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Construction of Ideological and Political Education System in Traffic Engineering Major in the Background of New Engineering Discipline in China

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ABSTRACT: At present, there exist problems in the ideology and politics education of specialty courses in universities such as the lack of systematic moral education, the unclear goal of curriculum collaborative education, and the difficulty in integrating into the talent training system. In view of these problems and taking the traffic engineering major of an applied university as an example, this paper constructs a curriculum ideology and politics educational system in the major with the characteristics of "traffic guide", which is based on the talent training requirements of the new engineering discipline from four aspects of tempering the character, forging the literacy, innovating the thinking and being dedicated to the motherland. It clarifies ways to support this ideology and politics education system from the curriculum level. The practice results show that after the implementation of the system, the improvement both in the teachers' quality and the education quality has been achieved, which provides useful reference for universities to carry out the ideology and politics education practice systematically.

KEYWORDS: Traffic guide, Curriculum ideology and politics, Traffic engineering

"New engineering" is the new idea, new pattern and new trend of the development of higher engineering education in China at present, which puts forward higher requirements for talent cultivation. In order to train "new engineering" talents with both virtue and ability, a high-level talent training system with Chinese characteristics is need to build, in which the curriculum ideology and politics construction is indispensable. Professional curriculum is the main field of ideology and politics education, and professional teachers are the main body of ideology and politics education. How to organically combine the ideology and politics education with the professional teachers' teaching is the difficulty and hot spot in current education practice.

Traffic engineering is a comprehensive, application-oriented major, which mainly cultivates engineering and technical talents in the field of traffic engineering planning, design, construction, management and operation. At present, the field of traffic engineering has a new trend of network connectivity, collaboration and intelligence, and there are new characteristics such as huge engineering, cross-border collaboration and interconnection. New technologies such as big data, cloud computing and artificial intelligence are integrating this major, which will put forward higher requirements for the ideology and politics education of traffic engineering courses under the background of "new engineering" construction.

I. OVERVIEW OF IDEOLOGICAL AND POLITICAL RESEARCH OF TRAFFIC ENGINEERING COURSES

The ideology and politics in curriculum is a form of ideology and politics education. It combines with the curriculum syllabus, curriculum implementation and curriculum evaluation by adopting the method of recessive education. Some researches and explorations on the ideology and politics of courses in the traffic major have been done in China. Zhang et al. have comprehensively combed the "moral education elements" in the course of "Traffic Management and control" from different perspectives such as natural science and social science, so as to achieve the ideology and politics education goal smoothly and silently [1]. Chen et al. focused on the five ideology and politics elements of cultural confidence, artisan spirit, society responsibility, humanistic modality and legal idea, and carried out the research on teaching content, teaching steps and assessment methods, in which the implementation method of the ideology and politics education in the course of "Traffic Design" course was proposed [2]. Ren et al. explored and practiced the ideology and politics education in the course of "Traffic Simulation Experiment", focusing on the ideology and politics education elements such as craftsman spirit, ideas of family and country [3]. Wang et al. discussed the ideology and politics education methods of the courses of traffic engineering major [4]. Wei et al. put forward and designed the mode of integrating ideology and politics education into the teaching of transportation major [5]. Chu elaborated the four-fold logic from " ideology and politics in curriculum" to " ideology and politics in major" [6]. However, the existing researches discussed the ideology and politics education mode and method of a single course, but did not consider the ideology and politics education in curriculum from a major perspective. There are some problems such as the lack of systematic ideology and politics education in curriculum, unclear curriculum collaborative education goals, and difficulty integrating into the professional talent training system. The implementation of ideology and politics education in curriculum is a systematic, long-term and collaborative complex project. It is dispensable and feasible to promote the ideology and politics education in major begins with the ideology and politics education in each course under the framework of professional talents training system.

II. EXCAVATION OF IDEOLOGICAL AND POLITICAL ELEMENTS IN TRAFFIC ENGINEERING

Under the current background of "new engineering" subject, the ideology and politics education in traffic engineering major is considered to provide a strong ideological support for the training of talents who serve the national strategies such as "transportation power" and "Yangtze River Delta integration", urban traffic congestion control, intelligent transportation construction, as well as the future development of traffic engineering. This requires traffic engineering teachers to be the "guide" of students through the steps combination of knowledge transfer, ability training and value guidance in the whole process of talent training, from the aspects of dedication to the motherland, tempering character, forging quality and innovative thinking. Among those, Dedication to the motherland is the direction, tempering character is fundamental, forging quality is the key, and innovative thinking is the foundation.

