



Analysis of the mechanism of digital empowerment to promote the practical ability of college students' innovation and entrepreneurship education

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SUMMARY: *In order to alleviate the current employment pressure of undergraduate learners and promote the orderly social production, this paper digitizes the I&E education in colleges and universities, reforms the curriculum system of I&E education in colleges and universities and introduces the PBL teaching theory, and applies the digitized teaching mode based on PBL to the I&E education, which is aimed at enhancing the employment ability of undergraduate learners. This paper proposes the implementation approach of I&E education in digitalized colleges and universities, and tests the underlying mechanism role of the method of this paper with teaching experiments. The innovation and entrepreneurship practice ability of subjects in the experimental group and the control group did not differ significantly before the experiment ($\text{sig} > 0.05$). After the experiment, the score difference of each dimension between the two groups widened to 10 points above and below, and the innovation and entrepreneurship practice ability of the experimental group was much higher than that of the control group, and the difference of each dimension was significant ($\text{sig} < 0.05$). The intra-group difference between the experimental group before and after the experiment is significant ($\text{sig} < 0.05$), and all dimensions have been improved more substantially, while the control group basically remains the same ($\text{sig} > 0.05$). In this paper, the I&E education implementation approach of digitalized colleges and universities has a significant positive effect on improving undergraduate learners' innovation and entrepreneurship practice ability.*

KEYWORDS: *digital construction; PBL; innovation and entrepreneurship; practical competency; underlying mechanism effect*

1 Introduction

With the rise of digital technologies such as the Internet, big data, artificial intelligence, cloud computing and blockchain, traditional industries are accelerating their transformation towards digitization, intelligence and convergence, and new industries, new modes and new business forms are flourishing [1-3]. Taking digitalization as an opportunity, countries around the world have released national-level education digitalization strategies, and the cultivation of digital talents with digital thinking, digital literacy, and numerical skills has become an important trend of education reform in countries around the world [4, 5]. Under the environment of the new

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digital era, it is the inherent demand of colleges and universities to comply with the trend of the digital era and promote the digital transformation of I&E education [6].

The traditional I&E education model often focuses on the teaching of theoretical knowledge and the training of basic skills, while there are obvious deficiencies in practical teaching, personalized learning, and the cultivation of innovation and entrepreneurship [7, 8]. In addition, with the rapid development of digitalization technologies such as artificial intelligence, big data, cloud computing, etc., the traditional education model gradually reveals its limitations in resource allocation, teaching methods, and assessment of learning effects, making it difficult to fully meet the needs of I&E education in the new era [9-12]. The reform of I&E education model empowered by digitalization is a key link to promote the modernization of education. Through the introduction of digital technology, intelligent management and optimal allocation of educational resources can be realized, and the efficiency and effect of education and teaching can be improved [13, 14]. At the same time, digital technology can also provide richer, more diverse and personalized learning resources and tools for I&E education, and promote the double improvement of educational equity and quality [15-17]. Therefore, it is of great significance to study the digital transformation implementation approach of I&E education to enhance the quality of digital entrepreneurship talent cultivation and support the development of digital economy.

The article digitizes the personality of I&E education course sports in colleges and universities, and realizes the transformation of I&E education system in colleges and universities through digital construction. Secondly, the concept of project-based teaching is introduced to construct a digital teaching mode of digital innovation and entrepreneurship based on PBL. By exploring the relationship between I&E education and undergraduate learners' employability, the implementation approach of I&E education in digitalized colleges and universities is proposed, with a view to improving students' innovation and entrepreneurship practice ability and employability. Teaching experiments are designed to test whether the digital college I&E education implementation approach of this paper improves students' innovation and entrepreneurship practice ability. The innovation and entrepreneurship practice ability of the subjects in the experimental group and the control group is tested before and after by dimensions, and the test data are compared between and within groups and the significance is verified.

