

Exploration of Ideological and Political Education in the Course of "Environmental Engineering Drawing and CAD" under the Task-Based Teaching Concept

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Abstract: Under the concept of task-based teaching, an exploration of the ideological and political education reform in the course of "Environmental Engineering Drawing and CAD" at Zhaoqing University has been conducted. The current situation and challenges of the ideological and political construction in the course of "Environmental Engineering Drawing and CAD" at Zhaoqing University were analyzed. By employing the task-based teaching method, ideological and political elements were integrated into the teaching process of "Environmental Engineering Drawing and CAD". This approach allows students to actively accept ideological and political elements and enhances their willingness to absorb ideological and political knowledge while learning this course. Through methods such as interpreting related laws and regulations in the context of the "Belt and Road" initiative, students are guided to establish a correct worldview and outlook on life, cultivate a sense of national honor, and also develop the habit of drawing according to laws and regulations.

Keywords: Task-Based Teaching; Ideological and Political Education; Environmental Engineering Drawing and CAD.

1. Introduction

With the development of economic globalization, as the builders and successors of China's socialist cause, how college students establish a correct world view, outlook on life, and values is closely related to the success or failure of China's socialist cause [1-3]. In 2016, at the National University Ideological and Political Work Conference, General Secretary Xi Jinping proposed that "we should make good use of classroom teaching as the main channel and integrate ideological and political work throughout the entire process of education and teaching." He demanded that all types of courses should "maintain their responsibilities and cultivate their respective fields" while making clear demands for university teachers[4]. This provides a clear direction for the ideological and political work of colleges and universities. Currently, colleges and universities are in the midst of a high tide of ideological and political education curriculum construction. How to reasonably integrate ideological and political education resources in colleges and universities and improve the quality of ideological and political education has become the focus of research and discussion in the ideological and political education of various colleges and universities[5-6]. The discussion on ideological and political education mainly focuses on the construction of ideological and political courses such as the basic principles of Marxism, while the exploration of ideological and political education in professional courses is still insufficient, such as the low correlation between professional courses and ideological and political courses[7]. Therefore, it is necessary to discuss the construction of ideological and political education in professional courses.

"Environmental Engineering Drawing and CAD" is an engineering drawing course tailored to the needs of environmental engineering majors. It primarily utilizes graphics for teaching, aiming to cultivate students' drawing skills and map reading abilities. This course provides a foundation for students to learn subsequent professional

course content and design work, serving as a required basic professional course for environmental engineering students. It is the first professional course that environmental engineering students encounter, as well as a prerequisite foundation course, marking the starting point for achieving comprehensive curriculum education. The quality of engineering drawings created in environmental engineering drawing directly impacts the quality of work. Therefore, the course requires students to possess a high level of rigor and precision in their drawings, adhering to relevant national drawing standards to create accurate and precisely sized engineering drawings.

During the teaching process of this course, extracting and integrating ideological and political elements into the instructional design can not only help environmental engineering students continuously improve their professional theory and practical abilities, but also inspire their learning enthusiasm, establish correct world views, life views, and values. It cultivates the craftsmanship spirit of environmental engineering students, fostering a work attitude that strives for excellence and allowing them to deeply understand the purpose and significance of this course. Therefore, many university teachers have conducted ideological and political analyses and research on engineering drawing courses from various aspects, exploring aspects such as course objectives and content[8-10]. However, current discussions primarily focus on mechanical engineering drawing, with relatively few discussions on environmental engineering drawing. There is a lack of integration of ideological and political elements into the curriculum, and the use of teaching methods in ideological and political education is limited, primarily relying on traditional lecture methods. Students often passively receive information, lacking corresponding internal motivation. How to enhance students' active acceptance and absorption of ideological and political knowledge during this course is a challenge that needs to be addressed in the ideological and political construction of this course.

This article proposes a teaching reform for the

"Environmental Engineering Drawing and CAD" course at the Environmental Engineering Department of Zhaoqing University, integrating ideological and political elements into the teaching of professional courses. This approach aims to allow students to subconsciously form correct social and life views during their professional knowledge learning process, strengthening their national consciousness and sense of honor.

2. Applying Task-Based Teaching Method for Ideological and Political Education Reform in the "Environmental Engineering Drawing and CAD" Course

To reform the ideological and political education in this course, it is necessary to combine the course content and characteristics to find the entry point to integrate ideological and political elements and optimize the teaching content.

