

Thinking on the Strategy of Improving College Students' Innovation and Entrepreneurship Ability under the Background of Digitalization

Xueyi Wang^{*a}, Hao Huang^b, Xuanyu Liu^c, Jiachen Hao^d, Jingming Li^e, Jinyang Liu^f,
Lan Wang^g

{^a3010325126@qq.com, ^b1663958904@qq.com, ^c1694928144@qq.com, ^d3036615449@qq.com,
^e977876455@qq.com, ^f1257338619@qq.com, ^g3425018919@qq.com}

Xi'an Polytechnic University, Xi'an, 710600, China

Abstract. Under the background of "mass entrepreneurship and innovation", colleges and universities need to combine the needs of The Times to cultivate the complex talents with innovative consciousness and entrepreneurial ability. Digital education provides a new opportunity for the cultivation of innovative and entrepreneurial talents. This paper analyzes the difficulties of the development of innovation and entrepreneurship education in universities, and discusses the development strategies of improving college students' innovation and entrepreneurship ability.

Keywords: Digital education; Innovation and entrepreneurship ability; Education effect; Teacher competence

1 Introduction

With the advent of digital transformation of higher education, how to empower innovation and entrepreneurship education and how to improve the innovation and entrepreneurship ability of college students through digitalization are the problems that need to be explored urgently. This paper studies under the background of digital college students' innovative entrepreneurial ability promotion path and countermeasures, build college education digital how to improve college students' innovative entrepreneurial ability path model, and through the questionnaire data validation model, finally provide countermeasures to improve college students' innovative entrepreneurial ability, has important theoretical value and practical significance.

2 The relevant background and development status of educational digitization

2.1 Digitalization of higher education

China's higher education has gone through three stages in teaching digitalization: 2013-2015, for the construction stage of MOOCs, its core is focusing on learning; 2016-2019, for the hybrid teaching stage, its core is to promote interaction; 2020-2022, for the online and integrated teaching stage, its core is to obtain data. In the future, we should consciously

analyze, mine and apply the data to achieve a more intelligent education.

The core of the digital transformation of education includes knowledge and data-driven, whose data is the foundation, and collaborative sharing is the key. Knowledge-driven means that students learn knowledge, cultivate ability and shape core values in school. The purpose of data-driven is to teach students in accordance with their aptitude, cooperate and share them, and provide more open and shared education by strengthening data sharing and data exchange between platforms. The digital transformation of higher education has become the focus of the current higher education reform, and also the research focus of realizing the sustainable development of higher education.

2.2 Innovation and entrepreneurship education in colleges and universities

Innovation and entrepreneurship education is the key for countries to enhance the innovation ability of college students, promote regional economic growth and technological change, and enhance national competitiveness. However, due to the limitations of entrepreneurs' innovation and entrepreneurship ability, entrepreneurs still face great difficulties, leading to a great risk of entrepreneurship; in addition, the data show that the current employment situation in China is not good, the employment pressure of college graduates is greater. Therefore, in the face of the current situation of entrepreneurship and employment, strengthening the innovation and entrepreneurship education in colleges and universities, improving the innovation and entrepreneurship ability of college students and enhancing their entrepreneurial willingness will become one of the important means to ease the pressure of entrepreneurship and employment and promote economic development.

3 Innovation and entrepreneurship ability improvement path model hypothesis

The main content of this paper is to study the concrete forms of the digitalization of college education, to construct the path model of the digitalization of college education, and to verify the path model of the digitalization of college education to improve the innovation and entrepreneurship ability of college students. Based on the previous relevant literature research, this project puts forward five hypotheses, believing that the digitalization of university education improves the college students' innovation and entrepreneurship ability by providing and creating data, providing and creating knowledge, resource sharing and resource coordination, and also promotes the innovation and entrepreneurship ability of college students by improving the competence of innovation and entrepreneurship teachers.

