

Research on the Integration and Reform of Ideological and Political Elements in the Teaching of Rapid Prototyping Technology Course

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Abstract. With the continuous development of science and technology, rapid prototyping technology has been widely used in manufacturing industry. However, the teaching of rapid prototyping technology often pays attention to the technology itself and ignores the cultivation of students' ideological and moral literacy. In order to better cultivate students' comprehensive quality and sense of social responsibility, this study aims to explore how to integrate ideological and political elements into the teaching of "Rapid Prototyping Technology" to improve students' ideological and moral quality and comprehensive ability. The results of this study are of great significance for promoting the reform of ideological and political education in the course of rapid prototyping technology, and provide useful reference for relevant teachers and decision makers.

1 Introduction

Rapid prototyping technology is a kind of three-dimensional model data created by using computer-aided design software, which is cut into multiple thin layers, and a complete three-dimensional solid model is made by stacking materials layer by layer. These materials can be liquid, powder or wire, and can be customized according to design requirements [1]. It is also called additive manufacturing or 3D printing technology. Through rapid prototyping technology, product prototypes with complex shapes can be manufactured in a short time for functional testing, appearance evaluation and market verification. The development of rapid prototyping technology makes the manufacturing industry more flexible and efficient [2]. Compared with traditional cutting methods, rapid prototyping technology does not need a lot of tools or molds, so it can reduce production cycle and cost. However, the rapid development of rapid prototyping technology has also brought a series of social and ethical problems [3]. Therefore, it is of great significance to introduce ideological and political elements in the teaching of rapid prototyping technology to cultivate students' moral concept and social responsibility [4].

2 Integration of Rapid Prototyping Technology and Ideological and Political Elements

2.1 The Connotation of Ideological and Political Elements

The ideological and political elements refer to the core elements in ideological and political education, which include the following aspects [5-6]:

(1) Marxist theory: The most important part of ideological and political elements is Marxist theory. This includes the basic principles, viewpoints, and methodology of Marxism, such as historical materialism, dialectical materialism, socialist theory, etc. Marxist theory is the foundation for cultivating students' correct worldview, outlook on life, and values.

(2) The Party's line, principles, and policies: The ideological and political elements also include learning and understanding of the Party's line, principles, and policies. This includes the Party's various principles and policies, national development strategies, and socialist core values. Students need to understand and comprehend the Party's line, principles, and policies, in order to actively practice and implement them in practice.

(3) National conditions and current affairs politics: The ideological and political elements also include an understanding of national conditions and current affairs politics. Students need to pay attention to the development status of the country, international situation, and social issues, enhance their understanding and

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understanding of the real world through learning and thinking, and cultivate correct judgment and decision-making abilities.

(4) Moral character and social responsibility: The ideological and political elements also emphasize the cultivation of students' moral character and social responsibility. This includes education on ethical norms, civic ethics, professional ethics, and other aspects. Students need to possess correct moral concepts and behavioral norms, as well as a focus and responsibility for social issues and public interests.

The integration of ideological and political elements into education aims to cultivate students' ideological and moral literacy, political awareness, and social responsibility, promote their comprehensive development, and make contributions to the socialist cause.

2.2 Education objectives

The fundamental goal of ideological and political education in the curriculum is to cultivate students' ideological and moral qualities and comprehensive abilities, promote their comprehensive development, and become qualified builders and reliable successors of the socialist cause. For the cultivation of higher education talents, the goal orientation of guiding college students to establish "morality" and cultivate "people" must have distinct characteristics of the times and be closely related to the development and progress of society and the country. Our education must take the training of socialist builders and successors as the fundamental task, and train generation after generation of useful talents who support the leadership of the CPC and our socialist system and aspire to become lifelong fighters for socialism with Chinese characteristics. This is the fundamental task of educational work and the direction goal of educational modernization.

2.3 The correlation between ideological and political elements and rapid prototyping technology

The correlation between ideological and political elements and rapid prototyping technology is mainly reflected in the following aspects [7-9]:

(1) Ethical norms and the application of rapid prototyping technology: Rapid prototyping technology involves a series of ethical and ethical issues in the production and manufacturing process, such as intellectual property protection, product safety, environmental protection, etc. The ideological and political elements can guide students to deeply think and discuss these issues, cultivate their moral awareness and sense of responsibility, and enable them to follow ethical norms in technological applications, pursue social benefits and sustainable development.

(2) Social responsibility and the development of rapid prototyping technology: The application of rapid prototyping technology has a certain impact on society and the environment. The ideological and political

elements can guide students to pay attention to social issues and public interests, cultivate their sense of social responsibility, enable them to actively participate in social governance, pay attention to social welfare undertakings, and promote the healthy development of rapid prototyping technology.

