship, the problem of employment of college graduates has been a hot issue among the public. This issue highlights the gap and conflict between individual employability and societal demands. One reason for graduates' difficulty in finding jobs lies in the mismatch between labor market needs and talent cultivation [7-9]. As economic restructuring continues and market demands evolve, imbalances in talent supply and demand within certain sectors have led to relatively poor employment prospects for some majors [10]. Consequently, when these students enter the workforce, significant gaps exist between their academic specializations and actual job requirements, resulting in employment difficulties. This also highlights insufficient guidance and cultivation within the higher education system regarding students' personal cognition and skills [11]. The practice of innovation and entrepreneurship in higher education organically combines the innovative element with the entrepreneurial element, which includes not only innovative ideas and methods but also the enterprising spirit that drives entrepreneurial activities [12]. They can be considered a critical route through which university students are able to respond positively to the country’s strategy of innovation-driven development in the new era based on their own strengths and make active explorations in value creation [13, 14]. As an essential part of higher education, innovation and entrepreneurship practice makes an increasingly significant contribution to the comprehensive capabilities of students. It is thus essential to analyze how these behaviors impact the employability of university students from various angles and identify the interrelation between these aspects.

The current literature recognizes the immense importance of innovation and entrepreneurship because of their ability to promote the development of innovation skills in universities and facilitate the reforms in innovation and entrepreneurship training in universities. As stated by Swayne, N et al., innovation and entrepreneurship constitute different notions, whereby innovation training comes first, is independent of any discipline, and highlights the need to combine the two [15]. The authors of another study entitled “Software Designing Using Outcome-Based Education” utilized the Outcome-Based Education model to create a software system aimed at improving innovation and entrepreneurship training at universities by enhancing project management and data verification, achieving the desired results [16]. Bu, L and Zou, J employed the Internet Plus strategy in enhancing university innovation and entrepreneurship education by forming an all-encompassing infrastructure including mindset development, knowledge acquisition, skills improvement, and team assistance, advocating for a systematic educational program for fostering students' motivation, innovating potential, and competencies [17]. Silva, F et al. merged innovation and entrepreneurship education with the Tri-Helix model in order to enhance collaboration between stakeholders in the innovative learning process, providing suggestions towards the implementation of innovative learning strategies and entrepreneurial education by educational establishments, governments, enterprises, and NGOs, indicating the future direction of entrepreneurial education [18]. Hardie, B et al. studied various approaches to entrepreneurial education in nine countries and concluded that even though these approaches were incorporated into the university curriculum, they were hardly ever implemented, highlighting that teachers needed sufficient institutional support to successfully adopt them [19]. Halsall, J et al. introduced an innovative, global, and multidisciplinary approach to social enterprise education, acknowledging the indispensable nature of innovation and entrepreneurship in higher education institutions. The proposed framework is based on the concept of sustainable development where global thought processes are coupled with local actions, and from such an approach develops a revolutionary pedagogical approach [20].

In this regard, employability is more than just an individual's ability to find career opportunities; rather, it consists of sustaining and adapting oneself to work changes as well as his or her ability to progress and constantly upgrade him/herself within his or her occupational

field [21]. According to Heijde, C et al., employability is defined as the ongoing performance, acquisition or creation of work through the effective use of capabilities with due consideration given to the person's constant adaptation to and shaping of the work environment [22]. Behle, H. proposes a holistic approach for categorizing and assessing employability at higher education institutions, paying particular attention to personal variables, environmental factors, supportive systems, and labor market dynamics while using examples from Germany and the United Kingdom to test this classification system [23]. Pouratashi, M. and Zamani, A. examined how graduate employability can be classified as basic, intermediate, or advanced and discussed how personal variables and demographic attributes affect the employment of Latin American university graduates, coming up with conclusions of practical value for the relevant authorities and higher education organizations [24]. According to Jiang, L et al., the key drivers of graduate employability were found to be personal qualities, social experiences, and on-the-job learning, suggesting that variables like knowledge understanding, personal management, emotional quotient, soft skills, professional ability, and career planning are essential in the attainment of employability outcomes [25]. On the other hand, Yizhong, X et al. studied the impact of graduates' self-perceived employability on their employment search processes, based on the theory of planned behavior framework [26].

Various attempts have been made by researchers to improve graduate employability. One aspect that is currently receiving much attention by researchers is the incorporation of innovation and entrepreneurship in enhancing graduate employability. In particular, Li and G explored the ways in which innovation and entrepreneurship play a role in employability improvement through the promotion of entrepreneurial skills, innovative thinking, and the required industry skills [27]. Killingberg, N et al. carried out theoretical analysis on the impact of innovation and entrepreneurship education on employability in volatile labor markets, taking into account its effectiveness in fostering adaptability, and suggested seven guidelines on improving graduate employability outcomes [28]. Lastly, Sánchez, P et al. researched the effects of innovation and entrepreneurship competencies on graduate employability and found that collaboration and practical exercises affect not only intention to become entrepreneurs but also employability while open innovation contributes to enhancing stakeholders' motivation and competence [29]. Li, X et al. studied the impacts of innovation and entrepreneurship capabilities, social adaptability, and self-efficacy on university student employability and concluded that innovation and entrepreneurship capabilities exhibited a significant positive correlation with employability and self-efficacy played a mediating role in the process [30]. On a similar note, Huang, Y et al. conducted a study investigating the impact of decision-making ability on college student employability with specific emphasis on the significance of judgment ability as the primary determinant influenced by self-efficacy, self-control, and self-regulation. The paper then discussed the influence of innovation and entrepreneurship education in colleges under the frameworks of technological and rational decision-making theory [31].

In contrast to the large amount of research conducted concerning college students' innovative and entrepreneurial activities and employability after graduating from college, the studies that prove the direct impact of these activities on the development of employment competencies are quite scarce. All the studies focus on how innovative and entrepreneurial education activities contribute to the development of quality projects and expand opportunities for employability. However, in spite of a small amount of research dedicated to this problem, most of the authors use qualitative research techniques that add subjectivity to their works.

This thesis outlines the basic principles and theories underlying the research and presents the scope and characteristics of the research objects and hypotheses. Theories of planned behavior were adopted for designing a research framework employing Pearson correlation coefficient analysis and multiple linear regression modeling. Based on previous studies utilizing

the validated measuring tools, customized surveys and scales were developed, which involved reliability and validity tests, exploratory factor analysis, and common method variance analyses. Descriptive statistics, difference analysis, correlation analysis, and regression analysis were conducted for the empirical study.

2 Study Design

For a thorough examination of the influence of innovation and entrepreneurship activities at college institutions on the employability of their graduates, it is crucial to begin by defining the core concepts and developing the theoretical framework that underlies this research endeavor, and design the research project in a scientifically rigorous manner. Such actions will allow for a rigorous study logic and correct direction while providing an appropriate background for further development of the research process. This paper includes precise definitions of the core concepts, elaboration on the theories and their adequacy, and comprehensive explanations about all aspects of the research design, such as research hypotheses, model development, and questionnaires. Thus, a strong theoretical framework can be developed to understand the link between the two core factors.

2.1 Definition of Relevant Concepts

In order to conduct an objective evaluation of the impact of innovation and entrepreneurship activities within university settings on the employability of their graduates, it becomes critical to derive a definition for the core concepts that form the focus of this investigation. The two core concepts identified here are innovation and entrepreneurship activities in universities and employability.

2.1.1 Innovation and Entrepreneurship Practice Activities in Higher Education Institutions

Activities for innovation and entrepreneurship practice outside class instructions refer to practical innovations conducted beyond classroom teaching, during which students design, plan, innovate, and create solutions to certain or actual problems [32]. The current paper uses a relatively broad conception of innovation and entrepreneurship practice activities. Such activities include well-known and distinctive competitions involving innovation and entrepreneurship, such as Challenge Cup and Internet Plus contests, wherein teamwork, planning, and presentation help promote innovative spirit and entrepreneurial vigor among students. It also includes all kinds of exchanges, seminars, trainings, and practical exercises conducted by entrepreneurial clubs, which give students opportunities to share their innovative ideas and entrepreneurial experience, thus nurturing innovation consciousness and laying the foundation of entrepreneurial skills. Also included is the innovation and entrepreneurship learning activities taken from courses offered by universities, whereby students learn the relevant knowledge in a systematic way through both theoretical teaching and practical exercise in order to cultivate innovative approaches and entrepreneurial skills.

