

Construction and Practice of Functional Pavement Structures and Materials from the Perspective of Curriculum Ideology and Politics

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Abstract: With the proposal of the fundamental task of “fostering virtue through education,” ideological and political education in colleges and universities has ushered in new opportunities for reform. In this context, how to more effectively cultivate students’ ideological and political literacy and help them establish correct ideological concepts and value perceptions has become one of the teaching challenges perplexing college teachers. Integrating curriculum ideology and politics into the teaching of Functional Pavement Structures and Materials can not only enrich teaching content, expand teaching forms, and effectively stimulate students’ interest in learning, but also infiltrate ideological and political education while imparting professional knowledge, achieving the organic unity of knowledge transmission and value guidance. It can be said to serve multiple purposes. In this regard, this paper first briefly analyzes the teaching of Functional Pavement Structures and Materials from the perspective of curriculum ideology and politics, hoping to provide some valuable references for readers.

Keywords: Curriculum ideology and politics; Functional Pavement Structures and Materials; Construction

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1. Introduction

“Functional Pavement Structures and Materials” is a core course in civil engineering-related majors, playing an important role in cultivating students’ professional knowledge and skills. However, in previous course teaching, some teachers often focused on imparting professional knowledge and skills while neglecting the cultivation of students’ ideological and political literacy, which has had a certain impact on students’ all-round development ^[1]. In this regard, in the new era, colleges and universities should fully recognize the importance of the concept of ideological and political education in courses and integrate it into the teaching of Functional Pavement Structures and Materials. While imparting professional knowledge and skills to students, they should imperceptibly infiltrate

ideological and political education into them, helping students establish correct ideological concepts and value perceptions, thus laying the foundation for their all-round development in the future ^[2].

2. Connotation and value of curriculum-based ideological and political education

2.1. Connotation

Curriculum-based ideological and political education is an innovative educational concept and one of the important approaches for ideological and political education in colleges and universities ^[3]. It mainly refers to the in-depth integration of ideological and political education with curriculum teaching. While imparting knowledge and skills to students, it imperceptibly infiltrates ideological and political education into them, shapes their excellent character, and enhances their sense of social responsibility and mission, thus laying a foundation for their all-round development in the future.

2.2. The value of integrating curriculum-based ideological and political education into the course “Functional Pavement Structure and Materials”

Integrating curriculum-based ideological and political education into the course “Functional Pavement Structure and Materials” has important value ^[4]. In this regard, this paper makes a brief analysis of the following aspects.

2.2.1. Enriching the teaching content of the course

“Functional Pavement Structure and Materials” is a core course for civil engineering majors, mainly teaching students knowledge such as the selection of pavement materials, performance evaluation, and construction technology ^[5]. Some of the course knowledge is relatively professional and abstract, which increases the difficulty of learning the course. By integrating curriculum-based ideological and political education into the teaching of “Functional Pavement Structure and Materials,” teachers can introduce some engineering cases, hot issues, scientific stories, and other content. This not only enriches the teaching content, improves the teaching atmosphere, and stimulates students’ interest in learning, but also imperceptibly infiltrates ideological and political education into students, strengthens their sense of social responsibility and mission, and thus effectively promotes the all-round development of students.

2.2.2. Implementing the fundamental task of moral education and talent cultivation

In order to fully implement the fundamental task of moral education and talent cultivation, ideological and political education in colleges and universities has ushered in a new opportunity for reform. In this context, ideological and political education is no longer limited to the teaching of ideological and political courses, but is infiltrated into professional course teaching. While imparting professional knowledge to students, it also infiltrates ideological and political education, thereby improving the effectiveness of ideological and political education and better implementing the fundamental task of moral education and talent cultivation ^[6]. “Functional Pavement Structure and Materials” is one of the core courses for civil engineering majors, which contains rich ideological and political elements. Excavating and refining these elements can not only help students learn and master professional knowledge more deeply, but also effectively cultivate their professional ethics and innovative spirit, to train students into high-quality talents meeting the needs of the civil engineering industry and future social development.

