

# Exploration of Ideological and Political Construction of Software Testing Course

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## Abstract

**In order to strengthen the moral education work in colleges and universities, this paper takes the software testing course as an example to construct the ideological and political teaching mode of the first-class courses in ordinary colleges and universities. This paper organically combines teaching content with ideological and political elements, and proposes a student-centered teaching model and evaluation system reform. It has gradually formed a comprehensive training model of in-class and extra-curricular, pre-class and after-class, promoting learning through competition, and improving the level of scientific research, in order to cultivate socialist builders with both political integrity and talent, and realize long-term training for students at different levels in and out of class. Judging from the two years of teaching practice, the innovative curriculum design has effectively improved students' ideological and political literacy, and the educational function of professional courses has been effectively brought into play, laying a solid foundation for students' further development.**

## Keywords

**Moral Education in Colleges and Universities; Software Test; First Class Courses; Teaching Mode; Evaluation System .**

## 1. Introduction

In December 2016, at the National Ideological and Political Work Conference in Colleges and Universities, General Secretary Xi proposed: "Adhere to the central link of moral education work, integrate ideological education into the whole process of teaching, and achieve comprehensive education". In May 2020, the "Guidelines for the Ideological and Political Construction of Colleges and Universities Curriculum" issued by the Ministry of Education pointed out: "80% of college teachers are professional teachers, 80% of their courses are professional courses, and 80% of students' study time is dedicated to professional learning" [1]. Professional courses are the most difficult core part of ideological and political education. Therefore, colleges and universities should grasp the "main position" of professional courses, unify explicit education and implicit education, and deeply implement the ideological and political construction of professional courses [2-3].

Combined with the first-class courses and golden courses proposed by the Ministry of Education in 2018, the difficulty of the current teaching reform lies in how to organically combine high-quality courses with ideological and political elements. In response to this problem, some colleges and universities have made many teaching attempts: they have carried out beneficial teaching reforms and innovative explorations in the teaching concepts, teaching content and methods, and teaching concepts of the whole process of professional courses [4]. The relevant ideological and political elements are excavated from the professional courses, and they are skillfully integrated into the teaching content design to realize the function of teaching and educating people.

However, due to the strong logic, strong theory and strong practicality of computer professional courses, there is less exploration of ideological and political construction in this area. The teaching form of many science and engineering ideological and political courses is just "addition": imposing ideological and political factors into the teaching goals is just a formality; the teaching process is not systematic, and the ideological and political education in the curriculum is not integrated into every link, but mechanically inserted into the classroom [5]; the curriculum evaluation system has not yet been perfected [6]; in the end, it can only be separated from the professional courses, and the ideological and political factors can be "explicitly" explained [7]. Therefore, ideological and political construction still has great difficulties in the teaching of computer professional courses, which forms a certain contrast with other professional courses [8]. Faced with this practical problem, this paper takes the software testing course of software engineering majors as an example, and combines the education model of "learning as the center and output as the guide" to explore a more suitable classroom ideological and political teaching method [9]. In order to realize the combination of professional courses and curriculum ideological and political education, to create a student-centered "three comprehensive education" education model, to cultivate software engineering professionals with rigorous innovation and continuous learning ability.

## 2. The Necessity of Integrating Ideological and Political Education

Software testing is one of the most effective means to ensure software quality. With the advancement of "Internet +" and artificial intelligence technology, the software industry is facing a new wave of development, and it is particularly important to cultivate software testing talents [10]. As the "back line" of software quality, ideological and political education plays an important role in software testing teaching, which is conducive to maintaining a rigorous testing work attitude, cultivating professional ethics, enhancing legal literacy, and establishing cooperation capabilities. Higher education shoulders the important task of cultivating talents. It always uses professional courses to cultivate students' theoretical knowledge and practical skills, and uses ideological and political education to subtly influence students' character, and deeply implement the ideological and political construction of professional courses.

Our school's software testing course takes knowledge and technology as the carrier, cultivates innovative thinking as the core, expands the breadth of knowledge as the foundation, and aims to improve the practical ability. In order to better integrate ideological and political education into computer professional courses, this paper explores a new teaching mode that combines ideological and political education with software testing courses. In order to cultivate students' own quality and craftsmanship spirit, it will lay a solid theoretical and practical foundation for students to engage in actual software testing work and further in-depth research in the future.

