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*Retraction*

# Retracted: Construction of Virtual Simulation College Students Innovation and Entrepreneurship Platform Using Internet of Things Technology

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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[1] X. Wang and J. Li, "Construction of Virtual Simulation College Students Innovation and Entrepreneurship Platform Using Internet of Things Technology," *Mobile Information Systems*, vol. 2022, Article ID 7931417, 12 pages, 2022.

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*Research Article*

# Construction of Virtual Simulation College Students Innovation and Entrepreneurship Platform Using Internet of Things Technology



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IoT technology originated from the third scientific and technological revolution, which refers to the connection of objects and networks through information sensor devices according to an agreed protocol. It communicates and circulates information through the information dissemination medium during the connection process to achieve smart recognition, supervision, and other functions. The Internet of Things is to interconnect all items with the Internet through radio frequency identification, infrared sensors, global positioning systems, laser scanners, and other sensing equipment according to the agreed communication protocol. It is a kind of network that realizes intelligent identification, positioning, analysis, monitoring, and management. The development of virtualization technology promotes the development of educational computers, and the reform of basic education curriculum promotes the profound reform of science education. It is also an inevitable requirement for cultivating talents with scientific culture and innovation ability. Virtual simulation technology is the product of combining simulation technology and virtual reality technology on the basis of the rapid development of information technology such as multimedia technology, virtual reality technology, and network communication technology. This paper is aimed at studying the construction of a virtual simulation college student innovation and entrepreneurship platform based on the IoT technology. This paper takes college students as the research object, and according to the application characteristics of local higher education institutions, establishes a systematic training platform for college students' innovation ability to improve students' innovation and entrepreneurship ability. This paper shows that the proportion of students' innovative ability is as high as 56%, and the proportion of innovative activities organized by schools is as high as 70%. Students are generally not very motivated to innovate.

## 1. Introduction

With the development of economic globalization, humanity has moved into a knowledge-based economy. Science and technology have become the core of economic development. In recent years, the country has implemented the basic national policy of rejuvenating the country through science and education, followed by the increase of students and the expansion of college enrollment. Therefore, the current employment pattern urgently needs to reform higher education. With the continuous popularization of Internet of Things technology, the combination of educational means and Internet of Things technology has become a common phenomenon today. VR is another new teaching method after the emergence of intelligent teaching. Applying virtual reality technology to subject teaching is a hot issue at present. The use of virtual technology in the teaching and learning process can improve the innovation skills of university students.

For the country, it is conducive to cultivating innovative talents in line with the country's future strategic height. For the training of these college students, in addition to the

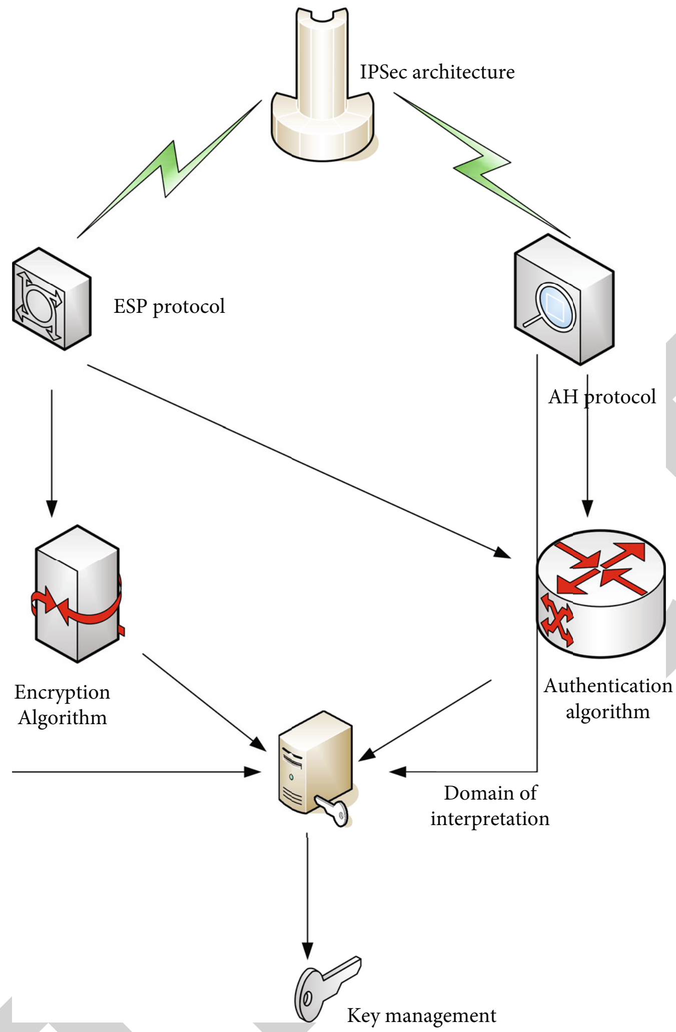


Figure 1: Virtual network framework structure diagram.



traditional teaching methods, through the innovation and entrepreneurship training program, the opportunities and proportions of practice are increased, and the students' interest in innovation and entrepreneurship is mentioned. For schools that carry the important responsibility of cultivating the success of young students in previous years, while following the teaching methods explored by the school over the years, they should also actively explore teaching methods that meet and conform to the requirements of the new era. It cultivates outstanding graduates who are more in line with the talent market. For individual students, it is beneficial to cultivate innovative and entrepreneurial thinking and to understand the operation of various functions in the workplace in advance.

This paper proposes to strengthen the training of innovation and entrepreneurship as the core ability of college students and establish the educational concept of "sustainable engineering concept." On the basis of developing university innovation ability, this paper provides some guidance for promoting the reform and construction of colleges and universities by discussing the innovative learning and teaching mode of college students.