Under this conception, the innovation and entrepreneurship practice activities at university level involve a wide range of actions taken by university students regarding innovation and entrepreneurship in an academic context. They are characterized by vigorous exploration and courageous experimentation, motivated by the goal of enhancing job competitiveness and personal value realization. Based on data collection and the analysis of previous studies, the innovation and entrepreneurship practice activities listed below will be considered the main topics to be discussed in this paper. Universities usually offer specialized programs including

support program for technological startups, culture and creativity industry, business plans, flea markets, as well as innovation and entrepreneurship component in industry-university-research cooperation program, which allow students to participate.

2.1.2 Employment Readiness

Based on relevant literature and materials, graduate employability is categorized into four dimensions: self-awareness, career management, professional development, and social adaptability. Self-awareness encompasses understanding one's physical, psychological, and social selves, with interests, personality, abilities, and values being the most critical factors for college students when making career decisions. Career management abilities encompass career perception, career planning, and career decision-making. Professional competence encompasses the body of knowledge and practical skills that enable an individual to carry out work-related responsibilities or pursue entrepreneurial activities effectively. At its core, the defining feature of professional competence lies in the capacity to apply theoretical understanding alongside hands-on skills in order to address real problems encountered in professional contexts. No matter what career an individual chooses, he or she should have excellent professional competence, including knowledge conversion, professional expertise, and continuous skill upgrading. Social adaptability means the capability of the executive to make psychological, physiological, and behavioral adjustments to function more effectively and get along smoothly with the environment, including environmental adaptation, interpersonal adaptation, and personal development.

In the present study, given that the focus centers on how university innovation and entrepreneurship education programs influence graduates' employment outcomes, self-awareness is understood as the recognition and evaluation of one's own interests, strengths, weaknesses, and values, which helps them position themselves reasonably when looking for jobs. Career management ability is understood as the planning, decision-making, and implementation skills of the students in career planning, job seeking, career path selection, and coping with changes in careers. Professional development ability is understood as the capability of continuous improvement in professional knowledge and skills by constant learning, accumulation, and innovation, which enables them to meet the requirements of competency for their target jobs and pursue long-term career development. Social adaptability is understood as students' present adaptability to their surroundings and their ability to face the pressure of social life.

2.2 Theoretical Foundations

2.2.1 Theory of Planned Behavior

Theoretical grounds not only make a research well-founded and academic but also indicate hidden patterns of some phenomena from different perspectives allowing a more in-depth investigation of mechanisms affecting them. The Theory of Planned Behavior offers a definite upgrade over rational choice theory in its ability to explain and predict human behavior. The key assumption here is that an intention to exhibit a specific behavior by an individual depends on three different variables: attitudes towards behavior, subjective norms, and behavioral intentions. Attitude towards a behavior can be defined as a person’s positive or negative evaluation of their likelihood to engage in some certain actions. Subjective norm is a measure of influence exercised on a person by other people – relatives, friends, or educators, leading to social pressure and expectations. Perceived behavioral control is defined as an evaluation made by a person regarding ease or difficulty to perform a certain action depending on factors such as availability of certain resources, opportunities, and personal abilities.

2.2.2 The Relationship Between Theory of Planned Behavior and This Study

Innovation and entrepreneurship practice activities performed at universities should be considered as a certain behavior associated with employability. The Theory of Planned Behavior can serve as a good theoretical foundation for investigating the motives and process of university students' participation in innovation and entrepreneurship practice activities and their impact on employability. Graduates' attitude towards innovation and entrepreneurship practices, subjective norms and perceptions of control over them become determining factors when making decisions regarding participating in such activities. In case if research hypothesis proves to be true and postparticipation experience affects their employability, the Theory of Planned Behavior will become especially important for this research.

2.3 Research Hypotheses

Employability as an essential factor that reflects students' overall abilities also reveals its significant relation to innovative and entrepreneurial activities. As can be seen from the aforementioned literature analysis, there is a range of academic publications which prove the effect of the aforementioned practices on the improvement of students' skills. Taking into account the results obtained during a theoretical study conducted in the paper, we can come up with several hypotheses related to innovation and entrepreneurship practices in higher education and their impact on employability:

General hypothesis: Innovation and entrepreneurship practices in higher education institutions exert a significant and positive influence on graduate employability.

Sub-hypothesis 1: Innovation and entrepreneurship practices in higher education institutions exert a significant and positive influence on student self-awareness.

Sub-hypothesis 2: Innovation and entrepreneurship practices among college students exert a significant and positive influence on career management skills.

Sub-hypothesis 3: Innovation and entrepreneurship practices among college students exert a significant and positive influence on professional development abilities.

Sub-hypothesis 4: Innovation and entrepreneurship practices among college students exert a significant and positive influence on social adaptability.

2.4 Construction of the Research Model

2.4.1 Pearson Correlation Coefficient

The Pearson correlation coefficient, at times referred to as the Pearson product-moment correlation coefficient, serves as a measure of the linear relationship between two variables X and Y in econometric analysis. Its value falls within the range of negative one to positive one. The coefficient is obtained by dividing the covariance of X and Y by the product of their respective standard deviations.

$$\rho X,Y = \frac{cov(X,Y)}{\sigma X \sigma Y} = \frac{E[(X-\mu X)(Y-\mu Y)]}{\sigma X \sigma Y} \quad (1)$$

Here, the two quantities under examination are labeled X and Y, with cov(X, Y) capturing the degree to which these quantities vary together. The formula presented above gives the population correlation coefficient, a parameter conventionally denoted by the Greek lowercase letter ρ. When the same calculation is applied to an observed statistical sample rather than the full population, the resulting measure is known as the Pearson correlation coefficient, written as the English lowercase letter r:

$$r = \frac{1}{n-1}\sum_{i=1}^{n}\left(\frac{\bar{X}-X_i}{\sigma X}\right)\left(\frac{\bar{Y}-Y_i}{\sigma Y}\right) \tag{2}$$

The Pearson correlation coefficient is a numerical index that can take on values between negative one and positive one. The value of positive one means that the relationship between X and Y can be modeled using a linear function in such a way that all the observed points lie on a single straight line and Y increases when X increases. A value of negative one means that again all the points lie on a straight line; however, now when X increases, Y decreases. Zero means there is no linear relationship between X and Y.

A value of one means that the relationship between X and Y can be represented as a linear function where all points lie on a straight line and Y increases when X increases. The value of negative one means that all points lie on a straight line but Y decreases when X increases.

Verification of the Pearson correlation coefficient generally involves three steps:

(1) Confirming the correlation between two sets of data

The Pearson correlation coefficient also applies to linear relationships between different variables, provided they are continuous data. Either the populations of different variables are normally distributed, or they follow an approximately normal unimodal distribution. Alternatively, the observations of different variables are paired, with each pair of observations being independent of one another.

(2) Population Mean and Variance of the Two Data Sets

The mathematical formulae are used to calculate the population mean and variance for the two data sets.

(3) Verification of the Pearson Correlation Coefficient

Through plugging the values of means and variances of the two sets of data into the equation above, the Pearson correlation coefficient between these two sets of data is derived. If the value of r is greater than zero, it indicates the existence of positive correlation between the variables where the increase in one variable will result in the increase of the other variable. When the value of r is less than zero, it implies negative correlation, which means that the increase in one variable will cause the other variable to decrease.

2.4.2 Multiple Linear Regression Analysis

When the variable y in the multiple regression analysis is influenced by some factors from outside, these factors will be treated as independent variables x_i. When the factor y is correlated with these factors to a certain extent, it is possible to set up the model of multiple regression, in which a relationship exists between y and each of the contributing factors. This relationship is expressed by the mathematical formula as follows:

$$y_1 = \beta_0 + \beta_1 x_{t1} + \beta_2 x_{t2} + \ldots + \beta_p x_{tp} + \varepsilon_t \tag{3}$$

(1) Establishing a Multiple Linear Regression Equation

The multiple linear regression model is expressed as follows, represented in matrix form:

$$y = x\beta + \varepsilon \tag{4}$$

Using the principle of least squares, the estimated value of β is $\hat{\beta}$:

$$\hat{\beta} = (x^t x)^{-1} x^T y \tag{5}$$

(2) Significance Test for Regression Equations

In many practical situations, the nature of the relationship between the dependent variable y and the independent variables x^i is not readily observable. Formal significance testing and verification are therefore needed to determine whether a meaningful, statistically robust relationship exists between them. Where no such relationship can be confirmed, it suggests that y and the independent variables bear no correlation with one another. The process of significance testing is consequently an indispensable step in regression analysis.