The model framework of this survey is shown in Figure 1:

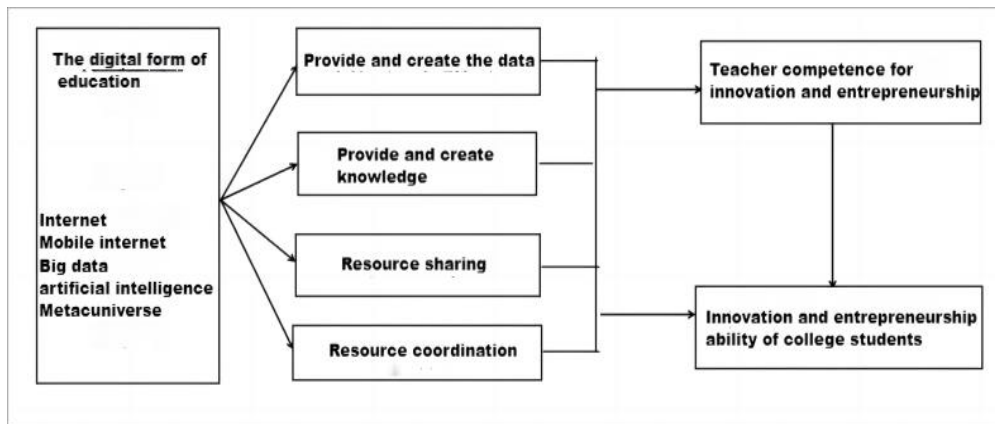


Figure 1 Framework diagram of the survey model

4 Improve the effect of digital education and verify the model

4.1 Questionnaire design and distribution

On the basis of the understanding of literature research and practice, this paper designs the questionnaire, and takes college students as the survey object to conduct the survey. After the questionnaire was recovered, a total of 202 valid questionnaires were obtained after removing the unqualified sample. The validity and reliability analysis of the questionnaire data was performed using Excel and SPSS statistical software.

4.2 analysis of validity

Validity is an important indicator of the effectiveness of reaction measurement, which is the degree to which the test scale can actually measure the characteristics to be measured. The scale used in this questionnaire covers the connotation of the variables. Exploratory factor analysis of the ability of learning items using digital technology and tools was conducted. As shown in Table 1, the KMO value of the variable teacher-student interaction was $0.891 > 0.6$, and the cumulative interpretation rate was $91.855\% > 85\%$. It indicates that the variable items were suitable for factor analysis, and each factor load was above 0.85, indicating that the ability of learning using digital technology and tools has good validity.

Table 1 Learning ability factor analysis using digital techniques and tools

variable	Question item	factor loading
KMO = 0.891 Cumulative interpretation = 91.855% $\alpha=0.05$	1. I can well use the online platform for learning (such as China University MOOC, Xuetang Online, Super Star Erya, netease Open Course and other online learning platforms)	0.914
	2. I can well use some online education methods well (such as: Tencent conference, rain classroom, online classroom and other online teaching methods, etc.)	0.898

	3. I can use some social media well for digital learning (such as wechat, QQ, etc.)	0.882
	4. I can use virtual reality and augmented reality technology very well (such as: VR, AR, meta-universe, etc.)	0.900
	5. I can use some network collaboration tools very well (such as: Kingsoft collaboration, Tencent Document, etc.)	0.999

Exploratory factor analysis was conducted on the innovation and entrepreneurship education path, and the results are shown in Table 2 below: the KMO value of creativity was $0.868 > 0.6$, the cumulative interpretation rate was $93.331\% > 85\%$, and the factor load of each item was greater than 0.9; indicating that each item had a high interpretation of variables. It shows that the digitalization of university education improves the innovation and entrepreneurship of college students 'ability of innovation and entrepreneurship by providing and creating data, providing and creating knowledge, sharing resources and coordinating resources, and promotes college students' innovation and entrepreneurship ability by improving the competence of innovation and entrepreneurship teachers.

Table 2 Analysis of the improvement path factors of innovation and entrepreneurship education

variable	Question item	factor loading
The path to improve innovation and entrepreneurship education KMO= 0.868 Cumulative interpretation = 93.331% $\alpha=0.05$	1. The use of digital technology in innovation and entrepreneurship education can provide and create a lot of data	0.953
	2. The use of digital technology in innovation and entrepreneurship education can provide and create a lot of knowledge	0.939
	3. The use of digital technology in innovation and entrepreneurship education can share many resources	0.924
	4. The use of digital technology in innovation and entrepreneurship education can improve the ability of innovation and entrepreneurship teachers	0.918

After exploratory factor analysis of learning behavior variables in innovation and entrepreneurship education, the results are shown in Table 3: the KMO value of knowledge skills was $0.841 > 0.6$, and the cumulative interpretation rate was $87.436\% > 85\%$, indicating that each item is suitable for factor analysis, and the factor load of each item is greater than 0.8, indicating that each item has a high interpretation degree of the variable. It shows that the learning behavior in innovation and entrepreneurship education has a good validity.

