

Research on the Reform of Assessment Methods for Core Courses of the Traffic Engineering Specialty

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Abstract: This paper deeply analyzes the characteristics of core courses of the traffic engineering specialty and the problems existing in traditional assessment methods, and proposes a series of reform measures for the assessment methods of core courses of the traffic engineering specialty. By introducing diversified assessment methods, focusing on process assessment, and strengthening the assessment of practical abilities, the aim is to improve students' learning enthusiasm and initiative, and cultivate students' innovation ability and practical ability to meet the needs of traffic engineering professionals in the new era.

Keywords: Traffic engineering specialty; Core courses; Reform of assessment methods; Course characteristics; Process assessment

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1. Introduction

Traffic engineering specialty is a relatively comprehensive discipline, involving multiple fields such as traffic planning, traffic management, traffic safety, and traffic design. Core courses are an important part of traffic engineering specialty teaching and play a crucial role in cultivating students' professional qualities and practical abilities ^[1]. However, traditional assessment methods often have problems such as emphasizing theory over practice and results over process, making it difficult to comprehensively and accurately evaluate students' learning achievements and ability levels. Therefore, reforming the assessment methods for core courses of the traffic engineering specialty has important practical significance ^[2].

2. Characteristics of core courses of the traffic engineering specialty

2.1. Strong comprehensiveness

Core courses of the traffic engineering specialty cover knowledge in multiple disciplinary fields such as engineering mechanics, traffic planning, traffic management, and traffic safety ^[3]. Students need to have a solid foundation in basic knowledge such as mathematics, physics, and computers, and need to master the basic theories and methods of the traffic engineering specialty ^[4].

2.2. Strong practicality

Traffic engineering specialty is an applied discipline, and the teaching content of core courses is closely combined with practical engineering ^[5]. Students need to apply theoretical knowledge to practical problems through practical links such as experiments, course designs, and internships to improve their practical and problem-solving abilities ^[6].

2.3. High demand for innovation

With the continuous development of traffic technology and the increasing complexity of traffic problems, the traffic engineering specialty needs continuous innovation and development. The teaching content of core courses needs to keep up with the times and cultivate students' innovative thinking and innovation ability to meet the development needs of the traffic engineering field in the future ^[7].

3. Problems of traditional assessment methods

3.1. Single assessment method

Traditional assessment methods mainly rely on final exams, and the proportion of usual grades is relatively small. This assessment method overly focuses on students' mastery of theoretical knowledge and neglects the cultivation of students' practical ability, innovation ability, and comprehensive quality.

3.2. Emphasizing results over process

Traditional assessment methods often only pay attention to students' exam scores and neglect their learning process. In order to achieve good grades, students may adopt rote learning methods and lack in-depth understanding and mastery of knowledge. At the same time, this assessment method is also not conducive to teachers' understanding of students' learning situation in time, and adjusting teaching methods and progress.

3.3. Insufficient assessment of practical ability

The core courses of the traffic engineering specialty have strong practicality, but traditional assessment methods often do not pay enough attention to the assessment of practical ability ^[8]. The assessment methods of practical links are usually relatively simple and difficult to comprehensively and accurately evaluate students' practical ability and innovation ability ^[9].

3.4. Lack of evaluation of students' comprehensive quality

Traditional assessment methods mainly focus on students' mastery of professional knowledge and lack effective evaluation means for students' comprehensive qualities such as teamwork ability, communication ability, and innovation ability.

4. Measures for reform of assessment methods

4.1. Diversified assessment methods

4.1.1. Final exam

The final exam is still an important way to assess students' learning achievements, but the traditional exam format should be changed. The proportion of comprehensive and open-ended questions should be increased,

and attention should be paid to examining students' understanding and application ability of knowledge. At the same time, the proportion of final exam scores in the total evaluation scores should be appropriately reduced to avoid students relying too much on the final exam ^[10].

4.1.2. Usual grades

Usual grades should include multiple aspects such as classroom performance, homework completion, experiment reports, and course designs. Teachers should give evaluations and feedback in time according to students' performance and urge students to actively participate in the learning process. The proportion of usual grades in the total evaluation scores should be appropriately increased to encourage students to pay attention to usual learning ^[11].

4.1.3. Practical assessment

Practical assessment is an important way to assess students' practical ability. Practical assessment should include links such as experiments, course designs, and internships. Teachers should give evaluations and feedback according to students' performance in practical skills, such as experimental operation ability, data analysis ability, and rationality of design schemes. The proportion of practical assessment scores in the total evaluation scores should be appropriately increased to highlight the importance of practical ability ^[12,13].

4.1.4. Group project assessment

Group project assessment is an important way to cultivate students' teamwork and innovation abilities. Teachers should assign group project tasks according to the course content and let students complete them in groups. Teachers should give evaluations and feedback according to the completion situation of group projects, such as the innovation, feasibility, and teamwork ability of the projects. The proportion of group project assessment scores in the total evaluation scores should be appropriately increased to encourage students to actively participate in group projects.

