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Research Article

Cultivation Design of Applied Undergraduates' Engineering Innovation Ability Based on Virtualization Technology

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The development of virtualization technology has promoted the development of computers in education, and the reform of basic education courses has promoted profound reforms in science education. The integration of virtualization technology and science teaching is an inevitable trend in the development of information technology and science education, and it is also training the inevitable requirement of talents with scientific culture and innovation ability. This article takes undergraduates as the research object and aims at the application characteristics of local higher education institutions, combined with the purpose of higher technical personnel training, application practical ability, and innovation ability, to establish a training system for college students with innovation ability suitable for engineering application undergraduate talent training mode, and improve students' research and innovation ability and engineering practice ability. This article proposes to organically integrate virtualization technology with undergraduate students' engineering innovation ability training courses, explore virtual technology experimental models, cognitive models, promote student self-study and student mutual learning, where students actively participate, and strengthen student innovation and creativity training. Improve the ability of design and transform teacher education into student-centered. The results of the study show that students' innovative ability generally accounts for 56%, and the effects of innovative activities organized by schools generally account for as high as 70%. Students are generally not very enthusiastic about innovation.

1. Introduction

1.1. Background. With the development of economic globalization, mankind has entered the era of knowledge economy, the production and dissemination of knowledge directly affects the development and progress of the economy, and science and technology have become the core of economic development. Education directly promotes the development of the national economy and the progress of science and technology, especially the development of higher education, and provides society with huge human resources and material wealth. 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. Due to the lack of resources to keep up, the quality of higher education and teaching has declined. This talent training model can no longer meet the social and economic development. Today's society has stricter requirements for talents and pays more attention to the comprehensive ability of talents, especially for leadership and innovative talents are more scarce. At the same time, social and economic development has put forward new requirements and expectations for college students, and the innovative ability of undergraduates has become the most important element of enterprises. Therefore, it is necessary to improve the quality of education in colleges and universities, and the current employment pattern urgently needs to reform higher education. The information age has brought not only the economic take-off but also new technologies and teaching methods. Virtual reality is another new teaching method after the emergence of intelligent teaching. Applying virtual reality technology to subject teaching is a hot topic at the moment. In the teaching process, virtual technology is used to organically integrate virtual technology and engineering innovation ability to improve the innovation ability of undergraduate students [1]. The power of engineering comes from innovation, and the essence of engineering lies in innovation. Innovative design is an indispensable skill for today's engineers. Therefore, to cultivate talents in the new era, the reform of engineering design education concept is of great practical significance.

1.2. Significance. Through a comprehensive analysis of the engineering innovation ability of applied undergraduate students, this paper puts forward the problems that need to be solved in the current development of innovation ability and provides a realistic basis for the development of this field. The reform has a certain reference value to cultivate the habit of independent thinking and active creative thinking and improve problem-solving ability of students of majors which is of great guiding significance for cultivating new talents who are adapting to the fierce market competition and seeking development.

1.3. Related Work. In order to cope with the complex multisatellite measurement and control in the future, Liu et al. proposed a shared satellite ground station (SSGS) using user-oriented virtualization technology. SSGS is based on a pool architecture, using baseband processor virtualization and software-defined networking to realize resource sharing and integration of high-speed and low-speed data streams and customized control networks [2]. Wallace et al. pointed out that subject education has the problems of inverted teaching subject status, weak coordination ability, single practice mode, etc., and the support of innovation ability training is weak and the effect is not good. Reform the traditional education model and improve the carrier support and target acquisition with outcome-based education (OBE) as the guidance and innovation ability training as the goal, to provide effective guarantee for the cultivation of top talents [3]. In order to cultivate the innovative ability of engineering undergraduates, Zhou et al. studied some of the problems that hindered the progress of students and studied the average and standard deviation of students' time management tendencies. The results show that the enthusiasm of graduate students should be mobilized, course settings should be optimized, new teaching methods should be introduced, practice should be strengthened and valued, and a strict management evaluation system should be established [4]. Lee proposed that novel engineering designs are usually not suitable for manufacturing or fail to meet the required performance. The different functions and ways of thinking between design and manufacturing bring challenges and opportunities to innovative projects. The innovation process of prototyping new engineering designs for haptic devices in engineering research labs spans several generations of design, and the interaction of design and manufacture drives innovation across generations. Through interviews with key figures, the characteristics, problems, and improvement suggestions of the innovation process were determined [5]. With the launch of the "New Engineering Course" construction plan, the research and discussion on the new engineering department is unprecedentedly active. From both internal and external perspectives, Cao et al. analyze the construction and development of new science. The inherent characteristics of engineering education as a new discipline are put forward, and the problems that need to be solved in the current and long-term promotion of engineering education innovation are discussed [6]. According to the article "Structural Engineering Innovation-The Art of Possibility," Turpin proposed a new and incremental innovation method for structural engineering and construction innovation, which was developed by scientists, philosophers, psychologists, and economics. It is developed by scientists to understand the world as a series of interconnected systems, each based on a small set of simple rules [7]. Zhao uses the virtual fitness club experience system as the application background, analyzes the function and performance requirements of the virtual reality experience system in the virtual reality environment, and proposes to use Kinect as a video capture device to extract the user's somatosensory operation actions and improve the final presentation of the virtual reality scene effect [8]. At present, these views are relatively theoretical, and their universal ability is not strong, and they need to be further improved.

1.4. Innovation. This paper proposes to strengthen the training of design ability as the core ability of engineering students, establish the educational concept of "sustainable engineering concept," and build the research learning target model and the evaluation index of the original learning ability of undergraduates based on the development of university innovation ability. And the fuzzy hierarchical evaluation model provides a scientific way for the cultivation of undergraduates' innovative ability and provides a scientific means for the test of undergraduates' innovative ability. This article provides some guidance for advancing the reform and construction of colleges and universities by discussing the innovative learning and teaching mode of undergraduates.