(3) Cultivation of innovative ability and ideological awareness: Rapid prototyping technology is a highly innovative technology that requires talents with innovative ability and pioneering spirit. The ideological and political elements can cultivate students' innovative thinking, scientific spirit, and theoretical literacy, improve their ideological awareness and innovation ability, and enable them to have better competitiveness in the field of rapid prototyping technology.

(4) Socialist core values and rapid prototyping technology education: Socialist core values are the spiritual pillar of socialism with Chinese characteristics and an important part of cultivating socialist builders and successors. The ideological and political elements can guide students to establish correct worldviews, outlooks on life, and values through education, enabling them to actively practice socialist core values in rapid prototyping technology education, and make positive contributions to the development of the country and society.

3 Implementation strategies for integrating ideological and political elements into the teaching reform of rapid prototyping technology courses

When implementing the teaching reform of integrating ideological and political elements into rapid prototyping technology courses, we are facing some challenges and problems. Firstly, rapid prototyping technology itself is a highly specialized course, and how to integrate ideological and political elements into the course requires us to conduct in-depth research and exploration. Secondly, due to the particularity of ideological and political education, how to combine it with rapid prototyping technology courses to organically integrate ideological and political elements into the curriculum and meet the learning needs of professional knowledge is a problem that needs to be solved. After discussion among all the teachers who taught the course 'Rapid Prototyping Technology', it was concluded that the following specific strategies can be adopted for the teaching reform of integrating rapid prototyping technology courses into ideological and political elements:

(1) Design Comprehensive Cases: Design a series of comprehensive cases that involve the application and impact of rapid prototyping technology in social, economic, environmental, and other aspects, guiding students to analyze and reflect on ethical, moral, and social responsibility issues. Through case discussions, stimulate students' thinking and exploration abilities, cultivate their moral awareness and sense of social responsibility.

(2) Guiding Discussion and Debate: Organize students to engage in discussions and debates, exploring ethical, moral, and social issues related to rapid prototyping technology. You can choose some hot topics, such as intellectual property protection, artificial intelligence ethics, environmental protection, etc., to guide students to think and express opinions from different perspectives, and cultivate their critical thinking and expression abilities.

(3) Practical projects and social practice: Organize students to participate in practical projects and social practice activities related to rapid prototyping technology. For example, organizing students to visit rapid prototyping technology enterprises to understand their technological applications and social impacts; Or conduct social research to investigate the problems and challenges of rapid prototyping technology in social development. Through practical projects and social practices, students can personally experience the application and impact of rapid prototyping technology, cultivate their sense of social responsibility and ideological awareness.

(4) Value guidance: Integrate socialist core values into curriculum teaching, and guide students to establish correct worldviews, outlooks on life, and values through textbook content, explanations, and discussions. For example, in teaching, it is emphasized that technological development should be combined with social benefits, and technological innovation should be matched with social responsibility, cultivating students' sense of social responsibility and mission.

(5) Teacher demonstration and role model: Teachers should lead by example and become role models for students in the teaching process. Teachers can demonstrate the importance and application value of ideological and political elements in rapid prototyping technology courses through their own words, deeds, and teaching practices. At the same time, teachers should also guide students to think and question, stimulate their thinking vitality and innovative spirit.

4 Evaluation methods for reform effectiveness

The effectiveness of integrating ideological and political elements into the teaching reform of rapid prototyping technology courses can be evaluated from the following aspects:

(1) Improvement of students' ideological and moral awareness: Assess students' understanding and understanding of ethics, morality, and social responsibility during the course learning process, as well as their thinking and attitude changes towards these issues. To understand the improvement of students' ideological and moral awareness through questionnaire surveys, discussion records, and homework evaluations.

(2) Cultivation of innovative and practical abilities: Evaluate the development of students' innovative thinking and practical abilities during the course learning process. Students' innovative and practical abilities in the course can be evaluated through project achievement

presentations, experimental reports, and work evaluations.

(3) Cultivation of social responsibility and values: Evaluate the cultivation of students' social responsibility and values during the course learning process. Students' understanding of social responsibility and changes in their values can be understood through questionnaire surveys, group discussions, and practical activity evaluations.

(4) Evaluation of teachers and teaching effectiveness: Evaluate teachers' ability to guide ideological and political elements in the curriculum and their teaching effectiveness. Teachers' teaching effectiveness can be evaluated through student evaluation, peer review, and classroom observation to understand their performance and improvement points in integrating ideological and political elements into teaching.