## 2. Related Work

Popular business and public creativity are the current new development trends. Tai designed a college student innovation and entrepreneurship assistance system based on a complex adaptive system. The model framework as a component, usually called agent, aimed to establish a better information interaction environment, market resource channel expansion, and venture capital integration scheme for college students through this system, thereby realizing the expected development conditions and goals of innovation and entrepreneurship [1]. Nie analyzed machine learning-based economic function data. Its support vectors are very responsive to the selection of factors, the accuracy of which can be improved by parameters obtained through the use of hereditary methods. Through the application of big data skills and tools, he provided data support [2]. Barba-Sánchez and Atienza-Sahuquillo aimed to analyze the impact of entrepreneurial motivation on entrepreneurial intentions and to identify the role of entrepreneurship education in fostering entrepreneurship among engineers. The results show that the need for independence is a key factor

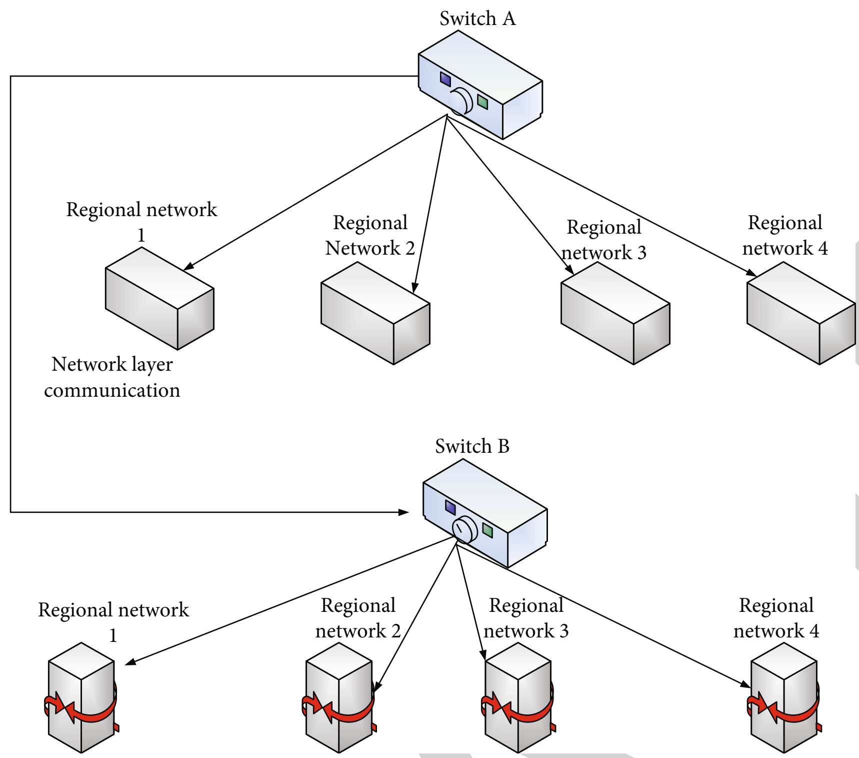


Figure 2: Working principle diagram of virtual network.



in the entrepreneurial intentions of future engineers [3]. Indeed, higher education institutions should be catalysts for the long-term development of an entrepreneurial culture. Innovative and entrepreneurial education models are timely, and this requires strong research initiatives. Rusok et al. proposed innovation and entrepreneurship education models and measurement tools and entrepreneurship frameworks suitable for different types of institutional settings and proposed practical ways and reliable methods for evaluating innovation and entrepreneurship success [4]. Although these theories have discussed the IoT technology and college students' innovation and entrepreneurship to a certain extent, the combination of the two is less and is not practical.

## 3. Platform Construction Methods

*3.1. Introduction to Virtual Technology.* In the 1960s, information technologists came up with a virtual technology aimed at making technical recommendations for efficient use of old computer equipment when computing blocks. By the 1990s, scientists had begun to explore how virtual technology could be used to solve some of the problems associated with the rapid growth of computer equipment, such as underutilization of resources, high costs, and fragility. So far, virtualization technology can realize functions such as expanding hardware capacity, integrating and dynamically assigning hardware resources, simplifying software reconfiguration process, and comprehensive background management by improving the capability of computing equipment. This greatly improves work efficiency [5, 6]. The technology takes computer technology as the core and combines computer graphics, computer vision, multimedia technology, simulation and artificial intelligence, and other disciplines to build a virtual simulation environment. It provides users with auditory, visual, and tactile simulations, making users feel like they are in a real environment. After years of development, virtualization technology continues to mature. This is also the most standardized technology we typically use when building data centers. Virtual technology is now used in many fields and is appreciated by companies and individuals. The functions and characteristics of virtual technology can be used to solve the challenges brought by resource allocation and rationalization, enterprise system management, etc. [7, 8]. In the field of education, virtual simulation technology can provide students with a realistic, interesting, and vivid learning environment, such as virtual classrooms, virtual laboratories, virtual simulation campuses, computer space travel, and CAI courseware. Figure 1 shows the structure of the virtual network framework.

The development of virtual simulation technology can be roughly divided into four stages. The first stage is called the predecessor stage. Inspired by animal flight, people rely on their rich imagination to promote the generation and development of simulation technology. The second stage is called the budding stage, which allows users to directly immerse themselves in the three-dimensional virtual world generated by the computer without going through the computer screen. The third stage is called the basic formation stage, which is mainly used for combat training of tank formations. The fourth stage is called the comprehensive development and application stage and determines the future