2 Implementation approach of I&E education in Digitalized Colleges and Universities

2.1 Digitalization construction implementation approach of I&E education curriculum system in colleges and universities

The construction of I&E education curriculum system is a fundamental work with the times, colleges and universities should take the initiative to cope with the challenges brought by the development of education digitalization, face up to the current problems, innovate and seek changes, and constantly accelerate the digital construction of I&E education curriculum system to continuously enhance the sense of access and satisfaction of teachers and students.

(1) Make good use of digital thinking to change the concept of the curriculum

In the digital era, colleges and universities must take human education as the main line and make good use of digital thinking to update and change the concept of innovation and entrepreneurship courses in the digital era. Specifically, first, the leadership team of colleges and universities should make clear the curriculum of digital construction, integrate the I&E

education courses into the overall situation of digital development, incorporate into the overall planning of the school curriculum reform, and take measures to promote the construction of digital technology-enabled courses. Secondly, the management department of innovation and entrepreneurship curriculum construction should work on the application of digital technology, enhance the business acumen and development agility of information technology, promote the business dataization of curriculum, accelerate the integration of digitization in innovation and entrepreneurship curriculum, and build a secure technical line of defense. Thirdly, innovation and entrepreneurship educators should fully understand the urgency and necessity of digitization, continuously explore the inherent nurturing advantages and value of digital education, better reshape the understanding of digital technology application in terms of the objectives, connotations and boundaries of I&E education curricula, and deepen the understanding of the innovation and development of digital technology in terms of curricula settings, contents, subjects and modes.

(2) Empowering digital construction and innovating curriculum teaching methods

The key to adapting the construction of innovation and entrepreneurship curriculum system to digital education lies in the innovation of teaching methods. First, it is necessary to pay attention to the teaching of comprehensive courses of I&E education. Colleges and universities should make full use of digital technology to reshape and integrate knowledge in management, accounting, political science, economics and other disciplines, promote curriculum research and development in a scientific and orderly manner, and then effectively integrate into the main framework of I&E education to form a comprehensive curriculum syllabus, so that students can form digital thinking and comprehensive development of comprehensive ability. Second, it is necessary to build courses at a deep level from the perspective of students' professional fields, and reasonably use digital technology to analyze the convergence of professional education and I&E education, so that students' innovation awareness, entrepreneurial opportunities and entrepreneurial projects can be fully cultivated in the professional fields they have studied. The third is to use the project as a bridge to guide students to practical learning, realize the integration of "teaching, learning, doing, and innovation" based on students' interests, and build innovation and entrepreneurship "practical courses, practical training, digital technology empowerment, project incubation" and other links and elements to form the integration of "knowledge and technology".

(3) Using digital technology to enrich course content

Colleges and universities can use digital technology to accurately analyze the fit between I&E education course modules and students' actual needs, so as to form a well-defined course content and make preparations for adapting to the learning of students at all levels. According to the accurate analysis and interpretation of students' needs in innovation and entrepreneurship awareness, innovation and entrepreneurship ability, innovation and entrepreneurship practice and other aspects by digital technology, the content of I&E education courses in colleges and universities can be divided into innovation and entrepreneurship basic courses, enhancement courses, practice courses and practical training courses. The basic courses take all students as educational objects, implement students' innovative ideas, entrepreneurial choices, and innovative and entrepreneurial understanding in the digital era, and stimulate students' interest in innovative and entrepreneurial learning.

(4) Enriching curriculum resources through digital transformation

Through digital construction and open sharing, colleges and universities can give full play to the advantages of innovation and entrepreneurship course resources, enhance the quality and effect of teaching, and better promote the creation of a digitally connected learning atmosphere. First, the establishment of a unified platform and standards, colleges and universities should increase investment in the establishment of digital resource platforms,

timely capture the resources and information of cutting-edge courses, unify the integration and optimization of course resources, and enhance the usability and operability of resources. Secondly, the dynamic adjustment of curriculum resources can use big data and cloud computing to analyze the problems existing in the curriculum resources, teaching mode and practice platform of I&E education, find out the realistic implementation approach to promote the curriculum reform of I&E education, nurture the innovation and entrepreneurship culture, accelerate the construction of innovation and entrepreneurship teachers, and promote the sustainable development of I&E education. Thirdly, to integrate students' learning resources, colleges and universities can connect to the mobile device side of the campus network to provide students with high-quality learning resource information accessible by mobile device terminals at anytime and anywhere.