To evaluate the significance of a regression equation, the F-statistic is commonly applied as a constraining condition for the model. The formula for the F-statistic is as follows:

$$F = \frac{S_{\text{back}} / p}{S_{\text{leftover}} / (n-p-1)} \tag{6}$$

In the above equation, S_{back} represents the sum of squares for regression, S_{leftover} denotes the sum of squares for residuals, and the F-statistic follows an $F(p, n-p-1)$ distribution, meaning it is subject to a significance level of a. The value of a can be determined using the following expression:

$$P\{|F| \geq F_{1-\alpha, p, n-p-1} | H_0 | = \alpha\} \tag{7}$$

The above equation represents the significance test expression. When the condition $|F| \geq F_{l-\alpha, p, n-p-1}$ is satisfied, it indicates that at the α significance level, y exhibits a strong and significant relationship with x_i, and the constructed model demonstrates good statistical significance.

(3) Significance Test of Regression Coefficients

A statistically significant regression equation in multiple regression analysis does not, by itself, confirm that each independent variable exerts a meaningful effect on the dependent variable. Each predictor must therefore be subjected to an individual significance assessment. Variables demonstrating strong significance are kept in the model, whereas those falling below acceptable significance thresholds are excluded. Through this selective process, the distorting influence of non-significant predictors on the overall model is effectively controlled. Once superfluous variables have been eliminated, the estimated parameters associated with the remaining independent variables become more reliable, which in turn enables a sharper characterization of the underlying relationship between y and x_i and supports a more rigorous decomposition of variation in the dependent variable.

When a given predictor x_i shows no substantial effect on the response variable y, the corresponding regression coefficient β_j in the fitted multiple regression model is treated as zero. To formally assess whether x_i carries meaningful explanatory power, the following test statistic is commonly employed:

$$\frac{\beta_j^2 / C_{jj}}{S_{\text{leftover}} / (n-p-1)} - F(1, n-p-1) \tag{8}$$

In the expression above, a finding that the independent variable x_i is significant with

respect to the dependent variable y implies that this ratio conforms to an $F(1, n-p-1)$ distribution.

If $|F| \geq F_{1-\alpha, p, n-p-1}$, then the regression coefficient β_j is considered significant at the $1-\alpha$ confidence level.

It should be noted that each time a variable is removed, the regression model must be rebuilt, and each coefficient retested until all regression coefficients are significant.

2.5 Questionnaire Design

2.5.1 Scale

Using innovation and entrepreneurship practice activities as the independent variable, this section primarily investigates the status of such activities. The questionnaire comprises 15 items covering three dimensions: practice subjects, practice content, and practice support. With graduate employment capability development as the dependent variable, this section primarily investigates the status of graduate employment capability cultivation. It draws heavily on existing measurement scales for the four sub-dimensions of university student employment capability, with appropriate adjustments made to the items based on the specific research needs. Specifically, graduate employment capability encompasses four research dimensions: self-awareness capability, career management capability, professional development capability, and social adaptation capability, comprising a total of 20 items. The marks will be obtained based on the five-point Likert Scale: Strongly Agree - 5 marks; Agree - 4 marks; Neutral - 3 marks; Disagree - 2 marks; and Strongly Disagree - 1 mark. The marks of the graduates will depend on how actively they engage in the activities undertaken by the universities to promote innovation and entrepreneurship and prepare for work.

2.5.2 Data Sources

In order to facilitate the smooth development of the research process, the pre-test process is carried out with the distribution of a questionnaire on a smaller scale. Randomly distributed questionnaire links are circulated within various colleges of M University through online sharing. The distribution process is mostly based on forwarding by classmates and friends, but with assistance provided by teachers and faculties of M University's Innovation and Entrepreneurship College. These professionals are kind enough to help us to distribute the questionnaire widely in order to make the data validity more effective. After a month, the data collection process was concluded, resulting in 900 returned questionnaires. Through removing those invalid answers, which answered very fast or gave identical answers, the researchers ended up with 850 valid questionnaires. In this case, the response rate is as high as 94.44%, which represents a fairly satisfactory response rate. After the completion of the questionnaire collection process, SPSS 22.0 was utilized to describe the basic information of all 850 valid samples. The sample basic information is illustrated in Table 1, where the frequency and percentage of the first three demographic variables (gender, academic performance, and major classification) are presented. It can be seen that, regarding gender, there are 400 males (47.06%) and 450 females (52.94%), with males being more than females by 50 (5.88%).

Table 1: Sample background information

Item	Options	Frequency	Percentage
Gender	Male	400	47.06%
	Female	450	52.94%
Academic performance level	Excellent	270	31.76%
	Good	214	25.18%
	Medium	185	21.76%
	Pass	181	21.29%
Professional category	Science	292	34.35%
	Engineering	247	29.06%
	Liberal arts	311	36.59%

2.5.3 Questionnaire Scale Reliability and Validity

(1) Reliability analysis

Reliability analysis of the recovered questionnaire data in this study was carried out using Cronbach's Alpha, commonly denoted as the α coefficient. Prior research has established clear benchmarks for interpreting this coefficient. When the α coefficient surpasses 0.800, the scale data are regarded as possessing very high reliability. Values falling between 0.700 and 0.800 indicate relatively good reliability, while those in the range of 0.600 to 0.700 are considered to reflect an acceptable level of reliability. On this basis, the questionnaire was subjected to testing through SPSS software. Reliability assessments were performed on the overall dimensions covering innovation and entrepreneurship practice activities and the cultivation of graduates' employability, as well as on each of the corresponding sub-scales. The detailed outcomes of these reliability tests are presented in Table 2. As the results indicate, the α coefficients across the scale range from 0.817 to 0.891, which confirms that the scale as a whole demonstrates very high reliability.

Table 2: Reliability test results

Variable	Cronbachs’s Alpha	Number of items
Practice subject	0.844	5
Practical content	0.833	5
Practical guarantee	0.827	5
Self-awareness ability	0.891	5
Professional management ability	0.885	5
Professional development ability	0.846	5
Ability to adapt to society	0.817	5

(1) Reliability Analysis

The Alpha Coefficient method or commonly known as Cronbach's Alpha will be used in this study for the purpose of carrying out reliability analysis using the collected data from the questionnaires. Based on previous researches, it is noted that a coefficient above 0.800 denotes very high reliability in the scale data, while a value ranging between 0.700 and 0.800 indicates a relatively good reliability. On the other hand, a value ranging between 0.600 and 0.700 signifies an acceptable reliability. In this study, SPSS software was applied to conduct reliability analysis on the questionnaire data, covering both innovation and entrepreneurship practice activities and the cultivation of graduate employability, along with their respective subscales. The resulting reliability test outcomes are presented in Table 2 below.

Table 3: Validity test results

Dimension.	KMO	Bartlett sphericity test		
		Approximate chi-square value	Degree of freedom	Significance
Innovation and entrepreneurship practice activities	0.884	3974.444	58	0.002
Graduates' employability	0.949	1236.223	736	0.005

2.5.4 Exploratory Factor Analysis

The findings obtained from the factor analysis are provided in Table 4 below. In performing exploratory factor analysis, the principal component analysis technique in SPSS software package was used to extract seven principal components, whose total variance in explanation was observed at 72.923%, higher than the threshold value of 70%. This means that these seven extracted principal components explain well the composition of innovation and entrepreneurship practice activity as well as graduate employment. The extracted factors were then subjected to a maximum variance rotation technique to determine their individual loading of the item, whereby all the loadings were greater than 0.8. Therefore, it can now be said that the total explanatory variance of the seven factors is 72.923%. The seven factors are named according to the principal component associated with each item as practical subject, practical content, practical guarantee, cognitive ability, professional management ability, professional development ability, and social adaptability.

Table 4: Factor analysis results

Item	Component						
	1	2	3	4	5	6	7
1	0.807						
2	0.922						
3	0.934						
4	0.861						
5	0.838						
6		0.832					
7		0.937					
8		0.947					
9		0.948					
10		0.868					
11			0.837				
12			0.874				
13			0.878				
14			0.835				
15			0.912				
16				0.938			
17				0.912			
18				0.913			
19				0.926			
20				0.822			
21					0.845		
22					0.894		
23					0.917		
24					0.816		
25					0.818		
26						0.876	
27						0.895	
28						0.812	
29						0.832	
30						0.844	
31							0.821
32							0.875
33							0.814
34							0.877
35							0.817
Characteristic value	6.062	3.042	2.711	1.645	1.389	1.241	1.083
Explain the variance %	28.309	26.008	15.111	16.846	17.333	18.392	19.466
Cumulative explained variance %	28.342	53.316	67.427	68.912	69.409	71.355	72.923

2.5.5 Common Method Bias Test

A single-factor common method bias test was subsequently performed across all items included in the questionnaire. The corresponding results are reported in Table 5. Wherein, C represents the characteristic root, V is variance explained, and T is cumulative sum. It can be seen from the results that there are seven characteristic roots larger than 1. Among them, the first characteristic root has an explained variance of 17.32%, lower than 20%, implying that no common method bias occurs among items.