2. Design and Research Method of Application-Oriented Undergraduate Engineering Innovation Ability Training Based on Virtualization Technology

2.1. Virtualization Concept and Development History. In the 1960s, information technology personnel proposed a virtual technology to provide technical suggestions to effectively use old computer equipment when calculating blocks [9]. Virtualization is a technology that provides superior access to the original configuration of resources by combining or partitioning existing computer resources so that they behave as one or more operating environments [10]. In the 1990s, scientists began to explore how to use virtualization technology to solve some of the problems related to the rapid growth of computer equipment, such as insufficient resource utilization, high cost, and vulnerability; so far, virtualization technology has been able to improve the capabilities of computing equipment and realize functions such as expanding hardware capacity, hardware resource integration, and dynamic allocation, simplifying the software reconfiguration process and background comprehensive management, which greatly improves work efficiency. After years of development, virtualization technology has continued to mature [11]. Compared to multimedia technology, virtualization technology has the advantages of interactivity, immersion, multiperception, and operability, allowing virtual teaching situations, teaching experiments, and skill training, which can fully mobilize students' initiative and creativity [12]. This is also the most standardized technology we usually use when building data centers. Virtual technology has been applied 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 about by resource allocation and rationalization and enterprise system management [13]. Figure 1 is a structural diagram of the virtual network framework:

(1) Development trend of virtualization technology

(1) Open platform: a basic platform with a closed structure. On this platform, virtual multibrand machines can coexist under the open platform. On this platform, applications of different brands can be operated through virtual management

(2) Standardization of the connection protocol: it can solve the final compatibility problem between the terminal station and the cloud layer related to multiple connection protocols, such as the Citrix and PCoIP protocols on the public office cloud

(3) Customer-customized computer equipment: improve terminal technology to enable virtual applications on mobile terminals through virtual simulation and applications without the physical support of terminal equipment and multimedia tests

(4) Public sector cloud: transform the corporate information technology structure into a public cloud "private cloud" while ensuring the access of open cloud and the security of private enterprise data [9]

User authentication refers to the additional information and verification required by the online platform in addition to the basic information that the user is required to provide, usually requiring the user to provide documentation sufficient to prove some kind of identity [14]. In the use of virtual technology, this part of the work is done by schools.

(2) Development trend of virtualization hardware

(1) The common solutions are mature, and the company has a better understanding of virtual technology and can choose according to actual business needs

(2) More and more companies are proposing virtual solutions. Companies will consider the "second source" strategy; while taking into account costs and potential problems, heterogeneous virtual management will replace enterprise virtual management

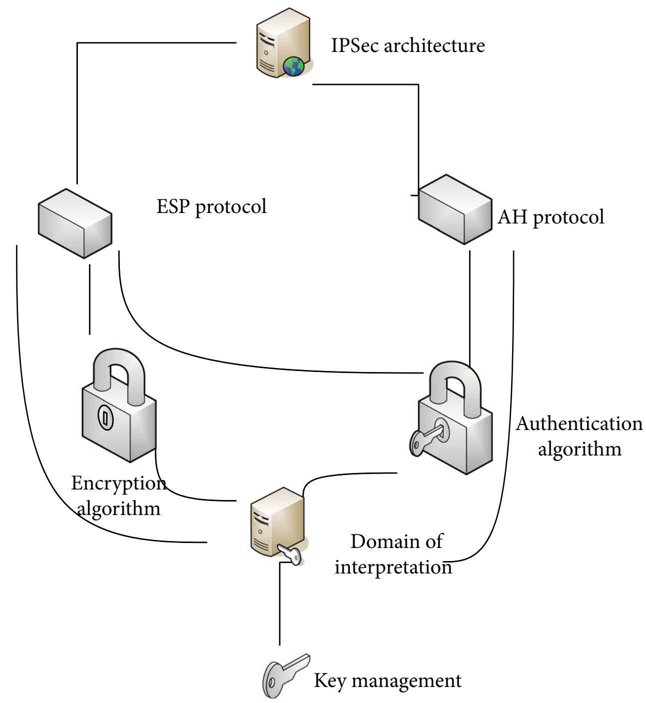

Figure 1: Virtual network framework structure diagram.

(3) Market demand has led to the reorganization of the pricing model. From the early pricing based entirely on the processor cores of the processing unit, it gradually transformed into virtual resources supported by computer equipment. On the other hand, the change in pricing model also explained the virtual development of chemical technology. It can be said that virtual technology will become an important part of future enterprise networks and data centers [15]. Figure 2 shows the working principle of the virtual network:

From the perspective of the overall application and development of virtualization technology, the trend of opening up the future platform of virtualization technology is very obvious; standardization of connection protocols, after the standardization of desktop connection protocols in the future, will solve the extensive compatibility between the terminal and the cloud platform, forming a benign industry chain structure; for the privatization of the public cloud, in the public cloud scenario, it is necessary to provide technology similar to VPN, turning the enterprise IT architecture into a "private cloud" superimposed on the public cloud.

2.2. Virtualization Mapping Algorithm. In the process of virtual network mapping, we use weighted undirected graphs to represent the physical basic network, including physical node sets, physical link sets, node attributes, and other elements [16]. They provide the data end devices with a pathway for transmitting data. The data pathway can be a physical media or multiple physical media connected to form; to transmit data, the physical layer is to form entities