2.2 Digital teaching mode construction based on PBL

Project-based teaching has achieved wide recognition and research application [18, 19], innovation and entrepreneurship course as a course to cultivate comprehensive knowledge, ability and quality, its high degree of theoretical and practical combination is very suitable for project-based teaching. This paper combines the characteristics of innovation and entrepreneurship courses offered in our university, focuses on the educational changes under the digital background, proposes the overall construction of the teaching mode of innovation and entrepreneurship courses, and puts forward the idea of comprehensive design from three main aspects, namely, teaching environment, teaching form, and teaching method, as shown in Figure 1. It aims to reach the organic combination of digitalization, PBL, innovation and entrepreneurship, realize the main line of practical innovation, the integration of theory and practice as the core, and ultimately realize the goal of cultivating innovative talents in the context of digitalization.

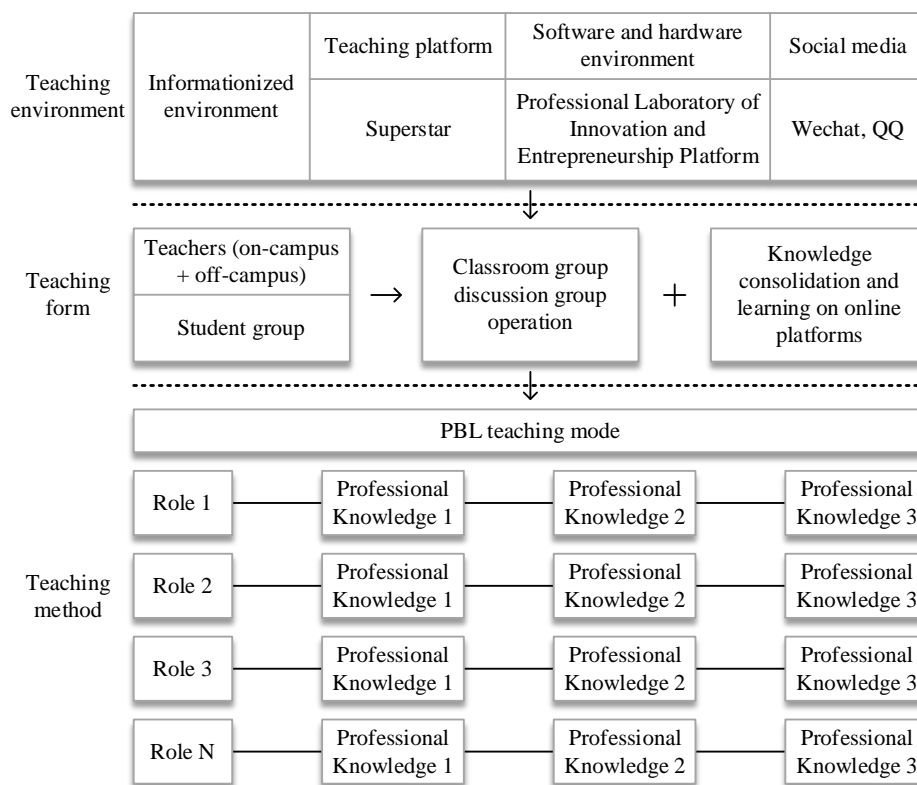


Figure 1: Construction of digital teaching mode based on PBL

Teaching environment is the basis for the realization of digital teaching and the carrier for the implementation of teaching practice. Combined with the actual situation of our school, the Super Star Learning Platform is selected for the construction of the theoretical system and the presentation of the content, and at the same time, in order to present the process management of the practical materials as well as the archiving of the complete set of learning materials, it is set as the storage carrier for the practical process materials and the ending materials. The practical training platform relies on the object simulation place provided by the experiment center and the comprehensive simulation practice platform for innovation and entrepreneurship to carry out practical projects combining reality and reality. In order to ensure the immediate notification of information, the WeChat group or QQ group needed for course teaching is established synchronously for online communication and interaction.

