

Optimal Allocation of Innovation and Entrepreneurship Education Resources in Colleges and Universities Based on Computer Multimedia Intelligent Network

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Keywords: Innovation and Entrepreneurship in Colleges and Universities, Optimal Allocation of Educational Resources, Computer Multimedia, Intelligent Network

Abstract: Due to the current national background of "diversified entrepreneurship and innovation", education in the field of innovation and entrepreneurship (hereinafter referred to as IE) has recently become a hot topic of higher education in China. While college students use the Internet, how to better allocate learning resources in the IE field is the focus of this paper. An examination of the existing environment explained the educational needs of students in the areas of IE, as well as the current challenges and solutions facing students' education in these areas. In the introduction section, it first provided the background of the creation of university IE teaching resources, which led to the following. Then, academic research was conducted on the educational resources of IE in school and the intelligent network of computer multimedia. Finally, a summary was made. In the second part, the algorithm model of computer multimedia intelligent network utilization was established, and various algorithms were proposed to provide algorithm basis for computer multimedia intelligent network. Then, the correlation factors related to the optimal allocation of educational resources of computer multimedia intelligent network were proposed. Finally, combined with the above research, SWOT (SWOT Analysis) was used to analyze the model experiment, and the experiment was summarized and discussed in detail. The research results showed that the optimal allocation of IE education resources in school based on the computer multimedia intelligent network constructed in this paper has been improved by 7.11%.

1. Introduction

Multimedia network education has created a broad educational space for cultivating innovative education and innovative talents. Multimedia network education has promoted the intellectual development of students, and promoted the innovation ability of teachers and the improvement of education quality. Based on this, the development of creative education not only provides intellectual support for the development of multimedia network technology, but also creates a strong

foundation for the implementation of education. It also encourages its popularization and application, promoting the creative growth of contemporary multimedia network technology. Therefore, in the face of increasingly fierce international education competition, school must implement educational reforms and transform educational concepts to effectively enhance students' entrepreneurship, innovation and creativity.

The development and reform of basic education depend heavily on the efficient use of resources. Therefore, the optimal allocation of educational resources is an important issue faced by researchers. Pardue S L argued that programs must develop courses that reflect market expectations, improve resource utilization and use new technologies that provide new methods of information exchange [1]. Omoeva C provided a methodological framework for measuring and analyzing the distribution of educational resources within and between systems and analyzing the potential impact of equity [2]. Comsa I S recommended allocating resources based on machine learning to improve the quality of video services and improve ratings. In an educational context, the solution has been used and tested, which showed its advantages over state-of-the-art technologies in terms of quality of critical service of a variety of video materials [3]. Wu Y introduced a brand new mobile education content prediction and distribution platform based on wireless broadband technology. The architecture of the resource-sharing system has resource layers, management, and service layers [4]. Taking high school and university educational resources as examples, Han W realized the distribution of educational resources based on a simple semantic argument of establishing a mapping relationship between learning resources and node distribution [5]. Wang Y analyzed the regional human, financial and material resources of preschool education allocation in a city, and proposed the proportion of preschool education allocation in different regions of the country [6]. When Ping M A continued to adjust the school structure, it is necessary to evaluate the use of educational resources [7]. Big data technology has been hotly discussed in English ideological and political education in life, and it has also attracted attention in the academic world.

Modern distance learning uses advanced technologies such as computer network, multimedia and artificial intelligence to build an online virtual learning environment. Multimedia intelligent computer network is also an important topic in the world. Han C discussed the basketball training teaching method based on NMT (Nano Molding Technology), and expounded the concept and function of multimedia learning. He proposed the NMT-based BTT (Banking Transformation Toolkit) method and examined the method of creating multimedia basketball courses [8]. Zhang M analyzed the intelligent teaching support scheme system of modern educational psychology based on the intelligent, network and multimedia learning support environment supported by computer multimedia [9]. Kumar P achieved comprehensive visual classification to fill semantic gaps through large-scale data mining, offering promising boundaries for accurate multimedia understanding. He analyzed huge datasets to extract patterns and make effective decisions [10]. Chen J's research found that in the context of global multi-polarization, economic globalization and education globalization, multimedia computing technology stood out [11]. Zhang J proposed that the use of multimedia rooms allowed students to interact with various texts, which provided them with a solid foundation for assignments and content in general university courses [12]. Zhao F believed that with the development and development of science and technology, multimedia technology had developed rapidly, and the application of multimedia technology in various aspects had also undergone earth-shaking changes [13]. Wang Z studied on the basis of defining the meaning of multimedia learning, and made a detailed analysis of the advantages of multimedia technology in language teaching [14]. This paper studied how to use the computer multimedia intelligent network to optimize the resource allocation of entrepreneurship and innovation education in colleges and universities.

