Research and Practice of Integrating Ideological and Political Elements into Embedded C Language Course

DanJuan Liu[1a], Wei He[2 *], NanJun Zhou[3b]

[1] ZTE Communication Information Institute, Xinyu University, Xinyu 338000, China
[2] School of New Energy Science and Engineering, Xinyu University, Xinyu 338000, China
[3] ZTE Communication Information Institute, Xinyu University, Xinyu 338000, China

Corresponding author: Wei He
aEmail address: liudanjuan@163.com
*Corresponding author. Email address: heweixyxy@163.com
bEmail address: 1339194189@qq.com

Abstract. In the process of embedded C language teaching, the ideological and political elements are added, and the theoretical and practical teaching links are designed, and the teaching cases including curriculum knowledge and ideological and political education are designed, and the online and offline flip teaching mode is adopted. To achieve the goal of stimulating students' learning enthusiasm, enhancing their practical ability of program reading analysis and programming, improving the quality of classroom teaching and educating people.

Keywords: Ideological and political elements; Theoretical teaching link; Practical teaching link; Impart knowledge and educate people

1 Introduction

In December 2016, the spirit of the national conference on ideological and political work in colleges and universities put forward: "To integrate moral education into the whole process of education and teaching, we should change the' ideological and political course' in colleges and universities into' curriculum ideological and political', fully mobilize the moral education function of various courses in colleges and universities, deeply explore and sort out the ideological and political elements of various courses. We should adapt ourselves to the situation, advance with the times, innovate with the times, and strive to do a good job in curriculum ideological and political education[1]."

Embedded C Language is a professional basic course of science and engineering, which offers many majors and benefits a large number of students. After the ideological and political elements are added, it can cultivate both skilled and high-quality embedded programming talents.

This paper will study and explore how to excavate the ideological and political elements in the course of Embedded C Language, and organically integrate these ideological and political elements into the course of Embedded C Language.

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2 Teaching design with ideological and political elements

If teachers can't cut ideological and political elements into the knowledge points of the course without leaving a trace, it will affect students' understanding of knowledge and reception of ideological and political content, which requires teachers in our curriculum team to strengthen political theory learning and improve political literacy and policy literacy[2]. In the teaching process, students are the center, paying attention to students' needs and development, combining with course knowledge points, finding the ideological and political elements that students are interested in, and corresponding the course knowledge points with the ideological and political elements one by one.

Dig the ideological and political elements from the knowledge points of Embedded C Language course, clarify the core knowledge, accurately integrate the ideological and political elements, organically combine them, and turn the pieces into a whole to achieve the educational effect of small knowledge and great ideological and political education[3]. The teaching design of one-to-one correspondence between ideological and political elements and knowledge points of this course is shown in Table 1 below.

Table 1. Teaching design of one-to-one correspondence between ideological and political elements and knowledge points of this course

Key points of knowledge		Integration point of ideological and political elements	Integration point of ideological and political elements
1	Integration point of ideological and political elements	Lead the students into the wonderful world of C language, understand the general development process of C language programs, and the important role of C language in background programs.	Understand the role of programmers in the professional field, arouse students' career vision for the future, and stimulate students' professional self-confidence.
2	Data types, operators and expressions	A comparative study of the previous students who were expelled from the college because they did not abide by the school rules and seriously violated the school system.	We should learn to be responsible for our actions, be professional, and abide by the craftsman spirit.
3	Sequence structure programming	Input-output statement	Pay attention to the input of cultural accomplishment and moral accomplishment, export the value of life for the society and contribute to the development of the country.
4	Select structure programming	If statement and switch statement, branch programming idea to solve the problem of selecting classes.	Guide students to handle the relationship between personal interests, collective interests and national interests, and make the

			right choice when conflicts occur.
5	Cyclic structure programming	While, do-while and for statements	Cultivate students' perseverance, dare to try, and constantly polish the quality of professional ability and craftsmanship.
6	Function and its application	Definition and call of functions	The idea of divide and rule, enhance team spirit and overall planning consciousness.
7	Array and its application	One-dimensional array, two-dimensional array and character array	Encourage students to associate with people with positive energy, and establish a correct concept of making friends and values.
8	Pointer and its application	Although the pointer is flexible, it is always the same.	Do not forget your initiative mind, keep in mind the mission and serve the people wholeheartedly.
9	Application of C51 Language in Embedded System	Learn from chips with simple functions, understand the functions of these chips, and then expand the functions of the chips, so that students can understand how the program code controls the work of the chips.	An excellent programmer can only play its greatest role and achieve a win-win situation if he is integrated with the national family.