The change of teaching form is the key to adapt to the digital environment. First of all, the change of faculty structure is carried out. In terms of teacher composition, build a combination of on-campus and off-campus industry-teaching fusion faculty to jointly carry out the development of theoretical and practical knowledge of the content of the practice project, and jointly develop the knowledge lectures and practical guidance to realize that the theoretical knowledge is close to the ground, and the practical content is connected to the society. Secondly, it emphasizes students' autonomy and group learning. Students free consultation, random combination, the formation of 6-8 professional cross group for research and discussion, based on the role and knowledge, the members of the group independently of the theoretical knowledge and centralized seminars, and ultimately combined with the need to carry out practice simulation operations, based on simulation decision-making results instructors for targeted guidance. Digital resources are mainly used for theoretical knowledge learning and virtual practice, emphasizing students' "learning", while offline venues are mainly used for the reality of real scenarios and team results discussion and reporting, focusing on students' "practice".

Through the projectization of teaching methods, a number of theoretical knowledge points can be formed according to the students' professional characteristics and simulation needs, as well as the practical points combined with the characteristics of the post, forming a circular underlying mechanism of "learning by doing, practicing by learning, and doing by practicing". Based on the project-based professional training, a number of virtual enterprises will be formed to form a business community, simulating and rehearsing various real business situations, and promoting the application of project-based teaching in innovation and entrepreneurship courses.

2.3 Implementation approach of Innovative Entrepreneurship Education to Help enhance Undergraduate learners' Employability

(1) Improving the education system and institutions

1. Optimize the curriculum. Colleges and universities should optimize the curriculum of innovation and entrepreneurship according to market demand and students' characteristics, and increase the proportion of practical courses and interdisciplinary courses. For example, courses such as entrepreneurship practice, innovation design and interdisciplinary comprehensive practice can be offered to cultivate students' practical competency and interdisciplinary thinking. At the same time, colleges and universities should also focus on updating and innovating the content of the courses, introducing the latest innovation and entrepreneurship concepts and technologies in a timely manner, and improving the practicality and foresight of the courses.

2. Strengthen the construction of faculty. Colleges and universities should strengthen the construction of I&E education faculty, introduce teachers with rich experience in innovation

and entrepreneurship, and at the same time conduct I&E education training for existing teachers to enhance their innovation and entrepreneurship teaching ability and practical guidance ability. For example, entrepreneurs and entrepreneurs can be invited to serve as part-time teachers to teach students practical innovation and entrepreneurship experience and skills. At the same time, colleges and universities should also encourage teachers to participate in innovation and entrepreneurship practice activities to enhance their practical competency and innovative spirit.

3. Reasonable allocation of educational resources. Colleges and universities should reasonably allocate educational resources for innovation and entrepreneurship, increase investment in I&E education, and enhance hardware facilities and software environment for I&E education. For example, they can build innovation and entrepreneurship laboratories, incubation bases and other practice platforms to provide students with a good practice environment. At the same time, colleges and universities should also strengthen cooperation with enterprises and the society, and strive for more social resources to support the development of I&E education.

(2) Strengthen practice guidance and support

1. Innovative practice teaching methods. Colleges and universities should reform the practical teaching methods of I&E education, and make full use of new media technology, such as the Internet, big data, artificial intelligence, etc., to carry out innovation and entrepreneurship practical teaching. For example, online simulation of entrepreneurship and virtual practice can be used to provide students with richer and more diverse practice opportunities. At the same time, colleges and universities should also strengthen the guidance of practice teaching, establish a professional practice instructor team, and provide students with full practice guidance and help.

