

Design and Practice of Ideological and Political Elements of Engineering Technology Foundation under the Labor Education

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Abstract: Engineering Technology Foundation is a general education course that intergrate engineering technology education and engineering quality, the national open to the Non-engineering students. Firstly, though the teaching of mechanical, electronic, intelligent modules, comply with the new rules of the labor education, blend in ideological and political education, combined with the study situation analysis of private undergraduate colleges, under the teaching reform, teaching process and engineering practice and so on, which is discussed in the aspects of curriculum reform plan. Through theory and hard practice from easy operation, regular innovative design comes from life and nature, and combining the life demand and labor demand, developing mode of interdisciplinary teaching, enhance the students initiative, stimulate their intrinsic motivation, and the process of doing the actual project, students to participate in a variety of identity of engineering practice, Training students' comprehensive ability to analyze and solve practical problems provides theoretical and practical basis for training multi-level, multi-disciplinary and multi-type talents in colleges and universities.

Keywords: Engineering technology; Labor education; Ideological and political education; Interdisciplinary integration; Teaching reform

1. Introduction

National leadership stressed at the National Conference on Ideological and Political Work in Colleges and Universities, it is necessary to make good use of the main channel of classroom teaching, ideological and political theory courses should persist in strengthening in the course of improvement, enhance the affinity and pertinence of ideological and political education, meet the needs and expectations of students growth and development, and other courses should keep a good canal and plant a good responsibility field, so that all kinds of courses and ideological and political theory courses can go hand in hand and form a synergistic effect, which has become an important thrust for the reform of curriculum thinking and politics in various colleges and universities [1-2].

The construction of curriculum thinking in the labor

education environment is inseparable from National leadership, so this idea serves as a fundamental guide. In order to thoroughly implement the spirit of the National conference on ideological and political work in colleges and universities, combined with the professional characteristics of higher private colleges and universities in finance and economics, relying on the professional groups and teachers of the college, we will dig deep into the moral education elements in various professional courses, organically integrate professional knowledge with ideological and political elements, so that the ideological and political education of the curriculum runs through the whole process of education and teaching, give full play to the educational function of each course, and realize the great ideological and political pattern of educating people in the whole process, all-round education and all-staff education of the school [3-6].

2. Characteristics and Significance of the Course

The course Fundamentals of Engineering technology is a unique course offered by university for non-science and engineering students in the school, and is a general education course that integrates engineering technology education and engineering quality. It is a course aimed at enriching students knowledge structure, enhancing students' interdisciplinary thinking, and improving students' career competitiveness. And the course supports the teaching of subsequent interdisciplinary professional courses [7]. The course takes the basic knowledge of machinery and electronics as the context, so that non-engineering students can understand the world's four industrial revolutions and Chinese status and role in the four industrial revolutions, and promote the spirit of a strong country by explaining made in China [8]; always pay attention to students' knowledge of engineering, so that students can understand the relevant content of intelligent manufacturing, obtain the special knowledge of contemporary science and technology frontiers, cultivate students' engineering knowledge; highlight the cultivation of students' interdisciplinary thinking ability; pay attention to the latest development of intelligent manufacturing, and highlight the update of course content.

The teaching process takes the teaching of the Fundamentals of Engineering technology course as the

carrier, according to the characteristics and teaching content of the Fundamentals of Engineering technology course, constructs the teaching mode of ideological politics in the curriculum, takes the socialist core values as the guide, and starts from the aspects of patriotism education, integrity education, responsibility awareness education, legal awareness education and labor education, explores the design and practice of the ideological and political education elements in the curriculum, and cultivates students with basic engineering knowledge and interdisciplinary thinking through practice in the course teaching process. Expand disciplinary professional horizons through interest guidance; develop labor skills through hands-on development, and support the teaching of subsequent interdisciplinary professional courses. In terms of ability, through a large number of practical courses to cultivate students' hands-on skills; in terms of thinking, cultivate the engineering thinking ability of non-science and engineering students, strengthen the logical thinking ability of liberal arts students.

Therefore, as a public front for labor education and ideological and political education, the general education courses of the Fundamentals of Engineering technology course in the financial and economics majors actively design and explore the ideological and political elements of the curriculum in the teaching process are of great necessity and extraordinary significance, and provide a theoretical and practical basis for cultivating multi-level, multi-disciplinary and multi-type talents in colleges and universities across the country. nd imperceptibly teach patriotic education for students.

3. Teaching Design

3.1 Teaching Reform Program

The implementation path of Engineering Technology Foundations ideological and political education is from the unified thinking of the curriculum group to the final specific implementation, which is promoted layer by layer, and the curriculum teaching is from the circular teaching of 'theoretical knowledge - famous experts - experimental teaching - social practice - re-recognition of knowledge', the overall implementation path is shown in Figure1.