2.2.3. Meeting the needs of the times

With the rapid development of the construction industry, a large number of high-quality professional talents are urgently needed ^[7]. However, the construction industry has put forward higher requirements and standards for professional talents. They are required to not only have solid theoretical knowledge, strong practical ability and innovative ability, but also have lofty professional ethics, excellent character, and a strong sense of social responsibility and mission ^[8]. Integrating curriculum-based ideological and political education into the teaching of “Functional Pavement Structure and Materials” can not only enrich the teaching content, expand the teaching forms, and more effectively impart professional knowledge and skills to students, but also strengthen their sense of social responsibility, cultivate their moral qualities, and make them high-quality talents meeting the needs of the development of the times.

3. Problems in the teaching process of “Functional Pavement Structures and Materials” from the perspective of curriculum ideology and politics

3.1. Outdated teaching models and dull classroom atmosphere

Currently, in the teaching of “Functional Pavement Structures and Materials”, some professional teachers still adopt traditional and outdated teaching models ^[9], such as “cramming” teaching and preaching-style teaching. They regard students as “containers” for knowledge, and students are often in a passive acceptance position. Their enthusiasm and initiative cannot be fully mobilized, resulting in a dull and oppressive classroom teaching atmosphere. This not only seriously affects the improvement of teaching effectiveness but also hinders the integration of ideological and political elements.

3.2. Backward teaching concepts and weak teacher literacy

Teachers play an important role in promoting the construction of curriculum ideology and politics ^[10]. However, some professional teachers have backward teaching concepts, lack a comprehensive understanding and research on curriculum ideology and politics, and unilaterally believe that their own job is to impart professional knowledge and skills to students, while ideological and political education is the work of ideological and political course teachers, counselors, and class teachers. In actual teaching, they do not integrate ideological and political education into the curriculum, thus affecting the construction of curriculum ideology and politics. In addition, some teachers have weak teaching literacy and cannot flexibly integrate ideological and political courses into the teaching of “Functional Pavement Structures and Materials.” This not only affects the improvement of teaching effectiveness but also fails to give full play to the educational role of curriculum ideology and politics.

3.3. Imperfect evaluation system

The evaluation system is one of the important measures to promote the construction of curriculum ideology and politics ^[11]. However, the evaluation systems of some colleges and universities are not perfect. On the one hand, the evaluation criteria are not comprehensive, mainly taking students’ exam scores, learning achievements, etc., as the main criteria for evaluating students, resulting in evaluation results that cannot fully reflect students’ comprehensive abilities. On the other hand, the evaluation methods are relatively single, mainly based on teacher evaluation, which cannot comprehensively evaluate students from multiple dimensions and levels, thus hindering the construction of curriculum ideology and politics to a certain extent.

4. Teaching innovation strategies for the course “Functional Pavement Structures and Materials” from the perspective of curriculum-based ideological and political education

4.1. Adopting diversified teaching modes to cultivate students’ ideological and political literacy

To successfully integrate curriculum-based ideological and political education into the teaching of “Functional Pavement Structures and Materials” and effectively address the issue of outdated teaching modes, teachers can adopt diversified teaching approaches. Based on teaching content and students’ learning conditions, they can flexibly employ various teaching modes and methods, such as case teaching, virtual reality technology, and project-based teaching, to stimulate students’ interest and improve teaching effectiveness^[12].

4.1.1. Applying the case teaching method

The case teaching method is an approach based on specific cases. By introducing real or virtual cases into teaching, it guides students to analyze and discuss them, helping them master professional knowledge more deeply and cultivate their ideological and political literacy^[13]. For example, when teaching the content of “photocatalytic air-purifying pavements,” teachers can introduce a case like “an industrial park using this technology to reduce PM2.5 concentrations.” This strengthens students’ understanding, enabling them to recognize the significant role of innovative technologies in improving people’s livelihoods and enhancing their sense of social responsibility.

4.1.2. Utilizing virtual reality technology

Currently, cultivating students’ practical abilities has become one of the important goals of higher education. Introducing virtual reality technology into teaching can create various virtual scenarios according to teaching objectives and students’ learning conditions, allowing students to conduct practical operations and training in virtual environments, thereby effectively developing their practical skills. In this regard, teachers can integrate virtual reality technology into the teaching of “Functional Pavement Structures and Materials” to enhance teaching effectiveness and promote curriculum-based ideological and political education. For instance, when teaching “intelligent temperature-controlled pavement materials,” teachers can use the powerful functions of virtual reality technology to create virtual highway scenes, providing students with a profound learning experience and helping them master professional knowledge more thoroughly.