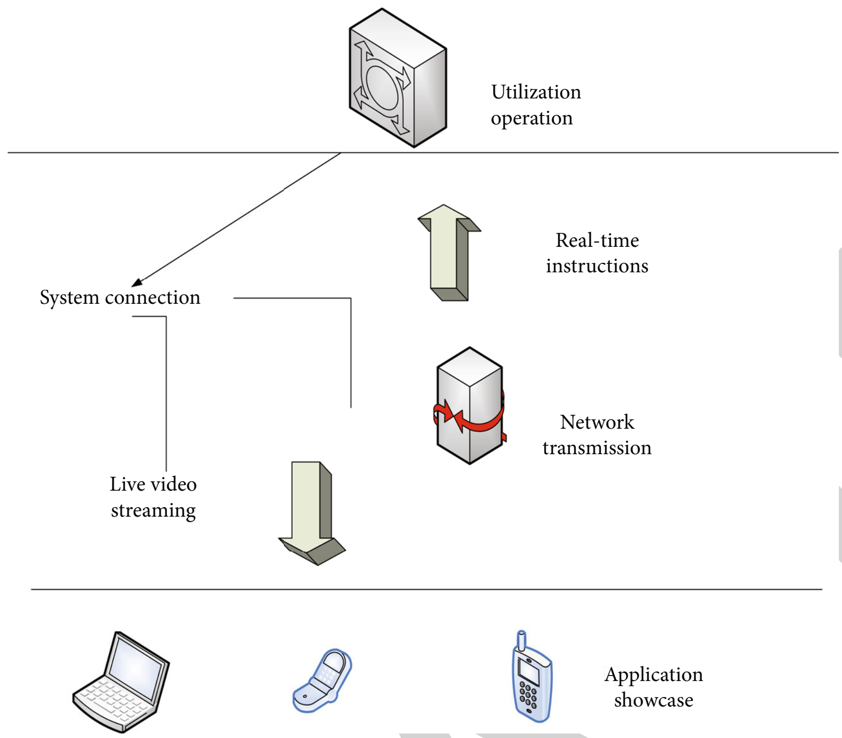


Figure 3: Schematic diagram of cloud computing.

Table 1: TF value reference table.

| TF value reference table | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $m$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| TF | 0 | 0.3 | 0.47 | 0.88 | 1.03 | 1.19 | 1.25 | 1.37 |
| $m$ | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| TF | 1.39 | 1.40 | 1.42 | 1.45 | 1.47 | 1.48 | 1.5 | 1.53 |

research direction for the development of virtual simulation technology.

Compared with other technologies, virtual simulation technology has good controllability, higher security, better energy saving, and is less affected by environmental factors; so, virtual simulation technology is widely used in many fields [9, 10]. Virtual simulation technology has the characteristics of immersion, interaction, illusion, and realism. It can be said that virtual technology will become an important part of future enterprise networks and data centers. Figure 2 shows the working principle of the virtual network.

*3.2. Virtualization Mapping Algorithm.* Physical network includes physical node sets, physical link sets, node attributes, and other elements [11]. We can express it with the following Formula:

$$k^a = (T^a, Y^a, V_c{}^a, F_U{}^a). \tag{1}$$

Under certain constraints, the virtual network can be mapped to the underlying physical network that is called the mapping process of the virtual network. We can express it with the following Formula:

$$N\left(T^b\right) \longrightarrow T^b = \left(T^b, Y^b, V_c{}^b, F_U{}^b\right) \longrightarrow k^a = (T^a, Y^a, V_c{}^a, F_U{}^a). \tag{2}$$

A virtual link can be composed of multiple acyclic physical links; so, the need to minimize the probability of request blocking can be achieved by reducing the total spectrum resources of the virtual link [12]. We can express the physical resources occupied by virtual links through the following Formula:

$$W\left(1^l\right) = T_h^a\left(1^l\right) * Y\left[Q\left(1^l\right)\right]. \tag{3}$$

In order to describe the problem more clearly, we list the following concepts, and Figure 3 is a schematic diagram of cloud computing.

(1) Virtual node weight used to indicate the importance of virtual node mapping:

$$B_a = \rho U\left[T\left(w^k\right)\right] + (1-\rho) F_U{}^b\left(w^k\right). \tag{4}$$

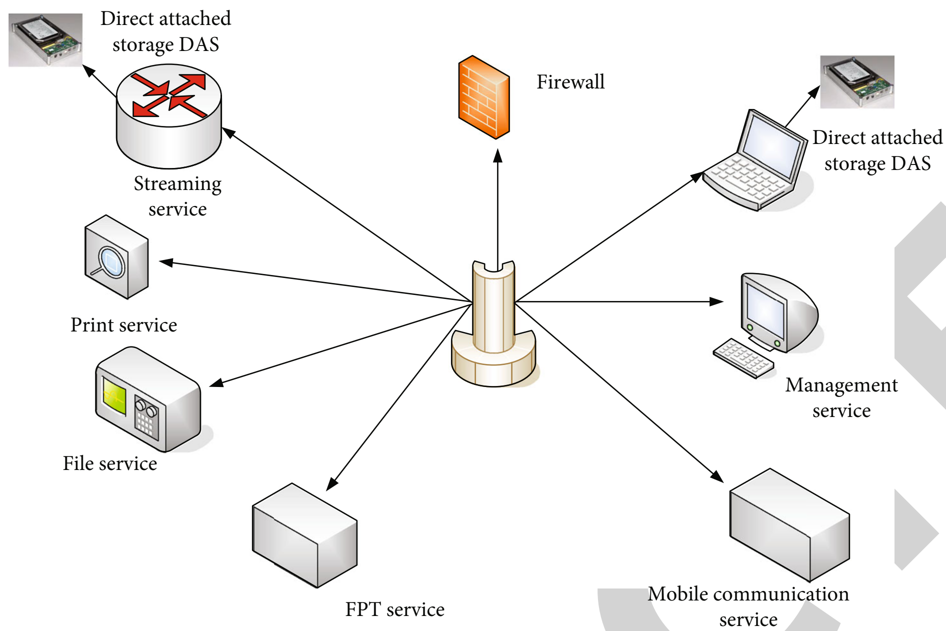


FIGURE 4: Traditional data center server composition diagram.

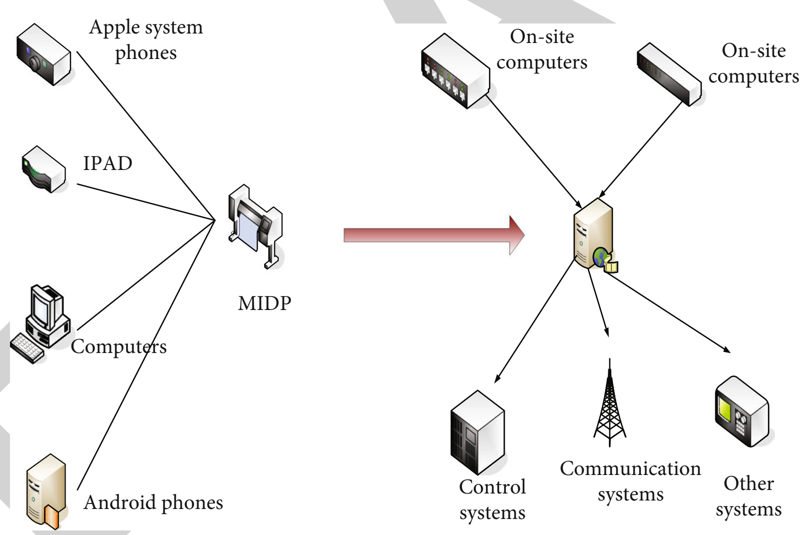


FIGURE 5: IoT network structure.