3 Reform of theoretical and practical teaching contents

Both theoretical teaching and practical teaching adopt a three-layer progressive teaching mode, focusing on cultivating students' basic programming ability, system design ability and research and innovation ability[4]. Theoretical teaching is divided into basic knowledge in the early stage of the course, program development in the middle stage of the course, and practical project cases in the late stage of the course. From shallow to deep, knowledge transfer and education are carried out step by step. The three-layer progressive theory teaching link is shown in Figure 1 below.

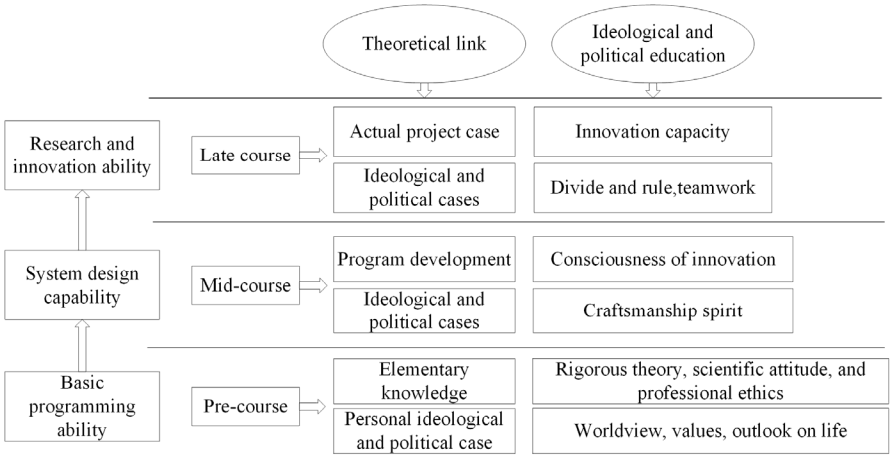

Fig. 1. Three-layer Progressive Theory Teaching Link

The practice teaching link is centered on the concept and principle of the subject, and through the construction of multi-level practice teaching links, from the shallow to the deep, step by step, research and integrate what students have learned, cultivate students' academic ability and give full play to their abilities[5], as shown in Figure 2. Practice teaching includes basic experiment, explorative experiment and exploratory experiment. Basic experiments mainly test students' mastery of basic theories, whether they can use what they have learned flexibly, strengthen students' practical ability and cultivate students' computational thinking; Exploratory experiments mainly cultivate students' systematic thinking ability and perceptual knowledge of majors, and iteratively cultivate students' programming ability[6]. When designing solutions, students are required to be meticulous, strive for perfection and innovate, and cultivate students' craftsmanship. Exploratory experiment is a difficult and challenging task, which is combined with teachers' scientific research projects and science and technology competitions. Because everyone's cognitive development rate is different, in order to help students use what they have learned flexibly and realize their cognitive development, cooperative learning mode is adopted in exploratory experiments. Students learn from each other and discuss with each other, and each student will have the opportunity to understand other people's problem-solving ideas. This process is also the process of students' thinking[7] .

