

The Exploration of Curriculum Ideological and Political Education Based on "Project + BOPPPS" Mode

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Abstract: At present, there are problems in the ideological and political education, such as insufficient awareness of all staff participation, difficulties in digging out ideological and political elements, educators with mixed qualities, single teaching mode of ideological and political courses, and lack of evaluation of ideological and political effectiveness. This paper takes the ideological and political course of "Principles and Interface Technology of Microcontroller Unit" as an example, from the top-level design of the university, the design of professional talent training programs to specialized course design of ideological and political education. Using "Project + BOPPPS" mode, the comprehensive project "Water Level Monitoring and Display" is divided into three sub-projects. Each project has its specific knowledge, ability, accomplishment and educational goals, and the matching educational elements are selected to be organically integrated into the sub-projects. The trinity assessment method of "Knowledge + Skills + Attitude" is not only the evaluation of knowledge and ability, but also the evaluation of ideological and political effectiveness. The curriculum ideological and political implementation under this model has certain achievements and has certain reference value.

1. Introduction

At the National Education Conference in September 2018, the general secretary emphasized: ideological and political work is the lifeline of all school work. Party committees at all levels, education authorities at all levels, and school party organizations must firmly grasp it. We need to carefully cultivate and organize the team that can do ideological and political work, and make ideological and political work a daily and personal task^[1].

In September 2018, the Ministry of Education issued the "Opinions on Accelerating the Construction of High-level Undergraduate Education and Comprehensively Improving Talent Cultivation Ability", which proposed integrate ideological and political education throughout the entire process of high-level undergraduate education, especially to build a full-staff, whole-process, and all-round "Three-full education". Efforts will be made to promote colleges and universities to comprehensively strengthen curriculum ideological and political construction, carry out overall design, strengthen ideological and political education, and scientifically and rationally design ideological and political education content according to the characteristics of talent cultivation in different majors and the requirements for professional abilities and qualities^[2].

Afterwards, Through multiple meetings and under the leadership of the Ministry of Education^[3-7], the concept of curriculum ideological and political education has been gradually developed, and schools at all levels

gradually implemented curriculum ideological and political education.

The implementation of curriculum ideology and politics in professional courses is an inevitable requirement for education in the new era. It is the necessary path for the construction of new engineering, and it is also the fundamental work to promote the construction of a high-quality talent training system and to establish a world-class university rooted in China.

2. Problems in Curriculum Ideological and Political Education

In recent years, the ideological and political education has been gradually promoted and implemented in colleges and universities across the country. In the process of implementing it in various majors and courses, there are some good experiences, but there are also many problems.

(1) Although curriculum ideology and politics are increasingly valued, they have not been unanimously recognized by all staff.

(2) It is difficult to dig out ideological and political elements. Some teachers have directly imitated the elements of ideological and political courses and forcibly added them to the major courses.

(3) The literacy of the implementers of ideological and political courses varies from good to bad. When teachers themselves do not have a thorough understanding of the educational philosophy of

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ideological and political courses and lack of humanistic literacy, the effect of implementing ideological and political courses will be greatly reduced.

(4) The mode of ideological and political courses is single. At present, ideological and political education is mainly lectured by teachers.

(5) There is a lack of evaluation of the ideological and political effectiveness of the curriculum. When evaluating students' learning effects, there is the lack the effectiveness of evaluating their ideological and political learning.

3. The Top-down Design of Ideological and Political Education

The curriculum of ideological and political work aims to dissolve the "salt" of ideological and political work into various courses of moral education and talent cultivation, achieving the organic unity of value guidance, knowledge education, and ability cultivation in curriculum teaching. It is a scientific practice of integrating the ideological and political work system into the talent cultivation system^[8].

3.1 Top Design from the University

In order to fully implement the fundamental task of Cultivate morality and educate people, Zhejiang Institute of Water Conservancy and Hydropower innovatively put forward the "Ten Points of Understanding" of Zhejiang Water Institute's curriculum ideology and politics (Zhejiang Institute of Water Consensus); developed the "Ten Methods" of curriculum ideology and politics (Ten Methods of Curriculum Ideology and Politics). Through the active efforts of the teachers and students of the school, fruitful phased results have been achieved in research institutions, project approval, exhibition hall construction, teaching team establishment, teaching system construction, etc., and are striving to create "one vision, one outline, ten standards" The ideological and political teaching system of undergraduate, higher vocational and secondary vocational integrated courses.