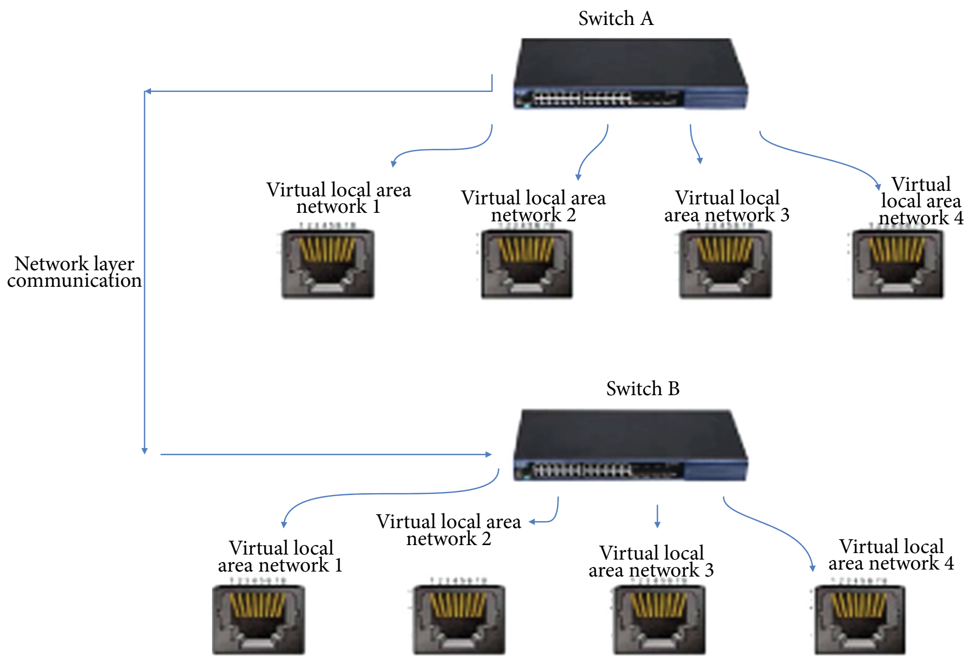

Figure 2: Working principle diagram of virtual network.

suitable for the data transmission needs for the data transmission. We can use the following formula to express

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

Under certain constraints, the virtual network can be mapped to the underlying physical network which is called the virtual network mapping process, which can be expressed by the following formula:

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

The 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 [17]. Each router requires a large storage space to store the link state groupings received for each node; the computational effort is high and the shortest path must be calculated each time. We can express the physical resources occupied by the virtual link by the following formula:

$$W\left(1^1\right) = T_h^a\left(1^1\right) * Y\left[Q\left(1^1\right)\right]. \quad (3)$$

In order to describe the problem more clearly, we have listed the following concepts, Figure 3 shows the schematic diagram of cloud computing:

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

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

where B_a denotes the virtual node weights and $T(w^k)$ denotes the set of links.

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

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

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 less than the physical candidate nodes:

$$K_w^f\left(w^f\right) > K_w^q(w^q) \quad (6)$$

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

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

A link state packet (LSP) typically contains the identifier

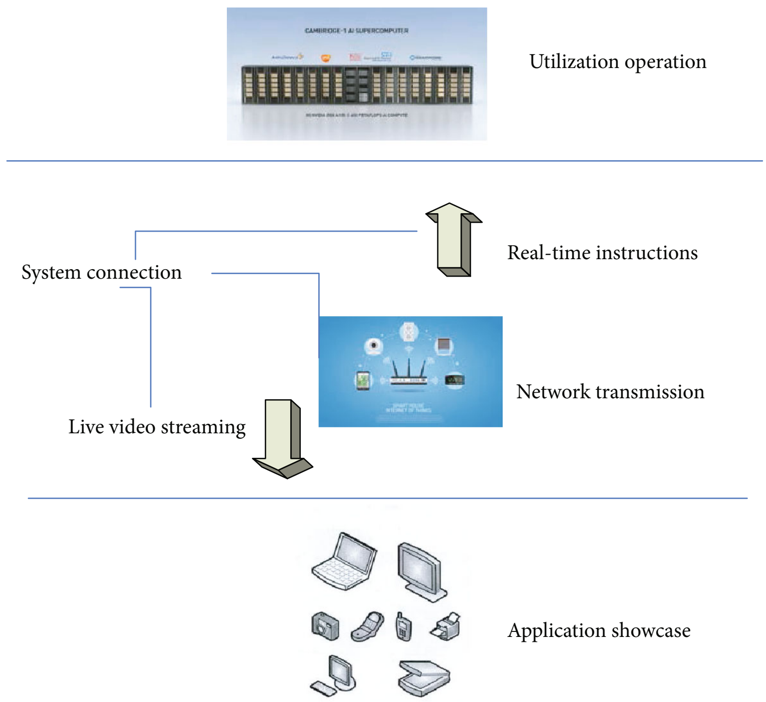

Figure 3: Schematic diagram of cloud computing.

of the source router, the identifier of the neighboring router, and the cost of the link between them. Each LSP is received by all routers in the network and is used to build a uniform topology database for the network as a whole. As all routers in the network send LSPs, after a period of time each router maintains a complete network topology map, and on this topology map, using the shortest path algorithm, the router can then calculate the best path from any source to any destination.

2.3. Independent Node Mapping. When the virtual node is an independent node, you only need to consider its own resource requirements during the mapping process. Since the set of candidate nodes are all physical nodes that meet the constraint conditions, in order to improve the link mapping success rate, the greedy algorithm can be used to complete the mapping [18]. The weight calculation formula is as follows:

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

According to the study, the use of virtualization technology significantly reduces the probability of blocking and improves the efficiency of network resource usage while increasing network revenue, given the same underlying physical network. The aim of reducing the probability of blocking and improving resource utilization was achieved.