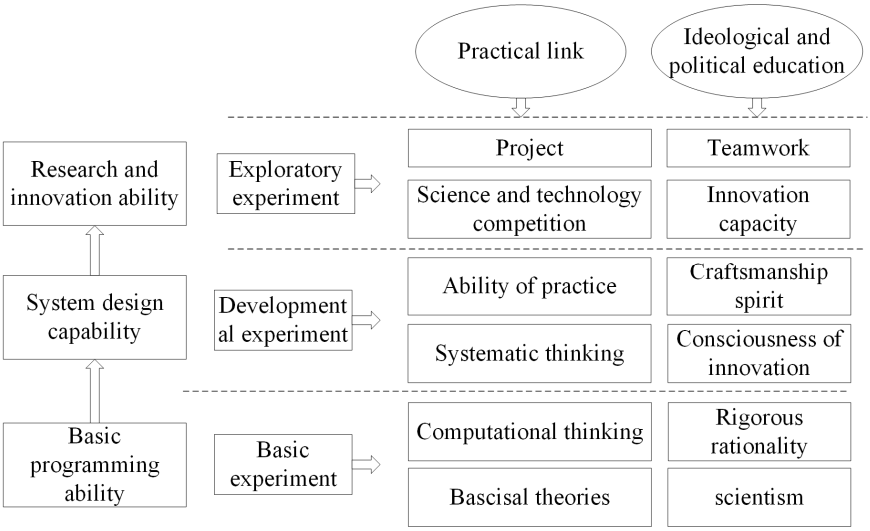

Fig. 2. Three-layer progressive practice teaching link

4 Design classic teaching cases with both course knowledge and ideological and political education

Introduce relevant ideological and political stories to share in appropriate teaching links, so as to achieve the effect of educating people like a duck to water, such as the interest-free feeling of salt in soup[8]. For example, in the early stage of the course, the story of Qiu Bojun, the first programmer in China, was introduced while teaching the basic knowledge of C language. Through the sharing of stories such as his schooling, entrepreneurial experience and the establishment of Jinshan Software Co., Ltd., students were made to realize the importance of embedded C language course and the necessity of continuous exploration and learning, so as to cultivate students' good consciousness of autonomous learning and continuous learning.

When learning the if…else if statement to realize the programming of choosing structure, the profound proposition of "choice" in life is introduced, and the case that Academician Wang Xiaoyun, a cryptographer, chose cryptography for the sake of national security and for China's cryptography to be in the forefront of the world, tried to take the road of strengthening the country through science and technology that benefited the country and the people, so as to guide students to make correct choices on the road of life.

5 Online and offline flip teaching mode

The online and offline flip mode[9] is a closed-loop teaching mode as shown in Figure 3 below. The learning of the knowledge module of the external circulation course is divided into six steps, namely, task assignment, APOC learning, autonomous learning,

offline reinforcement, offline guidance and offline acceptance. The internal circulation process includes setting learning objectives, autonomous learning, guiding learning process and evaluating learning effect. The online part makes full use of China MOOC University and its superstar platform, and completes video learning, after-class review, homework submission, question feedback and discussion, learning effect evaluation and other processes in spare time[10].

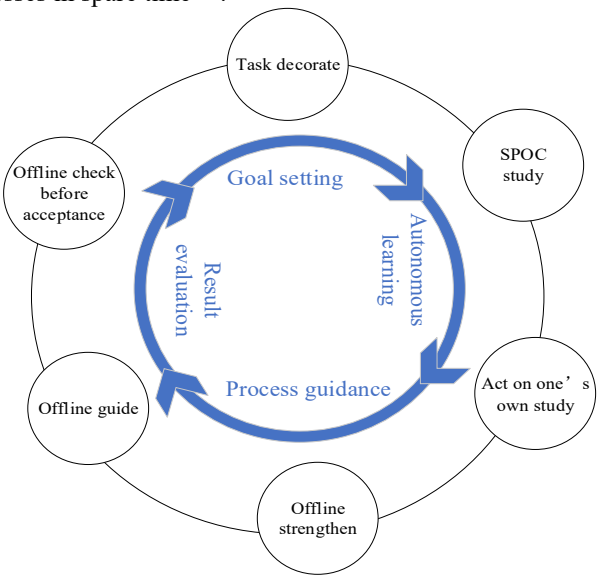

Fig. 3. Online and offline flip teaching mode

6 Conclusions

Curriculum ideological and political education is an educational idea, a way of thinking, an educational practice and a systematic project. Theoretical and practical teaching links with ideological and political education are constructed for C language programming course. In the process of knowledge learning and ability cultivation, students internalize the correct outlook on life, values and craftsman spirit into their own character, and then into their own spiritual world. This process cultivates students' scientific literacy and social responsibility, and strengthens their consciousness of innovation, and improves their ability to innovate.

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