

Reform and Practice of the Mode of Training Modern Apprentices in Engineering Measurement

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Abstract: This article starts from the actual situation of graduates of engineering surveying schools that are highly integrated with school-enterprise, in order to continuously improve the quality of teaching, promote the construction of engineering measurement technology, meet the needs of employers and adapt to the trend of social development, and work for graduates. The situation, the help of the course study during the school, the work and development, and the suggestions and requirements for the education work and teaching management work, the reform and innovation of the theoretical and practical teaching system of engineering measurement technology, proposed the school A new model of applied talents with a high degree of integration.

1. Introduction

At present, the demand for engineering survey professionals is increasing. Although some colleges and universities in China have trained a number of undergraduate students in measurement, the training objectives and training specifications of undergraduate education determine the characteristics of their design, scientific research ability and weak construction ability, which cannot meet the needs of construction enterprises for the professional competence of technical personnel. In addition, most undergraduate graduates are not willing to go to the construction line, even in the construction line, or because they do not have enough practical training, they can not quickly adapt to the needs of the construction line, or work in the frontline without peace of mind; Students are more comfortable with the first-line work of the construction, and they have strong hands-on ability and quick start, which can meet the employment standards of “going down, staying, and using”. This has been confirmed in the field investigation of the construction line. The "modern apprenticeship system" is a kind of talent training mode that combines school education and work training. This mode can largely alleviate the contradiction between the demand for enterprises and the talents that the output of the school cannot meet the actual needs. However, in the specific implementation process, the starting point of the system and various interests is involved, and the gap between the professional ability of the students and the actual needs of the enterprises cannot be solved. The contradiction between the “recruitment difficulties” of enterprises and the “difficult employment” of colleges and universities is still outstanding. E-commerce "modern apprenticeship" is still a topic worthy of further study[1].

2. Professional training objectives and training specifications

The training objectives determined by the engineering survey profession are comprehensive development of morality, intelligence, body and beauty, with high comprehensive quality, strong engineering surveying and mapping and surveying capabilities, and good first-line technical application talents for construction organization and management. Its professional features are "fine measurement, understanding of construction, management." The basic knowledge, basic skills, basic abilities and basic qualities that students should master are as follows: Have a certain knowledge of humanities and social sciences. Have sufficient advanced mathematics, engineering mathematics, computer language programming foundation, engineering drawing foundation. It has construction knowledge of roads, bridges, tunnels, civil works and other industries. Has a solid engineering measurement expertise. It has strong measuring instrument operation skills, especially the use of high-tech equipment represented by total station. Have certain computer operation and application skills. Has a strong topographic map and cadastral map mapping capabilities. Has a strong construction control network external deployment capacity and internal computing power. It has strong ability to lay out samples for roads, bridges, tunnels and civil works. Has the ability to engage in digital cadastral surveys and land management. Has general engineering construction management capabilities. Have a good ideological and political quality and behavioral norms. Have good physical quality and stable psychological quality. 3 Have the ideological concepts, ways of thinking and competition awareness that are compatible with the market economy environment. Innovative spirit, hard work spirit, unity and cooperation spirit. I love the first-line work of construction and construction [2]. Training impact weights are shown in the table below.

Table 1: Training impact weights

Index	Mode	Skill	Equipment
Weight	0.1865	0.4324	0.3811

3. Curriculum system and teaching content reform

3.1. Courses based on professional standards and professional job assignments

According to the requirements of the comprehensive ability and professional ability of engineering and technical personnel in the first-line job group, combined with the characteristics of this specialty and the front-line work positions, the theoretical teaching system and the practical teaching system will be constructed, and finally the students will be trained to be "fine measurement, Technical application talents who understand construction and management. According to the teaching characteristics of higher vocational education, the practice link teaching is strengthened, the core competence training is emphasized, and the following theoretical teaching system and practical teaching system are constructed around the core of competence training. The theoretical teaching system can be divided into basic quality series, engineering background series, and professional theory series. The corresponding courses are as follows: basic quality series, courses include political theory and legal knowledge, English, advanced applied mathematics, sports. , computer foundation, VB language, engineering drawing, AUTOCAD; engineering background series, courses include geotechnical engineering, engineering mechanics, building materials, introduction to building architecture, introduction to road engineering, introduction to bridge engineering, tunnel construction technology, project bidding, Construction organization and budget; professional theory series, courses include measurement, measurement adjustment basis, control measurement, GPS satellite positioning technology, engineering measurement technology, cadastral

measurement and digital mapping; practical teaching series, including the following parts : Topographic measurement technology training, control measurement technology training, digital cadastral survey training, engineering measurement technology training, curriculum design training, pre-job training and defense[3].

