

Research on the Application of Virtual Simulation Technology in Ethics Literacy Education of Agricultural Economic Management Major

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Abstract: Based on virtual simulation experiment technology, this paper simulates the process of modern agricultural management, and discusses the cultivation of ethics literacy of students majoring in agricultural economic management in practical teaching. In the process of practical teaching, students should truly restore the agricultural management process and simulate some special situations to minimize the irrational behaviors that damage the natural ecosystem. Utilize virtual simulation experiment technology to comprehensively improve the ethics literacy of students majoring in agricultural economic management, put knowledge into daily agricultural management, repair and protect the agricultural ecosystem, realize the quality and increment of agricultural products and the development in the direction of green, sustainable and ecological civilization, assist the revitalization of villages and promote the sustainable development of agricultural natural ecosystem.

Keywords: Virtual simulation experiment technology, Agricultural economic management, Ethics literacy, Practical teaching.

1. Research Background

In the early 1980s, the virtual simulation experiment technology was put forward by the American computer scientist Jay Lanier. Utilize and integrate a variety of high-tech technologies and the latest development achievements, and with the help of computers and other equipment to create a realistic virtual world of three-dimensional vision, touch, smell and other sensory experience, so that the experiencers can simulate a variety of states and environments in a virtual environment to achieve the optimum effect. Virtual simulation experiment technology has four typical characteristics: (1) interactivity. Experiencers can operate in virtual world and get corresponding feedback. (2) Immersion. Experiencers can obtain a high degree of reality in the virtual world, and there is no difference between the picture and the degree of constraint in the virtual world and real life. (3) Imagination. In this virtual world, developers give full play to their imagination, use advanced technology to build a new world, explore new mysteries, improve their understanding of certain things, and broaden the scope of human cognition. (4) Autonomy. The laws of natural physics in the virtual environment are still feasible, and the independent exploration of the experiencers will get real feedback.

In 2016, Goldman Sachs Group reported that the virtual simulation experiment technology will reach the ideal market of 182 billion US dollars in 2025, which is very promising. At present, virtual simulation experiment technology is widely used in education, industry, agriculture, commerce, games, medicine, military and other fields.

Since the reform and opening up, Rural economy in China has developed rapidly, and the production and trade of agricultural products have been unprecedentedly prosperous. However, many problems have also emerged in the process of agricultural production and trade, such as the risk of biotechnology application, the abuse of pesticides, the excessive use of chemical fertilizers, the toxic rice incident,

the monopoly of agricultural technology, the discrimination in the trade of agricultural products, the social, economic and institutional status of farmers and the sustainable use of agricultural resources, etc. These problems are not only economic problems, management problems, ecological problems, but also ethical problems. If these problems are not solved properly, they will not only affect the interests of agricultural consumers, but also affect the R&D and correct application of agricultural biotechnology, the protection of agricultural resources, the quality of agricultural products, and ultimately the development of agriculture, the interests of farmers, and the stability of rural and even the whole society. therefore, the research of ethics literacy education of students majoring in agricultural economic management has important theoretical and practical guiding significance for the healthy development of agriculture, the continuous improvement of farmers' income and the civilization and prosperity of rural areas in China.

2. Feasibility of Applying Virtual Simulation Technology to Agricultural Management Ethics Literacy Education

2.1. Strong support from national policies

The report of the 20th National Congress of the Communist Party of China emphasized that we should accelerate the construction of a powerful agricultural country, promote the green transformation of the whole process of agricultural development, establish and improve the value realization mechanism of ecological products, and improve the carbon sink capacity of rural ecosystems. With the development of modern science and technology and the arrival of the information society, the emerging revolutionary tide characterized by digitalization, intellectualization and scientificity has swept through, and ecological wisdom and values have become the focus of attention. Since the 18th

National Congress of the Communist Party of China, the Party Central Committee has always adhered to innovation as the first driving force to lead the development of agriculture, rural areas and farmers. China's agricultural scientific and technological strength has been continuously improved and its international competitiveness has been significantly enhanced, providing a strong driving force for the comprehensive development of agriculture and rural areas. The National Agricultural and Rural Science and Technology Development Plan for the "14th Five-Year Plan", issued in December 2021, pointed out that the past "13th Five-Year Plan" period was a key turning point for agricultural innovation and green development. The contribution rate of agricultural science and technology progress has exceeded 60%, a number of landmark achievements in agricultural science and technology have emerged, and the gap between the overall research and development level and the developed countries gradually narrowed[1].