2.1. Analyze the Course Objectives and Teaching Content, and Extract the Ideological and Political Elements Contained in the Course

The reform of ideological and political education in "Environmental Engineering Drawing and CAD" should take the course as a carrier, combining the educational goals of ideological and political teaching with the objectives and content of the course. The quality of environmental engineering drawing directly affects the quality of the project, so the goal of this course is to cultivate students' drawing skills, the ability to interpret related drawing standards, and the ability to read and draw engineering drawings based on national drawing standards. It requires students to draw engineering drawings that must be correct, precisely sized, and comply with relevant national standards. To delve into the ideological and political elements behind the course objectives, the focus should be on students' professional ethics and craftsmanship. With this goal, the course content is reorganized into three major parts: basic drawing theory knowledge, the use of CAD software, and CAD practical drawing of environmental engineering drawings. Since this course has strong theoretical and practical characteristics, the above course content is refined into multiple tasks according to the principle of "teaching, learning, doing, and evaluating". The teaching method of "lecture-exercise-interaction-summary" is adopted, and different tasks are integrated with course ideological and political elements according to their functions and characteristics, so that students can master the skills of drawing and standardized drawing while also developing a scientific and rigorous work style.

2.2. Integration Points of Ideological and Political Education in the "Environmental Engineering Drawing and CAD" Course

Integrating ideological and political content into the teaching of environmental engineering drawing and CAD should take the knowledge of professional courses as the main content, while also combining the characteristics of contemporary college students to guide the correct formation of their values and worldview. In teaching, it is necessary to permeate and integrate ideological and political content with professional teaching content, to guide and enhance students' ideological and moral qualities "silently" while clearly and

accurately explaining knowledge points.

The integration points of some knowledge points of environmental engineering drawing and CAD with ideological and political teaching content are as follows:

In the introduction, when introducing the drawing standards of environmental engineering drawing, explain the details and key points of the drawing standards, understand the rules for formulating related standards, guide students to recognize the importance and authority of national standards, establish the concept of standardization, consciously comply with and implement national standards, and develop a sense of standardization.

In the explanation of projection knowledge, take the initiative to make the world distribution of cities related to "One Belt, One Road", integrate "One Belt, One Road" with the professional knowledge of finding points on the surface of curved solids, exercise students' hands-on ability and spatial imagination ability, and also let students understand the achievements of the country and enhance their sense of national honor. In the drawing and interpretation of three-view drawings, guide students to look at problems from multiple perspectives, distinguish between primary and secondary, and need to connect multiple projections to effectively and clearly understand the essence of the object, cultivate students' scientific logical thinking.

In the use of CAD software, take drawing the national flag as the entry point, integrate the meaning of the national flag, drawing standards with professional knowledge, exercise students' drawing ability and standard interpretation ability, and also enhance students' national consciousness and awareness of loving the party and abiding by the law. In the practical drawing of CAD, take drawing the party flag as the entry point, let students interpret the production standards of the party flag, formulate drawing plans, and complete the drawing of the party flag through CAD, exercise students' ability to interpret standards and transform standards into drawings, and also exercise students' proficiency in using software.

2.3. Set Tasks in Combination with Reality

According to the integration points of ideological and political education in the "Environmental Engineering Drawing and CAD" course, set corresponding tasks.

1) For the teaching content of basic drawing theory knowledge, set the model task of the spatial geographical distribution of "One Belt, One Road" along the way, and integrate the teaching knowledge points of points and lines on the surface of curved solids into the spatial geographical distribution of "One Belt, One Road".

2) Set the task of drawing the national flag, let students draw the national flag according to the corresponding parameters of the national flag, and become familiar with the use of CAD software.

3) Set the task of drawing the party flag, let students find the corresponding party flag standards, answer the related standards of the party flag, design the drawing plan, and complete the corresponding drawing through CAD, exercise students' comprehensive practical ability.

2.4. Task Evaluation and Summary

Assessment and evaluation are means to achieve ideological and political education in the course, and are also indicators to evaluate the effectiveness of ideological and political education. To ensure the integration of ideological

and political elements with drawing teaching content, a reasonable assessment mechanism should be established. After students complete the tasks, evaluate the completion of the tasks, comment on the different drawing measures adopted by students, guide students to further think and explore, and continuously adjust and improve according to the actual effect.