Due to the development of the entrepreneurial field and the urgent need of entrepreneurial skills

in many industries, entrepreneurship education is attracting more and more attention from people from all walks of life. The entrepreneurial economy has advanced greatly in the 21st century. To conduct simulation studies through trials, this study has combined the solution method with an algorithmic model.

2. Computer Multimedia Intelligent Network Utilization Algorithm Model

(1) Estimation of algebraic connectivity of multi-agent networks

In this paper, an iterative power identification estimation algorithm is used to dynamically estimate the algebraic connectivity of graphs λ_2 . It is used as a measure of network connectivity. The main idea is that any agent i can only estimate the algebraic connectivity of figure λ_2 and the corresponding eigenvector v_2 through the interaction of local information with neighboring individuals j .

Let $\tilde{v}_2 = (\tilde{v}_2^1, \tilde{v}_2^2, \dots, \tilde{v}_2^n)^T \in R^n$ be the estimate of eigenvector v_2 , and I-aL is iterated to the power. a is small enough that $a > 0$. The power iterative consensus estimation algorithm is the following three steps.

$$\text{Step1: } \tilde{v}_2 = -\text{Ave}(\{\tilde{v}_2\})1 \quad (1)$$

$$\text{Step2: } \tilde{v}_2 = -aL\tilde{v}_2 \quad (2)$$

$$\text{Step3: } \tilde{v}_2 = -(\text{Ave}(\{\tilde{v}_2\}^2) - 1)\tilde{v}_2 \quad (3)$$

The above steps are combined by linear weighting to obtain:

$$\tilde{v}_2 = -k_1\text{Ave}(\{\tilde{v}_2\})1 - k_2L\tilde{v}_2 \quad (4)$$

Among them, $k_1, k_2, k_3 > 0$, which is the control gain. Formula (4) can be further rewritten as:

$$\tilde{v}_2 = -\frac{k_1}{n}1^T\tilde{v}_2 - k_2L\tilde{v}_2 - k_3\left(\frac{\tilde{v}_2^T}{n} - 1\right)\tilde{v}_2 \quad (5)$$

(2) Characteristics of STNP smart transmitter network

The sampling period of the sensor usually has some numerical properties, for example, the sampling period is usually an integer multiple of 100s. The sensor sampling period in an intelligent STNP (Smart Transmitter Network Protocol) has the following characteristics: the length of the sensor sampling period is an integer multiple of the time slot length.

Condition 1: T_{samp} is the sampling period of the sensor. T_{slot} is the size of a time slot. There are:

$$T_{samp} = N \times T_{slot} \quad (6)$$

Condition 2: $T_{samp-each}$ is the sampling period of any sensor in the STNP network. $T_{samp-min}$ is the sampling period with the smallest sampling period value among all sensors. Then there are:

$$T_{samp-each} = T_{samp-min} \times M \quad (7)$$

In the STNP network, the sampling period of the sensor is not only an integer multiple of the time slot size, but also an integer multiple of the length of each epoch stage.

Condition 3: T_{epoch} is the time length of each epoch phase on the bus, then:

$$T_{\text{samp-min}} = S \times T_{\text{epoch}} \quad (8)$$

At the same time, each epoch consists of R time slots and satisfies:

$$T_{\text{epoch}} = R \times T_{\text{slot}} \quad (9)$$

In the STNP network, there is a time interval for data transmission between nodes. Time on the bus is based on time slots. Therefore, in the transmission process, each time the collected data occupies a lot of time slots.