2. Establish the practice guidance system. Colleges and universities should establish a perfect innovation and entrepreneurship practice guidance system, including practice project declaration, practice process management, practice results evaluation and other links to standardize the management of innovation and entrepreneurship practice. For example, a practice project library can be set up to provide students with a rich selection of practice projects.

3. Strengthen the cooperation between schools and enterprises. Colleges and universities should strengthen cooperation with enterprises, establish a long-term underlying mechanism for school-enterprise cooperation, and realize resource sharing and complementary advantages. For example, they can cooperate with enterprises to establish internship bases, innovation and entrepreneurship incubation bases and other practice platforms to provide students with practice opportunities and entrepreneurial support.

(3) Strengthen the construction of teachers and evaluation underlying mechanism

1. enhance the innovation and entrepreneurship ability of teachers. Colleges and universities should strengthen the training and cultivation of teachers of I&E education to enhance their innovation and entrepreneurship ability and practical guidance ability. For example, teachers can be organized to participate in innovation and entrepreneurship training courses, seminars and other activities to learn advanced innovation and entrepreneurship concepts and methods.

2. enhance the evaluation underlying mechanism. Colleges and universities should enhance the evaluation underlying mechanism of I&E education, establish a scientific and reasonable evaluation index system, and focus on the evaluation of students' practical competency. For example, students' innovation and entrepreneurship practice results and project implementation effects can be incorporated into the evaluation index system to comprehensively evaluate students' innovation and entrepreneurship ability.

3 Analysis of the role of the underlying mechanism

In order to examine the impact of the innovative entrepreneurship education implementation approach of digitalized colleges and universities proposed in this paper on students' innovative and entrepreneurial practice ability, two classes in W colleges and universities were randomly selected as the experimental subjects of this paper, and were divided into experimental group and control group. The experimental group implements the innovative entrepreneurship education method of digitalized colleges and universities in this paper, while the control group carries out the innovative entrepreneurship course education according to the traditional way. Through the comparison before and after the teaching experiment, test whether the innovative entrepreneurship education implementation approach of this paper's digitalized colleges and universities has effectiveness.

3.1 Analysis of innovation and entrepreneurship practice ability between groups before and after the experiment

3.1.1 Pre-experimental intergroup innovation and entrepreneurship practice skills

Pre-testing is a part of testing students' levels in various aspects before the experiment, and the analysis of pre-testing data can help the educational subject to grasp the students' original practical competency. This test was conducted through a Likert scale questionnaire to understand various aspects of students' innovative thinking and cognitive ability, business knowledge and operational ability, resource integration and execution ability, teamwork and leadership, digitalization and technology application ability, psychological quality and risk-taking ability. The questions in the pre-measurement form avoided the old stereotypes, so that the questions in the questionnaire could not only collect relevant information, but also help students to recognize and reflect on their own learning status so as to make appropriate adjustments for independent learning monitoring. The pre-measurement form was distributed in the 1st teaching week, the target was all the members of the two classes, and the method of distributing paper questionnaires offline was used, and 97 questionnaires were distributed and 97 were recovered in the end.

The results of innovation and entrepreneurship practice ability of the experimental group and the control group before the experiment are shown in Table 1. From the results of Table 1, the mean value of the subjects in the experimental group in the six dimensions of innovation and entrepreneurship practice ability is lower than that of the control group, but the difference between the scores of each dimension of the two groups is not more than 0.5, which shows that there is not a big gap between the two groups in innovation and entrepreneurship practice ability.

In order to understand whether the two groups of subjects are significant in entrepreneurial innovation practice ability, the scores of the two groups on the 6 dimensions of entrepreneurial innovation practice ability are examined by the method of independent samples t-test, and the results of the test are shown in Table 2, with A~F representing innovative thinking and cognitive ability, business knowledge and operation ability, resource integration and execution ability, teamwork and leadership, and digitalization and technological application ability, respectively, Psychological quality and risk-taking ability. As shown in Table 2, the significance of the experimental group and the control group in the dimensions of innovation and entrepreneurship practice ability is greater than 0.05, and the 95% confidence intervals of each dimension contain 0. It can be seen that before the experiment, there is no significant difference in the entrepreneurship and innovation practice ability of the two groups of subjects.

