

Discussion and Implementation of Ideological and Political Construction of Chemical Engineering Courses: Polymer Characterization and Testing as an Example

Jincheng Wang*, Ting Gong, Runhua Wang

College of Chemistry and Chemical Engineering, Shanghai University of Engineering Science, Shanghai 201620, China

*Corresponding author: Jincheng Wang, wjc406@126.com

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Abstract: Curriculum ideological and political construction is a novel requirement and concept of the current curriculum colleges and universities' teaching reform. As the undergraduate core course majoring in Polymer Materials and Engineering, the course of Polymer characterization and Testing has updated their teaching concept, and introduces ideological and political elements in their course to keep pace with the time. Firstly, it expounds the necessity of performing ideological and political education in the new engineering professional curriculum, and then introduces the implementation status of the curriculum ideological and political education. Secondly, the professional curriculum framework system and the teaching content were combined, and it deeply excavates the strategies and methods of the curriculum ideological and political education. Thus, the experience for the ideological and political construction of the professional curriculum under the background of the new engineering was provided.

Keywords: New engineering specialty; Professional courses; Ideological and political construction; Talent training

Online publication: July 14, 2022

1. Introduction

In September 2018, a view was pointed out at the National Education Conference where “To serve economic and social development, we must improve the ability of education, and try our best to cultivate innovative, compound, and practical personnel [1].”

The “New Engineering Specialty” is the reform direction of higher engineering education, where it is proposed for the development of emerging industries based on national strategic planning, in combination with the trend of international competition [2,3]. The new engineering specialty focused on the development of new technologies, new business forms, and new industries, further establishing morality and cultivating people as one of the criteria. In addition, there is a need for new requirements in the professional technology and creative ability of engineering talents in the new era. The construction of ideological and political curriculum is a new ideological and political work, which integrates the concept and practice of talent training and education. Professional courses should be combined with ideological and political curriculum with professional teaching knowledge, and course practice guidance and course task completion, to realize the whole education process. Based on the teaching practice of Polymer Characterization and Testing, and the trend of teaching reform, this paper used a novel teaching mode by integration professional courses

with ideological and political education.

2. The necessity of integrating ideological and political education into new engineering courses

2.1. The need of implementing education of building morality

The fundamental purpose of talent training is to establish morality and cultivate people [4,5]. Most teachers, in their daily teaching work, often pay attention to the teaching of professional knowledge and try their best to teach professional skills and application abilities, however, there are rarely involved the ideological and political elements in their teaching content. The ideological and political construction of professional courses should not only impart professional knowledge, but also should integrate the value orientation and use professional advantages to achieve the ideological and political guidance of students, to achieve the overall goal of socialist core values [6].

2.2. The need of strengthening the construction of new engineering specialty

Building a new structure and new connotation of disciplines and specialties is the goal of the construction of new engineering specialty. This structure should combine the characteristics and advantages of modern and traditional engineering [7-9]. As the main implementer of talent training, teachers may combine curriculum ideology and politics in the process of talent training. Additionally, all courses are designed to have their own function in educating people, similarly in the professional course of Polymer Characterization and Testing in the context of the new engineering. Engineering courses focus on the cultivation of professional knowledge and engineering practice ability, and the ideological and political factors which are contained in the course itself seem to be difficult to be integrated and implemented. Therefore, college teachers should be fully familiar with their professional knowledge, explore relevant ideological and political elements, realize ideological and political courses, and complete the teaching construction and reform of ideological and political courses.

2.3. The need of students to follow the growth and development of present time

The comprehensive goal of cultivating talents with high moral quality in colleges and universities, and the key period of improving the qualities in college students is the stage of learning in school, where during this stage, students' life, world, and values outlook are truly formed [10,11]. For a long time, professional teachers believe that cultivating students' professional skills is the primary task of professional courses, meanwhile educating people is the task of ideological and political courses. Therefore, while imparting professional knowledge, teachers should not only follow the growth law or notice the growth of the students, but also should actively guide the students to ensure that the previously mentioned three outlooks are formed in the students, and they have the courage to take responsibility.

3. Education and teaching status of ideological and political building of professional courses

3.1. The teaching teachers do not have a deep understanding of the curriculum ideology and politics

The process of student education, professional ability, and ideological and political building are equally essential and closely related. Due to the construction and development of today's colleges and universities, young teachers who have just graduated are forced to undertake the teaching tasks, however, they have not received professional education and teaching training, thereby their ideological and political level only stays at the relevant education level received by the school [12]. As a student, their ideological and political education in school is limited, thereby they do not have a deep understanding of the relevant concepts and detailed connotation of ideological and political construction. Further, they may misunderstand the ideological and political education, and think that ideological and political construction has no effects on the social and economic development.

3.2. The teaching method of teachers' ideological and political education is simple

Many professional course teachers follow a simple teaching method, therefore teaching methods unable to adapt to the current need. When they teach professional knowledge, the teachers only explain the basic knowledge according to the content of the courseware, in return the student record the teaching content of the course. Therefore, the students' thinking is easily become tired, limited, and stagnant. Students' active participation in the teaching process is obviously insufficient, and easy to decreased the students' interest in listening, listen carelessly or even unwilling to listen. Obviously, such an old teaching model, even if it used to introduce the ideological and political content of the curriculum, it could not achieve the profound education of students' ideological and political aspects.