Condition 4: $T_{\text{send-time}}$ is the time it takes for a node to transmit data sampled by a certain sensor. T_{occupy} is the number of time slots occupied by the node to transmit this sampled data. There are:

$$T_{\text{occupy}} = \text{ceil}(T_{\text{send-time}} / T_{\text{slot}}) \quad (10)$$

3. Relevance Factors on the Optimal Allocation of Educational Resources for Computer Multimedia Intelligent Networks

(1) Computer multimedia intelligent network factors

Computer network refers to the connection between geographically different and functionally independent multiple computer systems through communication equipment and lines. The sharing and transmission of network hardware, software and resources are realized through a set of network software with complete functions [15], as Figure 1.

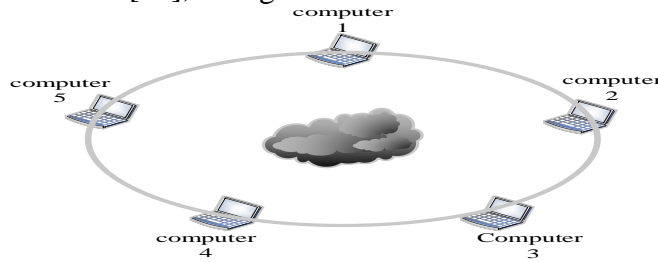


Figure 1: Factor analysis of computer multimedia intelligent network

1) Resource sharing

Resources refer to all data and hardware and software resources on the Internet [16]. Sharing refers to sharing all or part of network resources, such as online games. Resource sharing is mainly the sharing of software and hardware.

2) Data communication

One of the most basic functions of a computer is data communication. Computer users all over the world can connect to computers through a computer network, and transfer files, programs and data between computers.

3) Comprehensive information service

The information service platforms with many business functions and rich materials are developed by different departments according to their information consulting needs, which are called comprehensive information services.

4) Distribution processing

Distributed processing refers to one or more computers in a network composed of multiple computers, which can share resources and exchange information.

Text, data, and graphics-based information can all be processed by standard computer application systems. Multimedia computers are creating a new era of computing, processing information about pictures, sounds, animations and movies in addition to the above types of information mentioned, as

shown in Figure 2.

The significance of multimedia technology application lies in:

It makes it possible for computers to process the most direct and prevalent information of everyday life. It greatly expands the application scope and ability of computer, and improves the user friendliness and convenience of computer system interface [17]. Media technology makes computer multimedia technology easy to use and operate to most non-professionals. The close combination of computer, major information processing technology, communication and audio and video has laid a new foundation for the progress of information processing technology.

Multimedia technology has been developing for years. Audio, video and picture compression technologies are also steadily, and spawned several products. Now popular techniques, including pattern recognition MPEG (Moving Pictures Experts Group) compression technology, and virtual reality technology, have gradually matured. It is believed that it would not be long before they are put into the market.

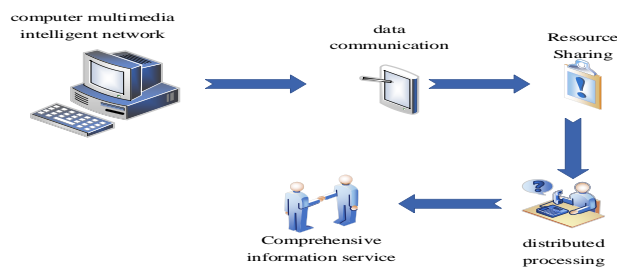


Figure 2: The computer application system

(2) Optimal allocation factors of IE Education resources

The purpose of IE education is not only the education of entrepreneurship and entrepreneurial spirit, but also the development of human resources with entrepreneurial and innovative spirit for the whole society. A group of entrepreneurs carry out innovative thinking training and entrepreneurship training education in stages and levels [18], as shown in Figure 3.