2.1 Dedication to the motherland

It is implemented in the whole process of talent training. It can be combined with the important role of China's traffic engineering construction in promoting national economic and social development and the urgent expectations of the people to alleviate urban traffic congestion. It can establish a strong will to study for the development of the motherland, and inspire students the emotion of "Family-country" and the mission of "traffic power". It also can guide students to actively contribute to the country and serve the society, so as to realize the value of life.

2.2 Temper character

It is implemented in the process of value guidance. It can be combined with the strategy of "transportation power" and the transportation development goals of "safe, smooth, civilized, orderly and harmonious". Students are cultivated to establish the core values, such as "civilization and harmony" at the national level, "justice and rule of law" at the social level and "patriotism and dedication" at the personal level. In combination with the great achievements made in the construction of China's transportation system in the past 40 years of reform and opening up, the confidence in the road, theory, system and culture will be established. The noble character of the students will be cultivated.

2.3 Forging quality

It is implemented in the process of knowledge transfer. It can be combined with the traffic engineering design course teaching to cultivate students' craftsman spirit of "meticulous and excellence" and engineering ethics of "fairness, justice, safety and reliability". It can be combined with the traffic safety course teaching and the traffic management course teaching to cultivate students' humanistic consciousness of "people-oriented and caring for life". It can be combined with the relevant standards and norms teaching to cultivate students' legal sense and guide students to forge excellent engineering professional quality.

2.4 Innovative thinking

It is implemented in the process of ability training. It can be combined with curriculum design - comprehensive design - graduation design, traffic survey, innovative social practice and other practical teaching, intelligent transportation system and other cutting-edge courses to cultivate students' scientific spirit of "seeking truth from facts" and "innovation, the pursuit of excellence", and guide students to grow into a new generation of traffic engineers with scientific spirit and innovative consciousness, so as to make urban traffic safer, smoother, more civilized, more orderly and more harmonious.

III. ANALYSIS ON THE CONSTRUCTION OF IDEOLOGY AND POLITICS EDUCATION SYSTEM IN TRAFFIC ENGINEERING COURSES

The ideology and politics education in traffic engineering courses should be based on the major talents training system and the specific knowledge points. The ideology and politics education elements should be integrated into the knowledge imparts in a gentle and silent way through the form of actual traffic case analysis, excellent design case display, accident warning case analysis and industry model display. Taking the traffic engineering major in an application-oriented university in central-southern of China as an example, this paper constructs the ideology and politics education system in the traffic engineering major curriculum.

3.1 Ideology and politics education system construction

The ideology and politics education system in traffic engineering major relies on the undergraduate teaching reforms such as "whole-course tutorial system", "project-based teaching", "course design-comprehensive design-graduation design", which is showed as Fig.1. This system adheres to the education purpose of cultivating virtues and training talents and reflects the characteristics of traffic guide. Students are guided to forge noble character and professional quality, creatively think, dedicate to the motherland and serve society in this system. This system can serve for cultivating the application-oriented undergraduate talents.