Table 5: The results of the common method deviation test

Factor	C	V	T	Before rotation			After rotation		
				C	Y	T	C	Y	T
1	6.062	17.32%	17.32%	6.062	17.32%	17.32%	4.777	13.65%	13.65%
2	3.042	8.69%	26.01%	3.042	8.69%	26.01%	3.017	8.62%	22.27%
3	2.711	7.75%	33.76%	2.711	7.75%	33.76%	2.299	6.57%	28.84%
4	1.645	4.70%	38.46%	1.645	4.70%	38.46%	2.212	6.32%	35.16%
5	1.389	3.97%	42.43%	1.389	3.97%	42.43%	1.885	5.39%	40.54%
6	1.241	3.55%	45.97%	1.241	3.55%	45.97%	1.735	4.96%	45.50%
7	1.083	3.09%	49.07%	1.083	3.09%	49.07%	1.248	3.57%	49.07%

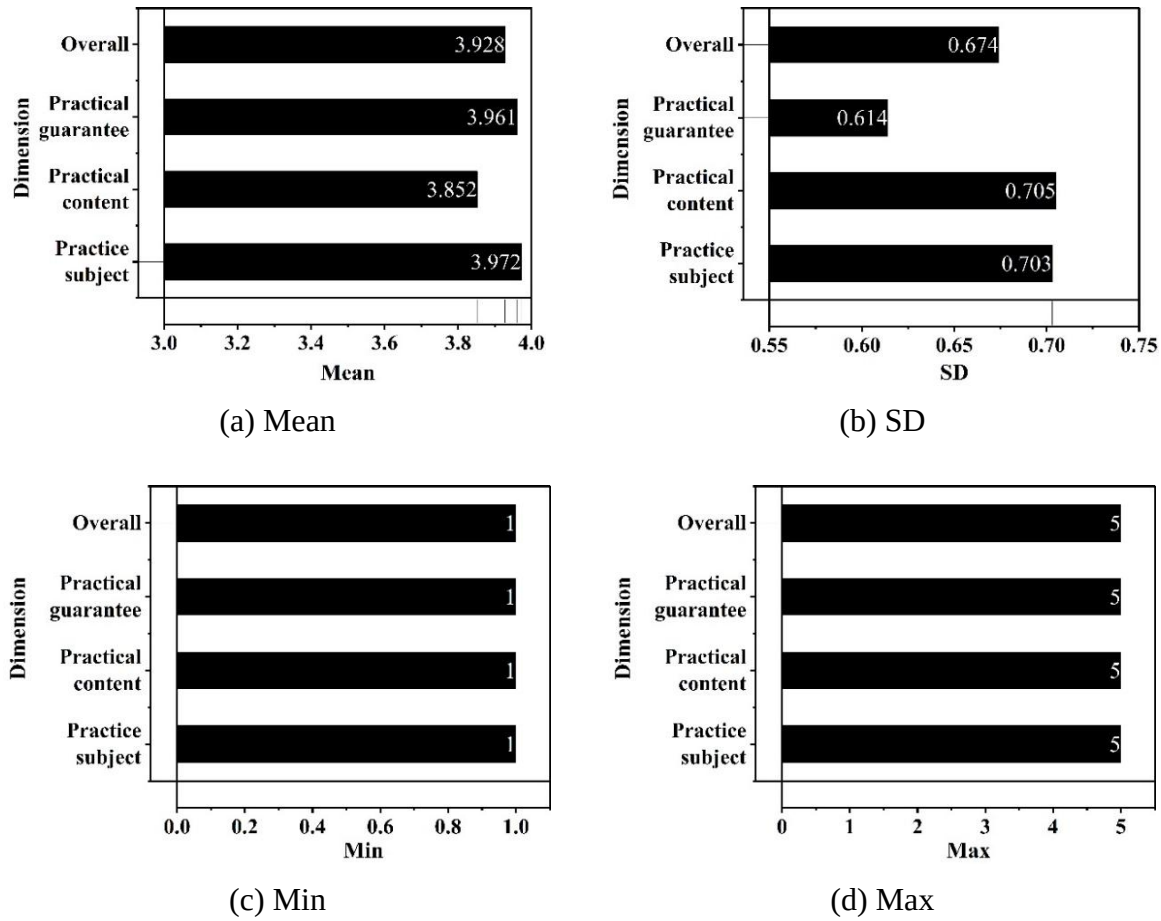
3 Empirical Research Analysis

3.1 Descriptive Statistical Analysis

In this chapter, the current status of innovation and entrepreneurship activities in colleges and universities as well as graduates' employment status is discussed, showing the quantitative distribution values of both variables. This will serve as a basis for the variance analysis, correlation analysis, and regression analysis to follow. The steps involved include:

3.1.1 Descriptive Statistical Analysis of Innovation and Entrepreneurship Practice Activities

Innovation and Entrepreneurship Practice Activities are measured through 15 questions, each having a Likert scale of rating ranging from 1 to 5. The five levels range from strongly disagree to strongly agree in terms of meaning. These 15 items have been classified in groups of three according to their content, namely Practice Subjects, Practice Content, and Practice Support. Descriptive statistics for the total innovation and entrepreneurship practice activities scale and individual scales are presented through figure 1 in which Panel a shows mean, panel b shows standard deviation, panel c shows minimum value and panel d shows the maximum value respectively. Some significant trends emerge from the statistical analyses performed. In all three dimensions, the Practice Subject dimension scores the highest in average, achieving a mean of 3.972, a standard deviation of 0.703, with a minimum of 1 and a maximum of 5. Practice Content dimension obtains the least average score among all three, recording a mean of 3.852, with a standard deviation of 0.705, a minimum of 1, and a maximum of 5. Overall, innovation and entrepreneurship practice activities scale records a mean of 3.928, standard deviation of 0.674, with values ranging from 1 to 5.