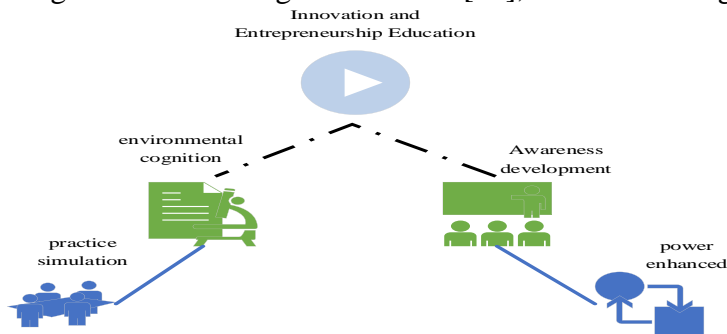


Figure 3: Optimized allocation of IE education resources

1) Consciousness training: The creativity and entrepreneurial spirit of students' entrepreneurship are stimulated, so that they can understand the essence, elements and characteristics of entrepreneurship, so as to achieve the purpose of entrepreneurship.

2) Capability enhancement: Students' innovative and entrepreneurial qualities are identified and developed, such as critical thinking, insight, decision-making, organizational coordination and leadership, to ensure that students develop essential entrepreneurial skills.

3) Environmental Cognition: Students are allowed to understand the current business and industry environment, understand entrepreneurial opportunities and risks to master business model development processes, design strategies and techniques.

4) Practical Simulations: Students are encouraged to experience all aspects of business

preparation by developing a business plan and developing hands-on simulations.

With the advancement of computerization, educational resources have been organically linked with web-based systems [19]. Emerging online learning communities, educational blogs, university networks, and other platforms have made online learning materials available, disrupting traditional notions of time and place. Due to the development and application of the information platform of the education system, especially according to the "Twelfth Five-Year Plan" of the Ministry of Education, many teaching materials are integrated into the comprehensive education cloud platforms such as the new generation education network, the university network, and the classroom network. At the same time, the integration of a large number of educational resources has become part of the overall cloud platform, which must become the best choice for modernization. The high-quality education cloud platform of the Asian education system is the first intelligent cloud education platform in China that realizes the integration of three networks and realizes the use of multiple platforms such as the Internet, telecommunication network, radio and television network, and mobile phone SMS support [20], as shown in Figure 4.

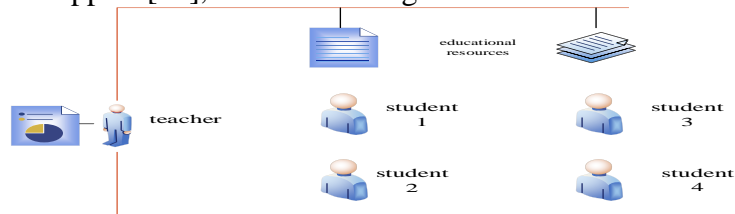


Figure 4: Association between educational resources and the network system

4. Experiments of Resource Optimization Allocation of IE Education in Universities

It is generally believed that creativity is the most important skill in the 21st century, and is even called "cultural capital" in the 21st century by foreign scholars. The cultivation of innovative talents is the key to promoting the development strategy of scientific and technological innovation. Through SWOT analysis, this paper summarizes the advantages and disadvantages, opportunities and challenges encountered by domestic and foreign universities in the process of IE education development. Table 1 is an analysis of the IE capabilities of national graduates from 2017 to 2021.

Table 1: Table shows the innovation and entrepreneurship ability of national graduates from 2017 to 2021

	2017	2018	2019	2020	2021
Undergraduate graduates	0.91%	1.1%	1.3%	1.21%	2.4%
Vocational college graduates	2.7%	2.3%	2.8%	3.1%	3.6%
National graduates	1.8%	1.7%	2.05%	2.15%	3%

(1) Advantages of IEE in colleges and universities

One is the internal resource support for the school. From the perspective of knowledge resources, universities are the main carriers of scientific and technological productivity and human resources. They have rich teaching and research resources, which provide favorable conditions for college students to innovate and start businesses. School have strong research capabilities in professional fields. Professors of various majors are gathered together to provide sufficient theoretical support for students' creativity and creative thinking. In terms of material resources, the university's teaching facilities and venue resources can provide a practical platform for college students' creative activities. With the acceleration of education modernization and the continuous improvement of classroom education informatization level, the connection between schools and the outside world is getting closer and closer. This helps students to keep abreast of the latest subject frontier

information to speed up the update of knowledge, thereby promoting students' creative thinking. Due to the existing system and management system and other factors, it is impossible to effectively integrate and use the internal resources of the school. However, if these resources can be fully utilized, it can play a very good role in promoting students' creative entrepreneurship education.