4.2. Emphasizing process assessment

4.2.1. Classroom performance assessment

Teachers should pay attention to students' classroom performance, such as attendance, classroom participation, and asking and answering questions. Teachers can assess students' classroom performance through roll call, asking questions, and group discussions, and give evaluations and feedback in time ^[14].

4.2.2. Homework assessment

Teachers should assign an appropriate amount of homework for students to complete after class. The content of homework should cover the key points and difficulties of the course, and the forms can be diversified, such as calculation questions, short answer questions, and papers. Teachers should carefully correct students' homework, give evaluations and feedback in time, and include homework scores in the total evaluation scores.

4.2.3. Experiment report assessment

Experiment reports are an important basis for assessing students' experimental ability. Teachers should require students to write experiment reports carefully. The content should include the purpose of the experiment, the principle of the experiment, the experimental steps, and the results and analysis. Teachers should carefully correct students' experiment reports, give evaluations and feedback in time, and include experiment report

scores in the total evaluation scores.

4.2.4. Course design assessment

Course design is an important way to assess students' comprehensive application ability. Teachers should assign some course design tasks according to the course content and let students complete them within a specified time. Teachers should carefully guide students' course design, give evaluations and feedback in time, and include course design scores in the total evaluation scores.

4.3. Strengthening the assessment of practical ability

4.3.1. Experiment assessment

Experiment assessment should include aspects such as experimental operation ability, experimental data processing ability, and experiment report writing ability. Teachers should give evaluations and feedback according to students' performance in experiments, and include experiment assessment scores in the total evaluation scores.

4.3.2. Course design assessment

Course design assessment should include aspects such as the rationality of the design scheme, the accuracy of design calculations, and the standardization of design drawings. Teachers should carefully guide students' course design, give evaluations and feedback in time, and include course design assessment scores in the total evaluation scores.

4.3.3. Internship assessment

Internship assessment should include aspects such as internship performance and internship report writing ability. Teachers should cooperate closely with internship units to jointly assess students' internships and include internship assessment scores in the total evaluation scores.

4.4. Establishing a scientific evaluation system

4.4.1. Establishment of evaluation index system

Establishing a scientific evaluation index system is the key to the reform of assessment methods. The evaluation index system should include multiple aspects such as the degree of mastery of professional knowledge, practical ability, innovation ability, teamwork ability, and communication ability. Specific evaluation indicators should be set for each aspect so that teachers can conduct comprehensive and accurate evaluations of students^[15].

4.4.2. Selection of evaluation methods

Evaluation methods should be diversified, including a combination of quantitative evaluation and qualitative evaluation, a combination of teacher evaluation and student mutual evaluation, and a combination of process evaluation and summative evaluation. Through the comprehensive application of multiple evaluation methods, the objectivity and accuracy of evaluation results can be improved.

4.4.3. Feedback and application of evaluation results

Evaluation results should be timely fed back to students so that they can understand their learning situation and existing problems. Teachers should adjust teaching methods and progress in time according to evaluation results and provide targeted guidance and help to students. At the same time, evaluation results should also be used as

an important basis for students' evaluation and selection, scholarship evaluation, and graduation qualification review.

5. Evaluation of assessment methods

5.1. Comparison of assessment methods after reform

Compared with traditional assessment methods, there are obvious changes in assessment methods. The proportion of usual grades and practical ability assessment scores has increased significantly, as shown in **Table 1**.

Table 1. Comparison of traditional assessment methods and reformed assessment methods

Assessment method	Traditional assessment	Reformed assessment
Proportion of usual grades	20%	40%
Exam form	Closed-book exam mainly	Combination of multiple forms

5.2. Satisfaction survey of different assessment methods

After the implementation of the new assessment method, students' satisfaction has increased significantly, and the number of dissatisfied students has decreased significantly, as shown in **Table 2**.

Table 2. Satisfaction survey of students on different assessment methods (unit: %)

Assessment method	Very satisfied	Satisfied	General	Dissatisfied
Traditional assessment method	15.34	30.47	32.06	22.13
Reformed assessment method	36.58	46.49	14.11	2.82

5.3. Student grade distribution

By comparing and analyzing students' grade distribution, practical ability performance, and employment situation before and after the implementation of the assessment method reform, specific data is used to support the effectiveness of the assessment method reform. For example, before the reform, the average score of students' final exams was about 70 points, and the grade distribution was relatively concentrated; after the reform, the average score of students' final exams increased to about 75 points, and the grade distribution was more reasonable. The proportion of students in high-score and low-score segments has decreased. At the same time, students' performance in practical ability has also been significantly improved. The proportion of students participating in practical projects has increased from 40% before the reform to 60%, and students' employment competitiveness has also been enhanced.

6. Conclusion

The reform of assessment methods for core courses of the traffic engineering specialty is a systematic project that requires the joint efforts of schools, teachers, and students. By introducing diversified assessment methods, focusing on process assessment, and strengthening the assessment of practical abilities, students' learning enthusiasm and initiative can be improved, and students' innovation ability and practical ability can be cultivated to meet the needs of traffic engineering professionals in the new era. In the process of reform, experience should be continuously summarized, assessment methods should be improved, and a scientific

evaluation system should be established to provide a strong guarantee for improving the teaching quality of the traffic engineering specialty.

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