Research on the Case Library of Advanced Language Programming Teaching Practice Based on Ideological and Political Elements

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Abstract. This article explores the ideological and educational functions contained in high-level language programming. It attempts to closely integrate knowledge transfer and ideological education based on the application of teaching practice cases, in order to explore the new "integrated" pattern of full course education in new engineering and the resource utilization ecosystem based on case libraries.

1. INTRODUCTION

In May 2020, the Ministry of Education of China issued the "Guiding Outline for Ideological and Political Construction of Higher Education Curriculum", which pointed out that engineering professional courses should focus on strengthening students' engineering ethics education, cultivating students' spirit of striving for excellence as a great craftsman, and stimulating students' patriotism and sense of responsibility for science and technology to serve the country. In the new era, analyzing the characteristics of courses and majors, and deeply exploring the ideological and political connotations of professional courses are the responsibilities and missions entrusted to every university teacher in the new era [1]. To effectively integrate ideological and political elements into professional courses, new teaching reforms and innovative requirements have been put forward for various aspects of classroom teaching content for university teachers in the new era [2]. However, from the current research status both domestically and internationally, there is still a tendency to prioritize education in the implementation of various courses in universities. The introduction of ideological and political courses is a demand of the times to improve the quality of ideological and political work in universities. Curriculum ideological and political education cannot be simply understood as "curriculum+ideological and political education". There are relevant studies that suggest starting from the perspective of teaching theory research, studying the laws of the formation and development of students' ideological and political character, as well as the laws of education and teaching, in order to effectively carry out education work.

Advanced language programming is a fundamental course for computer majors with a wide audience, and its theory and practice are closely integrated. Taking students as the main body is an important foundation for implementing ideological and political education in the curriculum. To truly integrate ideological and political elements into the curriculum, it is necessary to deeply explore the content of the curriculum system and integrate ideological and political elements into the specific teaching cases of the curriculum modules. Fully explore the ideological and political elements contained in the course content and the ideological and political education functions carried by it [3]. By closely integrating knowledge transmission with ideological education, we can achieve a new "integrated" pattern of comprehensive education in the new engineering curriculum.

2. Exploration of Ideological and Political Elements in Advanced Language Programming

The goal of the Advanced Language Programming course is to enable students to understand and master modular programming thinking, understand the basic grammar structure and theoretical knowledge of C language, understand the basic process of C language programming, and master the basic methods of program debugging. While imparting professional knowledge, strive to explore the thinking patterns and cultural significance that permeate behind the knowledge.

Through in-depth research, the author summarizes the following aspects of ideological and political elements that can be excavated and infiltrated in high-level language programming:

2.1. Socialist core values

In the learning of the output function of the program, examples of output functions can be provided by listing the textual expressions about socialist core values that
can be seen everywhere in students' lives, so that students can have a more intuitive understanding of socialist core values and a deeper understanding of socialist core values in the classroom. Encourage students to actively think, communicate, and discuss in teaching. How to follow the strategic guidelines of national development and interpret the call of the new era? How to concretize and interpret core values? Guided by problems, mobilizing students' enthusiasm, achieving seamless integration of ideological and political points with teaching content, driving significant improvement in course teaching effectiveness, and stimulating students' interest in learning to help them better understand classroom content.

2.2. Craftsmanship spirit

In the actual process of writing a program in high-level language programming, students often understand the knowledge points taught by the teacher and have a rough grasp of the method of writing the program. However, when writing specific code, there are often cases of carelessness, such as not following the normal steps when creating a program, or not selecting a matching project type and file type, writing keywords incorrectly, and not having a semicolon at the end of the statement, Double quotation marks, mismatched braces, and other issues, while the error checking display of compiled software is not accurate, often a small mistake or error will display multiple errors. When students first come into contact, they often feel frustrated when they see so many error displays. After writing a program for more than ten minutes, they may not be able to run the program normally even after half an hour of error checking, leading to a loss of confidence and giving up on writing.