3. Application of Ideological and Political Education in the "Environmental Engineering Drawing and CAD" Course under the Task-Based Teaching Concept

3.1. Introduction to Drawing Standards

The precision and standardization required in environmental engineering drawing necessitate that the drawing process strictly adheres to the relevant national standards. In this lesson, the national standards for environmental engineering drawing are explained to students, clarifying that throughout the drawing process, from the size of the paper, lines, line width, annotations to the drawing of each view, it is essential to strictly follow the relevant national standards.

Taking the serious accident in November 2016 where a construction site's concrete pouring operation did not follow standard requirements, resulting in the collapse of the pouring platform, students are made aware that any non-standard and careless behavior can severely affect product quality, leading to economic losses and personal injury accidents, and may even bear criminal responsibility. Students are guided to learn from this example, and in subsequent drawing and design work, they must conscientiously and strictly adhere to the relevant rules and standards. This educates students to strive to be law-abiding citizens and to draw according to regulations.

3.2. Points and Lines on the Surface of Curved Solids

The main teaching objective of this lesson is to enable students to master the relationship between points and lines on a solid surface and the method of drawing them, and to become familiar with the three-view drawing of points and lines on the surface of curved solids.

Since the teaching knowledge point is quite abstract, it often requires examples to enhance students' understanding. In 2013, China proposed the significant initiative to jointly build the "Silk Road Economic Belt" and the "21st Century Maritime Silk Road," known as the "Belt and Road" initiative, and from the standpoint of a responsible power, established a Silk Road Fund of 40 billion US dollars to support infrastructure construction in countries along the route. China's proposal of the "Belt and Road" initiative and active participation in the construction reflects our country's sense of responsibility.

In this lesson, the "Belt and Road" initiative is used as an entry point. Before class, students are asked to search for materials related to the "Belt and Road" and, based on some of the routes, draw the positions of the relevant cities on a globe and connect them into a curve. Students can intuitively understand the properties of the three-view projection of lines on a curved surface, deepen their understanding of the knowledge in advance, and also learn about the achievements

of China's "Belt and Road," enhancing national pride.

In class, combining the national "Belt and Road" initiative, the teaching of points and lines on the surface of a curved solid sphere is carried out, allowing students to draw the three views of the Earth and the three views of some routes of the "Belt and Road" based on the model they made. By integrating the "Belt and Road" with the search for points and lines on the surface of a curved solid, students can more intuitively understand the distribution of points and lines on the curved solid surface and the drawing of three views, while also learning more about the "Belt and Road" content, enhancing students' sense of national honor and patriotic feelings, and promoting college students to set higher goals and ideals.

3.3. Practical Training in Drawing Command Operations of AutoCAD in "Environmental Engineering Drawing and CAD"

AutoCAD provides a large number of drawing commands. After learning the relevant commands, students need to be able to use the corresponding commands proficiently for drawing. However, in reality, students only master the use of the corresponding drawing commands but cannot flexibly use them according to different situations. This lesson takes drawing the national flag as an entry point, allowing students to independently complete the AutoCAD drawing of the national flag, become familiar with the use of AutoCAD drawing commands, and apply them flexibly according to the actual situation.

First, the regulations of the National Flag Law are explained to understand the size and drawing method of the national flag. Through demonstration and operation, the use of AutoCAD drawing commands in the process of drawing the national flag is explained, guiding students to draw the national flag by combining multiple drawing commands. After the demonstration, students are asked to practice, completing the AutoCAD drawing of the national flag according to the relevant requirements. Based on the students' drawing situation, some guidance is provided to encourage students to use different commands to draw the same shape and to draw the national flag according to certain requirements and standards.

After completing the drawing of the national flag, students are arranged to explain their drawing process, introducing the commands and coordinates they used. By completing the drawing of the national flag, students not only master the relevant knowledge about the national flag but also become proficient in the use of AutoCAD drawing commands.

4. Conclusion

This paper explores the teaching methods of "Environmental Engineering Drawing and CAD" at Zhaoqing University. Under the concept of task-based teaching, the knowledge of "Environmental Engineering Drawing and CAD" is integrated with the knowledge of ideological and political education, overcoming the shortcomings of poor integration between the two. This approach has enhanced students' initiative in learning, increased their interest in the course, and also strengthened their awareness of their own era's mission, as well as their emotional and cognitive connection to the country and the party.

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