

Integration of Ideological and Political Education into Comprehensive Experiment of C Programming Language

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Abstract. Implementing ideological and political education is a priority strategy for China's higher education development in the new era. Aiming at the comprehensive experiment of C programming language, this paper discusses the ideas and methods of integrating ideological and political education in each teaching link, and makes a useful exploration and practice for the future mode and approach of ideological and political education for college students.

Keywords. C programming language; Comprehensive experiment; Ideological and political education; Higher education

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1. Introduction

The ideological and political education is a new thing arising from the deepening and comprehensive reform of China's higher education field in recent years. In higher education, the ideological and political work should be transformed in the sense of methodology, that is, the ideological and political work should run through the whole process of education and teaching, and the ideological and political work system should be connected with the high-level personnel training system. It emphasizes that all classrooms are the main channel for educating people, and that all courses and all teachers should dig deep into the ideological and political education elements contained in the courses, and organically integrate them into the teaching of various courses. At present, major colleges and universities are scrambling to try to reform the teaching of ideological and political education, but they are still in the exploratory stage. This makes many professional course teachers believe that the direct correlation between the teaching of professional courses and ideological and political education is very small. At the same time, because ideological and political education involves many fields of knowledge, it is difficult for teachers to accurately grasp the ideological and political elements of professional courses. Therefore, how to build the "ideological and political education" system still needs to be carefully considered.

C programming language is a public basic course offered by most colleges and universities for science and engineering students, which plays a good role in cultivating students' computational thinking, programming literacy, and ability to discover and solve problems [1]. The comprehensive experiment

of C programming language is an important part of C language learning. It has very positive significance for students to consolidate the knowledge they have learned, systematically sort out the grammar rules, improve their engineering practice ability, and cultivate their sense of innovation. Score management system is an indispensable software for educational institutions. The system provides a powerful student performance management function, which is convenient for system administrators to add, modify, delete, and inquire about student performance and other information. At the same time, it also facilitates students to inquire about their scores in various subjects and exchange their learning experience.

This paper takes "score management system" as an example to show how to add ideological and political elements to this practical training course to achieve the goal of harmony between quality education and ideological education.

2. The Integration Strategy of Ideological and Political Elements

The integration of ideological and political elements in science and engineering courses should focus on shaping the students' great-country craftsman spirit of keep improving and the ideal, mission and feelings of rejuvenating the country through industry [2]. First of all, ideological and political elements should be fully reflected in the syllabus. The syllabus is the basis and criterion for teaching. Therefore, teachers should carefully sort out the ideological and political elements related to the knowledge points of this course through collective lesson preparation, and incorporate them into the syllabus to standardize teaching behavior before carrying out comprehensive experimental training courses [3].

Secondly, teachers should actively carry out ideological and political education in all aspects of the comprehensive experiment. According to the characteristics of programming courses, we divide the whole comprehensive experiment into several links, such as idea prompting, group implementation, individual counseling and assessment and scoring.

Finally, in the process of exploring the teaching of ideological and political education, teachers must summarize their experience in a timely manner, and promote the development of curriculum quality through on-site exchanges with other teachers, participation in training and other activities. Below, each link of the comprehensive experiment will be briefly introduced.

3. Teaching Design

First of all, teachers should let students clear learning goals. Real-life examples can make knowledge points easier to understand, make students pay more attention to current affairs, and use the technologies they have learned to solve social problems. At the beginning of the comprehensive experiment, teachers can mention the "Harmony operating system" independently developed by Huawei, whose kernel is written in C language. So that students can build a sense of pride in learning. Students can also realize that there is a long way to go to realize the great rejuvenation of the Chinese nation. With the development of the Internet of Things, the demand for talents in embedded programming is increasing day by day. The Internet of Things involves some low-level sensor data acquisition and embedded application development, and these technologies all use C language. As a result, these elements stimulate students' interest in learning and cultivate a spirit of innovation.