(2) Physical node weight is as follows: it represents the spectrum resource consumption between virtual nodes mapped to physical nodes:

$$B_f = Y\left(w^{f1}, w^{f}\right) \sum_{w^{q1} \in K_W^q} Z_R^q\left(w^{q1}, w^q\right). \tag{5}$$

Among them, the selection of candidate physical nodes needs to meet the following conditions:

(1) The resources (computing resources) required by the virtual node are smaller than that of the physical candidate node:

$$K_w^f\left(w^f\right) > K_w^q\left(w^q\right). \tag{6}$$

(2) For all the links adjacent to the candidate node, any virtual link needs to have at least one physical link resource

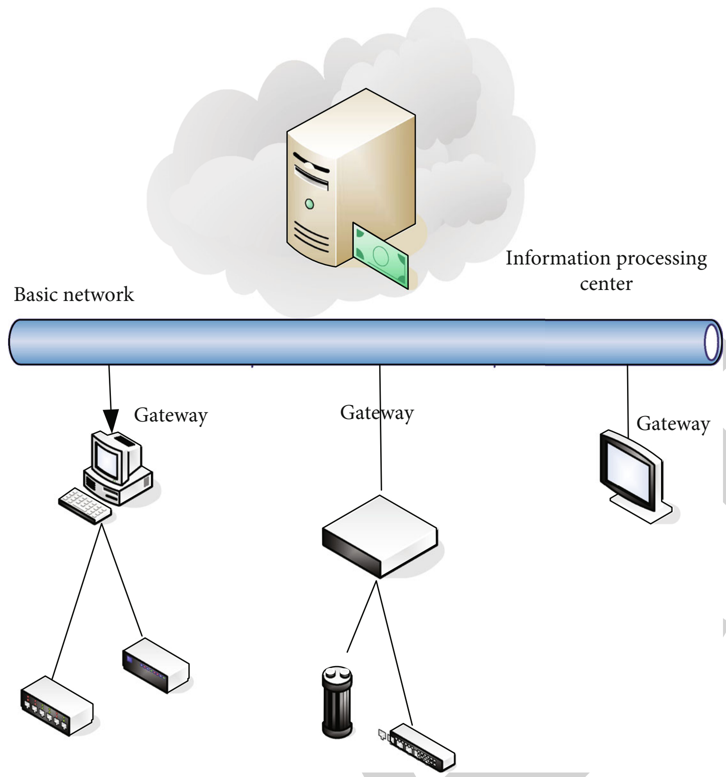


Figure 6: Information security protection structure.

Table 2: Grade and gender distribution table.

| Grade distribution | Gender (man/ woman) | Number of people | Proportion (%) |
|---|---|---|---|
| Freshman | 12<br>3 | 15 | 10 |
| Sophomore | 42<br>16 | 58 | 37 |
| Junior | 36<br>13 | 49 | 32 |
| Senior year | 25<br>7 | 32 | 21 |

$$\forall \mathrm{E}^{q} \epsilon \mathrm{R}(w^{q}), \exists \mathrm{E}^{f} \epsilon \mathrm{R}\left(w^{f}\right) \longrightarrow \mathrm{V}\left[K_{V}^{f}\left(u^{f}\right)\right] \geq K_{V}^{f}(E^{q}). \quad (7)$$

When the virtual node is an independent node, it is only necessary to consider its own resource requirements in the mapping process. The virtual node refers to the virtual private network technology. The so-called virtual means that the user does not need to have the actual long-distance data line but uses the long-distance data line of the Internet public data network, because the candidate node sets are all physical nodes that meet the constraints. To increase the link mapping process successfully, the greedy algorithm can be used to complete the mapping [13, 14]. A greedy algorithm means that when solving a problem, it always makes the best choice at the moment. That is to say, without considering the overall optimality, the algorithm obtains a local optimal solution in a sense. Its weight calculation formula is as follows:

$$P_{as} = \frac{1}{F} \sum_{1^{q} \epsilon D(1^{q})} W(1^{q}). \quad (8)$$

The average number of physical links occupied by link load balancing is the ratio of the occupied link hops of the underlying network to the link hops in link load balancing after all requested link load balancing are successfully mapped. This value can get the effect of this algorithm to reduce the number of link hops [15]. The Formula is shown like this:

$$\overline{F(K^{q})} = \exists \mu \frac{\sum_{1^{q} \epsilon K^{q}} F[N(1^{q})]}{|K^{q}|}. \quad (9)$$

The Formula for the economic effect of an information system is as follows:

$$a = \frac{k}{p}. \quad (10)$$

The economic benefits of the system refer to the difference between the results brought by the system and the cost of resources paid. We call it the difference between revenue and cost, which can be expressed as

$$A = k - p. \quad (11)$$

Table 3: Discipline distribution of respondents.

| Subject | Engineering | Literature | Science | Art | Economics | Jurisprudence | Management |
|---|---|---|---|---|---|---|---|
| Number of people | 107 | 3 | 7 | 6 | 15 | 12 | 4 |
| Proportion | 69.5 | 2 | 4.4 | 3.8 | 9.9 | 7.8 | 2.6 |
| Man | 95 | 0 | 5 | 1 | 7 | 6 | 3 |
| Woman | 12 | 3 | 2 | 5 | 8 | 6 | 1 |

Combining the two formulas, we can deduce

$$\mathrm{A} = \mathrm{P}(\mathrm{a} - 1). \tag{12}$$

First, normalize each column of the judgment matrix:

$$\overline{q_{ab}} = \frac{q_{ab}}{\sum_{f=1}^{z} q_{ab}(a, b = 1, 2, \cdots, u)}. \tag{13}$$