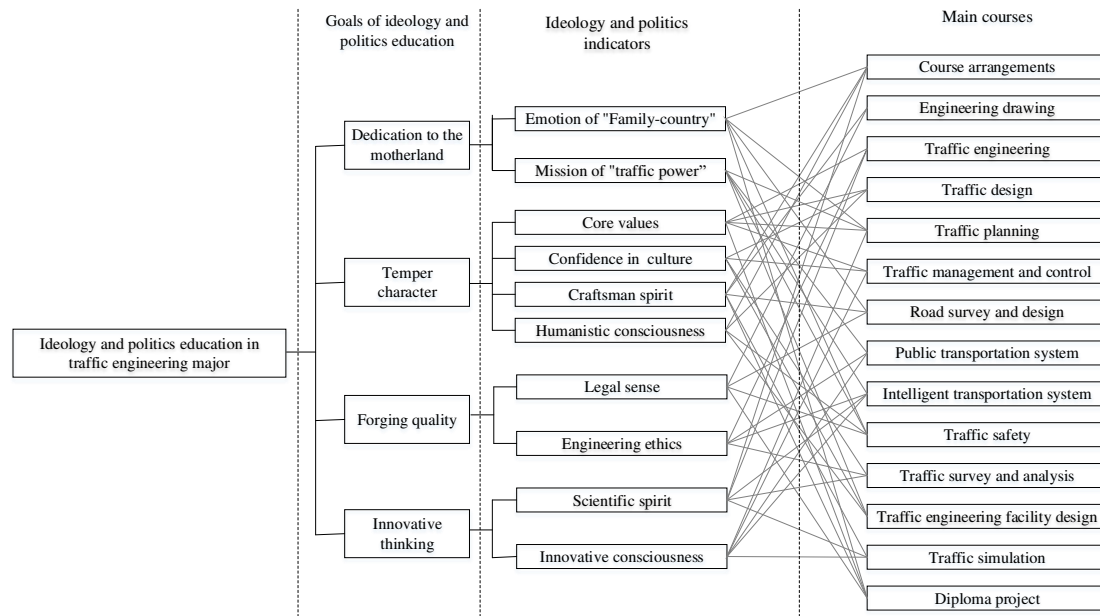


Fig. 1 Ideology and politics education system in traffic engineering major

First of all, four goals of ideology and politics education were confirmed according to the principle of "traffic guide", that is, tempering the character, forging quality, innovative thinking and dedication to the motherland. Secondly, the ideology and politics education elements were refined. The ideology and politics education goals were broken down into 10 major ideology and politics indicators, including socialist core values, cultural confidence, craftsman spirit, humanistic consciousness, legal concept, engineering ethics, scientific spirit, innovation consciousness, family and country feelings and mission responsibility. Thirdly, 10 major ideology and politics indicators were associated with some main courses of traffic engineering major. A many-to-many mapping relationship was established. Generally, one ideology and politics indicator corresponded to about 5 courses, and one course corresponds to about 4 ideology and politics indicator. Finally, each course was divided into several knowledge modules to support different ideology and politics indicators, so as to transfer knowledge and cultivate ability.

3.2 Practice effect

After nearly two years of ideology and politics education exploration and practice, the major has fully integrated the curriculum ideology and politics education system characterized by "traffic guide" into the talent training program, and created a curriculum ideology and politics education team. The comprehensive evaluation of the ideology and politics education was implemented through four dimensions of student self-evaluation, teacher evaluation, enterprise tutor evaluation, employer participation evaluation. Some results have been achieved.

(1) Student self-assessment (self-improvement)

The proportion of students participating in various innovation and entrepreneurship competition has increased from about 20% before the implementation of curriculum ideology and politics education to about 40% in 2022, which has enhanced students' enthusiasm for rejuvenating the country through science and technology. The proportion of students participating in the society service projects of teachers has increased from less

than 10% to 35%, which cultivates students' craftsman spirit; The success rate of students in the postgraduate entrance examination has remained about 20% of the total number of graduates for two consecutive years, which has stimulated the willingness of students to continue their studies.

(2) Teacher evaluation (ability improvement)

The ideology and politics education goals have been added to the teaching goals of more than 90% of courses. The integration of ideology and politics education and ability training is helpful to improve the cultivation of students' double ability of research and practice.

(3) Assessment of enterprise mentors (quality assessment)

According to the interview with the enterprise mentors of graduation design, the students' craftsman spirit and engineering literacy have improved to a certain extent compared with the students of previous years.

(4) Participation of employers (conduct assessment)

The degree of employer satisfaction in this major in the past two years is 80.15%, and 83.17%, respectively, and the degree of satisfaction increases year by year.

IV. CONCLUSIONS

Through the construction of ideology and politics education system that includes ideology and politics education goals, ideology and politics education indicators, courses, knowledge modules, the traffic engineering curriculum ideology and politics education was characterized by "traffic guide". The ideology and politics education system can cultivate talents from four aspects of tempering character, forging quality, innovative thinking and dedication to the motherland, which is conducive to promoting the talents' quality and the teachers' ability. It also has positive significance for exploring the construction of a community of teachers and students, and providing beneficial reference for universities to systematically carry out the ideology and politics education practice. In future, we will further clarify the implementation path of professional ideology and politics education, and integrate the ideological and political education system in courses into the professional talent training program more effectively.

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