The average number of physical links occupied by link load balancing is the ratio of the number of link hops in the underlying network occupied to the number of link hops in the link load balancing after all requested link load balancing is successfully mapped. This value can get the effect of this algorithm in reducing the number of link hops [19]. The formula is as follows:

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

The economic effect formula of the information system is as follows:

$$a = \frac{k}{p}. \tag{10}$$

The economic benefit of the system refers to the difference between the results brought by the system and the resources paid. We call it the difference in revenue and cost, which can be expressed by the following formula:

$$A = k - p. \tag{11}$$

Combining the above two formulas, we can deduce

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

Firstly, 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, sum up the judgment matrix normalized by column and row 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 expert's judgment. The consistency of the matrix needs to be tested. The specific inspection steps are as follows:

Calculate the largest characteristic root:

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

Consistency index:

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

Concordance ratio:

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

The value reference table of the average random one-time index is shown in Table 1:

When DF, $\mathrm{TF}<0.1$, it is generally considered that the consistency of the judgment matrix is acceptable. If it meets the requirements of the consistency test, the weight of the evaluation index will stop calculating. Otherwise, it will be repeated again until the conformance test is reached [20]. Figure 4 shows the structure of a traditional data center server:

The research object indicators are scored artificially to calculate the relative membership degree of each indicator. The formula is as follows:

$$K=\begin{bmatrix}k_{11} & k_{1\mathrm{i}} & k_{1\mathrm{m}}\\ k_{\mathrm{g}1} & k_{\mathrm{gi}} & k_{\mathrm{gm}}\\ k_{\mathrm{f}2} & k_{\mathrm{fi}} & k_{\mathrm{fm}}\end{bmatrix}. \tag{19}$$

A represents the degree of membership of the evaluation index to the fuzzy subset as a whole, and the formula is as follows:

$$A=Y*K=\left[\bar{y_1},\bar{y_2},\cdots,\bar{y_q}\right]\begin{bmatrix}k_{11} & k_{1\mathrm{i}} & k_{1\mathrm{m}}\\ k_{\mathrm{g}2} & k_{\mathrm{gi}} & k_{\mathrm{gm}}\\ k_{\mathrm{f}2} & k_{\mathrm{fi}} & k_{\mathrm{fm}}\end{bmatrix}=\left[C_1,C_2,\cdots C_Q\right]. \tag{20}$$

2.4. Undergraduate Students' Innovative Ability. Innovation refers to the wishes, desires, and ideas expressed by people in creative activities. These activities must not only meet new social needs but also better meet social needs in new ways, create unprecedented things, or generate new ideas [21]. The knowledge of innovation stems from the need to improve the material and spiritual living standards. This life is largely governed by specific social and historical conditions. In a class society, the knowledge of innovation is restricted by hierarchy and morality. The benefits of creative activities and creative consciousness should contribute to human progress and social development; the understanding of innovation must take into account social impact, so innovation is closely related to social status, education level and personal inclinations [22].

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

The spirit of innovation refers to the ability to combine knowledge and innovation systems with the skills that have been solved and the ability to propose new methods, new ideas, and the will to invent, create, and reform. The spirit of innovation belongs to the category of scientific spirit and scientific thinking, including innovation awareness and innovation psychological characteristics such as interest, courage to innovate, and determination to innovate [23]. The spirit of innovation is the spirit of abandoning old ideas and creating new things, including the following manifestations:

(1) Not satisfied with the known, constantly pursuing the unknown

(2) Continuously carry out reform and innovation

(3) Break the shackles and explore new laws and methods

(4) Not superstitious of authority, good at independent thinking

(5) Active thinking and daring to take risks

2.5. Design. The word "design" in English is usually translated as artisan, design, pattern, etc. It refers to when trying to make something with a certain purpose, to conceive and produce a work that fits its purpose and has a beautiful form [24]. Most domestic reference books define design as follows: design is the process of conveying an idea through reasonable planning, careful planning, and various sensory forms. Human beings transform the world through labor, create civilization, and create material wealth and spiritual wealth, and the most basic and main creative activity is creation [25]. Design is the preplanning of creation activities, and the planning technique and planning process of any creation activities can be understood as design. From the perspective of engineering psychology, the design of engineering innovation ability training is an intellectual activity. From

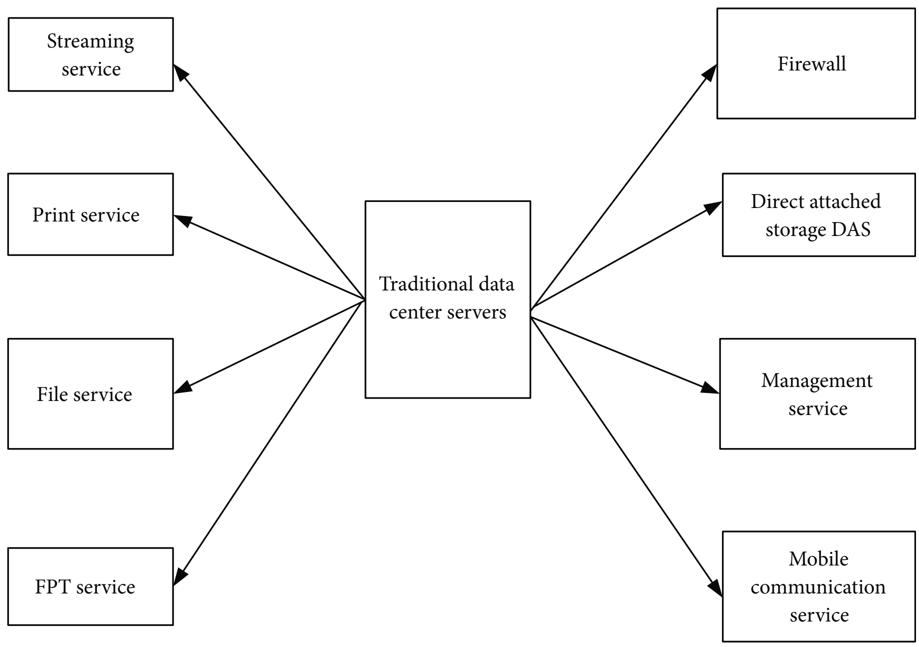

Figure 4: Traditional data center server composition diagram (reproduced from Wang and Li [34]).

the perspective of methodology, it refers to the process of finding the optimal solution under contradictory conditions in accordance with established goals; from the perspective of organization, engineering design is the part that creates value, and it is the link to process materials, enhance product value, and increase product value-added [26]. Due to the complexity of engineering design, it is difficult for us to summarize an accurate definition. In general, process design should not only focus on design problems and problem solving but also what should be designed or solved. All in all, design is a comprehensive and systematic ability. Engineering design is at the core of engineering and is an intermediary bridge between theory and practice. Cultivating students' engineering design ability is the core content of engineering education [27].