3.2 Design of Ideology and Political Education in the Talent Training Program

While doing a good job in the top-level design, when formulating the professional training plan, according to the characteristics of the Internet of Things engineering major and professional courses, combined with the requirements of engineering education certification, determine the requirements for the unity of engineering and professional differences, and set educational goals programmatically. And the overall coordination and classification guidance will be unified. Ideological and political courses give full play to their political and value leading roles in the school curriculum system to achieve explicit education. The educational elements of professional courses are guided in knowledge imparting and ability training to realize implicit education.

3.3 Overall Design of Curriculum Ideology and Politics

At the level of Internet of Things engineering teachers, we will continue to deeply understand the connotation requirements of achieving the "three essentials" and grasping the "three points" proposed in the "Ten Points Consensus of the Curriculum Ideological and Political Water Institute", focusing on the "water culture +" education elements, constantly excavating and updating the elements of educating people, and constantly strive to explore and practice in order to achieve the effect of educating people in a silent and subtle way.

In this way, the ideological and political courses of the course and the ideological and political courses go together in the same direction and the atmosphere of collaborative education is gradually formed in the way of point, line and surface, and the effect of the ideological and political courses of the courses in helping Lide cultivate people is gradually highlighted.

4. BOPPPS Design of Curriculum Ideology and Politics

Different from the ideological and political course, the main purpose of the ideological and political course is to "lead with the trend, talk about the frontier of the industry, talk about development and difficulties, talk about role models and struggle, talk about professional norms and accomplishments", and lead the cultivation of "professionals" from a professional perspective. Taking the course of Principles and Interface Technology of MCU as an example, relying on the school's water conservancy background, and according to the requirements of embedded single-chip microcomputer system development work, match industry positions with knowledge, ability, accomplishment and education elements. The course adopts a comprehensive project— "Water level monitoring and display" conducts project-based teaching. Relying on the comprehensive project of "water level monitoring and display" as the carrier, from simple to complex system formation process, the course is decomposed into: item 1 water level over-limit alarm, item 2 water level monitoring display and item 3 remote monitoring. Each project is divided into several tasks, and each project has its specific knowledge, ability, accomplishment and educational goals. A summary of the ideological and political integration points of the course is shown in Table 1.

Table. 1 Ideological and Political Elements of MCU

Serial number	Knowledge content	Cut-in method	Curriculum Civic Integration Points	"Water culture +" nurturing elements
Project I Water level overrun	Microcontroller Overview	Technology news, discipline frontier, industry ecosystem	From the history of the development of microcontrollers, the introduction of ARM and Ceres was acquired, the chip	Patriotic and dedicated, the national spirit

alarm			industry production chain and Chinese companies to take charge.	
Project II Water level monitoring display	Microcontroller control of LED digital tube display	Inspirational Role Models, Science and Technology Highlights	From the display introduced the CEO of AMD, a well-known company of graphics cards, Su Zifeng, to guide women to use it as a career inspirational role model. Virtual coins and mining guide students to establish a correct outlook on life and professionalism.	Three view orientations, the professionalism
Project III Remote Monitoring	The working principle and application of serial port	Technology News	Huawei's 5G standard and 5G product series layout guide students to love and respect their country and establish system thinking.	Patriotic, resilient, systemic thinking

Principles and Interface Technology of MCU course applies BOPPPS teaching mode to design course ideology and politics, that is, classroom teaching process planning is divided into 6 stages (or elements): Bridge-in, objective, preassessment, Participatory Learning, Summary/Closure. Each case of educating people is specifically written in the teaching plan to form a case library of ideological and political elements of the course, so as to achieve "explicit design and invisible construction". The following is an example of project 1 education design to illustrate the ideological and political design of the BOPPPS teaching model.

After the project-goal analysis and task decomposition, it is necessary to learn the corresponding knowledge of the single-chip microcomputer, and first introduce the question (Bridge-in): Do you know the specific application of smart home? What is the general household electrical appliances to control? From the students' interactive answers, introduce the embedded system controller - single chip microcomputer. When introducing the development history and trends of single-chip microcomputers, technology news-Nvidia will acquire ARM chip design company, AMD will acquire Xilinx as the entry point for ideological and political education. The chip industry ecological chain consists of four parts, and introduces well-known Chinese companies and their responsibilities. This link is the main implementation content of ideological and political education, leading students to be patriotic, dedicated and admiring the national spirit, and have a preliminary understanding of future career prospects.

Then analyze the goal to be achieved by project one: the water level in flood season or dry season exceeds the upper limit or lower limit and needs to be alarmed. On the basis of understanding the single-chip microcomputer, use the single-chip microcomputer to control the light-emitting diode to flash to warn that the water level exceeds the limit and the degree of the limit.

Then use the questionnaire to pre-evaluate to find out whether the students understand or have learned single-

chip microcomputers, as well as the previous hardware-related courses.

