

Exploring the Implementation Path of Curriculum Civics for Programming Courses

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Abstract: Programming courses have the characteristics of strong technical, practical, logical, and fast update and iteration. It is difficult to apply the teaching reforms based on curriculum Civics to this kind of courses in close connection with the students' actual professional learning, and the construction of curriculum Civics has certain difficulties. By analyzing the problems existing in the construction of program design courses' Civics, the Civics construction program for program design courses is elaborated from the objectives of Civics, the implementation path of Civics teaching, and the design of Civics teaching. A specific case is given, and the effect of the implementation of Civics in the courses is analyzed. The practice proves to be of certain reference value for the construction, evaluation and improvement of the program design courses

1. Introduction

Curriculum Civics requires that ideological and political education should not just be a separate course, but should be integrated throughout all disciplines and courses, aiming to emphasize the integration of the content and requirements of ideological and political education in the curriculum. The goal of Curriculum Ideology and Politics is to cultivate students' firm political beliefs through the education curriculum, equip them with socialist core values, and contribute to the development and construction of Chinese society [1]. The National Conference on Ideological and Political Work in Colleges and Universities emphasizes that the ideological and political work in colleges and universities is related to the fundamental question of what kind of people colleges and universities cultivate, how to cultivate people and for whom to cultivate people. It is necessary to adhere to the establishment of moral education as the central link, to carry out ideological and political work throughout the whole process of education and teaching, to realize the whole process of education and all-round education, and to strive to create a new situation for the development of China's higher education [2].

In recent years, colleges and universities across the country have carried out a series of internal reforms to meet the educational needs of the new era. Colleges and universities have independently explored how to strengthen Civic and Political Education in various disciplines to promote Civic and Political work. NET programming course is characterized by strong practicality, drawing on the concept of CDIO engineering education, literature [3] carries out the teaching reform practice of ".NET programming course". By improving

the syllabus and content, adopting diversified classroom teaching, designing "multi-layer progressive" experimental projects, and implementing a series of reforms based on the assessment and evaluation mode of CDIO, the interest of students to take the initiative in learning can be stimulated, the spirit of students' project cooperation can be cultivated, the students' practical ability and innovation ability can be enhanced. Literature [4] explored the method of establishing and integrating the five-dimensional course civic system under the concept of OBE in order to solve the problem that the traditional C programming course is practical and difficult to integrate the civic elements. Literature [5] summarizes the necessity of the program design foundation to carry out the Civics course, gives the course Civics construction plans and specific cases, incorporates the methodology and student feedback, etc., to provide the necessary reference for the construction of Civics courses in institutions of higher education. These practices have gradually shaped the specific model and implementation path of ideological and political education in higher education curricula. The specific way of implementing ideological and political education in higher education programs may vary from college to college and from region to region, but the core objective is to ensure that ideological and political education runs through the entire process of higher education. Strengthening the construction of high-level curricula and integrating value guidance into the teaching of knowledge and the cultivation of abilities is conducive to helping students develop a correct outlook on the world, life and values, so as to better provide human resources and intellectual support for the comprehensive building of a strong modern socialist country.

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Programming courses such as C Programming, Java Programming, Python Programming, C# Programming, etc. are important basic courses that must be mastered in computer science related majors, which usually involve technologies and innovations that can be used to solve societal problems and improve people's lives [6]. This paper firstly discusses the necessity of building curriculum Civics in programming courses, and then puts forward the path and program of building Civics in programming courses, tapping the Civics elements in professional courses, and exploring how the teaching of professional courses can be integrated with the Civics elements.

2. Main issues

2.1. characteristics of programming courses

Among the professional computer courses, programming courses are characterized by their technical, practical, logical, and fast updating iterations. These courses usually focus on teaching technical knowledge and skills such as programming languages, algorithms, and data structures [7]. Students need to learn and master specific programming skills and write computer programs to solve problems. The course emphasizes practical skills enhancement, and students are required to apply what they have learned by writing and debugging real-world computer programs, and this practicality helps to develop their problem-solving skills. Programming requires students to have the ability to think logically, analyze problems, design algorithms, and write code in a logical manner. The field of programming covers a wide range of areas, including web development, mobile application development, embedded systems, artificial intelligence and many others, and different programming classes may focus on different technologies and application areas. Most importantly, the field of technology is rapidly evolving, and programming courses need to be constantly updated and kept up to date with the latest technological trends, which also requires instructors to keep their teaching materials and course content up-to-date.

2.2. Problems in the construction of the Curriculum Civics

The construction of Civics in programming courses may be too theoretical and difficult to be integrated with students' actual professional learning, which may lead students to feel that Civics education is irrelevant to their professional learning and make it difficult to generate interest and motivation [8]. In actual teaching, there is a lack of teaching materials and teaching resources applicable to Civics in programming courses, or the teaching materials are not rich and practical enough, which limits the quality of Civics education. The construction of course Civics may neglect the diversified ideas and values, leading to the homogenization of Civics content, which is not conducive to the cultivation of students' ability to think critically and independently. The lack of an effective evaluation and supervision mechanism in the construction of course Civics makes it difficult to ensure the actual effectiveness of the construction of Civics in specialized courses. In addition, students may have a lack of interest and low participation in the content of Civics in programming courses, only formally fulfilling the requirements of the course, and measures need to be taken to improve students' motivation and participation. Trade-offs need to be found in integrating Civic-Political education in programming courses to ensure that students are able to master professional knowledge and receive adequate Civic-Political education at the same time.

