

Research on the Construction of Virtual Simulation Experiment Teaching Courses of Economics and Management Majors*

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Abstract—The teaching methods of economics and management courses are gradually developing towards the direction of intelligence, informatization and engineering. Against the background of cultivating innovative and applied talents in universities, economics and management majors should combine their own characteristics to reconstruct the practical teaching system. Universities should form an all-round, systematic, multi-level and three-dimensional practical teaching system with virtual simulation experimental courses as the core. By improving the software and hardware platform and the management system, virtual simulation experiment course system helps students to complete the experience experiment independently. This can make the students' academic and professional, theoretical and practical, knowledge ability and comprehensive quality to achieve coordination and unity, and form a three-dimensional talent training mechanism of comprehensive improvement of knowledge, ability and quality.

Keywords: *virtual simulation, experimental teaching, teaching reform, teaching system, economics and management majors*

I. INTRODUCTION

In October 2019, the Ministry of Education released the implementation guideline on the construction of first-class undergraduate courses. The guideline proposes to highlight the characteristics of advanced, innovative and challenging of virtual simulation experiment teaching courses, and create 1,500 national virtual simulation experiment teaching courses. The General Office of the State Council has issued several opinions on deepening the integration of industry and education, which require universities to strengthen practical teaching closely based on the needs of industry and improve the training system of application-oriented talents. With the adjustment of China's industrial structure and the transformation of economic development mode, the demand

for application-oriented talents in economic and management majors is increasing. It has become an important responsibility of higher education in China to train a large number of application-oriented talents majoring in economics and management.

The first-class course construction of virtual simulation experiment teaching can not only break through the limitation of time and space, but also complete the training function of applied talents which is difficult to complete in real environment and ordinary experiments. This study focuses on the training goal of applied talents in economics and management, and takes the collaborative training of "knowledge, ability and quality" as the center. This study focuses on creating a "golden lesson" construction mechanism of virtual simulation experiment teaching for economics and management majors, which is characterized by omni-directional, systematic, multi-level and three-dimensional.

II. VALUE OF VIRTUAL SIMULATION EXPERIMENT TEACHING FOR ECONOMICS AND MANAGEMENT MAJORS

A. *The Ministry of Education promotes national first-class courses of virtual simulation experiment teaching*

The Ministry of Education has issued a notice on the construction of national virtual simulation experiment teaching projects, stressing that universities should highlight student-centered virtual simulation experiment teaching. Universities should adhere to the principle of "student-centered, output-oriented and continuous improvement" and strengthen the ability-first talent training mode. The Ministry of Education also released the implementation guideline on the construction of first-class undergraduate courses, proposing to create 1,500 first-class national virtual simulation experiment teaching courses in universities across the country, known as the "golden courses" of virtual simulation experiment teaching. Universities across the country have pushed the work forward in various ways, trying to capitalize on this golden window for demonstration and preparation.

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B. Virtual simulation experiment teaching is advanced

Virtual simulation experiment teaching has the advantages of scene reproduction, vivid and intuitive, safe and reliable, economic and controllable, objective and real, precise and accurate. These advantages have their own unique advantages for cultivating talents of economics and management majors. It has become the direction of the current teaching reform of economics and management majors to strengthen the virtual simulation experiment teaching link, get close to the real situation of enterprise decision-making and operation activities as much as possible, and shape students' practical ability.

C. New requirements are put forward for application-oriented talents training in economics and management majors

The talent training of economics and management majors focuses on the construction of comprehensive knowledge system such as economic theory knowledge, production management skills and social adaptability. This puts forward higher requirements to the training of application-oriented talents. The practice teaching in the talent training of economics and management majors should emphasize more on the connection with the production and operation of enterprises and match with the work demands of enterprises. The training programs for economics and management majors have been gradually reformed, and practical training courses have been gradually increased to 30% of the total class hours. How to effectively train students' practical ability is a major problem to be faced in the talent training of economics and management majors.

D. Virtual simulation experiment teaching courses can effectively improve students' employability

The employment of graduates majoring in economics and management mainly focuses on financial accounting, logistics and marketing. There is a strong intersection, relevance and interaction between the work and operation processes of these positions. These positions have higher requirements on graduates' professional abilities, including executive ability, analysis and problem solving ability, communication and collaboration ability, etc. Universities build virtual simulation business environments in which students can be trained in environments that are more or less identical to real businesses. This enables students to understand the interrelationship between enterprises, departments and positions, and effectively train students' professional ability and quality.