Table 3 Analysis of learning behavior ability factors for innovation and entrepreneurship

variable	Question item	factor loading
Innovation and entrepreneurs hip learning behavior	1. I study innovation and entrepreneurship courses carefully	0.906
	2. I actively participate in enterprise practice or internship / social practice	0.872
	3. I actively participate in innovation and entrepreneurship competitions / business simulation	0.861

KMO= 0.841 Cumulative interpretation = 87.436% $\alpha=0.05$	4. I actively participate in innovation and entrepreneurship projects / projects with digital technology to improve the innovation and entrepreneurship ability of teachers	0.857
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Exploratory factor analysis was conducted on the improvement effect of innovation and entrepreneurship education ability. The results are shown in Table 4: the KMO value of knowledge skills was $0.968 > 0.6$, and the cumulative interpretation rate was $87.614\% > 85\%$, indicating that each item was suitable for factor analysis, and the factor load of each item was greater than 0.8, indicating that each item had a high interpretation degree of the variable. It shows that the effect of ability improvement in innovation and entrepreneurship education has a good validity.

Table 4 Analysis of the improvement factors of innovation and entrepreneurship education ability

variable	Question item	factor loading
The path to improve innovation and entrepreneurship education KMO= 0.968 Cumulative interpretation = 87.614% $\alpha=0.05$	1. Professional knowledge has been improved	0.954
	2. Improve your professional skills	0.951
	3. Research and exploration, and the ability has been improved	0.950
	4. Improved the logical thinking ability	0.948
	5. Improve the expression ability of the language and words	0.943
	6. Increased research knowledge and improved research ability	0.943
	7. Improve your interpersonal communication skills	0.939
	8. Cultivate and strengthen the awareness and ability of innovation	0.937
	9. Cultivate the entrepreneurial spirit, entrepreneurial consciousness and entrepreneurial ability	0.935
	10. Cultivate the spirit of positive and enterprising and the pursuit of excellence	0.934
	11. Improved the ability of teamwork	0.933
	12. Have developed a rigorous and realistic attitude	0.929
	13. Has cultivated the spirit of bearing hardships and standing hard work	0.926
	14. Cultivate the consciousness of positive thinking and active learning	0.910
	15, and to foster an awareness of competition and cooperation	0.908

4.3 Reliability analysis

Reliability is an important measure of the stability of the measured results. It measures the quality of a test scale. The most commonly used method to test reliability is Cronbach's Alpha, and Cronbach's Alpha is the most widely used reliability indicator. When it is below 0.5, the reliability of the scale is not acceptable; when it is between 0.5 and 0.6, the reliability of the scale is unsatisfactory; when it is between 0.7 and 0.8, the reliability is acceptable; when it is between 0.8 and 0.9, the reliability is good; when it is greater than 0.9. Next, SPSS statistical analysis software will be used to process the data. The results are shown in Table 5 :

2Table 5 Reliability analysis

variable	Scale average after item items	Scale variance after removing the items	The corrected were correlated to total	Clone Bach Alpha after the deletion term
Professional expertise has been improved	49.72	321.532	.940	.989
Professional skills have been improved	49.69	322.739	.929	.989
Research and exploration capabilities have been improved	49.68	323.187	.925	.989
Improved the logical thinking ability	49.70	323.318	.914	.989
Improved the expression ability of the language and words	49.74	324.563	.897	.990
Increased the research knowledge, improve the research ability	49.70	322.643	.944	.989
Improve your interpersonal communication skills	49.75	324.936	.924	.989
Cultivate and strengthen the consciousness and ability of innovation	49.63	322.410	.946	.989
Cultivate the entrepreneurial spirit, entrepreneurial consciousness, entrepreneurial ability	49.67	322.305	.934	.989
Cultivate the positive and enterprising, the pursuit of excellence spirit	49.67	322.316	.942	.989
Improved the ability of teamwork	49.61	324.193	.923	.989
Developed a rigorous and realistic attitude	49.65	322.884	.928	.989
Cultivated the spirit of hard work	49.74	326.127	.894	.990
Cultivate the consciousness of positive thinking and active learning	49.65	322.119	.934	.989
Cultivate a sense of competition and cooperation	49.63	323.046	.918	.989

According to the above table, the values of clone Bach Alpha after the deletion of the above 15 indicators are greater than or equal to 0.9, so the 15 indicators should be retained, indicating that each indicator has good reliability.