On July 29, 2022, the notice on supporting the construction

of a number of small science and technology academies pointed out that the cultivation of high-level applied talents in agricultural and rural areas should be placed at an important position in the school work, and at the same time, it should cooperate with multiple parties to cultivate talents with the integration of politics, industry, education and research, improve the comprehensive quality conditions of the organization, ensure the high-quality implementation of talent training programs in small science and technology academies, promote the close integration of graduate education with production practice, social needs and agricultural and rural development, guide the majority of graduate students to make contributions in rural revitalization, bloom their youth, and provide solid talent support for comprehensively promoting rural revitalization and accelerating the modernization of agriculture and rural areas[2].

2.2. Market needs derived from food security issues

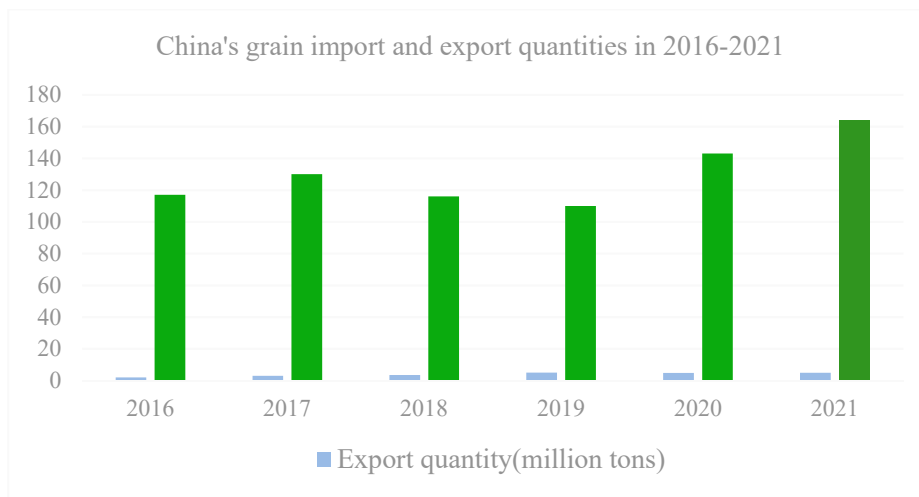


Figure 1. China's grain import and export in 2016-2021

As can be seen from FIG.1, since the outbreak of the epidemic in 2019, China's grain imports have continued to rise and the import volume has been very large. Compared with that, China's grain exports are very small. China has always paid attention to the issue of food security, which is "the largest of the country". At present, the risks of the global food supply chain are increasing, and ensuring the effective supply of domestic food is facing new situations and new

challenges. We should adhere to the principle of storing grain in the ground and storing grain in technology[3], and apply the emerging technology of virtual simulation experiment technology to the ethical literacy education of agricultural economic management to increase the income and quality of agricultural products, and boost the real realization of food security.