III. PROBLEMS IN VIRTUAL SIMULATION EXPERIMENT TEACHING COURSES OF ECONOMICS AND MANAGEMENT MAJORS

A. The positioning of virtual simulation teaching courses is not clear

In terms of positioning, the positioning of virtual simulation experiment teaching courses for economics and

management majors in application-oriented universities is mostly based on regional economic development, actively serving the society, and cultivating high-quality and application-oriented talents. The positioning of virtual simulation experiment teaching centers or courses in most applied universities is like this. Due to the unclear positioning, the curriculum design and construction lack of characteristic, and it is difficult to adapt to the personalized requirements for talent training in the context of economic transformation.

B. The curriculum system and standards are not perfect

First of all, the design of the curriculum system is not designed from the perspective of the requirements of discipline and specialty construction for talent training, which leads to the serious fragmentation and one-sided phenomenon of the curriculum system. Secondly, experimental teaching is still focused on single course experiments, while professional comprehensive experiments and innovation and entrepreneurship experiments account for a relatively small proportion. Finally, the curriculum standards are not standardized enough, resulting in teachers' strong arbitrariness in class, which seriously affects the quality of experimental teaching.

C. The practical teaching projects are not comprehensive

At present, the experimental teaching of management specialty is given priority to with fundamental, design experiments. Comprehensive practical teaching projects are usually arranged at the end of the semester. Due to the limitations of class hours and experimental conditions, only one or two simulated trainings are usually arranged. In the process of simulated operation, the training is finished in a hurry when students have just formed their perceptual cognition of enterprise operation. The comprehensive practice teaching project is not strong, students cannot combine professional knowledge and skills training effectively. They cannot form a systematic and rational cognition of enterprise operation management, and the effect of practical teaching is not ideal.

D. There are few horizontal contacts among different majors and courses

The practice teaching of each major and each course is lack of extensive cross - fusion and horizontal contact. The complexity and comprehensiveness of practice teaching content is low, and the phenomenon of fragmentation exists. The continuity and systematization of professional knowledge is not strong, which leads to the knowledge connection between different majors is not close. Students' overall perceptual knowledge of professional courses is not high, and lack of systematic understanding and application of professional knowledge. The introduction of virtual simulation technology can reform the practice teaching of economics and management majors and strengthen the horizontal connection among various majors.

E. Lack of integration between professional practice and innovation and entrepreneurship

With the development of innovation and entrepreneurship education in China, universities are integrating professional practice with innovation and entrepreneurship practice. However, under the existing teaching system, practice teaching belongs to the educational department, and innovation and entrepreneurship education belongs to the employment department. Each department only focuses on its own development, the sense of cooperation between each other is still relatively weak. The lack of effective communication and resource sharing among departments within universities, between universities and enterprises, and between universities and society greatly affects the quality of talent training. Therefore, how to build a virtuous circle between specialty and entrepreneurship and bridge experimental teaching and innovation and entrepreneurship has become an urgent problem to be solved.

F. Low sharing rate of course resources

First of all, the virtual simulation experiment teaching resources of most application-oriented universities basically adopt the usage mode of fixed location and fixed time. This is difficult to break the time and space limit, greatly reducing the efficiency of resource utilization. Second, there are serious barriers between different universities. In order to enhance their popularity, universities want to create their own distinctive results. This led to their rush to apply for and build virtual simulation projects, lack of quality, characteristic resources of inter-school promotion.

IV. PRINCIPLES OF VIRTUAL SIMULATION EXPERIMENT TEACHING COURSE CONSTRUCTION OF ECONOMICS AND MANAGEMENT MAJORS

A. Reform oriented to the transformation and development of application-oriented universities

Universities should follow the guiding spirit of application-oriented transformation and clarify the basic connotation and requirements of application-oriented universities. At present, applied universities are a type of running schools different from research universities and vocational colleges. The practical ability of students cultivated by application-oriented universities is stronger than that of students in research-oriented universities, and their theoretical basis and professional ability are stronger than those in vocational colleges. These universities serve the development of local economy with the aim of improving quality and meeting social needs. Application-oriented universities should constantly explore new teaching models and cultivate outstanding application-oriented talents with solid theoretical foundation, proficiency in various practical businesses and solid internship experience.

B. Talent training for emerging industries

In recent years, the state has put forward the key development of strategic emerging industries. Universities should develop talent training plans and comprehensive

professional reform plans for strategic emerging industries. Universities should promote the practical teaching of economics and management majors to carry out effective work in the aspects of teacher training, teaching plans, curriculum construction and teaching research.