Secondly, for the judgment matrix normalized by column, sum it by row:

$$y_{1=} \sum_{b=1}^{z} \overline{q_{ab}}(a = 1, 2, \cdots, u). \tag{14}$$

Finally, normalize the vector

$$\bar{y_1} = \frac{y_1}{\sum_{b=1}^{z} y_1(a = 1, 2, \cdots, u)}. \tag{15}$$

Since it is usually difficult to accurately explain the scale of the two indicators when evaluating indicators, the actual value will be different from the judgment of experts, and the consistency of the matrix needs to be tested. The specific testing steps are as follows:

Compute the largest eigenroot:

$$\frac{\beta_{\max} = \sum_{b=1}^{a}(VY_1)}{aY_1}. \tag{16}$$

Consistency metrics are as follows:

$$\mathrm{DF} = \frac{(\beta_{\max} - a)}{(a - 1)}. \tag{17}$$

Consistency ratio is as follows:

$$\mathrm{DT} = \frac{\mathrm{DF}}{\mathrm{TF}}. \tag{18}$$

The reference table for the value of the average random one-time indicator is shown in Table 1.

According to the data in Table 1, when DF and TF are 0.1, it is generally considered that the consistency of the judgment matrix is acceptable. If the requirements of the consistency check are met, the weight of the evaluation index will stop being calculated. Otherwise, it will repeat again until the conformance test is reached. Figure 4 shows the composition of a traditional data center server.

*3.3. IoT System.* The IoT is based on networks. Its service-oriented comprehensive information processing technology not only makes the communication between people a leap but also makes the communication between people and objects and objects and objects possible. All in all, IoT technology has transformed the whole world into a whole. Networking, materialization, interconnection, automation, perception, and intelligence are the basic characteristics of the Internet of Things. Although the IoT is very powerful, the foundation of the IoT is still the Internet. The IoT expands and extends on the basis of the Internet. From the current research progress, the IoT can be divided into a sensing layer, an application layer, and a network layer, as shown in Figure 5.

The job of the perception layer is to identify the target and record the corresponding information. In this process, network sensor technology or identifier equipment will be involved. Only with the mutual cooperation of multiple technologies can the accurate identification of the target be achieved.

IoT security is closely related to the three-tier architecture of the IoT. The research on the security of the IoT is a hot topic at present. Although the research angles are different, everyone has a consensus that the biggest security challenge of the IoT is data security and privacy protection. The IoT security is a combination of physical security and information security, and it is more difficult to protect privacy. Figure 6 is a structural diagram of information security protection.

## 4. Platform Building Experiments

*4.1. Grade, Gender, and Subject of Survey Respondents.* First of all, we conducted effective data sorting on the grade distribution, gender, number, and proportion of the questionnaire. The details are shown in Table 2. Table 2 is the subject distribution and proportion of the number of valid data collected.

According to the data in Table 2, in this survey of college students' innovation and entrepreneurship, we conducted an overall survey on students from freshman to senior year. Among them, 12 freshmen boys and 3 girls participated in the survey, accounting for 10% of the total survey staff. There were 42 sophomore boys and 16 girls who participated in the survey, accounting for 37% of the total survey staff. There are 36 junior boys and 13 girls participating in the survey, accounting for 32% of the total investigators; there are 25 senior boys and 7 girls participating in the survey, accounting for 21% of the total investigators. According to the data, among the researchers in

Table 4: The most important things to do to improve innovation.

| Questions | Options | Number of people | Proportion |
|---|---|---|---|
| The most important things to do to improve innovation (multiple choice) | Creative ability as the basis for admission | 39 | 25 |
| | Design teaching philosophy | 132 | 86 |
| | Establish effective cultivation mechanism | 95 | 62 |
| | Teachers strengthen creative ability guidance | 75 | 49 |
| | Establishing innovation bases | 112 | 73 |