Table 1: Student innovation and entrepreneurship practice ability before experiment of two groups

Dimension	Experimental		Control	
	Mean	SD	Mean	SD
Innovative thinking and cognitive ability	12.25	3.045	12.44	2.912
Business knowledge and operational ability	12.88	3.289	13.29	3.332
Resource integration and execution ability	13.82	3.627	14.07	3.006
Team collaboration and leadership	14.02	3.682	14.29	3.345
Digital and technical application ability	13.61	3.786	13.79	3.321
Psychological quality and risk capability	13.47	4.138	13.59	2.659

Table 2: Independent sample T test results of two groups before experiment

		Levine variance equivalence test		Mean equivalence t test						
		F	Sig	t	df	sig (2-tailed)	MD	SED	95% CI	
									Upper	Lower
A	Assumed	0.685	0.347	0.511	95	0.652	3.265	0.745	-1.262	2.625
	Unassumed			0.511	94.251	0.652	3.265	0.745	-1.262	2.625
B	Assumed	0.715	0.386	0.869	95	0.702	3.745	0.812	-1.635	2.385
	Unassumed			0.869	94.652	0.702	3.745	0.812	-1.635	2.385
C	Assumed	0.821	0.452	0.587	95	0.816	3.586	0.769	-0.952	2.745
	Unassumed			0.587	94.365	0.816	3.586	0.769	-0.952	2.745
D	Assumed	0.693	0.496	0.623	95	0.675	3.128	0.775	-1.063	2.938
	Unassumed			0.623	94.175	0.675	3.128	0.775	-1.063	2.938
E	Assumed	0.358	0.506	0.526	95	0.342	3.542	0.748	-1.745	2.584
	Unassumed			0.526	94.388	0.342	3.542	0.748	-1.745	2.584
F	Assumed	0.498	0.617	0.489	95	0.483	3.442	0.726	-1.385	2.649
	Unassumed			0.489	94.068	0.483	3.442	0.726	-1.385	2.649

3.1.2 Post-experimental Intergroup Innovation and Entrepreneurship Practical Skills

The purpose of conducting the experimental post-test is to correspond with the pre-test to understand the status of the model application, and to provide a reference basis for the evaluation of the effect of the innovative entrepreneurship education implementation approach in the digitized colleges and universities in this paper. The results of innovation and entrepreneurship practice ability of the experimental group and the control group after the experiment are shown in Table 3. The independent sample T-test results of the innovation and entrepreneurship practice ability of the two groups after the experiment are shown in Table 4.

As can be seen from Table 3, the subjects in the experimental group are far beyond the control group in all dimensions of innovation and entrepreneurship practice ability, and the difference in the scores of each dimension between the two groups is about 10 points. From the independent sample T-test results in Table 4, the significance of each dimension in the two groups is less than 0.05, and the 95% confidence intervals do not contain 0, which indicates that the subjects in the two groups produced significant differences in innovation and entrepreneurship practice ability after the experiment.

Table 3: Student innovation and entrepreneurship practice ability after experiment of two groups

Dimension	Experimental		Control	
	Mean	SD	Mean	SD
Innovative thinking and cognitive ability	22.53	4.326	13.87	3.513
Business knowledge and operational ability	23.41	5.672	13.46	3.595
Resource integration and execution ability	24.73	5.323	14.47	3.323
Team collaboration and leadership	23.21	3.728	14.94	2.853
Digital and technical application ability	22.62	5.568	13.91	4.173
Psychological quality and risk capability	23.19	3.807	13.68	3.142

Table 4: Independent sample T test results of experimental groups after experiment