5 Countermeasures and suggestions

5.1 Strengthen the digital construction in the process of innovation and entrepreneurship

The construction of digital campus provides more opportunities and resources for innovation and entrepreneurship. By establishing a digital platform, students can easily access a variety of innovation and entrepreneurship information, such as policies, market trends, technology trends, etc. At the same time, the digital platform can also provide a platform for online communication, collaboration and sharing, promote the cooperation and communication among students, and help them better understand and master the principles and methods of innovation and entrepreneurship [1].

5.2 Strengthen the practicality of innovation and entrepreneurship education

Innovation and entrepreneurship education is not only the teaching of theoretical knowledge, but also the cultivation of students' practical ability and innovative thinking. Colleges and universities can organize various practical activities, such as entrepreneurship competition, entrepreneurship training, entrepreneurship practice, etc., to improve students' practical ability and innovation consciousness [2], so as to help students better understand and master the principles and methods of innovation and entrepreneurship, and enhance students' confidence and teamwork ability.

5.3 Strengthen school-enterprise cooperation

School-enterprise cooperation is a cooperation mode between universities and enterprises, which can provide students with more practical opportunities and resources. Through cooperation with enterprises, students can understand the actual needs and market trends of enterprises, so as to better understand and master the principles and methods of innovation and entrepreneurship, and obtain more employment opportunities and entrepreneurial support, so as to help students to better realize their career planning and entrepreneurial dreams [3].

5.4 We will establish and improve a practice platform for implementing innovation and entrepreneurship

The practice platform is the key to cultivate students' innovation and entrepreneurship ability. Colleges and universities can provide more practice opportunities and resources by establishing and improving practice platforms, such as entrepreneurship parks, innovation laboratories, and incubators, etc. These practice platforms can not only provide the students with opportunities to simulate the practice, but also promote the communication and cooperation between the students, and improve the students' innovation ability and teamwork ability. At the same time, the practice platform can also provide talent reserve and technical support for enterprises to promote economic development and social progress [4].

5.5 Improve the ability level of innovation and entrepreneurship teachers

Teacher is one of the key factors to cultivate students' ability of innovation and entrepreneurship. Colleges and universities can improve teachers' innovation and entrepreneurship ability through training and communication, so as to better guide students [5].

Under the background of digital campus construction, the above five ways are of great significance for cultivating the innovation and entrepreneurship ability of college students. By strengthening the construction of these aspects, the quality and effect of innovation and entrepreneurship education can be improved, and students can prepare for their future career. At the same time, these methods can also promote the reform of innovation and entrepreneurship educations in colleges and universities, improve the level of innovation and entrepreneurship educations in colleges and universities, and provide talent support for the national innovation-driven development strategy.

6 Conclusion

This paper constructs and tests the model of the path of digital education in colleges and universities to enhance the innovation and entrepreneurship ability of college students, discusses how to improve the innovation and entrepreneurship ability of college students from the perspective of digital education, and provides ideas and countermeasures for the improvement of the quality of innovation and entrepreneurship education in colleges and universities. It links the cutting-edge educational digital technology with the improvement of college students' innovation and entrepreneurship ability, and provides a new idea for the improvement of college students' innovation and entrepreneurship ability. At the same time, a variety of research methods, quantitative methods and qualitative methods are combined to conduct in-depth research ; using literature research, questionnaire survey, and SPSS software for data analysis, the research methods are more rigorous and in-depth, making up for the shortcomings of existing research. The research of this paper has important theoretical value and practical significance for colleges and universities to implement digital education, improve college students' innovation and entrepreneurship ability, and improve the quality of innovation and entrepreneurship education.

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