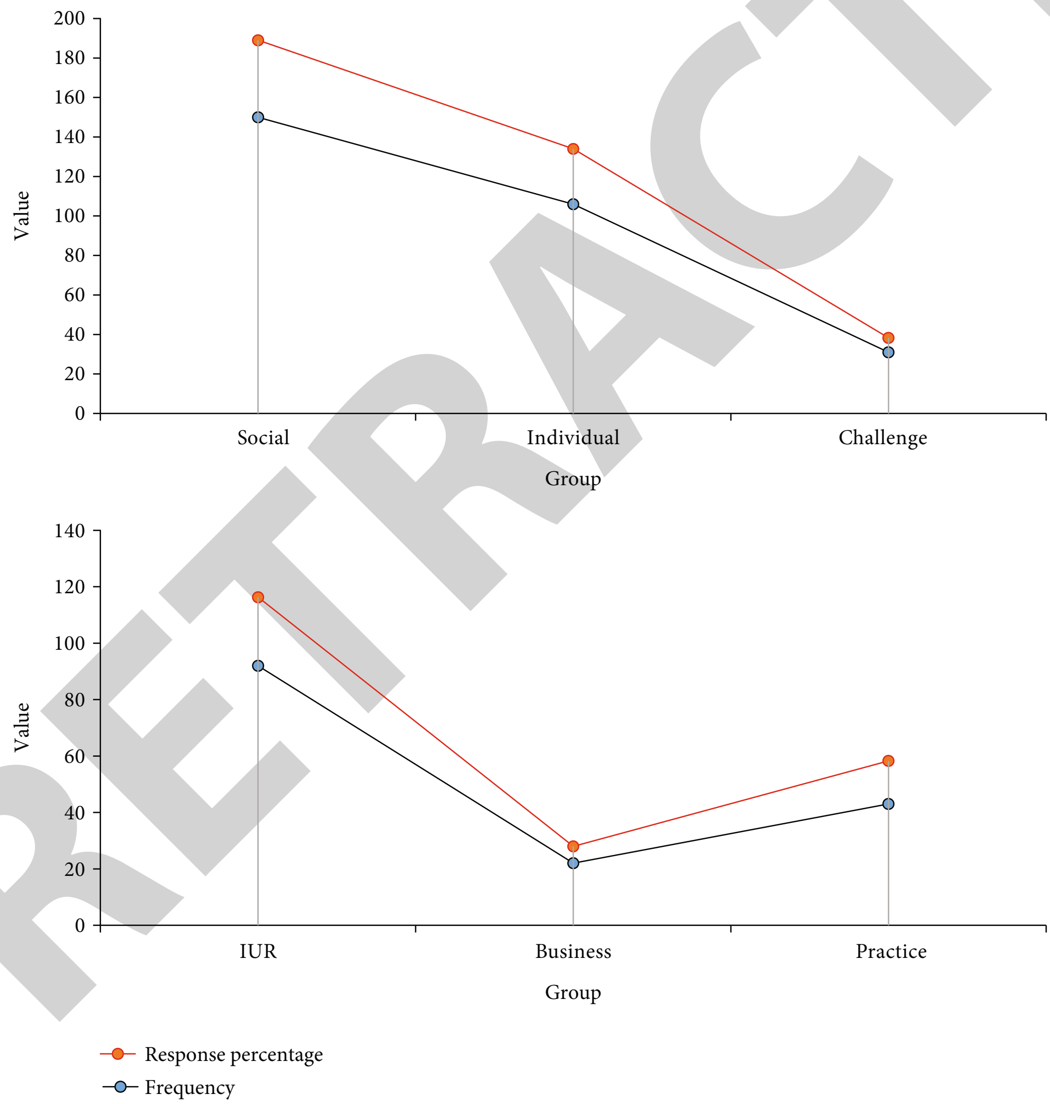


Figure 7: The form of guiding students' entrepreneurial practice activities.

this study, sophomore students accounted for the largest proportion, and freshman students accounted for the least, which also shows the enthusiasm of students for innovation and entrepreneurship.

According to the data in Table 3, among the students who participated in the survey, there were 107 engineering majors, accounting for 69.5% of the total survey number, including 95 boys and 12 girls. There are 3 literature majors,

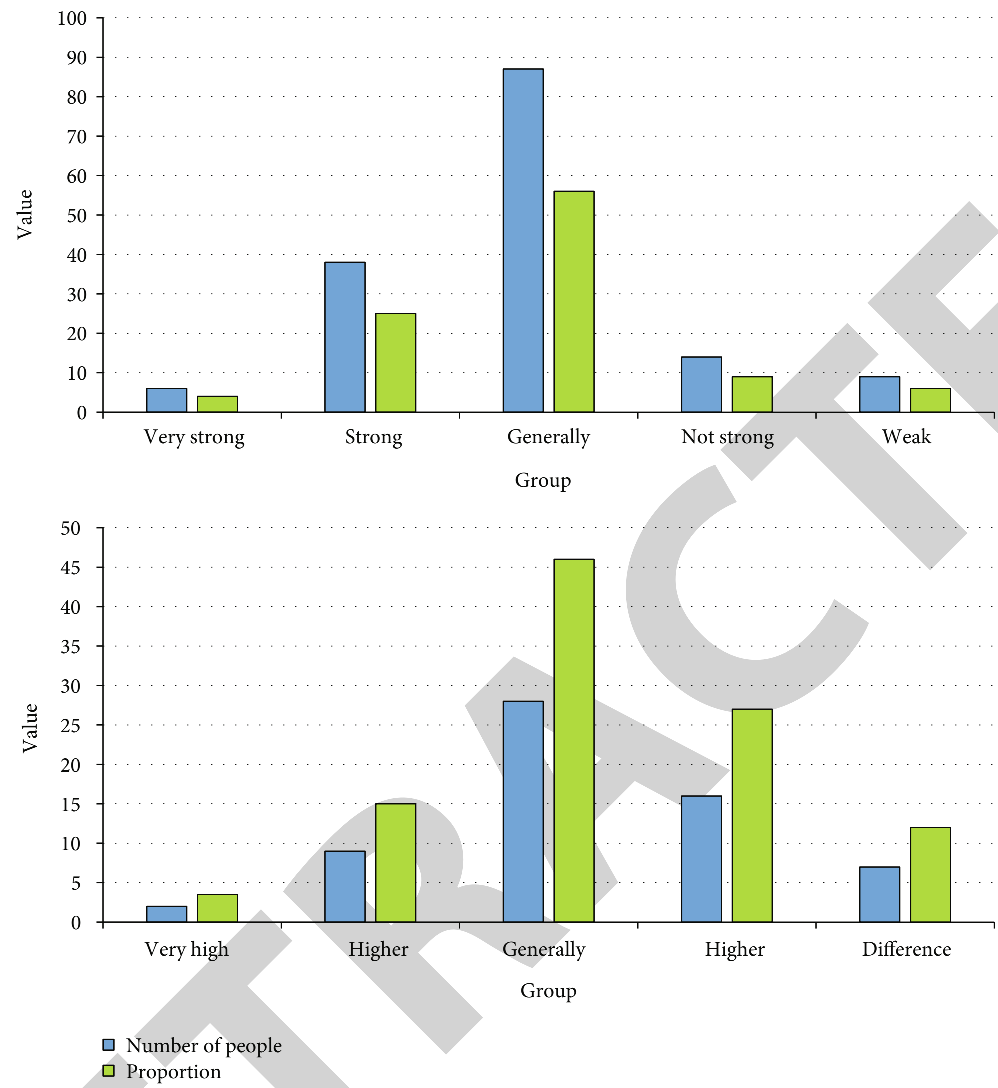


Figure 8: Investigation of students' innovation ability and enthusiasm.



accounting for 2% of the total number of respondents, including 0 males and 3 females. There are 7 engineering majors, accounting for 4.4% of the total number of respondents, including 5 boys and 2 girls. There are 6 art majors, 3.8% of total respondents, including 1 male and 5 female. There are 15 people majoring in economics, accounting for 9.9% of the total number of respondents, including 7 boys and 8 girls. There are 12 people majoring in jurisprudence, 7.8% of total respondents, including 6 boys and 6 girls. There are 4 people majoring in management, 2.6% of total respondents, including 3 boys and 1 girl. According to the data, among the entire investigators, engineering students are more interested in innovation and entrepreneurship. The data is consistent with the general atmosphere, indicating that the data is more effective.

