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Reach on Teaching Model of Virtual Simulation Experiment Based on Ideological and Political

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Abstract

Every teacher in Linyi University is motivated by the superior geographical environment and rich spiritual wealth to devote himself to the teaching practice of curriculum reform. Therefore, some problems, such as students' low enthusiasm in class, poor thinking activity, fuzzy learning objectives in the traditional teaching mode are considered. Firstly, the ideological and political elements in the virtual simulation experiment course are deeply dug. The system tree of ideological and political elements of virtual simulation experiment course is constructed. Based on Delphi expert survey method, the relative importance of ideological and political elements at all levels is judged and scored. Analytic Hierarchy Process (Ahp) and matrix analysis are applied to determine the weight and consistency of ideological and political elements at all levels in the ideological and political elements system. It lays a foundation for better integrating ideological and political elements into the content of virtual simulation experiment course and developing the teaching of virtual simulation course with Yimeng spirit characteristics. Secondly, the three-dimensional curriculum ideological and political matrix teaching model of the whole course, the whole period and the whole ideological and political elements is put forward. Professional training is combined with moral cultivation, Yimeng spirit and Linda spirit. A mix of online and offline teaching modes is designed. The teaching method of scientific research and teaching in collaboration with teachers and students is adopted. The collaborative teaching system of practice teaching and virtual simulation is developed. At the same time of implanting knowledge, students are actively guided to improve their ideological and moral cultivation, and cultivate students to become compound talents with self-confidence in science and technology, culture and power. In this revolutionary hot land, preaching, receiving, and solving doubts continue to be carried out. Yimeng spirit continues to be carried forward.

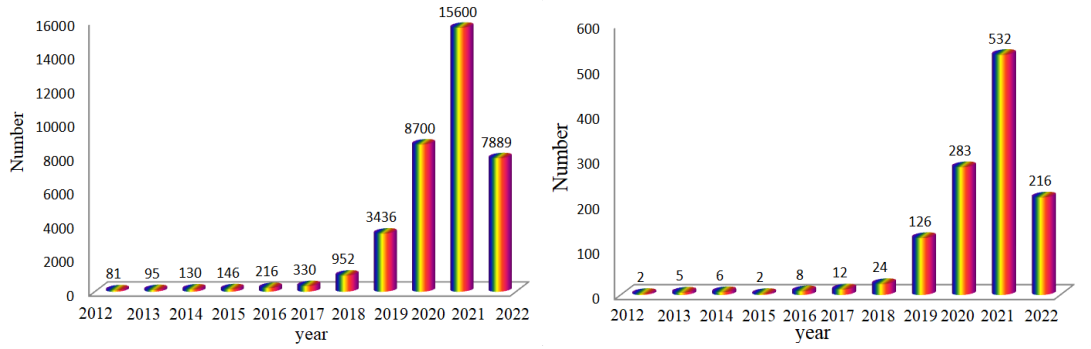
Keywords: Virtual Simulation Experiment, Ideological and Political Teaching, Collaboration Between Science and Education, Teaching Mode

Introduction

The General Secretary delivered an important speech at the symposium of representatives of experts in the field of education, culture, health and sports. We must adhere to the socialist direction of running schools and take moral cultivation as the fundamental task of education.

The important role of education in cultivating and practicing socialist core values has been brought into play. The reform and innovation of ideological and political theory courses in schools have been deepened. Students' moral, intellectual, physical, American and labor are fully developed, and students' patriotic feelings, social responsibility, innovative spirit and practical ability need to be cultivated. In the school's ideological and political theory course teachers' speech at the symposium stressed: "Ideological and political course is the key course to implement the fundamental task of moral education, the role of ideological and political course is irreplaceable, ideological and political course teachers have great responsibilities."

Under the background of engineering education certification in the new era, the cultivation of students' practical ability is also inseparable from the ideological and political education of professional courses. Therefore, the research on ideological and political education has exploded across the country, and experts and scholars in various fields have conducted multi-dimensional research (Meng et al. 2024, Gao et al.2022, Ouyang et al.2024). The research results of " Curriculum ideology and politics" and " Ideological politics of inorganic chemistry " in recent ten years are given. Figure1 shows trends in research results over the past decade.