3. Application-Oriented Undergraduate Engineering Innovation Ability Training Design Research Experiment Based on Virtualization Technology

In order to better understand the status quo of undergraduate students' engineering innovation ability, the author designed a corresponding questionnaire based on the xx university education and teaching research key project "engineering innovation ability of undergraduate students in science and engineering" questionnaire. "Questionnaire on How to Cultivate Undergraduate Students' Innovative Ability" for teachers was used. Students generally agree that the use of virtualization in innovative classrooms improves classroom concentration, provides a more visual understanding of classroom content, and increases classroom efficiency.

3.1. The Grade, Gender, and Subject of the Survey Object. First, we organize the effective data of the grade distribution, gender, number, and proportion of the questionnaire survey. The specific situation is shown in Table 2. Table 3 is the subject distribution and proportion of the number of effective data collected:

Table 2: Grade distribution of investigators.

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

It can be seen from the survey data that the subjects of this questionnaire survey are mainly sophomores, colleges, and seniors with a certain academic foundation. The gender distribution is also in line with the gender norm in science and engineering colleges. The distribution of disciplines is wide, and engineering students are the majority. Most of them are in line with the main body of this research [28].

3.2. Students' Understanding and Satisfaction with the Innovative Activities Organized by the School. In order to understand the degree of students' understanding and satisfaction with the innovative activities organized by the school, the survey is mainly based on the questions of whether you know the innovative activities of the school, how to know the activity, whether the school's innovative activities are rich, and how effective the activities are. As shown in Figure 5, 62.3% of students generally understand

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

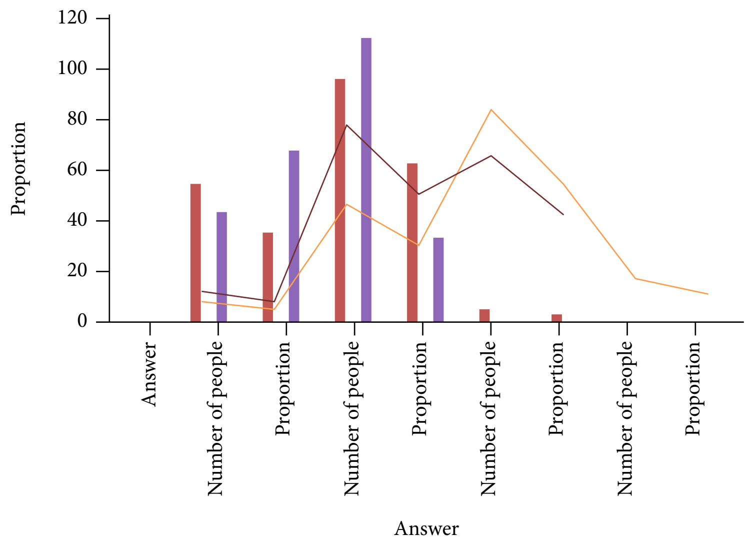

Figure 5: A survey of students' understanding of school innovation activities, understanding ways, and satisfaction.

innovation activities, and the way to understand is mainly through bulletin boards and classmates' notifications, accounting for up to 57%. The survey shows that innovation activities organized by schools generally account for up to 70%. Approximately 11% of those considered invalid [29].

3.3. The Setting of Professional Courses by Students and the Cultivation of Innovative Ability in Teachers' Teaching. In order to understand students' views on professional curriculum settings and teachers' innovative ability education in teaching, we mainly solve the problem from whether you think traditional education is in line with the current education model, whether the teacher adopts heuristic teaching in the classroom, and whether the professional teacher guides students to innovate methods. whether there are innovative activities in the professional curriculum, and whether the teacher's scientific research activities are closely integrated with the teaching work. Then, the data in Figure 6 shows that about 80% of the students believe that the current school education philosophy needs to be reformed; 76% of the students believe that there are fewer innovative activities in the professional curriculum; 70.6% of the students believe that there are few teachers in the classroom. Heuristic teaching methods are adopted in the classroom; 76.8% of students believe that professional teachers are not doing enough to guide students to solve problems in innovative ways and need to be strengthened; 70.5% of students believe that the teachers' scientific research activities and teaching work are not closely integrated [30].

In order to understand students' awareness of their own innovation capabilities and participation in school's innovation activities, we focus on whether you have had a small invention experience, whether you think you have the ability to innovate, what do you think of your own innovation ability, and whether you have participated in the innovation organized by the school; questionnaire surveys are conducted on activities and other issues. It can be seen from Figure 7 that 35% of students have an invention experience, 62% have no experience but want to try, and the two together account for 87%; they think they have innovation; 67% of students think that they do not have the ability to innovate, 33% think that they do not have the ability to innovate; for their own innovative ability, 5% of students think that they are strong in innovation ability, 30% of students think that they are strong in innovation ability, 54% students think their own innovation ability is average, and 11% of students think their own innovation ability is poor; 8% of students have participated in innovation activities organized by the school many times, 50% of students participate in innovation activities organized by the school, and about 42% of students never participated in the innovation activities organized by the school [31].

Generally speaking, school students generally believe that they have a strong sense of innovation, but their innovative spirit is generally low, their innovation ability is generally low, and their enthusiasm for participating in innovation activities organized by the school is generally moderate.