3.2 Instructional Design Methods

The curriculum combines ideological and labor elements above implementation plan, with students 'learning to use' as the center, builds three learning levels of 'theoretical learning, classroom practice, practical application', carries out four teaching modes of 'ideological viewpoint - course objectives - practical module - practical environment', and the teaching of ideological and political courses is from the circular teaching of 'theoretical knowledge - famous experts - experimental teaching - social practice - re-recognition of knowledge', the course theory learns mechanical technology, electrical and electronic technology, Intelligent manufacturing technology and entrepreneurial creative design four modules, interactive practice in the classroom round table, in-depth community service,

holiday social practice and into primary and secondary schools to carry out application, the overall design is shown in Figure 2.

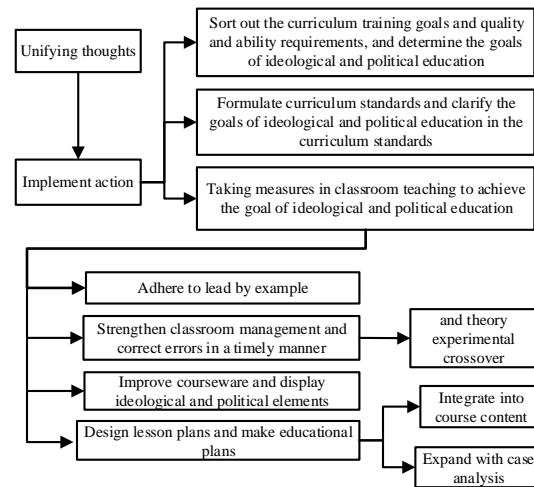


Figure 1. Diagram of Course Implementation Plan

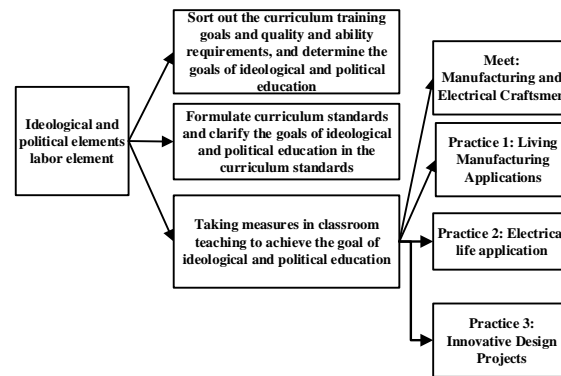


Figure 2. The overall design of ideological and political education basics of Engineering Technology

4. Methods and Path

4.1 Course Implementation Methods

The teaching method of this course combines pictures and videos, multimedia, lectures, case teaching, project-driven modular design and practice, and carries out flipped classroom teaching to help students understand and apply.

The specific teaching of the curriculum adopts the circular teaching process of 'theoretical knowledge - famous experts - experimental teaching - social practice - re-recognition of knowledge'. Theoretical knowledge module mainly explains the main points of knowledge and the scope of technical application, famous expert module explains the relevant founders and experts of the four major themes, analyzes and explains the professional spirit and life value, focuses on ideological and political education, experimental teaching mainly carries out mechanical manufacturing and electronic and electrical life practice, focuses on the selection of energy-saving incandescent lamps as the theme of home incandescent lamp transformation energy-saving LED as the practice theme, weekend or summer vacation selection volunteers into the community and rural areas,

engaged in labor practice, and finally summarize the knowledge and re-determine the value of technical application.as shown in figure 3.

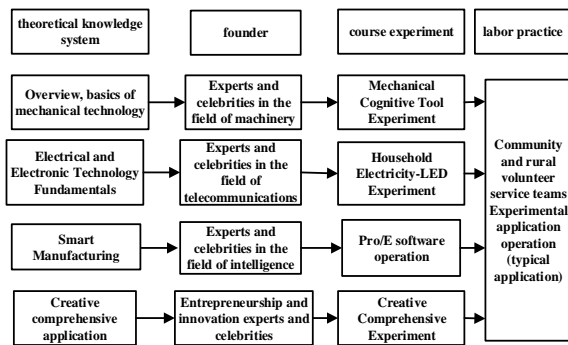


Figure 3. The implementation process of course

4.2 Case Demonstration Design

Taking the Electrical and Electronic Technology module as an example, according to the requirements of the syllabus, complete the history of the development of electrical and electronic technology, commonly used electrical tools, common electronic components and their applications, etc. The teaching goal is to mainly let students understand common electronic components, understand their applications, master the use of commonly used electrical tools, be able to master the installation, wiring and maintenance methods of commonly used lighting circuits, master the display principles and wiring methods of digital tubes, and master the design of simple logic circuits.