*4.2. Investigation.* The innovation and entrepreneurship concept of college students needs to be continuously cultivated, especially in university education, and teachers need to guide. To investigate college students' perceptions of innovation and entrepreneurship, we explored them as follows:

It can be seen from Table 4 that students generally believe that the most important thing to do to improve their innovation ability is to design new teaching concepts (86%) and establish an innovation base (73%). The next step is to establish an effective culture mechanism (62%). At the same time, it is necessary to pay attention to the guidance of teachers on students' innovative ability (49%) and regard innovative ability as the most important basis for enrollment, accounting for 25%. According to the data, university education needs to innovate the curriculum concept and add innovative elements to suit the current market environment.

## 5. Platform Build Analysis

*5.1. Basic Situation.* In order to explore the innovative activities of college students in the school, we analyzed the entrepreneurial practice activities carried out by the school. The details are as follows:

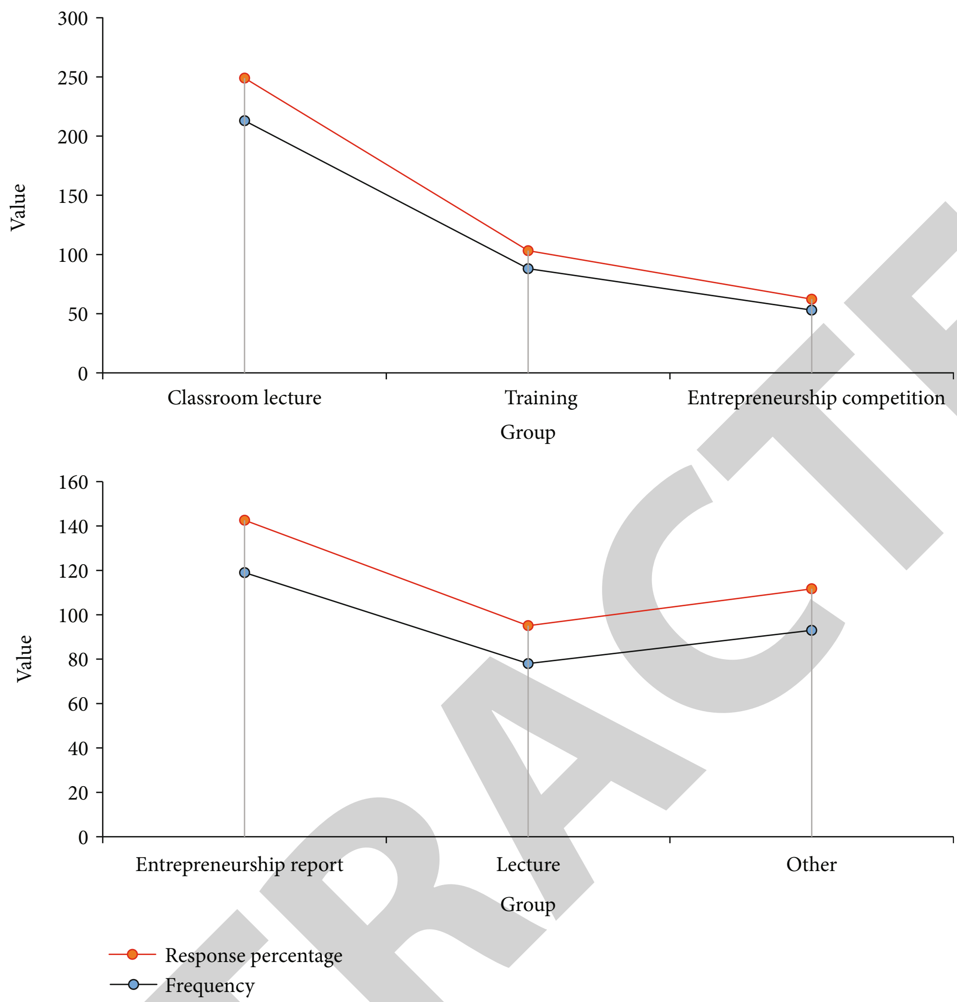


Figure 9: Innovation and entrepreneurship education methods.



According to the data in Figure 7, there are 150 innovative activities organized by the school, but the general participation rate of students is 39%. The school held 106 entrepreneurial guidance activities for individual students, and the response frequency of students was 28%. The school held 31 Challenge Cup entrepreneurship activities, and the response frequency of students was 7.3%. The school carried out 92 times of entrepreneurship activities for students in the production, education, and research, and the response frequency of students was 24.3%. The entrepreneurial project practice of participating companies was carried out 22 times, and the response frequency of students was 6%. Students were guided to carry out internships 43 times, and the response frequency of students was 15.3%. According to the data, in the innovation and entrepreneurship activities held by the school, there are fewer competition projects, and more associations and industry-university-research guidance activities are carried out. However, it can be seen from the response frequency of students that students are less interested in innovation and entrepreneurship activities, which requires teachers to guide them in the classroom.

In order to understand the innovation ability and innovation enthusiasm of school students, we conducted a questionnaire survey on students' innovation ability and innovation enthusiasm among school teachers and collected 60 valid data. The innovation ability is selected from very strong, strong, average, not strong, and very weak. Figure 8 shows that only 4% of teachers believe that students have strong innovation ability, indicating that students' innovation ability is generally not strong. 25% of teachers believe that students have strong innovative ability, 56% of students have average innovative ability, and 9% and 6% of students have low and weak innovative ability, respectively. This data shows that students generally have average innovative ability. Students' enthusiasm for innovation is investigated from very high, relatively high, average, not very high, and very poor. It can be seen from the table that all teachers believe that there are no students who are highly motivated to innovate. The highest proportion (46%) think that students' enthusiasm for innovation is average, 15% are high, 27% and 12% think that their enthusiasm is not high, and their fit is poor. The data shows that students' enthusiasm for innovation needs to be improved.