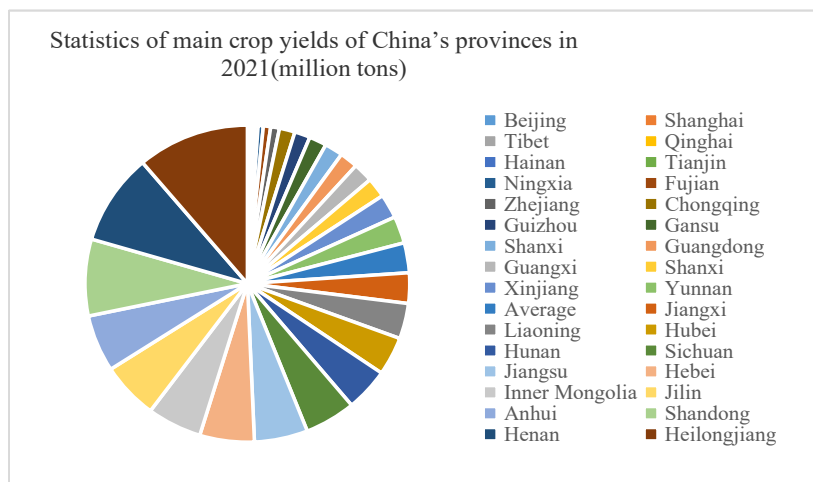


Figure 2. Statistics of main crop yields of China's provinces in 2021

As can be seen from FIG 2, the unit yield of summer grain in China's provinces and cities is quite high in 2021, and the basic food and clothing of the people are guaranteed. However, with the improvement of the living standard of the people, higher requirements are put forward for the food problem. In addition to "satiety", it is more important to "eat well". According to FIG 2, only four areas have reached the national average level. In order to improve the quality and production of agriculture, in addition to the traditional use of high-quality seeds and green fertilizers, it is also necessary to strengthen agricultural scientific and technological innovation. As a new product of the information era, virtual simulation experiment technology will provide solid foundation support for the high-quality development of agriculture by integrating with the ethics literacy education of agricultural economic management.

2.3. The high-tech nature of virtual simulation experiment technology improves the quality and output of agricultural products

The application of virtual simulation experiment technology to the ethics literacy education of agricultural economic management major can effectively complete the cultivation of ethics literacy involved in agricultural economic management decision-making in a specific environment in a relatively short time, improve the awareness of agricultural resources protection and agricultural product quality, avoid the loss caused by investment in actual production, enable students to improve the management level of crops, optimize the production structure, and save learning costs, maximize revenue. Intensive, specialized and scientific production modes will maximize the quality and output of agricultural products, solve social problems^[4], and ultimately maintain agricultural development, farmers' interests and the

stability of rural and even the whole society.

3. Practical Teaching Mode of Applying Virtual Simulation Experiment Technology to Ethics Literacy Education of Agricultural Economic Management Major

In the application of virtual simulation experiment technology, students majoring in agricultural economic management can identify and deal with immoral phenomena such as waste of agricultural resources, safety of agricultural products, environmental pollution and ecological damage caused by the abuse of agricultural means of production, compulsory use of agricultural technology, lack of fairness in agricultural products trading, fraud of agricultural products quality, and immoral behavior and so on in the decision-making environment set by the module. It is interactive and immersive to observe the game decisions of all stakeholders from the perspective of virtual reality supported by technology. In addition to the most basic visual experience, students majoring in agricultural economic management can also get feedback in hearing, touch, and even smell, and have a sense of immersive.

The strategic system design of the virtual simulation experiment system in the ethics literacy education of agricultural economic management major can be divided into reputation strategy, ethical product strategy, ethical production strategy, ethical organization strategy, ethical competition strategy, ethical marketing strategy, etc. (as shown in FIG 3). The strategic foothold is to meet the reasonable needs of consumers and other participants, respect the wishes and rights of shareholders and financial supporters, establish a legitimate competitive relationship with competitors, and actively assume social responsibilities.