When summarizing the effectiveness of integrating ideological and political elements into the teaching reform of rapid prototyping technology courses, the above evaluation results can be integrated to analyze the overall growth and development of students. At the same time, improvement measures and suggestions can also be proposed based on students' feedback and problems during the course implementation, to further optimize teaching reform plans and improve teaching quality and effectiveness.

5 Problems, Solutions, and Innovations in the Reform

5.1 Existing problems and solutions

The problems and solutions in the "ideological and political education" teaching reform of the course "Rapid Prototyping Technology" are as follows:

(1) Question 1: Lack of pertinence and effectiveness of ideological and political education.

Solution:

① Design specific teaching objectives: define the orientation and objectives of ideological and political education in the course of rapid prototyping technology, such as cultivating students' sense of social responsibility and professional ethics.

② Combining practical application scenarios: combining the ideological and political education content with the practical application scenarios of rapid prototyping technology, guiding students to think about the impact of technological development on society, environment and human values, and increasing the pertinence and effectiveness of teaching.

③ Introduction of case analysis and discussion: By introducing real cases and problems, students can analyze and discuss the ideological and political issues involved, and stimulate their thinking and exploration.

(2) Question 2: The idea of teachers' ideological and political education is not unified.

Solution:

① Teacher training and communication: organize teachers to participate in theoretical training of

ideological and political education to improve their theoretical literacy and methodology of ideological and political education. Organize regular teacher exchange seminars to share experiences and strengthen communication and collaboration.

(2) Establish a mechanism of teachers' co-construction and sharing: encourage teachers to jointly formulate the objectives and teaching contents of ideological and political education, and form a unified educational concept. Promote teachers to observe and learn from each other and jointly improve the teaching level.

(3) Question 3: Students are not interested in ideological and political education.

Solution:

① Creating situations and role-playing: designing situational teaching activities, so that students can play roles in simulated scenes and feel the importance and practical significance of ideological and political issues.

② Introduce interactive teaching methods: adopt interactive teaching methods such as group discussion, debate contest and case analysis to stimulate students' active participation and interest in learning.

③ Pay attention to individual differences: understand students' hobbies and needs, and provide personalized guidance and counseling according to students' characteristics, so as to increase students' sense of involvement and participation.

(4) Question 4: The evaluation system is not perfect.

Solution:

① Design diversified evaluation methods: In addition to the traditional written test and practical operation assessment, various evaluation methods such as project report, personal statement and group presentation can be introduced to comprehensively evaluate students' comprehensive quality and the effect of ideological and political education.

② Establishment of evaluation criteria and index system: define the evaluation criteria of ideological and political education, and formulate a specific index system, including evaluation indicators of knowledge level, moral emotion and ideological quality.

③ Combining self-evaluation and mutual evaluation: Encourage students to evaluate themselves and each other, and increase the objectivity and participation of evaluation. At the same time, feedback the evaluation results in time to help students understand their own shortcomings and provide suggestions for improvement.

5.2 Innovation points

The innovative points of the "Curriculum Ideological and Political" teaching reform in the course of "Rapid Prototyping Technology" are as follows:

(1) Strengthen ideological and political education: While imparting technical knowledge, pay attention to cultivating students' ideological and moral qualities, social responsibility, and innovative spirit, so that students can recognize the close connection between technological progress and social development.

(2) Stimulating students' participation and creativity: advocating for "applying what is learned", strengthening practical teaching, encouraging students to actively participate in course design, production, and practical operation, unleashing their initiative and creativity, and cultivating practical abilities and teamwork spirit.

(3) Strengthen the cultivation of scientific research ability: Guide students to conduct scientific research, exercise their scientific thinking ability, data analysis ability, and problem-solving ability, and cultivate their scientific research and innovation spirit.

(4) Establishing a teaching mode of interdisciplinary integration: integrating rapid prototyping technology with related disciplines such as mechanical design, materials science, and electronic engineering, forming a teaching mode of interdisciplinary integration, and cultivating students' comprehensive development abilities.

The above innovative points will help improve students' comprehensive quality and cultivate high-quality talents with an international perspective and innovative spirit.

6 Conclusion

By integrating ideological and political elements into the teaching of rapid prototyping technology courses, students' moral concepts, social responsibility, and innovation abilities can be effectively cultivated, promoting the sustainable development of the rapid prototyping technology industry. However, the implementation of the reform requires targeted strategies and evaluation methods, and there are still some challenges and shortcomings. Therefore, further research and improvement are needed in the future to continuously improve the effectiveness and quality of integrating ideological and political elements into curriculum teaching.

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