At this point, it is necessary for teachers to integrate the spirit of craftsmanship into students in the classroom. As an engineering student, we will encounter various difficulties during the process of completing projects. We cannot shrink back when encountering difficulties. We need to learn from generations of craftsmen, persistently focusing, striving for excellence, meticulousness, and pursuing excellence. As a major country, whether it is the traditional manufacturing industry or the emerging digital industry, the spirit of craftsmanship is a powerful driving force and source for the nation. In the new era, it is even more necessary for us to inherit and promote the spirit of great country craftsmen.

We need to emphasize to students that it is not scary to encounter problems in the process of writing high-level language programs. We only need to understand the steps and methods to solve the problem, and through program debugging, we can first locate the first problem, and then quickly identify the root cause of the error through the accumulation and summary of possible problems in the program, thereby solving the problem. Every time a problem is solved and compiled, sometimes the number of errors in solving a problem is significantly reduced. Then, we continue to locate the second problem and repeat the process until all problems are resolved. At the same time, accumulating errors, persevering, and slowly debugging programs and solving problems will also find patterns, become proficient, and the ability to write and debug programs will gradually improve.

2.3. Promote traditional culture, enhance cultural confidence, and cultivate patriotism

China has a long history, and in the long river of history, there are many excellent traditional cultures that we need to inherit and carry forward. For example, in ancient mathematics, the equation algorithm in China's "Nine Chapters of Arithmetic" is more than 600 years ahead of other countries; In addition, the idea of binary system originated from the Book of Changes in China, more than 2000 years earlier than Western countries. These development achievements are enough to astonish the world and are also a traditional culture that we are proud of. In high-level language programming, it is inevitable to apply mathematical algorithmic thinking. For example, in array learning, we can select some interesting mathematical problems from ancient Chinese "Nine Chapters of Arithmetic" and solve these mathematical problems through knowledge such as loops and arrays in high-level language programming. This not only enhances students' interest in learning, but also makes them aware of our excellent traditional culture, Let students feel the increasing strength of their motherland, strengthen their sense of national pride, cultivate their cultural confidence, strengthen their patriotism, and form a driving force for studying hard for the development of their motherland.

2.4. Dialectical Philosophical Thought

In the development law of things, the whole is composed of parts, but the key parts often play a decisive role in the development of the whole. For example, each element in an array is its constituent part, and each element in turn affects the overall situation of the array. This relationship also exists in program debugging in program design, such as the components of a program: a small punctuation error can cause the entire program to malfunction.

In high-level language programming, there is also a philosophical idea that practice determines cognition, cognition has a counterproductive effect on practice, and scientific theory has a guiding effect on practice. Without a correct understanding of the basic syntax of high-level language programming, code writing cannot be completed quickly and smoothly in programming practice. At the same time, without the accumulation and consolidation of code writing practice, it is also impossible to achieve a deep understanding of theoretical knowledge.
3. Teaching Practice Cases

In the practical teaching of advanced language programming, we should avoid adopting rigid and single rigid preaching, but instead build a classic teaching case that combines professional teaching and ideological and political education [4]. We should cut into ideological and political education at appropriate teaching nodes, moisten it silently, and achieve the natural integration of curriculum and ideological and political elements through soft processing, ultimately achieving good curriculum ideological and political effects.

The author used the knowledge point of the for loop structure as an example to design a practical case of ideological and political education in the curriculum, as follows:

3.1. Teaching objectives

(1) Enable students to master the basic grammar and form of the for loop structure;
(2) Enable students to understand the specific execution process of the for loop structure;
(3) Enable students to learn to use the for loop structure to solve specific problems.

3.2. Teaching focus

After mastering the basic knowledge, students only stay at the superficial stage and need to apply different practical cases to help them master the application of the for loop structure [5].

3.3. Difficult in teaching

In the teaching process, although different cases were used to help students grasp the practical application of the for loop structure, the difficulty in teaching is how to help students flexibly use the for loop structure when solving different problems.

