

Discussion on Graduation Design Mode of Undergraduate Transportation Engineering Major for Local Universities

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Abstract: The main problems in the current graduation design (thesis) for transportation engineering majors in local universities are analyzed. The first problem is to replace the graduation design with a graduation thesis, and the second problem is that the effect of the graduation design is not prominent. Discusses the relationship between graduation design (thesis) and talent cultivation for transportation engineering majors, proposes a graduation design (thesis) model that adapts to the talent cultivation objectives for transportation engineering majors. The model is standardized management of graduation design (thesis) for transportation engineering majors, and studies and develops the main form and framework of the model.

1. Introduction

The transportation engineering major is a typical engineering major. In local universities, similar to other engineering majors, graduation design (thesis) is the most critical link in undergraduate teaching plans, the main way to cultivate students' practical skills, and the main way to test whether students have comprehensive system knowledge and ability to solve practical problems [1].

Focusing on the issue of graduation design for transportation engineering majors, taking local universities as an example, based on the author's major, I have made attempts and research. Guided by standardization, I have explored a new model for graduation design (thesis) for transportation engineering majors in local universities, in order to cultivate more high-quality applied talents [2,3].

2. Analysis of Problems in Graduation Design (Thesis) of Transportation Engineering Major

2.1. Question 1: Replacing Graduation Design with Graduation Thesis

This approach is generally used by research universities, while for application based local universities, there are the following problems in replacing graduation designs with thesis approaches:

(1) Graduation papers are easily disconnected from employment. The writing of graduation thesis generally follows the methods of literature search, theoretical research, theoretical derivation,

and case study. This method cannot systematically train the practical application ability of transportation engineering majors, and students' ability to solve practical problems is weak, leading to easy disconnection from employment.

(2) The quality of graduation thesis cannot be guaranteed. Due to the large number of students and the relatively small number of tutors, one tutor needs to guide multiple students, and many students' thesis topics do not come from the tutor's research topics, and some tutors do not apply research topics, resulting in a strong degree of randomness and difficulty in selecting topics for students' theses, making it difficult to control the quality of graduation theses. In addition, because undergraduate students do not master the methods of thesis research, and their theoretical foundation is not yet solid, in order to complete the thesis on schedule, there will be a thesis writing model oriented towards avoiding repetition rates, which is actually disguised plagiarism and a key factor that cannot be controlled in the quality of graduation thesis.

(3) Guiding a graduation thesis does not help improve the guidance teacher's scientific research ability. Many students' papers do not belong to the research field that the instructor is good at. During the guidance process, it is difficult for teachers to exert their professional expertise in scientific research, and they cannot systematically guide students to write papers. Due to the lack of systematic guidance, the same type of problems may occur repeatedly in different graduate theses of students, and the process of instructing the thesis by teachers becomes repetitive work, which is not conducive to the improvement of scientific research ability.

2.2. Question 2: Poor Graduation Design Effect

(1) The topic selection of graduation project is divorced from the actual project. The characteristic of transportation engineering is that the major of transportation engineering involves three levels of content: macro, meso, and micro, while the design is mainly based on the micro level. There are relatively few practical projects in this area, which can easily trouble instructors to set questions. Due to the fact that many universities in China offer transportation engineering majors based on civil engineering, these universities often prefer to focus on road design in their graduation designs for transportation engineering majors. These operations have a significant deviation from the actual needs of transportation engineering.

(2) The instructor has insufficient engineering practical experience. The transportation engineering major is a newly established major, which is an emerging major both in my school and across the country. Compared with traditional majors such as civil engineering and mechanical engineering, the professional history is relatively young, and professional teachers are mainly young teachers. Taking the author's major as an example, the proportion of young teachers (under the age of 40) reaches 70%. Many young teachers do not have experience in design and research institutes after graduation, and lack project experience. Therefore, when guiding the design of transportation engineering majors, students cannot be well instructed to prepare graduation design plans.

(3) Lack of professional software or low use of professional software. During the graduation design process, students need to rely on a large number of professional software to better complete the design content. Due to the high price of professional software for transportation engineering, some universities have not purchased it, and students lack professional software. Some universities have purchased professional software. However, due to the low proficiency of teachers in software, the software teaching effect is poor, and students are not skilled enough to master it. The proportion of students using professional software is relatively low.

3. The Relationship between Graduation Design (Thesis) and Talent Cultivation in Transportation Engineering

Taking our school as an example, the main objectives of training professionals in transportation engineering are: based on the local situation, facing the needs of the future complex transportation problems, intelligent transportation technology, and professional development of the transportation industry, taking cultivating morality and cultivating people as the fundamental task, and taking the coordinated development of "comprehensive knowledge, professional ability, and healthy personality" as the foundation, in order to adapt to the needs of the new era of Guangdong, Hong Kong, Macao Greater Bay Area and national transportation development, cultivating humanistic spirit, solid knowledge High quality applied talents with practical ability, management ability, innovation ability, entrepreneurial awareness, and broad vision.

Graduation design (thesis) helps to build students' professional and practical abilities and accumulate practical experience in transportation engineering. From the perspective of professional training, graduation design better solves the transformation from professional knowledge to professional ability, and is an important foundation for cultivating qualified high-quality application-oriented undergraduate talents. Therefore, the graduation design (thesis) process is crucial for the cultivation of transportation engineering professionals.