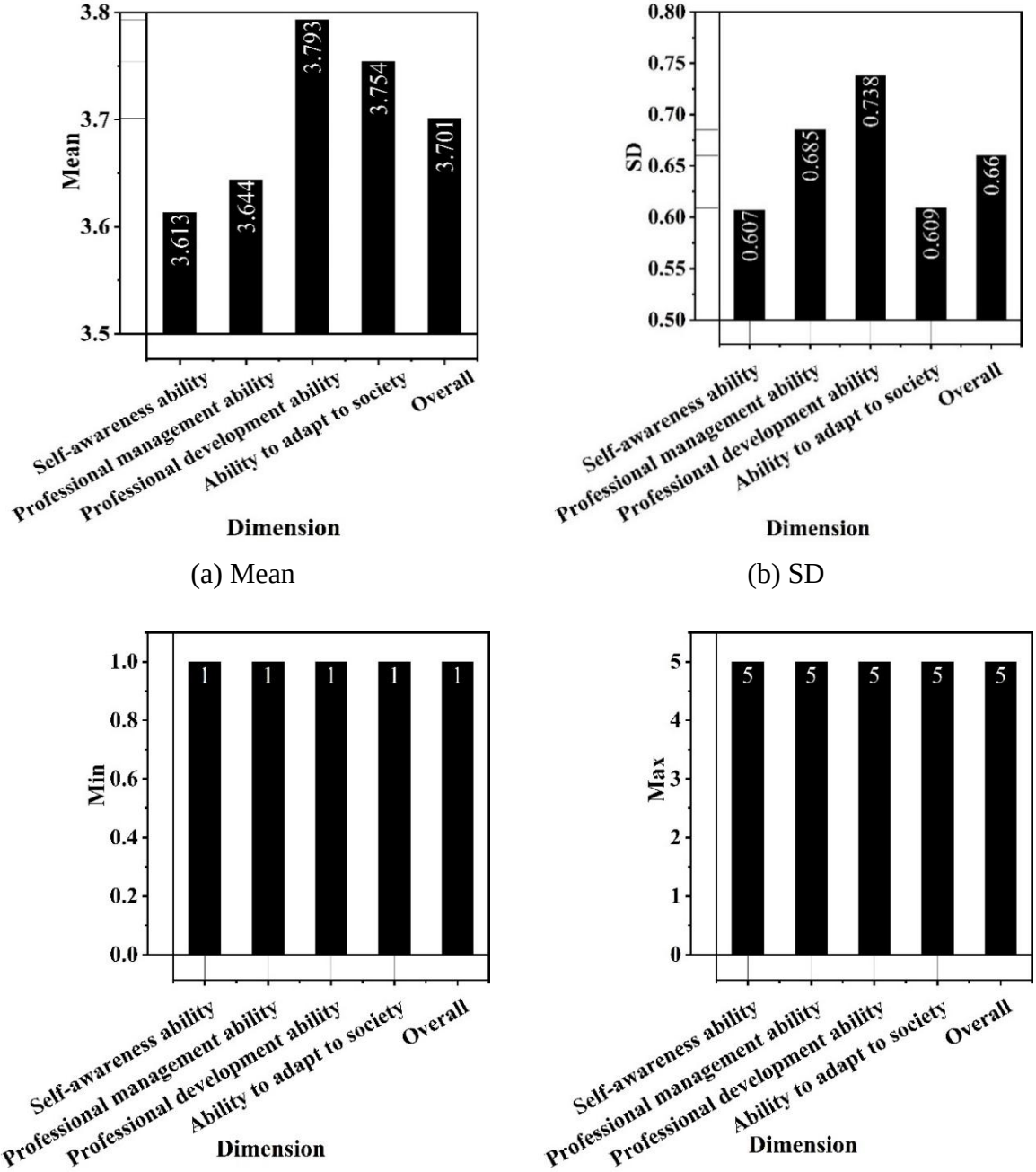
(a) Mean (b) SD

(c) Min (d) Max

Figure 1: Descriptive statistical analysis results

3.1.2 Descriptive Statistical Analysis of Graduate Employment Competency

The 20 questions used to measure graduate employability are provided on a Likert scale of five rating categories from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). These questions classify graduate employability based on four categories: self-awareness, career management, professional development, and social adaptability. With the same technique, descriptive statistical analysis of all the four categories of graduate employability is done, whose findings can be seen in Figure 2 below. On means: Self-Awareness (3.613) < Career Management (3.644) < Overall Graduate Employability (3.701) < Social Adaptability (3.754) < Professional Development (3.793). On standard deviations: Self-Awareness (0.607) < Social Adaptability (0.609) < Overall Graduate Employment Competency (0.660) < Career Management Competency (0.685) < Professional Development Competency (0.738). Furthermore, both the minimum and maximum scores were between 1 and 5, which depicted the quantitative distribution of graduate employment competencies and their categories.



(a) Mean (b) SD

(c) Min (d) Max

Figure 2: Descriptive statistics of graduates' employability

3.2 Analysis of Differences in Innovation and Entrepreneurship Practice Activities

In order to validate whether there is any effect of changing control variables in experimental data results during empirical research analysis, it is essential to analyze demographic variables in terms of innovation and entrepreneurship practice activities. To test the hypothesis of innovation and entrepreneurship practice activities, independent sample t-tests, one-way F-test, and others are applied in the following study to explore the differences among demographic variables including gender, academic performance, major types, etc.

3.2.1 Gender Differences Analysis

By utilizing SPSS, gender differences were analyzed in respect to practice activities of innovation and entrepreneurship. As for the results of the gender difference analysis, Figure 3 below provides the detailed information. In the figure below, X1–X4 stand for practice subject, practice content, practice support, and innovation and entrepreneurship practice activities respectively, and C/D indicate males/females correspondingly. It can be observed from the results that gender differences play an influential role ($p < 0.05$) not only in terms of the overall innovation and entrepreneurship practice activities, but also their specific components. Taking into consideration the already existing differences between males and females with regard to practice subject, practice content, and practice support, males display better performance overall and thus have better competencies in terms of innovation and entrepreneurship practice activities. On entering university, students get engaged in various activities and competitions other than their curriculum studies. Thus, they obtain a more clear notion and understanding of innovation and entrepreneurship practice activities along with its components: practice subject, practice content, and practice support.

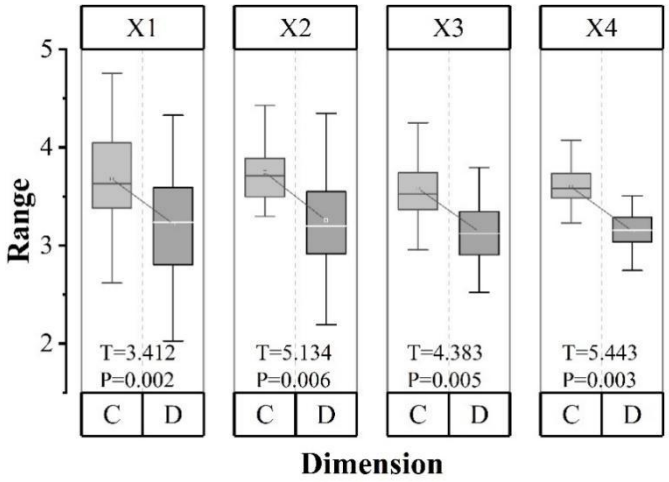


Figure 3: Analysis results of gender differences

3.2.2 Analysis of Academic Achievement Differences

Using the SPSS software analytical skills, an analysis was undertaken on the differences in the association between academic performance and innovation and entrepreneurship practice activities. The results obtained from the variance analysis regarding academic performance for innovation and entrepreneurship practice activities are shown in Figure 4, where E, F, G, and H stand for excellent, good, average, and pass grades of academic performance. From the analysis, it can be seen that there exists a significant difference in the relationship between academic performance and innovation and entrepreneurship practice activities in general and their three dimensions, which include practice subjects, practice content, and practice support, all at a level of significance $p<0.05$. Such a trend arises due to the tendency of students having a better academic background being involved more effectively and obtaining greater engagement in innovation and entrepreneurship practice activities.

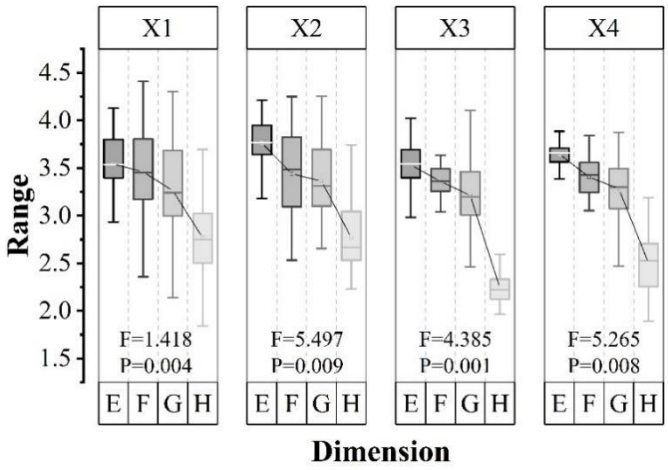


Figure 4: Analysis results of academic performance differences

3.2.3 Analysis of Professional Differences

Furthermore, under the same method of analysis, the differences between the various disciplines in innovation and entrepreneurship practice activities have been studied. The findings are shown in Figure 5, where I, J and K denote the discipline of sciences, engineering and liberal arts respectively. The findings reveal that there exist differences among the various disciplines in engaging themselves in innovation and entrepreneurship education and its dimensions. These findings have been brought about mainly because of the fact that disciplines of sciences lay more importance on innovation and entrepreneurship practices, while those of engineering and liberal arts focus more on activities associated with specialized knowledge acquisitions.

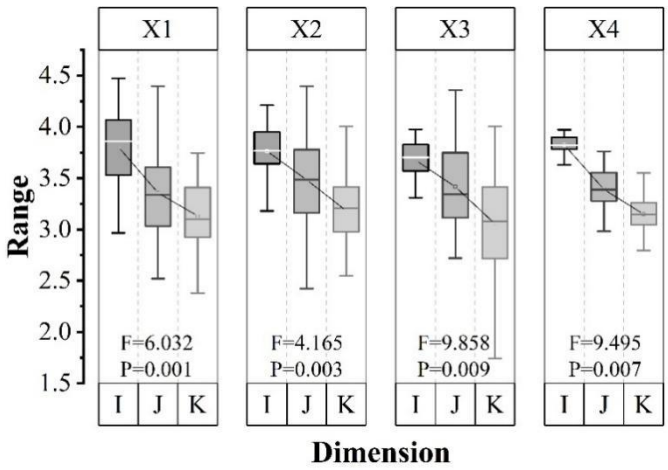


Figure 5: Analysis results of professional differences

3.3 Analysis of Employment Competency Differences

Following the analysis of the disparities among demographic variables and innovations and entrepreneurship activities in universities, this part discusses the disparity among demographic variables and graduates' employability using the same methodology. The findings from this part are provided below.

3.3.1 Gender Differences Analysis

Figure 6 illustrates the findings of gender differences analyses, whereby Y1, Y2, Y3, Y4, and Y5 indicate self-awareness, career management, professional development, social adaptation, and employability, respectively. From the graph, there are considerable gender differences among the overall employability level of graduates and its related dimensions ($p < 0.05$). This could be mainly because men show more flexibility when choosing jobs and adapting to the environment than women.