C. Practice-oriented teaching system construction programs

Practical teaching objectives can be summarized as three aspects of the ability requirements: general practical ability, professional specific practical ability, post comprehensive practical ability. The teaching system construction program should focus on the cultivation of comprehensive practical ability, the cultivation of professional skills engaged in a certain occupation or post, and the cultivation of professional accomplishment.

D. Cultivation of innovative practical ability conducive to the independent development of personality

The independent development innovation practice ability, must fully respect the student individual characteristic, and combines own specialty, the interest hobby independent development. Universities can urge students to participate in practice sessions, and teachers are responsible for identifying credits for innovative practice. The training objective of this aspect can be summarized as having certain innovative and practical ability.

E. Conducive to scientific research and social services

The practical course of virtual simulation for economics and management majors not only serves for teaching, but also can be used for scientific research. The virtual simulation practice course of economics and management majors can establish an open and shared operation management mechanism. This can break through the bottleneck of technology, equipment, teachers and management, promote the constant updating and optimization of teaching resources, and effectively improve the level of teaching and scientific research services.

V. CONSTRUCTION PATH OF VIRTUAL SIMULATION EXPERIMENT TEACHING COURSES FOR ECONOMICS AND MANAGEMENT MAJORS

A. Reforming the concept of experimental teaching of economics and management majors

The current situation of college students in the new era is that they are deeply dependent on electronic products such as mobile Internet, smart phones and smart terminals. Universities should attach more importance to the cultivation of social responsibility, entrepreneurship and innovation spirit and practical ability of students majoring in economics and management. Universities should work with enterprises to build a collaborative education mechanism between industry and school from the aspects of financial and economic management knowledge imparting, practical ability training, inter-disciplinary talent training, and

application-oriented high quality improvement. Universities should mobilize students to actively participate in and experience experimental teaching, constantly stimulate students' potential, and cultivate students' awareness and ability of innovation and entrepreneurship.

B. Optimization of teaching content and methods

Universities should be guided by the real needs of the society and learn the actual needs of economic development for talent training of economics and management majors through the investigation of employers. Universities should strive to integrate the latest achievements of industrial development into application-oriented development plans and personnel training programs. At the same time, with the help of the new generation of information technology, universities can develop virtual simulation experimental teaching projects with financial characteristics and conduct practical tests. In terms of teaching methods, universities can promote such teaching methods as problem introduction, case driven and discussion interaction. Universities can also explore autonomous, cooperative and inquiry-based flipped classroom teaching methods. With the help of big data, artificial intelligence and other technologies, universities have realized pre-class lesson preparation, classroom teaching and blended teaching through text, voice, graphics, images, videos and other media forms.

C. Promoting the openness and sharing of virtual simulation experiment courses

The Ministry of Education issued the "notice on the construction of demonstration virtual simulation experiment teaching project". Universities should, in accordance with the requirements of the notice issued by the Ministry of Education, fully consider the operational needs of different levels and types of students to access experimental teaching programs. Universities set up the running platform of virtual simulation experimental teaching courses with openness, expansibility, compatibility and foresight. At the same time, universities should pay attention to the protection of their own or joint intellectual property rights of relevant experimental teaching projects, and pay attention to the protection of students' personal information. Universities should strictly abide by laws and regulations related to education, intellectual property and the internet, and determine basic security responsibilities according to the principle of "who develops who is responsible".

D. Training more virtual simulation experiment teachers

In order to improve the application efficiency of virtual simulation courses, it is very effective to train more teachers who are competent for such courses. The frequent application of virtual simulation technology can quickly detect the gap between the teacher's teaching method and the enterprise's actual situation. This can help teachers get familiar with the operation process of enterprises, greatly shorten the time required by teachers to prepare lessons, and improve the comprehensive quality and ability of teachers. Universities can select teachers who are ready to be trained

according to the selection criteria of high ethics, patience, love of teaching and practical ability. Universities can set up and train virtual simulation experiment teaching team through on-the-job training, enterprise post, etc., and actively promote teachers to participate in the research and development or teaching practice of virtual simulation experiment teaching projects.

E. Improving the evaluation mechanism of experimental teaching courses

Virtual simulation experiment teaching courses have online and offline combination, across time and space, knowledge fragmentation and other characteristics. According to the idea of "strengthening process management", universities optimize the evaluation method of experimental teaching effect by combining the actual situation of students majoring in economics and management. Universities use the technology of big data analysis to comprehensively evaluate the teaching effect of virtual simulation experiments through students' online time, discussion activity and experiment completion. Universities should try to promote the incentive mechanism of virtual simulation experiment teaching open and sharing. Universities should try to promote incentive mechanism to improve the openness and sharing degree of virtual simulation experiment teaching. After the conditions are ripe, universities should establish the mechanism of mutual recognition and credit transfer of inter-school experimental teaching courses. Universities offer online teaching services or technical support for support experimental teaching courses to improve the teaching effect.