4. Discussion on the Model of Undergraduate Graduation Design (Thesis) for Transportation Engineering

Many teachers in Chinese universities have conducted research and discussion on graduation design (thesis) models in universities [4-8], and proposed graduation design (thesis) models that adapt to different training models. However, for transportation engineering majors, they cannot simply apply them. The author believes that for application-oriented undergraduate institutions, they should closely focus on the construction of application-oriented talent cultivation goals, closely link with the employment intentions of graduates, closely link with the needs of society and industry, and build a standardized teaching management model.

(1) Main mode

The talent cultivation plan for transportation engineering majors is oriented towards achieving talent cultivation goals. During the graduation design (thesis) process, the learning content of each main course is fully integrated and combined with industry practice. The specific mode is: a multi-level and multimodal graduation design (thesis) model that focuses on traffic design, supplemented by road design, and supplemented by thesis research. The design technology and management process are standardized, and standards are continuously optimized and improved to meet the development needs of the industry.

(2) Framework content

Classified according to the content of the graduation design (thesis), the content of the graduation design mode for transportation engineering is shown in the Figure 1.

(1) Technical Guidelines for Establishing Standardized Guidance

The teaching and research team of the transportation engineering discipline should prepare a comprehensive standardized technical guidance guide, which should prepare traffic design, road design, and thesis research separately. Among them, the traffic design guide should continuously improve the design indicator system based on the research of the "Traffic Design" course [9,10], and formulate detailed standards for current situation refined investigation, simulation modeling, demand modeling, scheme design and evaluation, and drafting standards for current situation traffic governance design, short-term traffic improvement design, and long-term traffic new construction design; Road design guidelines should be based on traditional road design, subdivide highways and

municipal roads, strengthen the design content of engineering feasibility studies and preliminary design, and weaken the content of the construction drawing design stage. The research guide for the thesis should closely focus on the prominent local traffic problems, weaken theoretical research, strengthen experimental and empirical research, and provide decision-making support for solving local traffic problems.

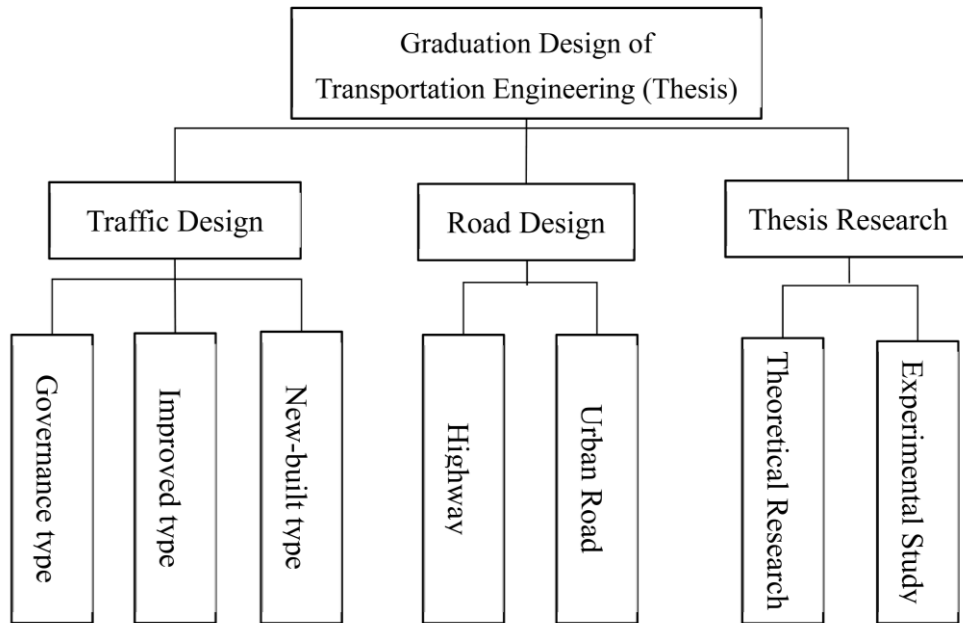


Figure 1: The Model Framework for Graduation Design (Thesis) of Transportation Engineering.

(2) Establish standardized teaching management processes.

Establish a standardized management process for task assignment, topic opening, daily guidance, review, and defense, and specify the time nodes, work frequency, and work duration requirements for each management link in detail to ensure that teachers conduct guidance work in a planned and high-quality manner during the guidance process of graduation design (thesis). Although there will be a series of graduation design (thesis) management documents at the educational administration level of the school, it is difficult to give full consideration to detailed management. Therefore, based on the school's management documents, it is necessary to refine them into standardized management system documents for graduation design (thesis) of transportation engineering majors.

5. Conclusions

This paper focuses on the prominent issues in the current graduation design (thesis) process of transportation engineering majors, and combines the characteristics of application-oriented undergraduate majors to propose a standardized management model for graduation design (thesis) teaching oriented to meet talent cultivation goals, namely, the standardized management model for graduation design (thesis) of transportation engineering majors. Due to space limitations, the specific details of technical guidance standardization and process guidance standardization are not presented in this article.

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