		Levine variance equivalence test		Mean equivalence t test						
		F	Sig	t	df	sig(2-tailed)	MD	SED	95% CI	
									Upper	Lower
A	Assumed	3.286	0.013	3.574	95	0.002	2.262	0.625	0.586	3.265
	Unassumed			3.574	93.625	0.002	2.262	0.625	0.586	3.265
B	Assumed	4.063	0.015	5.084	95	0.001	2.054	0.574	0.574	2.846
	Unassumed			5.084	94.284	0.001	2.054	0.574	0.574	2.846
C	Assumed	5.816	0.006	6.849	95	0.001	2.632	0.603	0.715	3.052
	Unassumed			6.849	94.087	0.001	2.632	0.603	0.715	3.052
D	Assumed	2.986	0.007	3.056	95	0.002	2.411	0.593	0.695	3.326
	Unassumed			3.056	93.544	0.002	2.411	0.593	0.695	3.326
E	Assumed	3.542	0.008	3.865	95	0.002	2.305	0.608	0.728	3.214
	Unassumed			3.865	94.674	0.002	2.305	0.608	0.728	3.214
F	Assumed	4.215	0.005	5.475	95	0.001	2.186	0.642	0.596	2.927
	Unassumed			5.475	94.128	0.001	2.186	0.642	0.596	2.927

3.2 Analysis of innovation and entrepreneurship practice ability within the group before and after the experiment

3.2.1 Innovative entrepreneurial practice ability before and after the experiment in the experimental group

The changes in six aspects, namely, innovative thinking and cognitive ability, business knowledge and operation ability, resource integration and execution ability, teamwork and leadership, digitalization and technology application ability, psychological quality and risk-taking ability, before and after the experiment of the experimental group are compared to examine the changes in the innovation and entrepreneurship practice ability of the experimental group subjects. The results of the comparison of innovation and entrepreneurship practice ability of the experimental group before and after the experiment are shown in Table 5. The results of the independent sample t-test of the experimental group's innovative entrepreneurial practice ability before and after the experiment are shown in Table 6.

Observing Table 5 and Table 6, it can be found that the experimental group's innovative thinking and cognitive ability, business knowledge and operation ability, resource integration and execution ability, teamwork and leadership, digitalization and technology application ability, psychological quality and risk-taking ability increased by 10.28, 10.53, 10.91, 9.19, 9.01,

and 9.72 after the experiment compared to before the experiment, and the dimensions of the The significance is less than 0.05, and the innovation and entrepreneurship practice ability of the subjects in the experimental group has been significantly improved.

Table 5: Innovation and entrepreneurship practice ability of experimental group

Dimension	Before		After	
	Mean	SD	Mean	SD
Innovative thinking and cognitive ability	12.25	3.045	22.53	4.326
Business knowledge and operational ability	12.88	3.289	23.41	5.672
Resource integration and execution ability	13.82	3.627	24.73	5.323
Team collaboration and leadership	14.02	3.682	23.21	3.728
Digital and technical application ability	13.61	3.786	22.62	5.568
Psychological quality and risk capability	13.47	4.138	23.19	3.807

Table 6: Independent sample T test results of experimental group

		Levine variance equivalence test		Mean equivalence t test						
		F	Sig	t	df	sig(2-tailed)	MD	SED	95% CI	
									Upper	Lower
A	Assumed	7.068	0.008	6.523	95	0.001	2.362	0.623	0.596	3.623
	Unassumed			6.523	94.263	0.001	2.362	0.623	0.596	3.623
B	Assumed	7.842	0.006	6.054	95	0.001	2.745	0.614	0.574	3.425
	Unassumed			6.054	94.085	0.001	2.745	0.614	0.574	3.425
C	Assumed	8.748	0.005	7.815	95	0.001	2.485	0.658	0.623	2.846
	Unassumed			7.815	93.886	0.001	2.485	0.658	0.623	2.846
D	Assumed	5.184	0.007	5.062	95	0.003	2.952	0.627	0.702	2.945
	Unassumed			5.062	93.974	0.003	2.952	0.627	0.702	2.945
E	Assumed	3.542	0.006	2.546	95	0.003	2.348	0.634	0.684	3.074
	Unassumed			2.546	94.835	0.003	2.348	0.634	0.684	3.074
F	Assumed	6.348	0.009	5.745	95	0.002	2.277	0.629	0.593	2.945
	Unassumed			5.745	94.571	0.002	2.277	0.629	0.593	2.945