Re-guided teaching, leading students to participate in learning, starting from the needs of project 1, learning relevant theoretical knowledge, so as to guide the application. That is to say, starting from the difference between general-purpose PCs and special-purpose microcomputers, it introduces the development history, characteristics, applications and development trends of single-chip microcomputers, as well as the existing common MCS-51 series single-chip microcomputers. Then familiarize yourself with the composition of the typical application system of single-chip microcomputer: on the basis of the minimum system of single-chip microcomputer, add various peripheral interfaces and devices required to form a hardware application system; then use Keil to program, compile, debug, download and run, and the Proteus simulation operation is initially successful. On the basis of the actual operation and commissioning, the project goal of water level overrun alarm will be completed.

Ask questions during the acceptance of the first project, and evaluate the results of the first project of the students according to the trinity assessment method of "knowledge + skills + attitude", that is, the post-realization evaluation. Among them, attitude (six aspects of "comprehensive quality, management ability, innovation ability, cooperation and coordination ability, interpersonal communication ability, psychological quality and stress resistance ability") occupies a certain proportion, and this part is the evaluation of students' ideological and political effectiveness.

Finally, according to the situation of the project completed by the students, the overall evaluation and summary will be carried out, so that the students can learn good experience from other teams, know their shortcomings and make changes, so as to facilitate the continued development and improvement of the project. The practice process of the project is also a process of ideological and political education. With students as the center and teachers as the guide, the team needs to communicate and coordinate, analyze and solve various problems encountered, and need to continuously debug until the final goal is achieved, so as to cultivate their team spirit and craftsman spirit of excellence.

Project 2 and Project 3 also adopt the BOPPPS teaching mode to design course ideology and politics. Of course, the elements of ideological and political education will need to be constantly updated with changes in society and industries, and the design concept is not static, but needs to be constantly updated with the development of education to adapt to changing academic conditions.

5. Course ideological and political effectiveness and experience

"Principles and Interface Technology of MCU" implements course ideology and politics in Internet of Things engineering and Internet of Things engineering (upgraded to undergraduate). From the perspective of

course performance, it can be clearly seen from Figure 1 that the grades are increasing year by year. The overall score of the Internet of Things 19 level that adopts project-based teaching + course ideological and political education is the best, and the number of students with a score of 80 or above is significantly more than the first three. session.

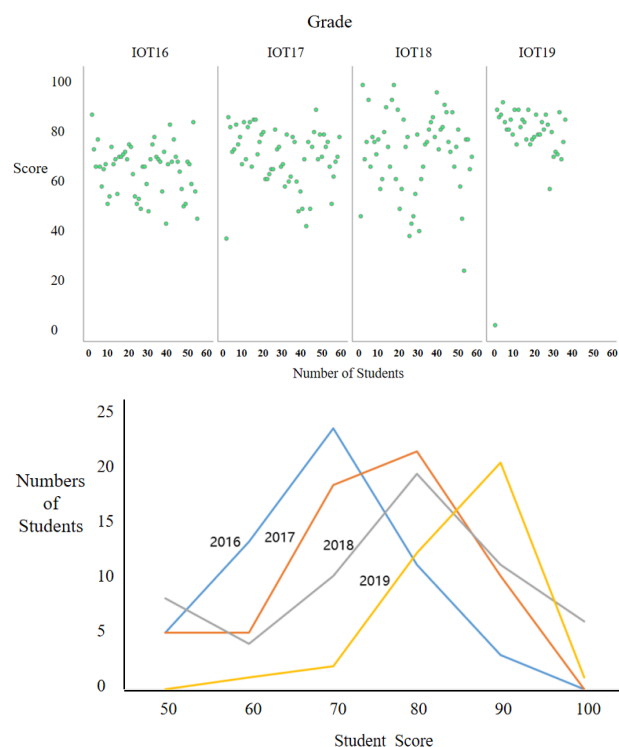


Fig. 1 Scatter chart and line chart of previous Achievements in Internet of Things

In terms of the effectiveness of professional training, about 18% of the students in grade S19 of IoT were admitted to postgraduates. 22% of students in the grade 19 of IoT have been admitted to various universities (including 985 project universities) for graduate studies. Grade 20-2 of IoT won the honor of excellent academic atmosphere class in university.

Of course, there are also some shortcomings in the ideological and political implementation of the curriculum. Students are not familiar with some technological news, so their sense of mission and resonance in the industry is relatively weak. The solution to the above problems is to arrange corresponding reading materials before ideological and political education. It is better to discuss and guide on the basis of understanding the relevant content.

In short, the ideological and political construction of the curriculum requires continuous exploration and long-term practice in order to be innovative and effective.

Acknowledgments

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