*5.2. Implementation.* Innovation refers to the will, desires, and ideas that people express in creative activities that both

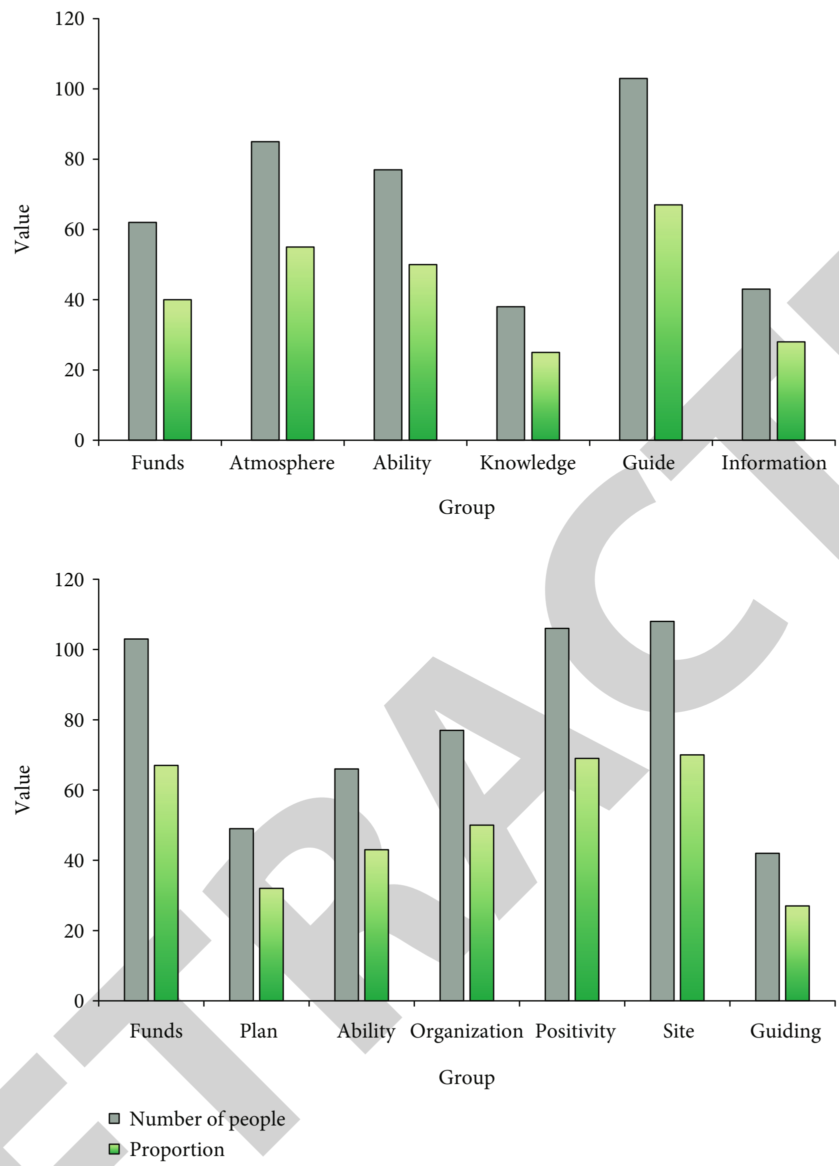


FIGURE 10: The most important things and influencing factors to improve innovation ability.



meet new social needs and better meet social needs in new ways, create something unprecedented, or generate new ideas. The innovation and entrepreneurship activities of college students are a major feature of the current social and economic development. What kind of educational activities are carried out in schools will have a significant impact on students.

According to the data in Figure 9, there were 213 activities to transmit innovative and entrepreneurial ideas through classroom teaching, and the response frequency of students was 28%. The school organized 88 training activities, and the response frequency of students was 15.3%. The school held 53 innovation competitions, and the response frequency of students was 9.3%. 119 entrepreneurship reporting activities were carried out, and the response frequency of students was 23.6%. Alumni lectures were held 78 times, and the response frequency of students was 17.1%. Communicate innovative ideas through other means 93 times, and the response frequency of students is 18.7%. According to the data, there are many ways to convey innovative and entrepreneurial ideas to students through traditional teaching methods, classroom teaching is the main form, and competition activities are less held. According to the students' participation in various activities, it can be seen that the students' attention to innovation and entrepreneurship is not high. This may be related to our traditional culture. The traditional culture is speeding us up, and what students have to do is go to school. They do not need to focus on things other than their studies, just have a secure job after graduation. Various reasons have led to the low enthusiasm of students for creativity and enterprise.

*5.3. Influencing Factors of Students' Innovation and Entrepreneurship Ability.* In order to understand the most missing part of students' innovation ability training at this stage, we designed questionnaires from the aspects of school funds, atmosphere, student ability, professional knowledge, teacher guidance, and information. From Figure 10, we can see that the most urgent need for students to innovate at this stage is the guidance of teachers (accounting for 67%), followed by the innovation atmosphere (accounting for 55%). Regarding the effect of influencing innovation, we conducted a questionnaire study on funding, planning ability, student ability, organizer ability, student enthusiasm, activity venue, and instructor ability. Among them, activity venues (70%) and student enthusiasm (69%) accounted for the highest proportion. It shows that there are few places for professional innovation activities in daily activities, and students are less motivated to innovate activities; 67% are affected by funding reasons, 50% are the organizer's ability, and the lowest proportion is the teacher's guiding ability. It shows that the effect of teachers in daily learning is not particularly great.

## 6. Conclusion

The innovation and entrepreneurship competence of university students is a necessary means to adapt to the contemporary economic development. With the growth of the socialist system with Chinese characteristics, the current society has higher and higher demands on the innovation ability of applied university students, and innovation ability has become an important basis for enterprise recruitment. This paper is aimed at studying the construction of a virtual simulation college student creativity and enterprise platform based on the IoT technology. Although some progress has been made, there are still some shortcomings: (1) due to the limited level and lack of experience of the author, the elaboration and understanding of the problem are not deep and comprehensive enough; so, the depth and breadth of the research are still insufficient. (2) Due to the limitation of time and region, the data conclusions are regional.

## Data Availability

The experimental data used to support the findings of this study are available from the corresponding authors upon request.

## Conflicts of Interest

There are no potential competing interests in our paper.

## Authors' Contributions

And all authors have seen the manuscript and approved to submit to your journal.

## Acknowledgments

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