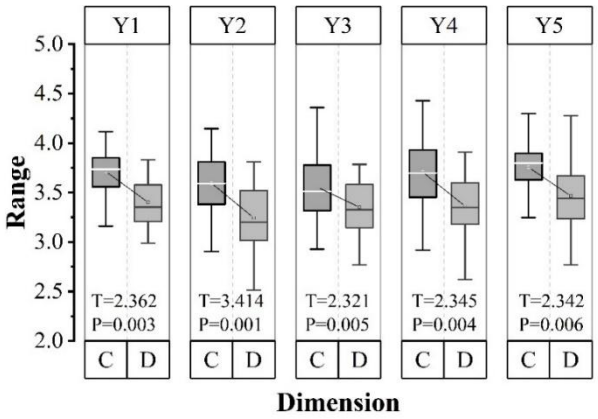


Figure 6: Analysis results of gender differences

3.3.2 Analysis of Academic Achievement Differences

SPSS was used to analyze the disparity of innovation and entrepreneurship activities on academic performance. Figure 7 illustrates the findings of academic performance differences analysis. It is evident that academic performance is a crucial factor in influencing the overall employability of graduates and its dimensions ($P<0.05$). This is because students with high academic performance can choose a variety of jobs as opposed to those with poor academic performance.

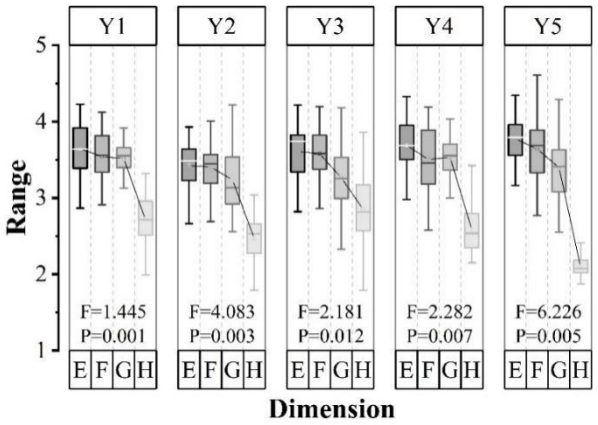


Figure 7: Analysis results of academic performance differences

3.3.3 Analysis of Professional Differences

A comparative study of the differences between innovation and entrepreneurship activities in relation to various academic disciplines was conducted through the use of the aforementioned information and techniques. This comparison of innovation and entrepreneurship activities in various academic disciplines is presented graphically in Figure 8. As can be seen from the above

figure, there are substantial differences in innovation and entrepreneurship activities among individuals studying various disciplines. In comparison with engineering and liberal arts, science disciplines show better employability skills among students. This is due to the higher level of job compatibility in science-based professions.

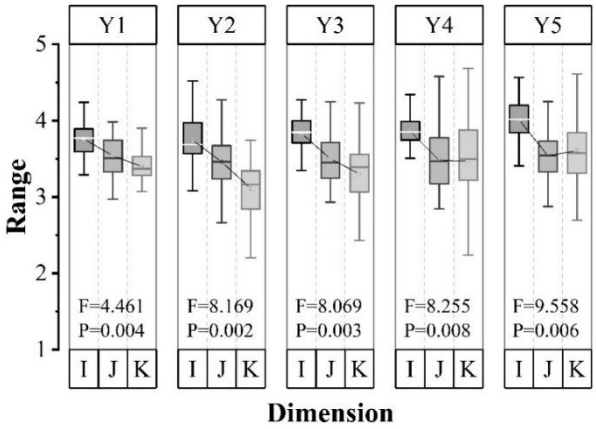
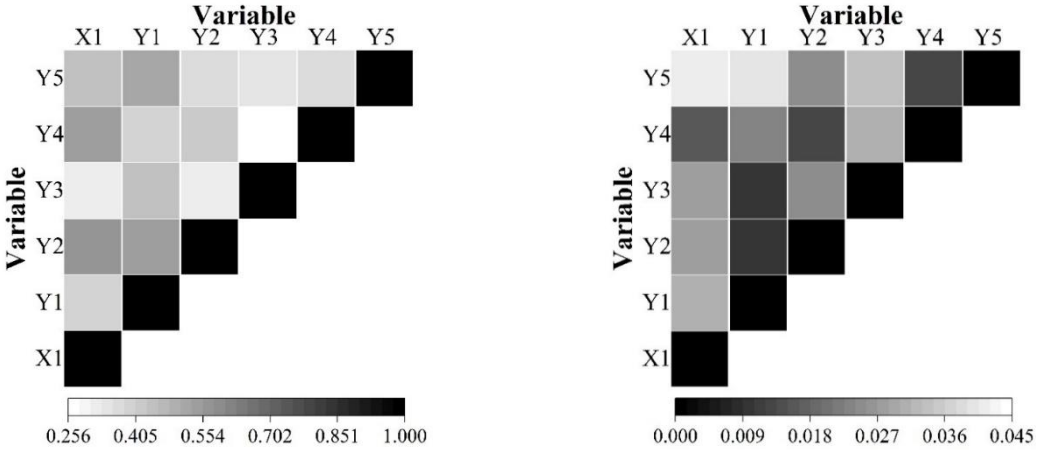


Figure 8: Analysis results of professional differences

3.4 Correlation Testing and Regression Analysis

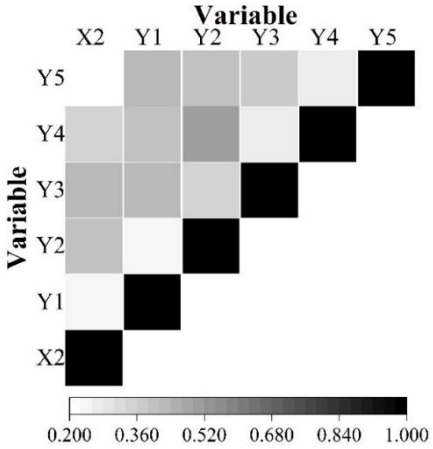
3.4.1 Correlation Analysis

Using Pearson's correlation coefficient, the correlations among the study variables were verified. The correlations between X1–X4 and Y1–Y5 are shown in Figures 9–12, where (a) and (b) represent the Pearson correlation coefficient and significance level, respectively. A comprehensive review of Figures 9–12 reveals that university innovation and entrepreneurship practices, along with their respective dimensions, exhibit significant positive correlations with graduate employability and its corresponding dimensions. With Sig values consistently below 0.05, this confirms that the established research variables are suitable for regression analysis and ensures the feasibility of this study.