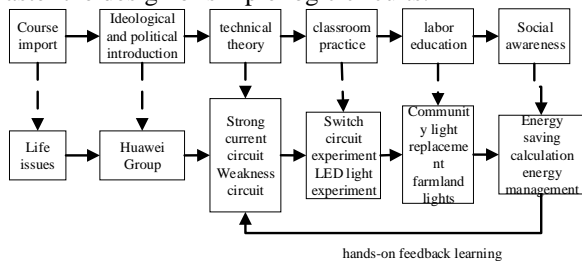


Figure 4. The actual process of the electrical module

The teaching design is designed according to the teaching scheme of Figure 2, with the introduction of familiar problems in the life of household electricity, explaining the history of electronic technology development (at home and abroad), combining chip hotspots, integrating ideological and political education, explaining Huawei cases, theoretically analyzing the principles and applications of strong electricity and weak circuits, carrying out household electricity wiring (strong electricity experiments) and LED practice (weak current experiments), completing round table interaction, and forming social practice groups and volunteer community teams. Carry out community bulb replacement LED lamp operation (strong and weak current application scenarios) and farmland irrigation effective coefficient solar wiring work (weak current application scenarios), complete labor education, come back to summarize, recalculate the light bulb for LED lamp power saving

calculation, LED compared to ordinary bulbs 10 hours a day energy saving, how much a year cumulative, how much the country can save energy and other practical, complete the teaching application feedback, as shown in Figure 4.

5. Practical Effect Analysis

5.1 Experiments and Practical Effects

Students actively participated, and the specific participation in the practice effect is shown in Figure 5.



Figure 5 Students practical results

5.2 Teaching Assessment and Analysis

The final closed-book theory examination uses the same type of paper in the two teaching modes, and the scaled scores are also different, and the statistical results are shown in Table 1.

Table 1. Practical results at the end of the period

	teaching class	grades	90—100	80—89	70—79	60—69	<60
1	19audit	number of people	2	64	24	1	0
		The proportion	2%	70%	26%	1%	0%
2	19Accounting	number of people	3	39	29	6	0
		The proportion	4%	51%	38%	8%	0%
3	19Financial Management	number of people	9	54	28	2	0
		The proportion	10%	58%	30%	2%	0%

From the table results can be seen, this course using the form of large homework practice project for assessment, divided into 3D modeling and creative product design two modules, the amount of tasks is moderate, the knowledge is complete, the difficulty is appropriate, the two major projects require each student to choose one of the topics or self-proposed topics, in order to encourage students to be independent creativity, fully reflect the innovation and application, in the specified time according to the requirements of the topic task to complete the design task, the new integration of labor education teaching mode is conducive to promoting students' learning initiative and goal.

The practice reports of the three majors basically reflect the learning of students. A total of 259 people

took the test, concentrated in medium and good, and none failed. From the perspective of the large homework handed in, the 3D modeling module has a high degree of independent completion, the creative product design module mainly chooses the Huiyu group design, and the final presentation of the work results and creative design are good, the instructions are completed according to the requirements, the teaching effect is good, so the excellent rate is higher. Through the exercise of engineering practice, students have changed from indoctrination learning to starting from practical engineering applications, learning knowledge, mastering methods, applying to engineering and improving programs, and then learning and returning to engineering, forming circular learning.

5.3 Analysis of the Subsequent Effects of the Course

The 2019 class of business students study the Fundamentals of Engineering technology course after the assessment, and then through the course questionnaire and feedback, summarize to achieve the following effects:

Students discuss and feedback that our country is strong and strong in science and technology, and the spirit of patriotism is imperceptible;

Students can have a good grasp of the tools in engineering;

Students will engage in simple repair work at home;

Students are also engaged in engineering competitions, such as 2 groups of college students registered for the ecological science and technology competition;

Students are willing to participate in social practice groups and love to enhance their awareness of labor;

Students are willing to go into the community, serve the elderly, and have a spirit of love;

Through energy-saving and power-saving accounting, students improve their awareness of energy conservation, and their awareness of social ownership is strengthened.

6. Conclusion

Engineering Technology Fundamentals course is a general education course that integrates engineering and technical education and engineering quality, non-engineering students through the simple theory and strong practical operation, from the law of life and nature of innovative design, and combined with life needs and

labor needs, to carry out multimode interdisciplinary teaching, enhance students initiative, stimulate their internal learning motivation, and in the process of doing practical projects, students participate in engineering practice in a variety of identities, cultivate students' comprehensive ability to analyze and solve practical.

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