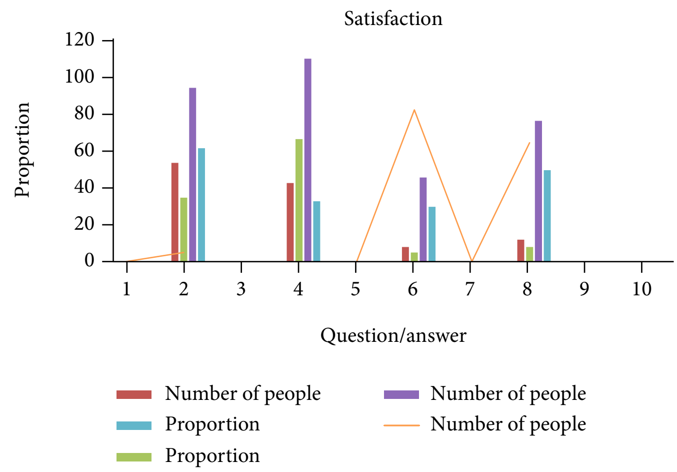

FIGURE 6: Students' education of professional curriculum and teachers' innovative ability in teaching.

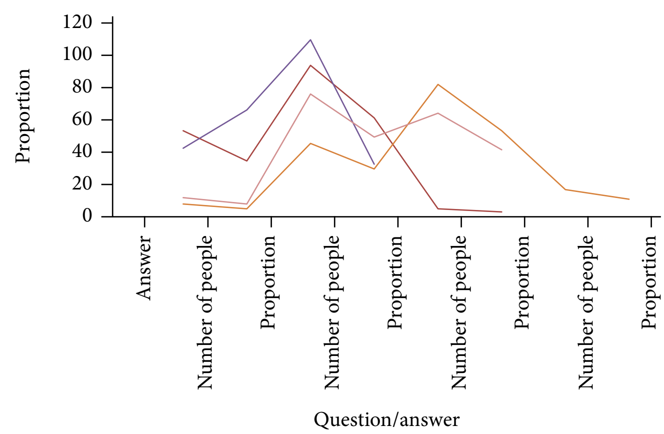

FIGURE 7: Students' own awareness and participation in innovative activities.

It can be seen from Figure 8 that among the conditions that students hope teachers can provide in the cultivation of innovative ability, the highest is to provide necessary research opportunities, accounting for 80%, and the lowest is to participate in academic exchanges, accounting for 46% [32].

It can be seen from the data in Figure 9 that students believe that teachers should pay the most attention to innovative thinking (82%), professional knowledge (70%), innovative spirit (56%), and inquiry methods (47%); there can be less guidance on academic ethics. In general, it is to pay attention to the guidance of specific methods and thinking methods.

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 (accounting for 86%) and establish an innovation base (accounting for 73%). The next step is to establish an effective training mechanism (accounting for 73%). At the same time, it is necessary to pay attention to teachers' guidance to students' innovation ability (accounting for 49%). The importance of taking innovation ability as the basis for enrollment is low, accounting for 25%.

4. Application-Oriented Undergraduate Engineering Innovation Ability Training Design Based on Virtualization Technology

4.1. Influencing Factors of Students' Innovation Ability. In order to understand the most missing part of students' innovation ability training at this stage, we designed questionnaires from school funding, atmosphere, student ability, professional knowledge, teacher guidance, and information. From Figure 10, we can see that students are the most innovative at this stage. What is urgently needed is the guidance of teachers (67%), followed by the atmosphere of innovation (55%); the effect of innovation is affected by funding, planning ability, student ability, organizer ability, student enthusiasm, activity venue, and instructor ability to conduct questionnaire research, the highest proportion of which is the activity venue (70%) and student enthusiasm (69%). It shows that there are fewer professional innovative activity places in daily activities, and students are less enthusiastic about innovative activities; the impact of funding accounted for 67%, and the ability of organizers accounted for 50%. The lowest proportion is the ability of teachers to guide,

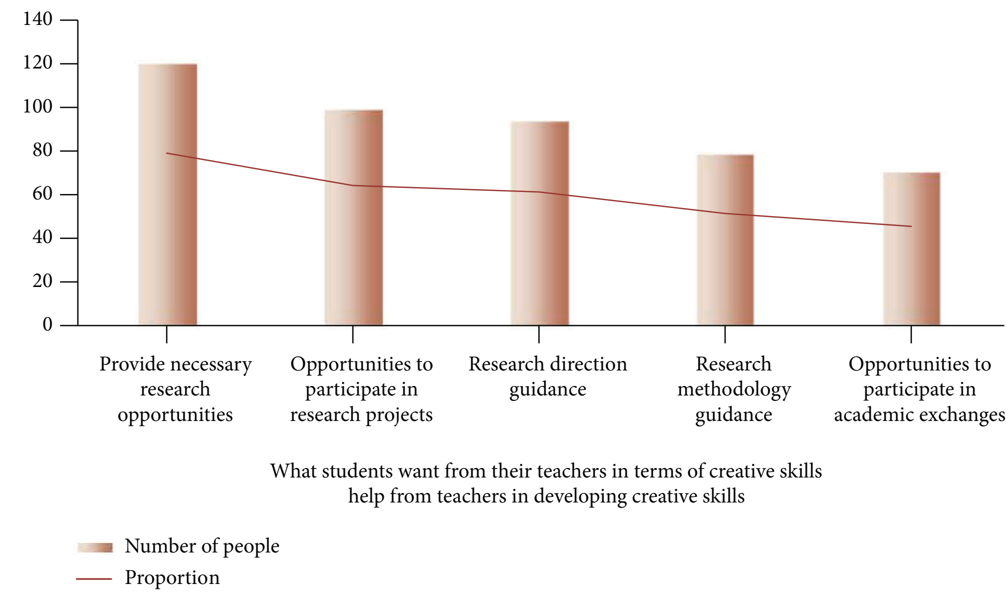

Figure 8: The help that students expect teachers to provide in the cultivation of innovative ability.