3.3. Students attending the class are lacking interest in ideological and political education

The fundamental purpose of ideological and political construction in the professional courses is to promote the overall development of the students. However, at present, the establishment of curriculum ideological and political education is still in the initial development stage, and there is insufficient understanding of the value and application of the curriculum ideological and political education. In real life, it is difficult for students to find the connection between ideological and political knowledge, professional skills, employment, and further study. Thereby the students assume that the ideological and political construction and professional ethics are empty words, therefore they are not interested in learning.

4. Reform and strategy of ideological and political building of professional courses

4.1. Reform approaches

4.1.1. Constructing an education and training system of curriculum ideological and political

To guide the teachers to conduct the ideological and political construction in depth, we need to build a comprehensive and reasonable curriculum of ideological and political construction system. In the course of ideological and political construction, it should not only focus on the top-level design of colleges and universities, but it also should involve the internal staff of colleges and departments, and finally implemented it in the actual teaching activities of front-line teachers. Colleges and universities may perform different types of curriculums ideological and political work training for professional teachers, subsequently guide the teachers to actively develop ideological and political teaching exchanges and discussions.

4.1.2. Building a contingent of teachers with high ideological and political level

Continuously improving the overall quality of the teachers, and cultivating high-level teachers are the key problems to be solved in higher education in China. In order to improve students' professional knowledge level, relevant practical skills, and corresponding ideological and political level, we need a team of teachers with both political integrity and ability. In addition to the professional level suitable for professional development, which meets the requirements of the present time and career development, teachers also need to systematically master their basic knowledge and principles of the Communist Party of China, learn to observe and find a solution with the Party's positions, viewpoints, and methods ^[12].

4.1.3. Forming an evaluation and assessment mechanism related to ideological and political construction in professional courses

The important means in testing the effect of curriculum ideological and political work, is by establishing the evaluation mechanism of professional curriculum ideological and political education. When conducting the ideological and political education in the professional courses, the teachers should accurately construct

the teaching objectives, requirements, and contents, as well as diversified curriculum assessment and evaluation mechanisms [8,11]. In the evaluation and assessment mechanism, one should not only comprehensively and objectively reflect the students' real learning ability based on the professional knowledge, but also comprehensively reflect the students' ideological, moral level, and professional quality at the same time.

4.2. Specific strategies

4.2.1. Adjusting curriculum training objectives

Implementing morality and educating people is the ultimate goal of education and teaching system. Teachers should, initially should adjust the curriculum training objectives, and combine the ideological and political education with professional curriculum teaching [11,13]. After the adjustment, the teaching goal of Polymer Characterization and Testing is to enable undergraduates to master the basic concepts and principles of polymer material structure and performance through course learning, and be able to explain the complex engineering problems of polymer materials according to the basic principles of material structure analysis, and this may lay a certain foundation for the research of material physical and chemical structure.

4.2.2. Revising course syllabus

Cultivating professional and technical talents and improving students' professional skills is the basic objectives proposed in the syllabus of Polymer Characterization and Testing. The ideological and political education elements are rarely involved or included in the outline [11], therefore, for the sake of enhancing students' ideological and political education, as professional curriculum teachers, we should first introduce the ideological and political elements, revise the curriculum syllabus and supplement, and lastly improve the talent training objectives. For example, during the teaching process of infrared spectrum testing method, the teachers can introduce the reform of relevant scientists in the relevant testing methods and equipment, which can fully show the new atmosphere brought by the progress of science and technology, also the prosperity of society and the country.

4.2.3. Improving the course teaching methods

At present, the course of Polymer Characterization and Testing mainly teaches the characterization methods, and testing means of polymer material structure. In addition, the course focuses on the combination with the times, the transition from basic knowledge to new material representation cases, and the transition from traditional methods to newly emerging technologies. However, there is a lack of relevant content of ideological and political construction in the curriculum system. Therefore, multi-media teaching means and various teaching methods, including typical cases, interactive discussion and reporting on the podium, should be used to transmit the knowledge to students through multiple channels, forms, and vivid images [11].

5. Conclusion

In summary, combining the ideological and political education with professional curriculum, teaching is a very arduous task, however, it is very meaningful and necessary. To perform ideological and political education in Polymer Characterization and Testing, we should realize the dual tasks of explicit professional knowledge learning, and implicit ideological and political education in promoting the improvement and development of students' various abilities and qualities. In this process, teachers should use the professional knowledge and skills of the course, as well as the ideological and political moral quality and literacy as the training objectives, and realize the educational effect of enhancing morality, and teach the student in a silent

way. In short, professional teachers should adhere to the socialist core values of the new era, guide the students to study majority knowledge, and form correct values, thereby the student can become builders, and successors of the socialist causes.

Funding

This work was supported by the project of “Curriculum construction project of Shanghai University of Engineering Science (c202204001).”

Disclosure statement

The authors declare no conflict of interest.

Author contributions

J. W. is responsible for writing the paper; T. G. is responsible for literature retrieval; R. W. is responsible for checking the paper.

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