3.4. teaching method

Using case teaching method, explain the basic grammar and execution process of the for loop structure through specific practical cases, concretize abstract knowledge points, and help students understand and master knowledge points; Using task driven approach, students can learn how to use a for loop structure to solve specific practical problems in specific situations, thus achieving practical application results.

3.5 Teaching Design Integrating Ideological and Political Education

The entire teaching process mainly includes 7 parts: knowledge citation, knowledge learning, Practical Attempts, reflection and summary, communication and discussion, expansion exercises, and case summary. The specific content is shown in Figure 1.

3.5.1. knowledge citation

Through the story of Australian rabbit breeding, ask the question: If there is a pair of newborn rabbits, starting from the third month, breeding a pair of little rabbits every month, following this pattern, and assuming no rabbits die, how many pairs of rabbits will there be one year later? This leads to a cycle, thinking about how to apply programming methods to solve practical problems, while integrating the dialectical relationship between the whole and parts, inspiring students to think.

3.5.2. knowledge learning

Explain the basic syntax and general form of the for loop structure, as well as the execution process. Introduce ideological and political elements that make every mistake a thousand miles away. A small mistake can cause the program to run in a completely different direction, cultivating students' spirit of rigor and excellence in their work.

3.5.3. Practical Attempts

Through case analysis, students are encouraged to try to apply their learned knowledge to practice [6]. When students encounter difficulties in analyzing problems, teachers provide timely guidance to help students solve problems, and introduce the general laws of understanding things: from practice to understanding, from understanding to practice, continuous repetition and infinite development. It is necessary to play the guiding role of theory in practice, and also adhere to theoretical innovation based on practice.

3.5.4. Reflection and summary

By summarizing students' practical cases, students can reflect on the problems and solutions that exist in practice, and introduce a spirit of perseverance and perseverance as a craftsman.
3.5.5. Communication and discussion

By analyzing the program codes of different students, we help them find the optimal solution to problems and cultivate their rigorous programming thinking.

3.5.6. Expansion exercises

Assign after-school tasks, ask students to carefully analyze the program code provided by the teacher on the online learning platform, identify errors, and correct them, in order to strengthen their ability to debug and correct programs. Then, ask students to use the for loop structure to solve the problem of buying a hundred chickens for a hundred dollars, in order to transfer and apply the knowledge they have learned.

3.5.7. Case Summary

Throughout the entire teaching process, the student's subjectivity is fully reflected, progressing layer by layer, guiding students to think and master methods for discovering and solving problems. The integration of ideological and political elements with programming methods and thinking is not farfetched, exploring and trying to achieve a smooth and silent environment.

4. Existing problems and considerations

How to integrate the elements of ideological and political education into teaching practice and organically integrate them, without being too farfetched or simply grafted, and to enable students to receive ideological and political education unconsciously in professional practice is currently the biggest problem in curriculum teaching.

In this regard, we have conducted a lot of practice and attempts in the teaching process. In practical research, we found that students do not reject the ideological and political elements themselves. What students are more disgusted with is the forced integration of ideological and political elements. If we can find interesting ideological and political stories or cases in the learning of the knowledge points of the "Advanced Language Programming" course and integrate them into practical programming questions or output designs, It can not only enhance students' interest in learning, but also enable them to better understand and accept ideological and political elements, which can effectively achieve the goal of mutual promotion between professional education and ideological and political education.

5. CONCLUSION

Through the above research, we can see that the ideological and political elements that can be excavated in advanced language programming courses are relatively rich, and the difficulty of course teaching is how to effectively integrate these ideological and political elements into professional courses, making it easier for students to accept.

The construction of a teaching practice case library for "Advanced Language Programming" based on ideological and political elements can effectively solve this problem. In the process of teaching practice, we continuously explore and accumulate scattered teaching resources, establish a practical teaching case library, which can help teachers effectively improve the teaching effectiveness of ideological and political courses. At the same time, we can also investigate the learning effectiveness of students after the completion of course teaching, Supplement and improve the case library to achieve a good ecosystem for resource utilization.

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