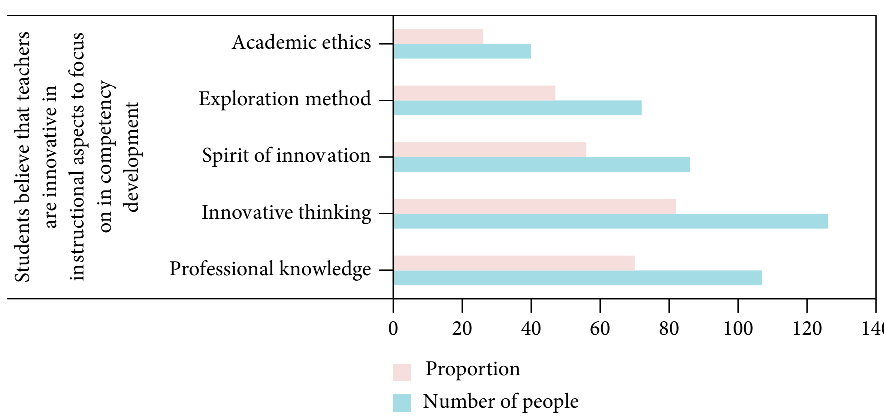

Figure 9: Guidance aspects that students think teachers need to pay attention to in cultivating innovation ability.

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

indicating that they are in daily learning. The effect of the middle school teacher is not particularly great [33].

4.2. Students' Innovative Ability and Initiative. In order to understand the innovation ability and innovation enthusiasm of school students, we conducted a questionnaire survey on school teachers about students' innovation ability and innovation enthusiasm and collected 60 valid data. Innovative abilities are selected from strong, average, not strong, and very weak. Figure 11 shows that only 4% of teachers believe that students' innovative abilities are strong, indicating that students' innovative abilities are generally not strong, and they believe that students' innovative abilities are relatively strong. Strong teachers accounted for 25%, students with average innovation ability accounted for 56%, and students with weak innovation ability accounted for 9% and 6%, respectively. This data shows that students' general innovation ability is relatively average. Students' innovation enthusiasm was investigated in terms of high, average, low, and poor. From the table on the right, all teachers

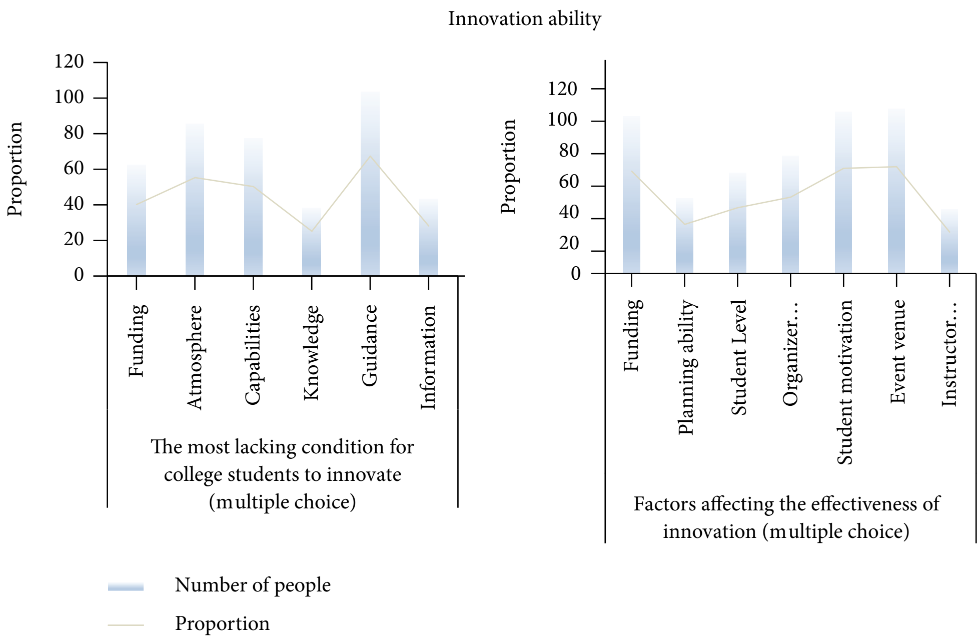

Figure 10: The most important things and influencing factors to improve innovation ability.

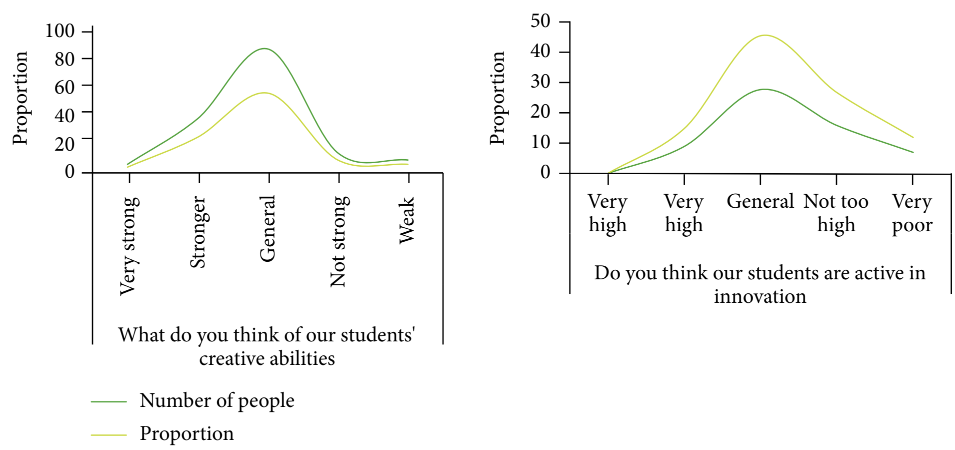

Figure 11: Investigation of students' innovation ability and enthusiasm.

believe that students with high innovation enthusiasm do not exist, and the proportion of students who believe that students' innovation enthusiasm is average is the highest (46%), 15% are higher, and 27% and 12% are poorly motivated. The data shows that students' initiative to innovate needs to be improved.