## 3. Curriculum Construction

### 3.1. Reform of Teaching Mode

The content of ideological and political education serves students, and subject competitions promote career connection. Combined with the actual needs of students to enter the post after graduation, combined with the concept of "integration of production and education" for teaching, to solve the current situation of "mere formality" of ideological and political education in the current curriculum. The ideological and political elements are implicitly integrated into the whole process of student competitions, scientific research, and interest classes, so that the ideological and political content can be externalized into various learning activities of students. The competition project corresponding to this course is the "National College Students Software Testing Competition" jointly organized by the Software Engineering Teaching

Steering Committee of the Ministry of Education, the Software Engineering Professional Committee of the China Computer Federation and other institutions. By participating in national subject competitions, we can stimulate the enthusiasm of colleges and universities and enhance the sense of responsibility for the revitalization of the country. Through the training of the competition preparation process, the spirit of perseverance and hard work is cultivated in the students. Through the intense competition process, students are trained to challenge themselves and deal with problems calmly in a tense environment. Finally, through the students' awards, they can inspire other students' sense of honor and self-confidence, and cultivate their enterprising spirit. As the content of the competition is based on the actual work flow of the software testing position, the skills required by the "Software Testing Competition for College Students" are integrated into the practical teaching of the course, so as to realize the connection between the course content and the professional requirements, thereby promoting the combination of production and education, and effectively cultivate students' practical ability. At the same time, it can also arouse students' professional needs and awareness of rules in advance, so as to make better preparation for students to cultivate core values.

Using various teaching methods such as video learning of quality courses, teacher lectures, group discussions, student demonstrations, presentation-assimilation-discussion classes, etc., the educational role of ideological and political education in the curriculum is subtly played. Students can learn specific knowledge points independently through videos before class, so as to avoid the phenomenon of teachers' "one-word teaching" in the classroom. Instead, teachers are mainly responsible for explaining the framework structure of the course, introducing knowledge points, helping to clarify the relationship between knowledge points, summarizing and guiding students to explore after mastering the knowledge, and cultivating students' learning ability and autonomous learning ability. Students can then deepen their understanding through classroom group discussions and validate knowledge mastery by solving specific problems assigned by the teacher. By establishing a learning community, cultivating team spirit, and win-win cooperation, students are encouraged to solve problems independently. Incorporating the content of ideological and political education into the group discussions in which students interact with students can be presented in a way that is easier for students to understand, and students can further deepen their understanding of knowledge in the process of presenting ideological and political and professional knowledge. Positive peer pressure urges learners to learn from outstanding students, make up for their own deficiencies, and achieve scientific innovation. Students will be able to conduct self-summary through speech assimilation-discussion classes outside of class time and develop a critical thinking learning style.

### **3.2. Evaluation System Reform**

The educational function of ideological and political education in the curriculum emphasizes "moisturizing things without sound", and a simple summative evaluation cannot reflect the real level of students. Therefore, more attention should be paid to process evaluation to solve the current situation of lack of ideological and political education in the curriculum evaluation system [11-12]. The evaluation items should be comprehensive and diverse: the course adopts a combination of intra- and extra-curricular, online and offline, process evaluation and terminal evaluation. In the process of assessment, the survey and evaluation of ideological and political literacy is added, and the teaching methods and evaluation system are continuously adjusted through the feedback results of students. The summative evaluation is composed of the knowledge mastery and learning attitude performance in the classroom, independent study outside the classroom and various examinations. In addition, in the process of classroom teaching, popularize the content related to software copyright to students, actively guide

students to apply for software copyright, and regard relevant content as a bonus item in the process evaluation, which will effectively cultivate students' legal awareness and ethics.

### 3.3. Integration of Various Information Technologies

Using modern teaching methods to assist teaching, based on the teaching concept of "Internet + ideological and political", flip the classroom, allowing students to discuss and learn outside the classroom. For example, the online teaching resources based on MOOC and Chaoxing Erya platform are convenient for students to preview and review in time. At the same time, targeted teaching can also be carried out to guide students to independently adjust the learning progress of basic knowledge points and effectively cultivate their independent learning ability. With the help of these modern teaching methods, we provide learning platforms and resources close to life, and stimulate students' empathy for ideological and political education. Through online teaching activities and the exchange of homework between teachers and students, timely feedback is obtained, and an atmosphere of equal dialogue between teachers and students is created, so as to better play the educational function of professional courses.