The "score management system" of the C programming language comprehensive experiment mainly includes the following functional modules: main function, score modification, score query, score statistics, and score input. Each module consists of several sub-functions with certain functions (see Figure 1). The experiment adopts a top-down, step-by-step refinement method to complete the design of the entire program. When introducing the development concept of this "divide and conquer" idea, teachers can integrate the strategic thinking of our country's "Three-steps" and "Scientific Outlook on Development". The design of a program with certain functions is a complex process. In order to reduce the difficulty of development and improve the efficiency of programming, it is often necessary to divide complex problems into several relatively simple sub-problems, and then solve them. This is similar to the "Three-step" strategic thinking. By dividing the task of the great rejuvenation of the

Chinese nation into three stages, it provides scientific guidance for the construction of socialism with Chinese characteristics. At the same time, the "Scientific Outlook of Development" proposes to promote the coordinated development of all aspects of the economy and society, which also inspires us to balance the tasks and functions of each module during software development, allocate loads reasonably, and make the entire system harmonious and unified.

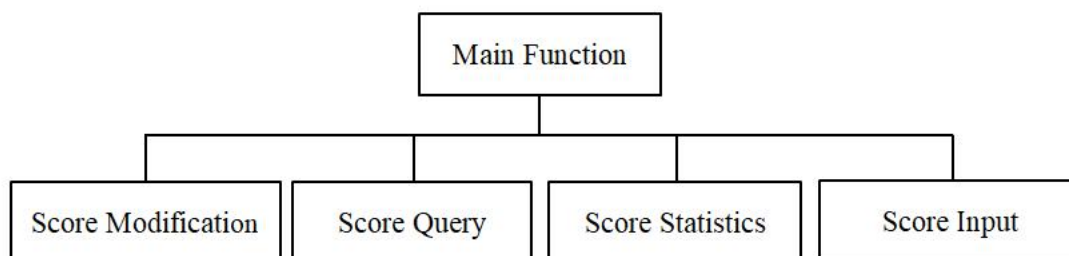


Figure 1. Score management system.

When designing the main menu in the main function, the teacher suggested to the students that a switch statement can be used here. At this time, according to the grammatical function of the switch statement, teachers can enlighten students that when faced with conflicts and choices between personal interests, collective interests and national interests, they should be brave and shoulder heavy responsibilities, strive to contribute to society.

When introducing the reading of grade files, the concept of "buffer" can be mentioned. The data read from the file will be put into the buffer first, and will not be sent to the CPU for processing until a certain amount is accumulated. This enlightens contemporary college students: they should be conscientious people in their daily study and life, and pay attention to the extensive accumulation of knowledge, experience and experience. In this way, once they encounter a suitable stage and opportunity to show themselves, they can stand out, achieve greater personal value, and make greater contributions to society.

When introducing the data structure that needs to be used in the system design, because it involves different types of data such as student ID, name, gender, grades, etc. of students, structure variables and their arrays need to be used. Teachers can integrate the concept of "national unity" with the knowledge points of structure data type, and preach our country's national policy to students. Different types of data are organically combined, and each plays its own role to complete the functions set by the system. Just like different nationalities, under the leadership of the Communist Party of China, twisted into a single rope, worked hard and forged ahead. At the same time, in order to facilitate data processing, the information of different students is stored in a structure array. At this time, the teacher led the students to review the definition of an array and review the concept that the elements of an array are of the same type of data. Further, teachers can integrate the concept of "selecting like-minded people as friends", emphasize the ancient Chinese adages that "birds of a feather flock together and "one who stays near vermilion gets stained red, and one who stays near ink gets stained black". It is hoped that the students will grow and progress together with those who meet the standard of "three kinds of worthy friends" said by the ancient Chinese philosopher Confucius.

In the grade query module, users can search a student's grade according to the student number. Teachers can inspire students to use the for loop statement here. By traversing the student structure array, the student ID member equal to the target student ID is found, and then the subscript of the array is returned. If not found, a specific value is returned. In the worst case, all student structs are looped over. Teachers can motivate students: this process is like our entire learning and working experience. In the journey of life, there will inevitably be setbacks and failures, and there will always be ups and downs. But we have to be like a "for loop". Once the initial value and step length are determined, we must unwaveringly move towards the goal, and the more we fail, the more courageous we are. Even if

we fail repeatedly, we must have a strong will and belief in victory. Until the end of the cycle is reached, we realize the value of life and gain a full sense of gain. When querying scores, the system can also display all scores in descending order of total scores. In this case, the bubble sort algorithm needs to be used. When the teacher explains the nested relationship of the for statement, the pairing principle, and the correct application of relational operators, logical operators, and conditional operators, the teacher guides the students to be a well-organized person who knows how to do things according to the plan and order, knows how to save time and improve efficiency.