(a) Curriculum ideological and political achievements (b) Mechanical ideological and political achievements

Figure 1 Knownet database included quantity statistics chart

With figure1, in recent years, all kinds of curriculum ideological and political research results have emerged explosively. The ideological and political science of courses has also been showing a growing trend since 2019. Studies have shown that in-depth study of ideological and political elements contained in professional courses is conducive to subtly transforming curriculum ideological and political elements into students' moral qualities (Zhang et al.2024, Ji et al.2024). Currently, research on ideological and political education in the field of Virtual Simulation can be roughly divided into two categories: one is the research on ideological and political education projects with a focus on teaching systems (Zhuang et al.2024, Yue et al.2023, Zhao et al.2024); the other is the research on ideological and political education courses focused on teaching methods and modes in classroom teaching (Luo 2022, Pan et al.2011, Chen 2024). However, there are few research reports on ideological and political education research, especially those that combine the school's positioning and local cultural features to study ideological and political education courses. In addition, the current research on virtual simulation in ideological and political education has shortcomings in teaching thinking, students' perception, teaching resources and effect evaluation, so further research and exploration are needed to promote the effective application of virtual simulation technology in ideological and political education. For example, the traditional teaching mode

of one-way transfer of knowledge is still dominant, resulting in insufficient participation and interaction of students in the virtual simulation environment. This rigid teaching thinking limits the potential of virtual simulation technology in ideological and political education. Due to the characteristics of virtual simulation technology, students may have a phenomenon of perception dilution during the use of virtual simulation technology, that is, although the technology is advanced, students may not be able to deeply understand the educational significance. The current virtual simulation teaching resources have the problem of homogeneity, lack of novelty and depth, it is difficult to attract students' interest and attention.

Therefore, our team combines the positioning of Linyi University and the local Yimeng Spirit cultural features of Linyi to conduct research on ideological and political education in virtual simulation courses. It is of great significance to conduct research on ideological and political education in virtual simulation teaching in combination with Yimeng Spirit. It can not only innovate teaching methods, carry forward red culture, expand educational resources, but also enhance students' participation and sense of experience, and inject new vitality into the reform and development of ideological and political education. For example, through virtual simulation technology, the time and space limitation of traditional ideological and political teaching can be broken, and Yimeng spirit can be presented in a more vivid and intuitive way, thus improving the effect of ideological and political teaching.

Ideological and Political Elements System Tree of Virtual Simulation Curriculum

Based on Yimeng spirit, the system tree of ideological and political elements of virtual simulation experiment course is built, as shown in Figure 2, and the systematic ideological and political teaching content is formed. The system tree has important theoretical and practical significance for improving the teaching syllabus, clarifying the teaching objectives and planning the teaching mode.

According to the above system tree of ideological and political elements, the relative importance of ideological and political elements at all levels is judged and scored based on Delphi expert survey method. The weight and consistency of ideological and political elements at all levels in the ideological and political elements system are determined by applying analytic hierarchy process and matrix analysis method (Zhou et al 2021, Zhou et al 2023). Based on above work, the content of inorganic chemistry course is better integrated with ideological and political elements.

In order to better integrate ideological and political elements into inorganic chemistry course content, Developing Yimeng spirit characteristic inorganic chemistry course teaching lays the foundation. Yimeng spirit characteristic of inorganic chemistry course teaching will be greatly improved.

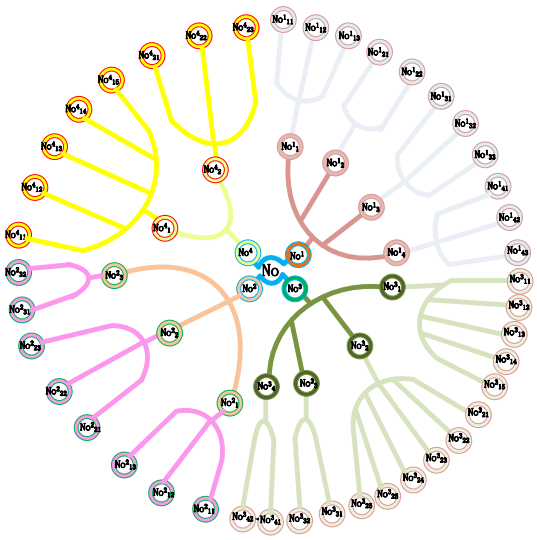


Figure 2 ideological and political elements system tree of virtual simulation experiment course

Teaching Mode And Teaching Method

Ideological and political elements matrix teaching mode of Virtual simulation experiment

Based on the system tree of ideological and political elements in virtual simulation experiment course, students' teaching nodes before, during and after class are used as reference points. The whole period of lesson preparation, lecture and question and answer is integrated into the planning of ideological and political elements. Consider why, what, and how to learn, Curriculum objectives, curriculum content, curriculum teaching mode of the whole curriculum ideological and political elements are integrated into the planning. The matrix teaching mode of ideological and political elements of inorganic chemistry course is constructed, as shown in Figure 3.