3. Construction program

3.1. Teaching and Learning Implementation Pathways

In the implementation of teaching, student-centered, around the teacher, the course, the ideology of the three aspects of the curriculum to carry out the construction of the course ideology, so that students in the program design courses can be both moral and legal, learn professional knowledge, improve the practical ability at the same time, shaping the correct value of the emotions. The specific implementation path is shown in Figure 1.

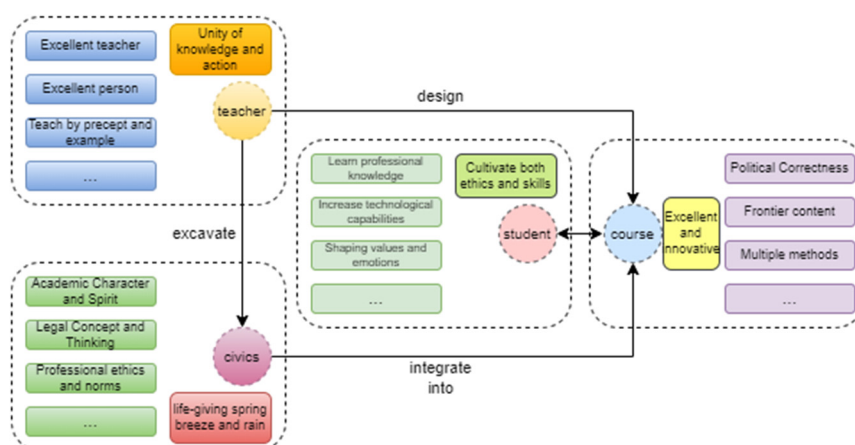


Fig. 1 Teaching and learning implementation path based on curriculum Civics

3.1.1. Teachers should realize the unity of knowledge and behavior

Teachers, as one of the main subjects of the classroom, have the most direct demonstration role for Civic Education, so teachers' behavior and role modeling have a far-reaching influence on students. Teachers should reflect their educational philosophy in their own behavior, honesty, integrity, responsibility, and lead by example.

3.1.2. Curriculum should be outstanding and up-to-date

Maintaining excellence and keeping the curriculum up-to-date is an ongoing process that requires effort and continuous commitment on the part of teachers. Teachers should pay close attention to educational trends and the latest research findings in order to make timely adjustments to course content and methods. Diversified teaching methods, including case studies, problem solving, group discussions, experiments, etc., are adopted to meet the learning needs of different students and to enhance the attractiveness and effectiveness of the courses. Encourage teachers to innovate teaching methods and content, and provide support and resources to facilitate teachers' educational research and practice. Students are encouraged to participate in course design and feedback to understand their needs and opinions, and student voices are incorporated into the process of course improvement.

3.1.3. Civic education should be achieved without obvious traces

Incorporating elements such as emotion, practice and interaction in the course design and teaching process, as well as full Concrete cases are used in the program design to explain abstract concepts of Civics and Politics, so that students can understand and feel the importance and impact of the concepts of Academic Character and Spirit, Legal Concepts and Thinking, and Professional Ethics and Norms through practical examples.

3.2. Instructional design incorporating elements of Civics

Practical ability enhancement is the teaching focus of program design courses, practice teaching is the main body of the program design course, occupies a crucial position, is of great significance to the program design course, which not only helps students to transform theoretical knowledge into practical skills, but also cultivates the key abilities such as problem solving, innovative thinking, teamwork and independent learning. The content of practical teaching can be designed around "two subjects, three dimensions, eight elements", as shown in Figure 2.