In the grade statistics module, teachers can prompt students to design a function to find the average grade of a certain course, and then call the function. In the calling process, both the actual parameter and the formal parameter are pointers which store the address of the average score variable, and the address of the average score variable is passed to the called function through the function call. The average score is obtained by first finding the total score and then dividing the total score by the total number of people. Finally, it is assigned to the average score variable through pointer arithmetic. Because of the use of pointer variables, the calling function and the called function jointly occupy a piece of memory space for data transfer. At this time, teachers can intersperse the concepts of "carbon peak" and "carbon neutrality" in teaching. The inhabitants of the earth are under the same blue sky, must have the awareness of green environmental protection, reduce carbon dioxide emissions as much as possible, and strive to maintain our common home. In addition, no matter what type of pointer, its essence is a variable that always points to a certain target. This reminds us that the majority of students must "remain true to their original aspirations and keep their mission in mind", cultivate the feeling of serving the country with science and technology, and bravely take on the mission of China's rejuvenation.

In the process of group programming, students will inevitably have doubts of one kind or another. Teachers should remind students to use data types and programming statements correctly, that is, to abide by the basic programming syntax of C language. For example, the rule of law is the foundation. Failure to abide by the rule of law will lead to crimes. So we have to abide by the corresponding basic rules in everything we do. While answering questions individually, teachers can integrate ideological and political elements in a timely manner, and have a subtle influence on students like timely rain moistens all things [4]. Group members can help each other to promote students' learning consciousness and learning efficiency, and ultimately achieve common progress. This is not only the improvement of knowledge, but more importantly, the training of teamwork ability, organizational leadership ability and positive enterprising spirit. In the assessment part of the comprehensive experiment, students will show the "score management system" designed by themselves in groups. Teachers give each group and each member a score according to the function of the system, the quality of the code, the process of presentation, the answer to the question, the division of tasks, etc. Extra points will be encouraged for those who demonstrate ideological and political elements in the presentation, defense and design. This will further affect the students' usual grades and even the final grades [5].

4. Conclusion

Ideological and political education are important means of educating people. College teachers, especially science and engineering teachers, should consciously implement classroom ideological and political education in the teaching process. When teaching, teachers should find the right entry point, do a good job in teaching design, and infiltrate ideological and political education into the corresponding teaching links. This paper carries out ideological and political education in the whole process of C programming language comprehensive experiment. The elements of ideological and political education are like salt melted into soup, fully combining explicit education with implicit education. It has good practical significance and promotion value for promoting students to form a correct world outlook, values and outlook on life, and achieving the educational effect of blending subject knowledge and ideological and political elements.

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Conflicts of Interest

The author declares that there is no conflict of interest.

References

- [1] Yu, L.L., Zhao, J.B., & Li, M.S. (2020). C programming language ideological and political education resource mining and teaching path exploration. *Journal of Social Sciences of Jiamusi University*, 38(6), 224-228.
- [2] Tang, J., Wang L. (2021). Practice of promoting C language function pointer teaching by ideological and political education. *Journal of Electrical and Electronic Education*, (5),1-5.
- [3] Wang, R., Huang, J.Q. (2022). C programming language ideological and political education teaching exploration. *Computer Education*, (1),74-83.
- [4] Xin, X.L. (2021). C programming language ideological and political education teaching design research and practice. *Journal of Beijing Vocational College of Political Science and Law*, (3),101-108.
- [5] Ren, Y.Y., Cui, R.R., & Wang, J.,L. (2022). Exploration of C language ideological and political education based on OBE concept. *Computer Knowledge and Technology*, (18),161-169.