In order to explore the relationship between students' innovation ability and employment, we explore from the aspects of great impact, general impact, small impact, and no impact. As shown in the left table, the proportion of no impact is at least 0%, and the largest is great impact (47%). This data shows that students' innovation ability has a great impact on employment. Need to attract the attention of relevant departments. In order to explore the main problems encountered by teachers in cultivating students' innovative ability, we conducted a questionnaire survey from the aspects of low students' enthusiasm, unreasonable curriculum, insufficient teaching conditions, and schools' lack of attention. As shown in the right of Figure 12, the most teachers think that students' innovative enthusiasm is not high, accounting for 75%, 66% of them lack of teaching conditions, and 50% of them are not paid attention to by schools. The curriculum setting is unreasonable, accounting for 47%. This data shows that teachers encounter more and more serious problems in the process of cultivating students' innovative ability, and students' innovation enthusiasm is generally not high.

4.3. The Main Problems of the Cooperation between Universities and Enterprises to Cultivate Students' Innovative Ability. Innovation ability needs to be tested in practice. At this stage, the cooperation between schools and enterprises to improve students' innovation ability has been recognized by both parties, but there have been many problems during the cooperation between the two. The government did not pay attention to other aspects. As shown in

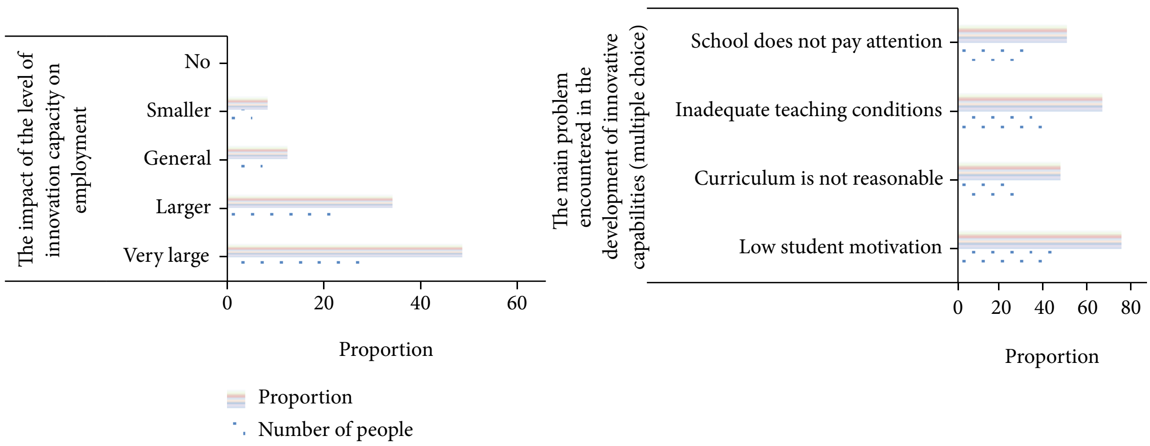

Figure 12: The impact and problems of innovative ability on employment.

Table 5: The main issues of school-enterprise cooperation in cultivating innovation capabilities.

Problem	Options	Number of people	Proportion
Problems existing in schools and enterprises in cultivating students' innovative ability	Insufficient school-enterprise communication	5	8
	The enterprise has no dedication	40	66
	Insufficient policy guidance	6	11
	The government does not pay enough attention	9	15

Table 5, the number of people who believe that enterprises have no dedication is the largest, as high as 66%. The government does not pay enough attention to it, accounting for 15%, and policy guidance is inadequate, accounting for 11%. The lesser proportion is the lack of school-enterprise communication (8%). This data shows that college teachers have greater opinions on the ways of fostering students' innovation ability in school-enterprise cooperation, and companies need to improve in future work.

To improve innovation ability, you need to start from the following aspects: choose a development direction; both innovation and entrepreneurship need to have a clear direction, with the direction to be able to carry out continuous improvement; pay attention to the cultivation of practical skills to lay the foundation for future entrepreneurial development; pay attention to the integration of resources; the process of innovation requires a certain degree of professional knowledge and industry cognitive ability, while the process of entrepreneurship requires continuous improvement of one's ability to integrate resources.

5. Conclusions

The training of engineering talents in the 21st century is now a key issue in the industrial development and international competition of various countries. With the development of the socialist economy with Chinese characteristics, the current society has higher and higher requirements for the engineering innovation ability of applied undergraduate students, and the innovation ability has increasingly become an important basis for corporate recruitment. Under the situation of "big engineering concept" and "returning engineering," it has become a consensus in the field of higher engineering education to cultivate innovative design engineering talents and build a country with a strong human resources. Universities continue to expand enrollment, followed by a decline in the quality of education. The people trained by the school cannot meet the needs of the society. Therefore, it is necessary to find other ways to actively promote the progress of students' engineering innovation ability. Through reading a large number of documents, using pedagogy and other related concepts, this paper combines qualitative and quantitative methods, and combines virtualization technology with students' engineering innovation ability for systematic analysis and in-depth research. (1) This article analyzes and summarizes the basic theories, analyzes the virtualization technology and students' engineering innovation ability, and lays the foundation for the subsequent theoretical research. (2) This article investigates undergraduate students in xx colleges and universities to understand current undergraduate students' views and opinions on innovation ability. (3) Conduct a questionnaire survey on teachers of xx colleges and universities to understand the innovation ability of students at this stage and the problems encountered in the process of cultivating students' innovation ability. Although the author has done a survey on the engineering innovation ability of undergraduate students and referred to a large amount of literature, there are still many problems due to the limited ability of researching this article. (1) Is the engineering innovation ability of undergraduate students at this stage compatible with the current education system? (2) How to effectively solve the problems encountered in cultivating talents? (3) Is the combination of virtualization technology and undergraduate engineering innovation ability related to the regional education model? These issues need to be further studied.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

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