F. Building the virtual simulation experiment teaching platform

When the content system of experimental teaching courses of economics and management majors is established, universities build the virtual simulation platform based on it. The platform designs experimental projects based on the actual operation process of the enterprise. The platform constructs a certain virtual organizations in the virtual environment, mainly including enterprises, market and related management and service organizations. Students participate in the operation through the position roles of virtual enterprises. The virtual simulation experiments mainly focus on manufacturing and business operation. Manufacturing companies, suppliers, customer companies, banks, leasing companies, logistics companies and other economic entities are collectively referred to as simulation enterprises. In virtual simulation experiments, manufacturing enterprises and external related departments are the relationship between the subject and the auxiliary, and they play different roles to improve the simulation effect.

VI. CONCLUSION

Practical teaching is an important part of talent training and has been the focus of research in universities for many years. The experimental teaching of economics and management majors is an important method to construct the

training system of applied talents. The experimental teaching of economics and management is an important method to construct the training system of applied talents. With the progress of information and internet technology, virtual simulation experiment courses have become an important way to strengthen practical teaching and improve students' comprehensive ability and professional quality. Under the limited capital investment of universities, constructing the virtual simulation experiment course system is the development trend of the experiment teaching of economics and management majors. At the same time, the construction of virtual simulation experiment teaching courses in economics and management majors is not yet mature. At the same time, the construction of virtual simulation experiment teaching courses in economics and management is not yet mature. Universities need to improve management system, simulation environment and software and hardware, so as to promote the construction of virtual simulation experiment teaching courses both well and quickly.