The second is to expand the entrepreneurial channels of college students. The university itself has rich alumni resources, which can greatly expand the entrepreneurial channels of college students, thereby promoting the IE of enterprises. It is mainly manifested in the following aspects: First, alumni can provide college students with the best employment information through the information of their units. Second, it has certain social resources and can provide corresponding financial aid and financial assistance for college graduates to start their own businesses. Third, alumni with outstanding entrepreneurs are invited to give speeches at the college to exchange entrepreneurial experience. Entrepreneurs use their personal experiences to inspire students and broaden their horizons, so as to stimulate their creativity. Figure 5 shows the analysis of the advantages of IE education in domestic and foreign institutions of higher learning.

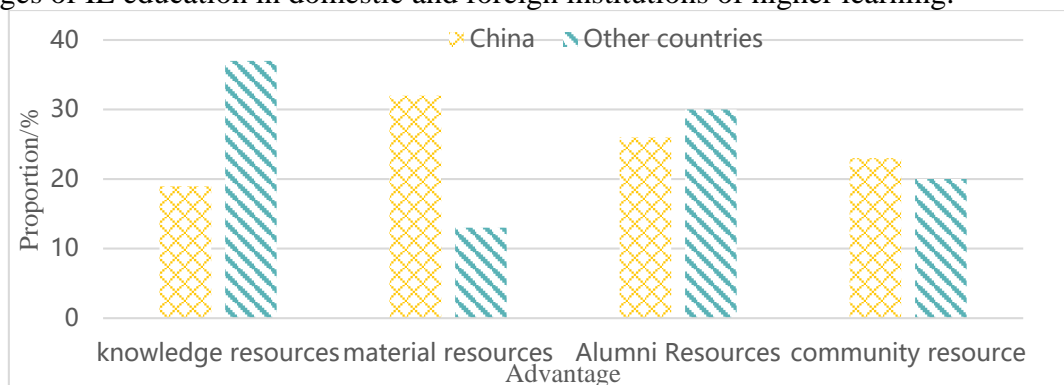


Figure 5: Analysis of the advantages of IE education in universities

As can be seen from Figure 5, the distribution ratios of knowledge, material, campus and culture are different. Let's look at China's attitude first. Among the four resources, the highest proportion is material resources, accounting for 32%. According to the size of the value, it is used as alumni resources, social resources, and knowledge resources, and the proportions are 26%, 23%, and 19%. Looking at the attitudes of other countries, the highest proportion of these four resources is knowledge resources, accounting for 37%. According to the size of the value, it is used as alumni resources, social resources, and material resources, and the proportions are 30%, 20%, and 13%. Due to different national conditions, attitudes towards IE in school are different.

(2) Disadvantages of IEE in colleges and universities

1) Insufficient cognition of IE education, and vague training orientation

Many universities do not have a deep enough understanding of IE education, and do not integrate it into the traditional teaching and training system, but only regard it as a kind of "extracurricular education". Some universities regard IE education as "elite education", aiming to win glory for the school by selecting a small number of students to participate in IE competitions. The reason for this phenomenon is that at present, universities have insufficient understanding of IEE, and its positioning is relatively vague. At present, school generally regard innovation ability as a basic skill for cultivating college students, while ignoring that creativity has become a basic quality in modern society. Many Western countries have recognized the importance of IE, as well as the importance of university education.

2) The educational methods are single, and the textbooks are outdated and lack pertinence

In terms of IE education methods, most school have not made breakthroughs in teaching content and teaching methods. The current teaching methods are mostly classroom lectures and case

discussions. There is lack of focus and training on reality. IE education is more based on practice to focus on practice and focus on practice. If the traditional classroom teaching methods and methods are still adopted, the implementation of IE education is affected. However, in the process of implementing IE education, there are also many problems. At present, most of China's textbooks on IE are imported from other countries. There is lack of "innovative" educational materials in line with national conditions and lack of practice and guidance. At the same time, the teaching materials used by teachers in teaching are also relatively random, lacking the systematic and scientific nature of relevant reference materials.