4.1.3. Implementing project-based teaching method

Project-based teaching is an innovative approach where teachers assign relevant project tasks based on teaching content and students’ learning conditions, requiring students to complete them. This helps students grasp professional knowledge more deeply and cultivates their teamwork, innovation, and practical abilities^[14]. From the perspective of curriculum-based ideological and political education, teachers can apply this method in the teaching of “Functional Pavement Structures and Materials” to infiltrate ideological and political education while imparting professional knowledge, promoting students’ all-round development. For example, when teaching “research and development of environmentally friendly pavement materials,” teachers can design a project task such as developing an environmentally friendly pavement material. Students are required to complete the task in groups through collaboration. This not only helps students learn and master professional knowledge more deeply but also strengthens their teamwork, innovation, and practical abilities, achieving multiple goals at once.

4.2. Strengthening the construction of teaching staff and improving teachers' literacy and ability

In the process of integrating ideological and political education into the teaching of Functional Pavement Structures and Materials, teachers play an important role. To give full play to the educational function of ideological and political education in courses and realize the organic unity of knowledge imparting and value guidance, colleges and universities should strengthen the construction of teaching staff and continuously improve teachers' literacy and ability.

4.2.1. Carrying out special training and academic exchange activities

In the new era, it is necessary for colleges and universities to regularly organize teachers to participate in special training and academic exchange activities on ideological and political education in courses, such as training courses, teaching seminars, and academic forums. This can strengthen their cognition, enable professional teachers to have an in-depth and comprehensive understanding of ideological and political education in courses, innovate teaching concepts, and master advanced teaching models and methods. In addition, colleges and universities can invite well-known educational experts, outstanding front-line teachers, and scholars to the school to give special lectures or report meetings, sharing educational experiences and insights, so as to broaden teachers' horizons and improve their teaching level.

4.2.2. Formulating incentive mechanisms

Moreover, colleges and universities can formulate a series of incentive mechanisms to fully mobilize teachers' enthusiasm for participating in ideological and political education in courses. For example, they can set up excellent teaching awards to reward teachers who have performed well in integrating ideological and political education into the teaching of Functional Pavement Structures and Materials. They can also regularly evaluate the teaching effect of ideological and political education in courses and link it with teachers' performance appraisal, professional title evaluation, and selection for awards and recognition. This will further enhance teachers' attention to ideological and political education in courses, prompting them to continuously innovate teaching models and methods, thereby effectively improving teaching effect and quality.

4.3. Optimizing the teaching evaluation system to ensure educational effectiveness

The traditional evaluation system is not perfect and can no longer meet the needs of students' development ^[15]. In this regard, to integrate ideological and political education into the course of Functional Pavement Structures and Materials, improve the teaching effect, and cultivate students' ideological and political literacy, colleges and universities should build a sound evaluation system.

First, establish a comprehensive and scientific evaluation standard. Not only should examination results and learning achievements be taken as the standards for evaluating students, but also students' learning attitude, teamwork ability, innovation ability, and moral character should be included in the evaluation system. In this way, students can be evaluated more comprehensively, and the accuracy of evaluation results can be improved.

Second, adopt diversified evaluation methods. In the past, colleges and universities often used teacher evaluation, but teachers are prone to being affected by various factors, leading to unscientific evaluation results. In the new era, to promote the construction of ideological and political education in courses and promote the all-round development of students, colleges and universities can also adopt student self-evaluation, peer evaluation, and enterprise evaluation. By evaluating students from multiple perspectives and levels, the accuracy

of evaluation results can be improved. In addition, colleges and universities can adopt the “process + result” evaluation method, which not only evaluates students’ learning achievements but also their performance in the learning process, to improve the scientificity of evaluation results.

5. Conclusion

In summary, in the new era, colleges and universities, as well as teachers, should fully recognize the important value of ideological and political education in courses. They should integrate it into the teaching of Functional Pavement Structures and Materials through various methods and means. While imparting professional knowledge and skills to students, they should infiltrate ideological and political education, shape students’ excellent qualities, and strengthen their sense of social responsibility and mission. In this way, students can be cultivated into high-quality talents who meet the needs of industrial and social development.

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