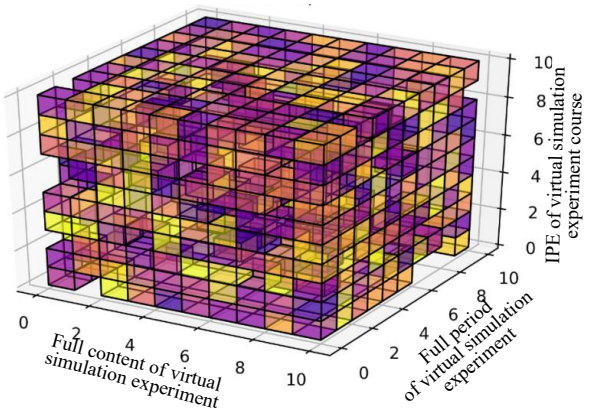


Figure 4 matrix teaching mode of virtual simulation experiment ideological and political elements

The teaching method of science and education cooperation with teachers and students

In terms of teaching methods, the purpose is to fully mobilize students' learning enthusiasm and participation. Theoretical teaching and scientific research are emphasized in synergy. In practice teaching, students' practical skills and innovative ability are cultivated. A variety of advanced teaching methods are flexibly used. The students' learning enthusiasm is effectively mobilized. It is of great practical significance to promote students' positive thinking, stimulate

students' potential and students' ability to use knowledge flexibly. The Examples of experimental teaching methods is given in Fig.4.

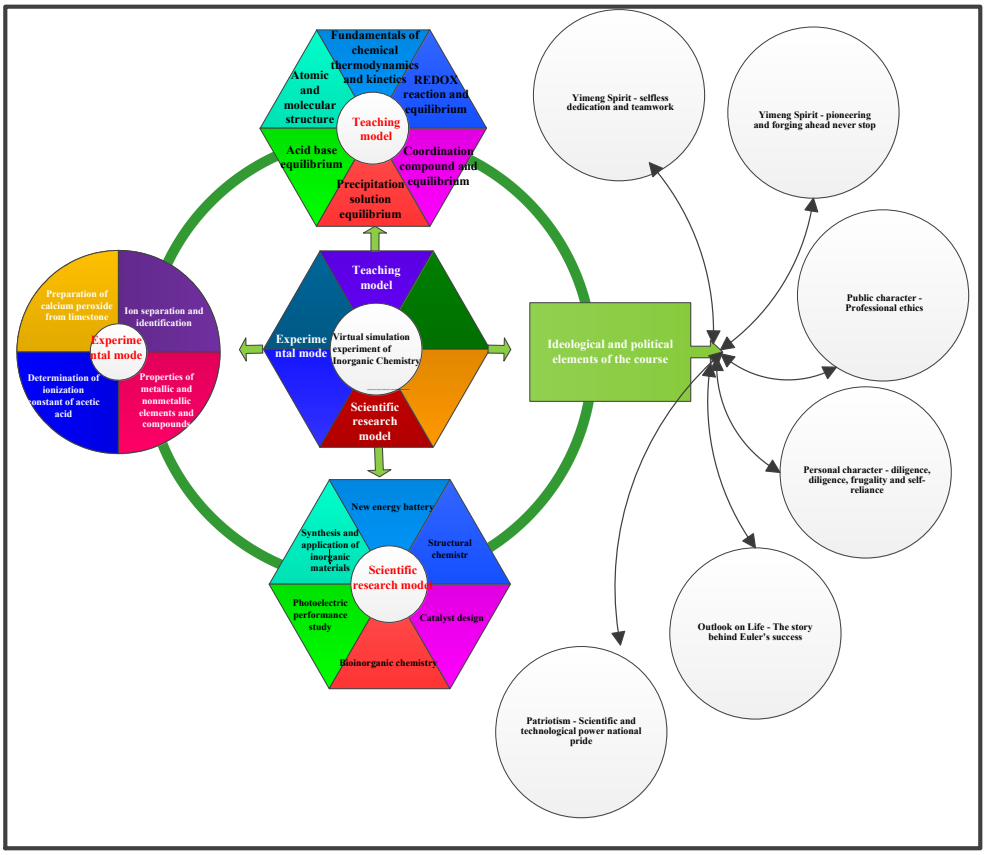


Figure 4 Virtual Simulation Experiment Teaching Method Case

Conclusion

Based on above teaching model, intelligent manufacturing specialty open experiment teaching and competition guidance are carried out. The teaching results are given in Table1.

Table 1

Teaching Results of Intelligent Manufacturing Specialty with Thirty Students

Category	High-level paper		Patent		
Level	SCI	EI	Invention	utility model	Appearance
Number	2	7	4	6	2
Category	Science and Technology Contest		innovation and entrepreneurship of college students		
Level	National	Provincial	National		Provincial
Number	14	8	2		2

In the teaching process of "virtual simulation experiment" course, the ideological and political elements contained in the course are deeply explored. Actual science and technology competitions and research cases are integrated into ideological and political elements. These measures greatly stimulated the interest of students. Students' professional education and ideological guidance are hidden teaching. For example, the above achievements guided by the teaching team as teaching cases have greatly stimulated students' enthusiasm for

learning, cultural confidence, technical confidence and national pride, and helped students establish a sense of science and technology power and science and technology to serve the country.

• Author's Contribution

All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by Lili Zhou and Mingming Xing. The first draft of the manuscript was written by Lili Zhou and Mingming Xing, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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• *Competing Interests*

The authors declare no competing interests.

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