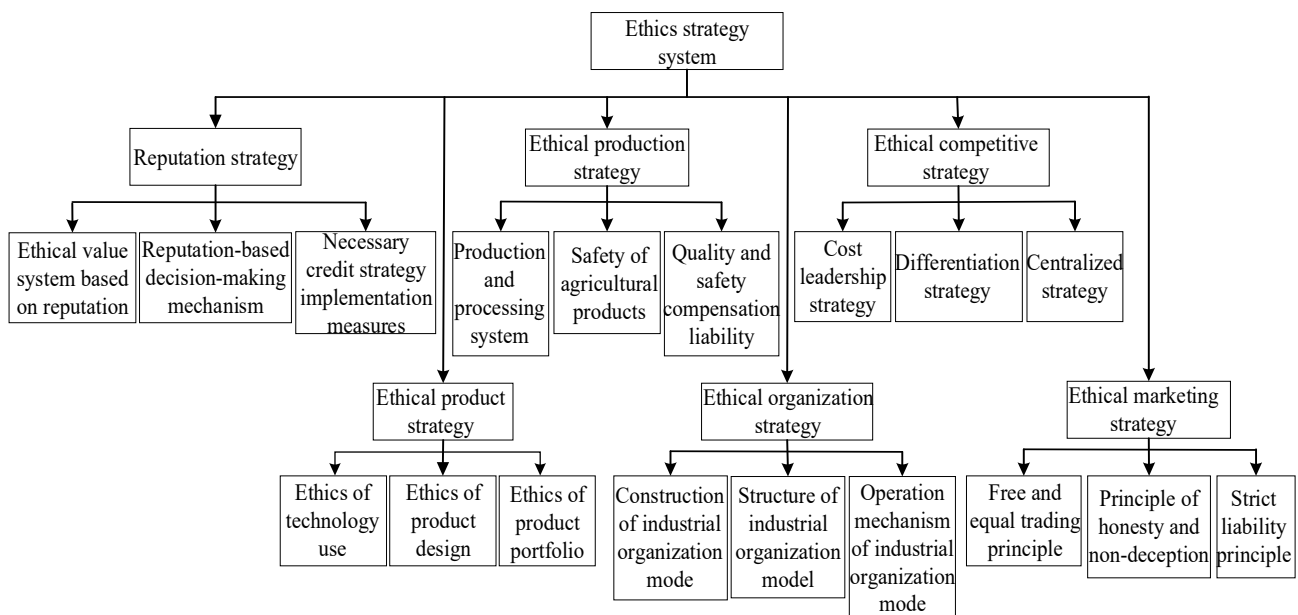


Figure 3. Strategic system design diagram

The autonomy of virtual simulation experiment technology provides a broad development platform for the virtual platform. With the emergence of practical problems, more and more students majoring in agricultural economic management put the ethical ideas they have learned into

production and life. At the same time, the virtual simulation experiment platform module has been more improved, which will be beneficial to the standardization, modernization and sustainable development of agriculture.

4. The Construction Effect of Practical Teaching Based on Virtual Simulation Experiment Technology

4.1. Basic results

The application of virtual simulation experiment technology in the ethics literacy education of agricultural economic management major not only reduces the trial and error costs of students in practice, but also provides relevant experience opportunities for non-agricultural practitioners.

In terms of practical decision-making, virtual simulation experiment technology has enhanced the cognition of students majoring in agricultural economic management to scientific issues. In the development of modern society, using science and technology to solve problems has become a common way, which is more efficient and reliable, increase judgment experience and reduce trial and error costs, can avoid actual decision-making mistakes and inefficiencies to a certain extent. At the same time, it can also provide students of relevant interdisciplinary disciplines with experience opportunities such as interactivity, immersion, imagination and autonomy brought by virtual simulation experiment technology, and cultivate potential agricultural economic management talents.

In education, virtual simulation experiment technology can effectively combine learning objects, key resources, situations and other relevant necessary resources to visualize abstract theoretical knowledge. The immersion of the virtual simulation experiment platform can create a good learning

environment for students, thus helping to greatly improve the theoretical teaching effect of agricultural economic management.

4.2. Social effects

According to the national policy of invigorating agriculture through science and technology, the virtual simulation experiment technology is used to make the agricultural economic management class full of vitality, which is conducive to cultivating more management talents. Virtual simulation experiment technology can fully mobilize learners' vision, hearing, touch, smell, taste, etc., realize the connection of physical and mental feelings, and enhance learners' perception. The potential of its application in the field of education stems from its advantages in stimulating learning motivation, enhancing learning experience, creating psychological immersion, realizing situational learning and knowledge transfer. The application of virtual simulation experiment technology in the ethics literacy education of agricultural economic management major mainly involves the business operation and ethical decision-making of the management system, in which the ethical decision-making is mainly based on the value system mainly including the values of food security, economic efficiency, ecological agriculture, natural resources, social justice and agricultural culture, etc. The business operation of the management system mainly includes the use and maintenance. Finally, we will achieve quality and efficiency improvement, green and sustainable development, rural revitalization and common prosperity, as shown in FIG 4.