### 3.4. Typical Cases of Ideological and Political Teaching Design

In order to solve the problem that ideological and political education is difficult to integrate properly in the curriculum [10], it is necessary to internalize the ideological and political elements into the specific teaching content of professional courses. Excavate ideological and political elements that can be integrated into the teaching content, and design the teaching process. For example, when teaching "software defects and software failures", the case teaching method can be used, combined with real cases of software testing defects at home and abroad, and videos related to software testing defects can be played. These contents will resonate with students, mobilize their enthusiasm for learning, and make students understand the importance of software testing and the awe that software testers should have. In addition, when learning the test case cause and effect diagram method, it is necessary to integrate the spirit of craftsmanship and the spirit of the big picture. When determining the test strategy, it is necessary to analyze the specific situation of the problem, combine various test methods, complement and cooperate with each other, and cultivate the overall spirit.

## 4. Curriculum Teaching Effect

Compare the extracurricular performance and classroom performance of students in 2020 and 2021 to verify the effectiveness of the curriculum reform. Through subject competitions and comprehensive results, the influence of the construction based on curriculum ideas on student training is expounded. The self-study process of preparing for the subject competition has exercised the will of the students, and the achievements have increased the students' self-confidence and interest in learning. The hard study, indomitable spirit and rigorous craftsmanship contained in the ideological and political courses have also created a virtuous circle among the students. The teaching method of ideological and political courses subtly affects the spiritual quality of students. Through the combination of explicit and implicit ideological and political teaching, the teaching quality and teaching effect have been greatly improved. Comparing the attendance rate and academic performance of the students in the past two years, after the study of this course, the students' autonomous learning ability has been continuously enhanced, and the moral and academic level have also been improved. The traditional evaluation method of analyzing the test paper, before adding ideological and political factors to the course, adopts the evaluation method that combines the usual grades and the final grades. In the ideological and political education mode of the course, the whole process evaluation is used for assessment, and students continue to review and consolidate through the online and offline mixed learning mode.

Students actively prepare for battles and participate in competitions outside the classroom, and no longer rely entirely on classroom learning. The learning attitude and academic performance have been greatly improved, realizing the long-term training of students' life-long learning. Through the analysis of the content of the test papers, before the ideological and political education, the students' mastery of the teaching objectives basically reached the expectation, but the achievement rate of the course objectives of "New Software Testing Technology" was low. This shows that the teaching mode with ideological and political elements pays more attention to cultivating students' innovative consciousness and enthusiasm to actively explore new fields of knowledge, which can promote students' comprehensive performance.

By adding ideological and political elements into the curriculum, the ideological and political permeable curriculum affects students' behavior patterns and promotes the development of teaching. Class performance comparisons show that the reformed teaching model improves students' classroom performance. The awards won in subject competitions show the improvement of students' autonomous learning ability; the behavior of actively participating in scientific research activities shows that students' innovative thinking has been greatly improved. Students' subject competitions and scientific research achievements further promote employment, and truly realize the educational function of long-term talent training and ideological and political education.

## 5. Conclusion

This paper takes the "software testing" course as an example to carry out the ideological and political teaching of the first-class courses in ordinary undergraduate colleges and universities, and conduct in-depth discussions on the teaching mode, teaching process, and evaluation system. According to the excavation of ideological and political elements in professional courses, this paper designs a teaching model that integrates ideological and political elements in the classroom, which implicitly incorporates ideological and political elements in the entire teaching process and externalizes them into daily learning and training actions. It has gradually formed a comprehensive training mode of in-class and extra-class, before and after class, competition to promote learning, and scientific research improvement. Ingeniously integrate ideological and political elements into professional courses and give play to the educational function of professional courses. It also pays more attention to students inside and outside the classroom, and finally achieves student-centered teaching and long-term cultivation. Two years of teaching practice show that the innovative curriculum design concept has effectively improved students' ideological level and political literacy, and has also laid a solid foundation for students' further development, and the educational function of professional courses has been effectively brought into play.

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