3) The structure of the teaching staff is unreasonable

Without the guidance of teachers, it is essential to the cultivation of students. The characteristics of IE education determine that teachers should not only have a solid theoretical foundation, but also have extensive social experience and rich social experience. In terms of the composition and structure of teachers, the current sources of IE education teachers in Chinese universities are relatively single. It is mainly selected from the existing teachers and lacks multi-disciplinary and multi-level teaching. Due to the lack of teachers' innovative practice and entrepreneurial experience, the main content of classroom teaching is the theory and knowledge of IE. However, on the other hand, due to the school's own management system and other factors, there are many problems in the introduction of IE education teachers, especially teachers related to IE education. This not only affects the replenishment of teachers, but also affects the rational allocation of teaching resources for IE education. Figure 6 shows the analysis of the disadvantages of IE education in colleges and universities.

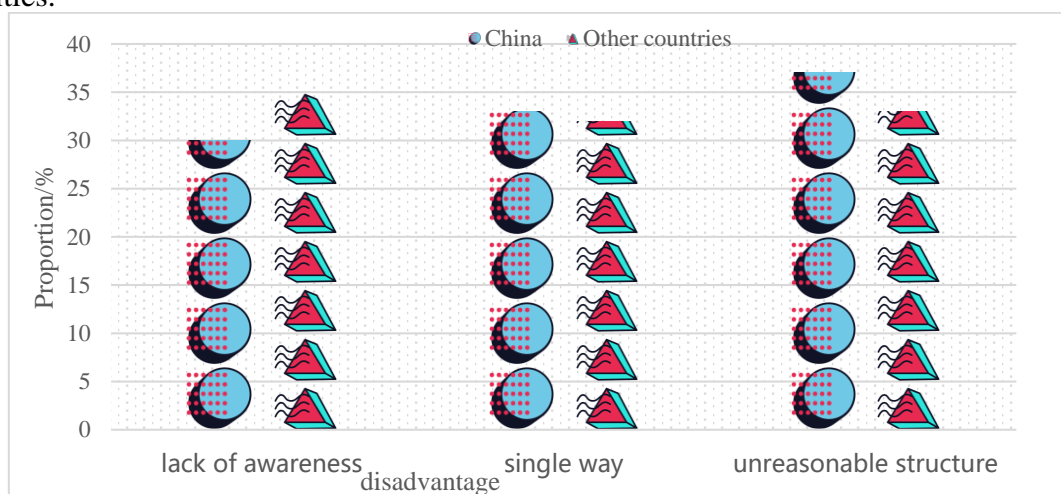


Figure 6: Analysis of the disadvantages of IE education

As can be seen from Figure 6, the cognition of disadvantages is roughly similar, and there are more or less problems such as insufficient understanding, single method, and unreasonable structure. In China, 30%, 33%, and 37% have insufficient understanding, single method, and unreasonable structure. Other countries have insufficient understanding, single method, and unreasonable structure, 35%, 32%, and 33%. The solution can refer to the analysis of the disadvantages above.

(3) The development of IE education in school faces opportunities

1) The worldwide emphasis on IE

From a global perspective, in order to achieve leadership in science and technology in the 21st century, governments around the world have put IE education and the cultivation of innovative talents in the first place. Both internationally and in China, the role of innovation in the national development strategy, especially the emphasis on innovative talents, has a positive and positive effect on promoting the development of IE education.

2) Innovative economic development, active innovation of enterprises

The innovation economy is one based on the creativity and creativity of entrepreneurs. It realizes the personal value of individuals at the micro level, thereby promoting the macro development of the country. It is a production mode with knowledge and entrepreneurs as the core, innovation and innovation as the main tool, small and medium-sized enterprises as the microeconomic foundation, and an economic form that continuously promotes economic development with the entrepreneurial mechanism. When a society develops to a certain stage, innovation is a more important source of power than economic and social progress. It is not only an inevitable choice for economic development, but also the cultivation of innovative talents driven by demand, thereby promoting the development of IE education.