REFERENCES

- [1] Bao S. Exploration and practice of the connotation of "entrepreneurship and innovation" talents training in economics and management specialty from the perspective of virtual simulation teaching [J]. *Intelligence*, vol.26,pp.183-186,October 2019.
- [2] Zhang Y C. Research on the construction of university economic management laboratory under the characteristics of the new era [J]. *Rural economy and technology*,vol.34,pp.289-290,April 2019.
- [3] Dong Y Z, Liu Z. Experimental teaching reform of economics and management specialty based on virtual simulation [J]. *Journal of henan college of finance and taxation*, vol.33,pp.84-87,March 2019.Wang H L, Geng X W, Shao H Q. Reform and practice of practical teaching model in universities based on "entrepreneurship and innovation" training [J]. *Journal of higher education*,vol.97,pp.53-55,January 2019.
- [4] Zhao Y, Zhong X. Research on the production and application of "micro-class" in virtual simulation comprehensive training [J]. *Curriculum education research*, vol.9,pp.205-207, January 2018.
- [5] Jiang L.Construction of practical teaching quality monitoring system for economics and management majors in application-oriented universities [J]. *Jiangsu science and technology information*,vol.36,pp.57-59,March 2019.
- [6] Wang Y, Zhang P L. Empirical research on the construction of a cross-specialty virtual simulation teaching platform for economics and management [J]. *Industry and information education*, vol.19,pp.74-79,November 2017.
- [7] Chen R, Zhang M.Research on teaching reform of economics and management majors in the era of big data [J]. *Information recording materials*,vol.20,pp.142-143,January 2019.
- [8] Deng W B. Exploration and practice of cross-specialty virtual simulation comprehensive training in economics and management [J]. *Transportation vocational education*, vol.36,pp28-32, April 2017.
- [9] Wang H L.On the improvement of maker education in Chinese universities [J]. *Journal of fuzhou university*,vol.32,pp.104-108,February 2018.
- [10] Li Y Q. Research on "school-enterprise" cooperation in creating innovative and entrepreneurial training mode for economic and management talents [J]. *China light industry education*, vol.20,pp8-11, January 2017.
- [11] Wang D, Li P, Wang Z T.Research on construction of "1+3" course assessment mode for economics and management majors in applied universities [J]. *Journal of suihua university*,vol.38,pp.130-132,May 2018.
- [12] Jin K. Construction of an open virtual simulation experiment teaching platform [J]. *Science and technology innovation*, vol.21,pp146-149, September 2017.
- [13] Wang S, Zhang Q, Cai X. Multiple practice teaching reform of economics[J]. *Journal of Graphics*,vol.38,pp.453-457,March 2017.
- [14] Zheng X .Analysis on virtual simulation experiment teaching of finance major in colleges and universities [J]. *University education*, vol.6,pp131-132,April 2017.
- [15] Wang R. Practical research on school-enterprise cooperative talent training model [J]. *Discussion on education and teaching*, vol.9,pp.43-44,September 2017.
- [16] Xu W. Suggestions on the construction of virtual simulation teaching center for economics and management [J]. *Modern economic information*, vol.16,pp.460-462,December 2017.
- [17] Fawson C, Simmons R, Yonk R. Curricular and programmatic innovation at the intersection of business ethics and entrepreneurship [J]. *Advances in the Study of Entrepreneurship Innovation & Economic Growth*,vol.25,pp.109-130,April 2017.
- [18] Zhang G S. Innovation and practice of the construction of economic and management simulation laboratory under the condition of new information technology [J]. *Commercial accounting*,vol.37,pp112-114,October 2016.
- [19] Chen S, Yang C. Difficulties and solutions of the teaching reform of the undergraduate major of economics and management in local universities [J]. *Journal of tangshan university*,vol.29,pp.106-108, February 2016.
- [20] Liang L L, Guan W L. Practical research on cross-specialty virtual simulation comprehensive practice in economics and management [J]. *China management informatization*, vol.19,pp.235-238,July 2016.
- [21] Li W L. Research on integrated simulation virtual platform of economics and management and experimental teaching system [J]. *Experimental technology and management*, vol.33,pp.208-210,January 2016.
- [22] Cui Y. Construction of experimental platform for innovation and entrepreneurship of economics and management majors under the background of transformation of ordinary universities [J]. *Statistics and management*, vol.18, pp.160-161, May 2015.
- [23] Zhu J, Zhu H. Experimental center construction in the transformation of technology-based universities -- a case study of virtual simulation experiment center construction for economics and management [J]. *Journal of chongqing three gorges university*, vol.31,pp.163-166,February 2015.
- [24] Li Y. Experimental teaching research with innovation and entrepreneurship ability as the training target -- taking economics and management major as an example [J]. *Inner Mongolia education*,vol.23,pp.83-84,May 2015.
- [25] Wang Z Z. Application of virtual simulation technology in comprehensive practice of economics and management [J]. *Software guide*, vol.14,pp.9-11,March 2015.
- [26] Ren Z A. A study on the industry-learning fit of school-enterprise cooperative talent training mode for economics and management majors [J]. *Higher education research for ethnic minorities*, vol.3,pp.84-89, January 2015.
- [27] Zhang H X, Yang Y. Construction of virtual simulation experimental teaching center for economics and management in colleges and universities [J]. *Journal of higher education*, vol.18,pp.238-239,October 2015.
- [28] Hechavarría D M, Welter, Chris. Opportunity types, social entrepreneurship and innovation: Evidence from the panel study of entrepreneurial dynamics [J]. *International Journal of Entrepreneurship & Innovation*,vol.6, pp.1-6, April 2015.
- [29] Bi J D. Design of virtual simulation comprehensive experimental teaching system for economics and management [J]. *Management observation*, vol.23,pp.99-101,July 2014.
- [30] Huang H. Exploration on school-enterprise cooperation course construction for economics and management majors in application-

- oriented undergraduate universities [J]. *Journal of chizhou university*, vol.27,pp.153-156, February 2013.
- [31] Luo P. Construction of practice teaching system for economics and management specialty based on cross-specialty virtual simulation experiment [J]. *Journal of Qingdao vocational and technical college*,vol.32,pp.38-42, April 2013.
- [32] Priem R L, Li, S, Carr, J. C. Insights and new directions from demand-side approaches to technology innovation, entrepreneurship, and strategic management research [J]. *Journal of Management*,vol.38, pp.346-374,January 2012.
- [33] Luo Y. Based on the "six combinations" construction of experimental teaching platform for economics and management [J]. *Modern education technology*,vol.22,pp.112-115,September 2012.
- [34] Dang J, Dong Y. Construction of experimental teaching system for economics and management based on professional ability improvement [J]. *Journal of northwest university for nationalities (philosophy and social sciences edition)*,vol.13,pp.182-188, March 2012.
- [35] Niu H, Zhang B G, Dong J G. Exploration on experimental practice teaching reform of economics and management majors oriented by cultivation of innovation ability [J]. *Laboratory science*,vol.15,pp.28-31,January,2012.