3.2.2 Innovative entrepreneurial practice ability of control group before and after the experiment

The control group adopts the same testing method, and the results of the comparison of innovative entrepreneurial practice ability of the control group before and after the experiment are shown in Table 7. The results of independent samples t-test of innovative entrepreneurial practice ability of the control group before and after the experiment are shown in Table 8.

From the results of Table 7 and Table 8, the score difference between the control group before and after the experiment in each dimension of innovation and entrepreneurship practice ability is not more than 1.5 points, and the significance of each dimension is greater than 0.05, which can be seen that the innovation and entrepreneurship practice ability of the control group of subjects did not produce obvious changes in this from experiment.

Table 7: Innovation and entrepreneurship practice ability of control group

Dimension	Before		After	
	Mean	SD	Mean	SD
Innovative thinking and cognitive ability	12.44	2.912	13.87	3.513
Business knowledge and operational ability	13.29	3.332	13.46	3.595
Resource integration and execution ability	14.07	3.006	14.47	3.323
Team collaboration and leadership	14.29	3.345	14.94	2.853
Digital and technical application ability	13.79	3.321	13.91	4.173
Psychological quality and risk capability	13.59	2.659	13.68	3.142

Table 8: Independent sample T test results of control group

		Levine variance equivalence test		Mean equivalence t test						
		F	Sig	t	df	sig(2-tailed)	MD	SED	95% CI	
									Upper	Lower
A	Assumed	0.968	0.426	0.956	95	0.685	3.286	0.726	-0.265	1.635
	Unassumed			0.956	93.526	0.685	3.286	0.726	-0.265	1.635
B	Assumed	0.423	0.589	0.432	95	0.312	3.475	0.715	-0.845	1.936
	Unassumed			0.432	93.714	0.312	3.475	0.715	-0.845	1.936
C	Assumed	0.841	0.723	0.684	95	0.542	3.694	0.746	-1.035	2.513
	Unassumed			0.684	93.684	0.542	3.694	0.746	-1.035	2.513
D	Assumed	0.866	0.826	0.723	95	0.593	3.815	0.736	-1.471	2.864
	Unassumed			0.723	94.052	0.593	3.815	0.736	-1.471	2.864
E	Assumed	0.321	0.842	0.305	95	0.356	3.674	0.754	-0.899	2.874
	Unassumed			0.305	94.106	0.356	3.674	0.754	-0.899	2.874
F	Assumed	0.211	0.963	0.268	95	0.245	3.711	0.742	-1.104	3.052
	Unassumed			0.268	93.688	0.245	3.711	0.742	-1.104	3.052

4 Conclusion

The author tries to empower I&E education in colleges and universities through digitalization in order to enhance the innovation and entrepreneurship practice ability of undergraduate learners, and test the actual effect of this paper's digital I&E education implementation approach in colleges and universities through teaching experiments.

Undergraduate learners' innovation and entrepreneurship practice ability is divided into six dimensions: innovative thinking and cognitive ability, business knowledge and operation ability, resource integration and execution ability, teamwork and leadership, digitalization and technology application ability, psychological quality and risk-taking ability. At the beginning of the teaching experiment, the score difference between the subjects in the experimental group and the control group in the six dimensions was no more than 0.5 points, and none of them had significant differences. After the experiment, the difference between the experimental group and the control group in each dimension widened to about 10 points, and the differences in each dimension showed significance. The experimental group significantly improved about 10 points in each dimension after the teaching experiment, while the control group did not see any significant changes, which shows that this paper's digital college I&E education implementation approach can effectively enhance undergraduate learners' innovation and entrepreneurship practice ability.

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