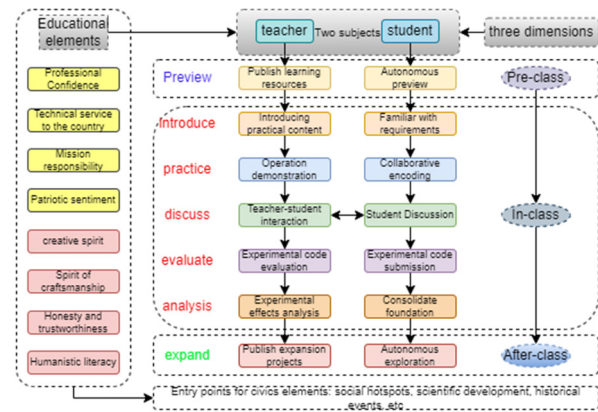


Figure 2 Curriculum Civics Instructional Design

The design of practical teaching takes teachers and students as the two main bodies, teachers release relevant learning resources through the online teaching platform of Learning Pass before the class, and relevant elements of Civics and Politics can be added to the learning resources, and students carry out independent learning according to the learning resources. In the class, the teacher introduces the practical content, operation demonstration, teacher-student interaction, evaluation of student code, and analysis of experimental results according to the learning resources. The corresponding activities of the student body are familiarizing with the experimental content, collaborative coding, mutual discussion, experimental code submission, and consolidating theoretical knowledge. Nurturing elements can be organically integrated into the five links of introduction, practice, seminar, evaluation and analysis. At the end of the class, the teacher releases extension projects for students to explore and research independently to digest the course content. Teachers can integrate professional confidence, technology for the country, mission bearing, national sentiment, innovation, craftsmanship, honesty and trustworthiness, humanistic qualities and other nurturing elements into teaching in different dimensions and different parts of the classroom. At the same time, the entry point of integrating the elements of ideology and politics should not be too hard, but should be silent, like "salt dissolves in water", from the hot spots of the society, historical events, scientific development and other different perspectives.

4. Teaching case

4.1. Case background

After learning about classes and object-oriented programming, students are asked to complete an environmental volunteer applet. Before the lesson, the teacher releases the learning resources and asks students to use their knowledge of classes and object-oriented programming to develop an environmental volunteer applet designed to encourage and manage the activities of environmental volunteers. The applet will help promote environmental action and raise environmental awareness in the community.

4.2. Case assignments

The program allows volunteers to register and log in to manage their personal information. Volunteers can post information about environmental activities, including the name, location, time and content of the activity. Other volunteers can browse and sign up for the posted environmental activities. Volunteers can evaluate and give feedback on the environmental activities they participate in and share their experience. Ability to generate statistical reports on environmental activities, including number of activities, number of participants, type of activities, etc., in order to improve the transparency of the activities.

4.3. Civics Element

In this case, it is possible to incorporate the elements of curricular Civics shown in Table 1.

Table 1 Curriculum Civics Integration Points

Civics Elements	Student activities
Social Responsibility	Students need to think about how their mini programs can contribute to the cause of environmental protection, how they can promote the cultivation of social responsibility, and how they can solve environmental problems through technology.
Moral character	Students need to ensure the integrity and fairness of the mini program, respect the rights of volunteers and environmental activities, and cultivate good moral qualities.
Creative spirit	Students need to creatively design and develop mini programs to meet the needs of environmental volunteers and event organizers, cultivate innovative thinking and technical abilities.
Technology serves society	Students can think about how to use technology to solve social problems, such as organizing and coordinating environmental activities, and how to guide volunteers to participate in social welfare.
Spirit of working hard for the public good	The theme of the case is related to public welfare activities and environmental protection, which helps to cultivate students' spirit of public welfare and sense of social responsibility.
...	...

Through this case, students are not only able to learn the programming concepts of classes and objects, but also to think about social issues and develop core socialist values and social responsibility. This helps to integrate curriculum thinking into specific programming tasks, so that students can develop comprehensive literacy in technical learning at the same time.

5. Effectiveness of implementation and evaluation

In the teaching of the C# programming course for students majoring in digital media technology, the teacher of the course designs and carries out the teaching of course

Civics based on the course Civics teaching path of this paper. In the teaching activities, students can actively participate in the classroom activities, and actively understand, accept and absorb the relevant elements of the ideology and politics. For example, students can take the initiative to realize that computer scientists have the academic attitude of rigor and sincerity and the academic spirit of selfless dedication. The case of Huawei Technology Co., Ltd. for chips and operating systems, although prepared many years ago, but independent research and development has always been China's shortcomings, the case triggered a lively discussion among students, but also inspired the students to persevere in the spirit of scientific exploration, and many students said that they would like to contribute to their own strength in independent research and development in the future. When introducing different data types in programming languages, the programming norms and professional norms of the industry were introduced to cultivate students to develop good habits of writing codes, and students also understood that not only programming needs to abide by the norms, but also their words and behaviors in daily life should also abide by the norms. Through the research feedback, students generally believe that the teaching design incorporating the elements of ideology and politics is no longer rigid, but rather the teaching content is richer, the classroom atmosphere is more active, the teacher focuses on the cultivation of students' comprehensive ability, focuses on inspiring and guiding, and can also feel the teacher's leadership in the values and the education of the spirit of science.

6. Conclusions

Programming course teaching needs to adhere to the student-centered, from the teacher, the course, the three dimensions of the ideological construction of the course, emphasizing the students' ultimate course learning experience, pay attention to the effectiveness of the course nurturing. The implementation of the program design course ideology teaching requires a good course ideology teaching design, oriented to the "two subjects, three dimensions" carefully designed to find the entry point, the ideology of the elements of human education in a natural way organically integrated into the course teaching, so that students in the program design course not only to obtain knowledge and skills, but also to establish a positive and correct socialist values, to play a role in the science and technology industry. The students can not only acquire knowledge and skills in the program design course, but also establish positive and correct socialist values and take the social responsibility of developing the country through science and education.

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