3) International exchanges and cooperation to promote the development of IE education

The cultivation of innovation ability and international exchanges are inseparable. The increase in the frequency of international exchanges has brought about various impacts: the popularization of advanced concepts and knowledge of IE education in colleges and universities, and the impact and enlightenment of culture. The government has led the construction of the "International Resource Service Platform for Scientific and Technological Innovation". The purpose is to use the power of international science and technology to improve the service level of scientific and technological cooperation and improve China's scientific and technological development strategy research capacity. By strengthening technological cooperation, the effective development and utilization of international technological innovation resources such as technology, skills and knowledge are promoted, and China's technological innovation environment is improved. Figure 7 is an analysis of opportunities for the development of IE education in colleges and universities.

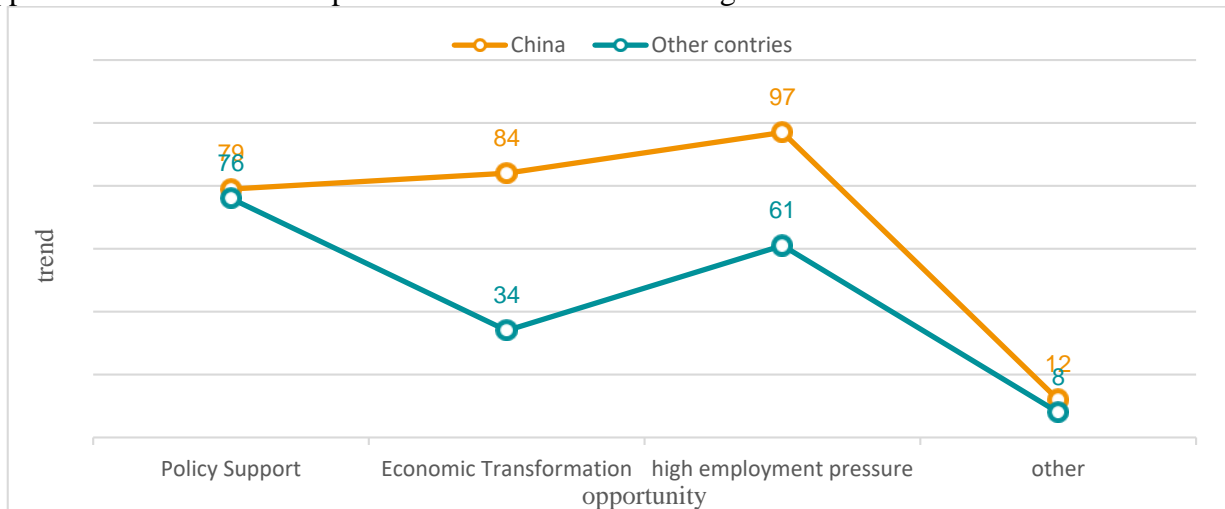


Figure 7: Analysis of the opportunities faced by IE

As can be seen from Figure 7, the trends of the two broken lines are different. The broken-line trend in China is a steady rise at first and then a sharp drop. The fold-line trend in other countries first decreases, then increases and finally decreases. Among them, it is worth analyzing the employment pressure in China. With a huge population base, uneven educational levels, and lack of jobs, China is bound to pay more attention to IE.

(4) The development of IE education in school faces challenges

1) The innovation policy supporting system is not yet perfect

College graduates faces a series of challenges and difficulties in the process of starting a business, which requires the help and support of the government, society, enterprises and other parties. IE in Western countries started late, and their related support and supporting systems are relatively

complete, which has certain reference significance. For example, the governments of other countries have stipulated that schools should have creative entrepreneurship, and that IE education should be written into state laws. School are encouraged to continuously improve and perfect IE education. A complete evaluation system and evaluation system have been developed. Through the evaluation indicators, the comprehensive IE education in school is evaluated. The IE of college students needs national policy support, especially in China, because the start of entrepreneurship is relatively late, which requires the establishment of an effective, complete and smooth policy support system.