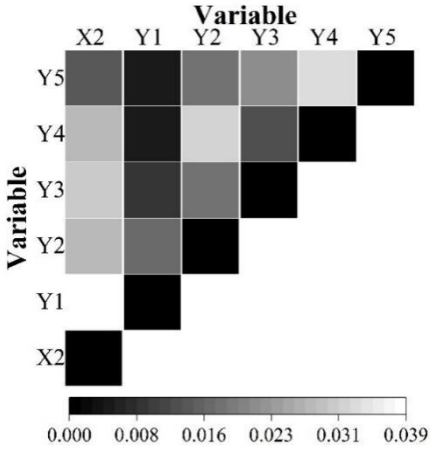


(a) Pearson correlation coefficient (b) Significance value

Figure 9: The correlation between X1 and Y1~Y5

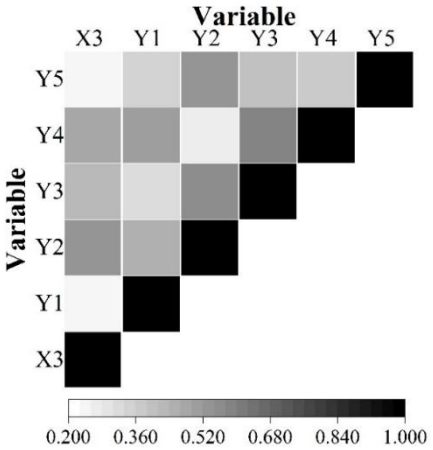


(a) Pearson correlation coefficient

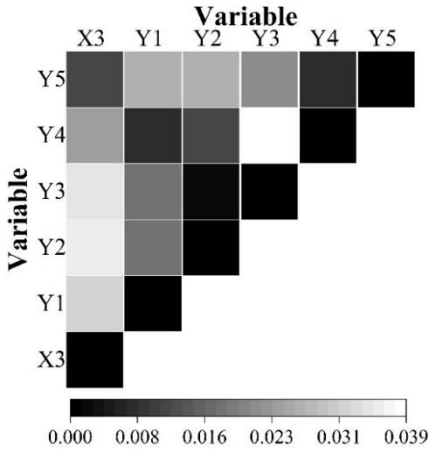


(b) Significance value

Figure 10: The correlation between X2 and Y1~Y5

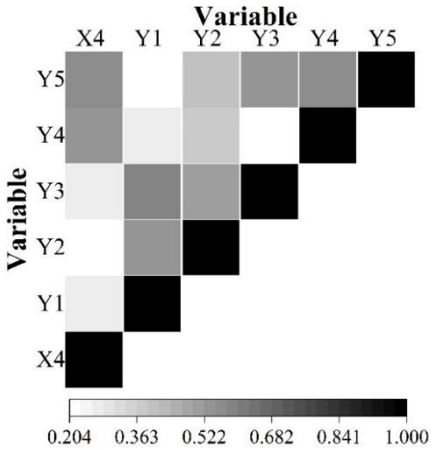


(a) Pearson correlation coefficient

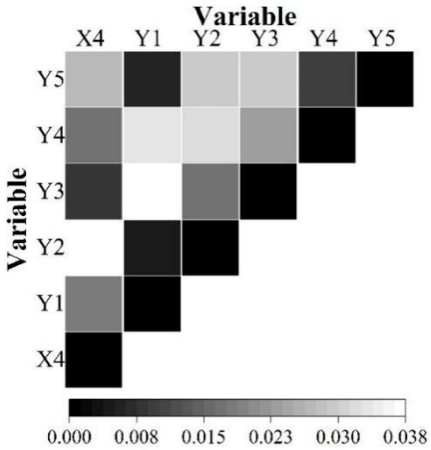


(b) Significance value

Figure 11: The correlation between X3 and Y1~Y5



(a) Pearson correlation coefficient



(b) Significance value

Figure 12: The correlation between X4 and Y1~Y5

3.4.2 Regression Analysis

(1) Overall Regression Analysis of Graduate Employment Competency

A regression analysis technique using SPSS software was used to examine the degree to which innovation and entrepreneurship practices affect graduates' competency in employability. The analysis process comprised of two parts. First, Model 1 was developed through a regression of the independent control variables on graduates' competency in employment, followed by Model 2, whereby the regression of graduates' competency in employment included not only the control variables but also innovation and entrepreneurship practices. Complete regression output is shown in Table 6. From Model 1, it can be seen that the effect of gender, performance, and major on graduates' competency in employability was statistically significant at the 0.01 level. For Model 2, the Adjusted R^2 value improved when compared to the previous one, increasing to 0.227, implying that the explained variance was 22.7 percent.The effect of the independent variables on graduate employability extended beyond that of the control variables, and the F-value was 14.159, showing significant value at 0.01. From regression analysis, the regression coefficients of X4 (innovation and entrepreneurship practice activities), X1 (practice entity), X2 (practice content), and X3 (practice support) in relation to graduate employability were 0.141, 0.124, 0.111, and 0.205 respectively, all being significant. It is evident that innovation and entrepreneurship practice activities enhance graduate employability, supporting the validity of Research Hypothesis 1.

Table 6: Overall regression analysis of employability

Dependent variable:Graduates' employability			
Name		Model 1	Model 2
Constant term		0.213**	0.224**
Control variables	Gender	0.045**	0.042**
	Academic performance	0.089**	0.082**
	Professional	0.046**	0.045**
Independent variable	X1		0.141**
	X2		0.124**
	X3		0.111**
	X4		0.205**
R^2		0.212	0.256
Adjusted R^2		0.187	0.227
F		8.219**	14.159**

(2) Regression Analysis of Self-Awareness Ability

With the aid of SPSS, regression analysis between Innovation and Entrepreneurship Practice Activities and self-awareness ability was done. First, Model 1 was achieved using the regression analysis of the control variables and self-awareness ability, while Model 2 was obtained by introducing the independent variables from Model 1. The result of regression analysis between self-awareness ability is shown in Table 7. It is observed that in Model 1, gender, academic performance, and major are significantly related to self-awareness ability at the 0.01 significance level. The Adjusted R^2 obtained for Model 2 is higher compared to Model 1, with a value of 0.206, which means that 20.6% of the variance can be explained. It is evident that the independent variables affect the professional application ability of the college students independently from the control variables. An F-value of 14.933 shows statistical significance at the 0.01 significance level. The regression coefficient of Innovation and Entrepreneurship Practice Activities (X4), Practice Subject (X1), Practice Content (X2), and Practice Support

(X3) concerning self-awareness ability is 0.157, 0.133, 0.248, and 0.254, respectively, with a significance level.

Table 7: Results of regression analysis of self-awareness ability

Dependent variable: Self-awareness ability			
Name		Model 1	Model 2
Constant term		0.107**	0.109**
Control variables	Gender	0.046**	0.036**
	Academic performance	0.036**	0.049**
	Professional	0.018**	0.006**
Independent variable	X1		0.157**
	X2		0.133**
	X3		0.248**
	X4		0.254**
R^2		0.214	0.267
Adjusted R^2		0.184	0.206
F		10.609**	14.933**

(3) Regression Analysis of Career Management Competence

Using the same technique, the correlation between innovation and entrepreneurship and career management competence was studied. The regression analysis findings for career management competence are shown in Table 8 below. Model 1 depicts the regression analysis model that includes control variables and dependent variable. On the other hand, Model 2 depicts the regression analysis model that incorporates control variables, independent variables, and the dependent variable. From the above table, it is clear that the control variables and dependent variable are significantly related at 0.01 significance level. Also, the R^2 value in Model 2 is higher than Model 1. Moreover, the adjusted R^2 value of Model 2 is 0.427 which implies that 42.7% of the variation is explained. Finally, independent variables are more influential than control variables. The regression coefficients between the independent variables and dependent variable are 0.229, 0.155, 0.184, and 0.151 respectively and all of them are significant. Thus, Research Hypothesis 3 is supported by findings.

Table 8: Regression Analysis of Professional Management Ability

Dependent variable: Professional management ability			
Name		Model 1	Model 2
Constant term		0.092**	0.098**
Control variables	Gender	0.011**	0.014**
	Academic performance	0.014**	0.019**
	Professional	0.029**	0.028**
Independent variable	X1		0.229**
	X2		0.155**
	X3		0.184**
	X4		0.151**
R^2		0.177	0.456
Adjusted R^2		0.156	0.427
F		8.118**	15.726**

(4) Regression Analysis of Professional Development Capabilities

The impact of innovation and entrepreneurship practice activities on professional development capability was analyzed through regression analysis. The results are shown in Table 9. It can be seen from the data that both the control variables and the independent variables are statistically significant at the 0.01 level. In addition, it can be noted that the independent variables have greater influence on the dependent variable compared to the control variables. Another supporting factor is that the Adjusted R^2 value is 0.328. That means that the model explains 32.8% of the total variation in the dependent variable. Moreover, the F value is 14.761, which is statistically significant at the 0.01 level. All these findings support the fact that there exists a significant and positive impact of innovation and entrepreneurship practice activities on professional development capability at the 0.01 significance level.

Table 9: Regression analysis results of professional development capabilities

Dependent variable: Professional development ability			
Name		Model 1	Model 2
Constant term		0.081**	0.087**
Control variables	Gender	0.025**	0.028**
	Academic performance	0.056**	0.065**
	Professional	0.028**	0.036**
Independent variable	X1		0.241**
	X2		0.195**
	X3		0.269**
	X4		0.181**
R^2		0.228	0.356
Adjusted R^2		0.231	0.328
F		6.191**	14.761**

(5) Regression Analysis of Social Adaptability

Furthermore, regression analysis was carried out to analyze the impact of innovation and entrepreneurial activities on social adaptability. The findings, as presented in Table 10, reveal that innovation and entrepreneurial activities have a significant impact on social adaptability. The regression values found from the above analysis were 0.149, 0.183, 0.206, and 0.271. In addition, the Adjusted R^2 value was 0.306, indicating that 30.6 percent of the variation in social adaptability can be attributed to the variables considered in the regression analysis. From the above findings, research hypothesis H5 is supported.