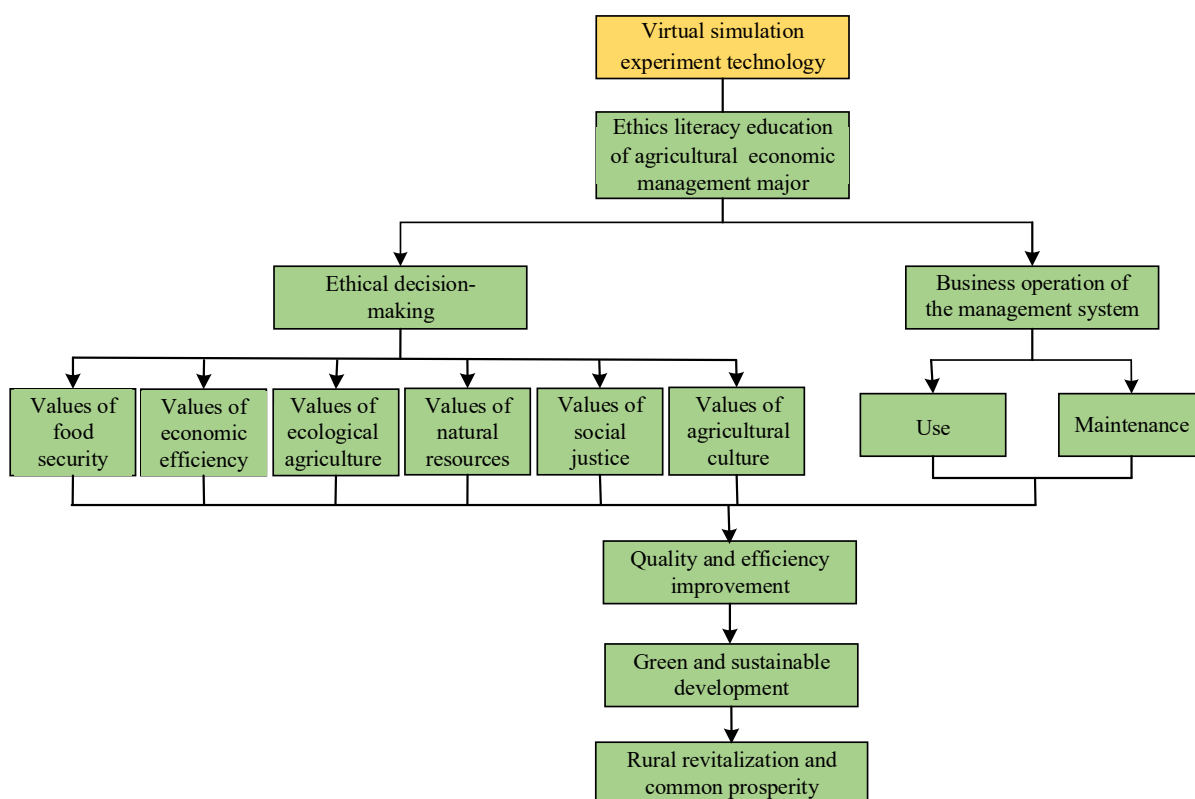


Figure 4. Flow chart of the app economic management major location of virtual simulation experiment technology to ethics literacy education of agricultural

Socialism with Chinese characteristics has entered a new era, and the main social contradiction has been transformed into the contradiction between the people's growing need for a better life and the unbalanced and inadequate development.

The unbalanced and inadequate development of urban and rural, regional and industrial development and the urban-rural income gap have become difficult problems that restricts the sustainable development of China's economy and society.

Based on the new stage of development, the CPC has constantly deepened theoretical thinking and practical exploration of common prosperity, and clearly pointed out that the issue of agriculture, rural areas and farmers are fundamental issues related to the national economy and the people's livelihood. Implementing the rural revitalization strategy, making up for the shortcomings of people's livelihood in development and promoting social fairness and justice are not only important measures to solve the problems of inadequate and unbalanced development, but also a key link to solidly promote common prosperity. Based on the above policy background, this paper proposes the application of virtual simulation experiment technology in the ethics literacy education of agricultural economic management major, hoping to contribute to the revitalization of rural areas and the realization of common prosperity.

5. Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

6. Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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