2) Intensified competition in overseas higher education and loss of innovative talents

In the 21st century, the internationalization of higher education is a trend. Especially under the current circumstances, IE education in other countries has a good history of development. There are sufficient policy support and sufficient supporting facilities, which can provide reference for innovation. The United States attracts creative talents through visits, exchanges, and immigration. The UK Government has established the Excellence in Talent visa to attract creative talent. Canada operates an immigration program designed to attract entrepreneurs. The policies formulated by these developed countries have great temptation for creative talents, making the competition more intense. The outflow of talents seriously affects the development of enterprises. Figure 8 is an analysis of the challenges facing the development of IE education in colleges and universities.

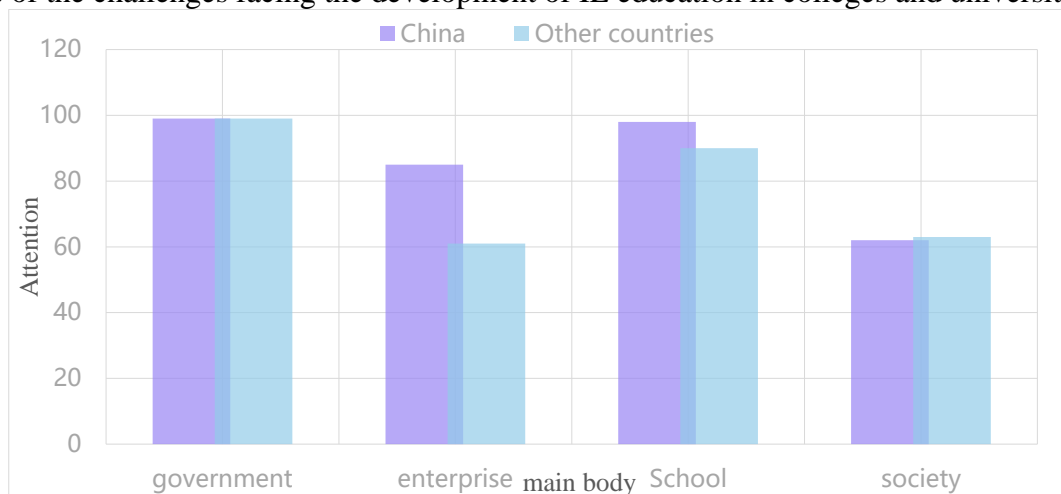


Figure 8: Analysis of challenges in IE

From Figure 8, it can be seen that the government, enterprises, schools, and society's attention to the development of IE education in school are analyzed to analyze the challenges they face. The government's attention to IE is 99%. This shows that the government still needs to play a leading role when school are facing challenges in IE. The attention of enterprises to IE is 85% and 61%. Chinese enterprises are in a stage of rapid development, so they pay more attention to IE. The school's attention to IE is 98% and 90%. Like the government, schools must also play a regulatory role. The society's attention to IE is 62% and 63%, and the society's attention to IE is low.

In summary, the optimal allocation of IE education resources in school based on the computer multimedia intelligent network constructed in this paper is effective by 7.11%.

5. Conclusion

This paper analyzed the existing problems in colleges and universities, and used the five forces model to study the development of IE education in colleges and universities. A total of the development of IE education in school facing challenges, the development of IE education in school facing opportunities, the analysis of the disadvantages of IE education in colleges and universities,

and the analysis of advantages of IE education in school were compared in this experiment. The experimental results showed that the optimal allocation of IE education resources in school based on computer multimedia intelligent network was more effective.

Acknowledgement

This work was supported by 2022 Guangxi Higher Education Undergraduate Teaching Reform Project "Path Exploration and Practice of Innovation and Entrepreneurship Hybrid Teaching Mode in Local Colleges and Universities under Multi-disciplinary Cross-fertilization" (2022JGB347); Guangxi University of Finance and Economics Undergraduate Teaching Reform Project "Application of Project Teaching Method in Construction Engineering Regulations Course under the Guidance of Engineering Education Professional Accreditation Concepts" (2021JG15)

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