Table 10: Regression analysis results of social adaptability

Dependent variable: Ability to adapt to society			
Name		Model 1	Model 2
Constant term		0.079**	0.085**
Control variables	Gender	0.067**	0.079**
	Academic performance	0.066**	0.047**
	Professional	0.074**	0.078**
Independent variable	X1		0.149**
	X2		0.183**
	X3		0.206**
	X4		0.271**
R^2		0.128	0.376
Adjusted R^2		0.174	0.306
F		10.397**	16.354**

4 Conclusion

In this study, innovation and entrepreneurship practices are assessed in terms of their ability to improve graduate employability. The study adopts statistical analysis methods comprehensively to assess the interrelationship between innovation and entrepreneurship practices and graduate employability in a multifaceted manner. This study draws upon previous findings to establish five hypotheses regarding the effects of innovation and entrepreneurship practices on graduate employability, after which a multiple linear regression model is developed. Relevant studies have provided insights into the development of a well-designed survey questionnaire to obtain data related to graduate demographic characteristics, innovation and entrepreneurship practices, and graduate employability. After conducting a descriptive statistical analysis on the research variables, the dataset was further analyzed based on students' gender, grades, and majors to investigate the differences in research variables. The correlation coefficients were calculated for the determination of the relationships between the research variables and the appropriateness of using those variables in the regression analysis was validated after that. On the basis of this, a multiple regression approach was used to investigate the extent to which innovation and entrepreneurship behaviors affect graduate employability. It has been found that all control and dependent variables become statistically significant at 0.01 level. Besides, it is observed that innovation and entrepreneurship behaviors play a significantly important role for the graduate employability as well as its different dimensions.

Funding

This work was supported by the 2024 General Research Project under the Henan Provincial Education Science Program: "From Alignment to Curriculum Development: A Study of Career Education for Normal Students in Regional Higher Teacher Education Institutions (2024YB0166)".

About the Author

Daoxin Wang was born in Tanghe, Henan, P.R. China, in 1988. He obtained a Ph.D. in Education from Siham University in South Korea. He currently works at the Collage of Teacher Education, Xinyang Normal University. His main research focus is career education and teacher education.

References

[1] Ilich, L. M., Hlushak, O. M., & Semenyaka, S. A. (2020). Modeling of employment structural transformations. Financial and credit activity problems of theory and practice, 1(32), 251-259.

[2] Li, P., Yu, H., Chang, H., & Tang, Y. (2021, June). Analysis on Employment Situation of Applied Universities in Transformation and Development. In International Conference on Applications and Techniques in Cyber Security and Intelligence (pp. 87-92). Cham: Springer International Publishing.

[3] Prozorova, M. N., Zharkov, A. D., Zharkova, A. A., Khamdamova, V. A., Sattorova, S. O., & Losev, V. S. (2021). University graduate career potential in digital transformation

period: Features and problems of formation. Linguistics and Culture Review, 5(S3), 1574-1585.

[4] Nabi, G. R. (2003). Graduate employment and underemployment: opportunity for skill use and career experiences amongst recent business graduates. Education+ training, 45(7), 371-382.

[5] Ma, X. N., & Sun, Y. (2013, June). Research on employment ability evaluation of graduates. In The 19th International Conference on Industrial Engineering and Engineering Management: Engineering Economics Management (pp. 1019-1025). Berlin, Heidelberg: Springer Berlin Heidelberg.

[6] Pan, S., Hafez, B., Iskandar, A., & Ming, Z. (2024). Integrating constructivist principles in an adaptive hybrid learning system for developing social entrepreneurship education among college students. Learning and Motivation, 87, 102023.

[7] Liu, Y. (2012). The Study on Education Reform for College Students Employment Competition Ability. In Future Communication, Computing, Control and Management: Volume 2 (pp. 575-580). Berlin, Heidelberg: Springer Berlin Heidelberg.

[8] Mazla, M. I. S. B., Jabor, M. K. B., Tufail, K., Yakim, A. F. N., & Zainal, H. (2020, September). The roles of creativity and innovation in entrepreneurship. In International Conference on Student and Disable Student Development 2019 (ICoSD 2019) (pp. 213-217). Atlantis Press.

[9] Yang, Z. (2025). Impact of English Major Talent Cultivation Models on Employment Directions. Interdisciplinary Humanities and Communication Studies, 1(2).

[10] Ding, L. (2025). Exploration of the Talent Cultivation Model for Applied Talents in Cross-Border E-Commerce from the Perspective of the Digital Economy. Frontiers in Educational Research, 8(4).

[11] Wei, B., & Binglong, L. (2014). Who is unemployed, employed or admitted to graduate school; An investigation of the employment situation of college graduates in China between 2003 and 2009. Chinese Education & Society, 47(6), 36-58.

[12] Xiang, B., Wang, H., & Wang, H. (2023). Is There a Surplus of College Graduates in China? Exploring Strategies for Sustainable Employment of College Graduates. Sustainability, 15(21), 15540.

[13] Küttim, M., Kallaste, M., Venesaar, U., & Kiis, A. (2014). Entrepreneurship education at university level and students' entrepreneurial intentions. Procedia-Social and Behavioral Sciences, 110, 658-668.

[14] Wu, D. (2015). Education of Starting Business and Employment of College Graduates. Management & Engineering, (21), 40.

[15] Swayne, N., Selznick, B., McCarthy, S., & Fisher, K. A. (2019). Uncoupling innovation and entrepreneurship to improve undergraduate education. Journal of Small Business and Enterprise Development, 26(6/7), 783-796.

[16] Dong, Q., & Liu, X. (2023). Optimization practice of university innovation and entrepreneurship education based on the perspective of OBE. Journal of Combinatorial Mathematics and Combinatorial Computing, 118, 181-189.

[17] Bu, L., & Zou, J. (2024). Reform and Exploration of University Students' Innovation and Entrepreneurship Course Teaching Based on Federal Learning Under the "Internet+" Perspective. Journal of Combinatorial Mathematics and Combinatorial Computing, 122, 197-205.

[18] de Oliveira Silva, F., Espuny, M., Costa, A. C. F., Anaya, Y. B., Faria, A. M., Santos, G., & de Oliveira, O. J. (2024). Drivers for Entrepreneurship Education: Harnessing Innovation for Quality Youth Employment and Income Generation. Quality Innovation Prosperity, 28(1), 193-222.

[19] Hardie, B., Highfield, C., & Lee, K. (2020). Entrepreneurship education today for students' unknown futures. Journal of Pedagogical Research, 4(3), 401-417.

[20] Halsall, J. P., Snowden, M., Clegg, P., Mswaka, W., Alderson, M., Hyams-Ssekasi, D., ... & Winful, E. C. (2022). Social enterprise as a model for change: mapping a global cross-disciplinary framework. Entrepreneurship Education, 5(4), 425-446.

[21] Weligamage, S. S. (2009). Graduates' employability skills: Evidence from literature review. Sri Lanka: University of Kelaniya, 115-125.

[22] Heijde, C. M. V. D., & Van Der Heijden, B. I. (2006). A competence-based and multidimensional operationalization and measurement of employability. Human Resource Management: Published in Cooperation with the School of Business Administration, The University of Michigan and in alliance with the Society of Human Resources Management, 45(3), 449-476.

[23] Behle, H. (2020). Students' and graduates' employability. A framework to classify and measure employability gain. Policy reviews in higher education, 4(1), 105-130.

[24] Pouratashi, M., & Zamani, A. (2019). University and graduates employability: Academics' views regarding university activities (the case of Iran). Higher Education, Skills and Work-Based Learning, 9(3), 290-304.

[25] Jiang, L., Chen, Z., & Lei, C. (2023). Current college graduates' employability factors based on university graduates in Shaanxi Province, China. Frontiers in Psychology, 13, 1042243.

[26] Yizhong, X., Lin, Z., Baranchenko, Y., Lau, C. K., Yukhanaev, A., & Lu, H. (2017). Employability and job search behavior: A six-wave longitudinal study of Chinese university graduates. Employee Relations, 39(2), 223-239.

[27] Li, G. (2017). Role of innovation and entrepreneurship education in improving employability of Medical University students. EURASIA Journal of Mathematics, Science and Technology Education, 13(12), 8149-8154.

[28] Killingberg, N. M., Kubberød, E., & Blenker, P. (2021). Preparing for a future career through entrepreneurship education: Towards a research agenda. Industry and Higher

Education, 35(6), 713-724.

[29] Iglesias-Sánchez, P. P., Jambrino-Maldonado, C., & de las Heras-Pedrosa, C. (2019). Training entrepreneurial competences with open innovation paradigm in higher education. Sustainability, 11(17), 4689.

[30] Li, X., Pu, R., & Liao, H. (2022). The impacts of innovation capability and social adaptability on undergraduates' employability: The role of self-efficacy. Frontiers in Psychology, 13, 954828.

[31] Huang, Y. M., Hsieh, M. Y., & Usak, M. (2020). A multi-criteria study of decision-making proficiency in student's employability for multidisciplinary curriculums. Mathematics, 8(6), 897.

[32] Hanmei Qu. (2025). Promoting Undergraduate Innovation and Entrepreneurship Practice Through Educational Reform on Finance. Exploration of Educational Management,3(5),