3.2. Organizing teaching content with the combination of work and study, designing teaching activities

The engineering measurement teaching team pays attention to the case teaching of each course, moves the case on the scene to the classroom, throws out questions, explains the theoretical knowledge with problems, and has interaction and discussion with the classmates in the classroom. Active position, let them take the initiative to learn, teachers have carefully designed and carefully prepared their own courses. Due to the lack of perceptual knowledge of students in practice, we sometimes organize students to go to the scene to explain and visit. This kind of teaching design is much better than classroom teaching. In the sixth semester, we selected a number of companies such as “Northern Jingwei Surveying and Mapping”, “Shenyang Guoyuan Science and Technology”, “Shenyang Golden Map Surveying” and “China Railway 19th Bureau” with certain influence in the industry. The training base is assigned by the technicians as field instructors for management[4].

4. Practice teaching reform

4.1. Surveying and mapping comprehensive training is completed in the simulation training base

According to the needs of high-skilled personnel training, construct a practical teaching system, pay attention to the cultivation of professional ability. In order to better complete the comprehensive training tasks, a simulated training base is needed for protection. In terms of perfecting and constructing the practice base, we mainly adopt A method of combining a fixed on-campus teaching practice base with an off-campus production practice base has been established. The Shashan Topographic Survey Training Base and the Shenshitai Control Survey Training Base have been established in Shenbei New District. At the same time, it cooperates with the Provincial Surveying and Mapping Institute and other road, bridge and tunnel construction units, and each year they provide bases to meet the needs of engineering survey pre-job training (such as Provincial Road and Bridge Corporation, Shenyang Municipal Government, Shenyang High-grade Highway Engineering Company, Ministry of Railways). Thirteen innings, nineteen innings, etc.)[5].

4.2. Graduation post training time is not less than half a year, training guidance, assessment standards, etc

The engineering survey major began to carry out the post training from the end of the fifth semester. Students should complete the training report during this period. Before the students go to the construction unit, we stipulate the format and requirements of the pre-job training report. The log, as well as the training evaluation of the construction unit and other related materials, in recent years, we have been through this way to complete the vocational ability training before the graduates, so that students can seamlessly connect with the construction unit after graduation. Two weeks before the graduation defense, the instructor began to review the training report and proposed the revision opinion. The teacher in the reply section strictly checked the content and proposed the content related to the actual training report. The applied questions and pertinence of the questions

were strong, and the defense was strict. The scoring standard can comprehensively assess my theoretical level and apply the professional knowledge to solve the problem of measuring problems on the construction site.

5. Teaching methods and means of reform

5.1. Actively explore a task-driven, project-oriented teaching model

The task-driven teaching method adopted by our school in the teaching of surveying and mapping majors is mainly reflected in the inter-class training and comprehensive training of professional courses. Each professional course takes the core competence of the course as the main line of task design. It can design a course as a big task, and then divide the big task into several small tasks, interspersed in each chapter and section. The practical training tasks and skill objectives are clear and specific. Teaching form as shown.

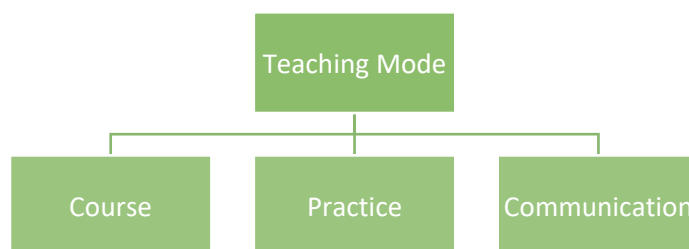


Figure 1: Teaching form

5.2. Focus on process assessment

For the assessment of the results of the measurement professional courses, we pay great attention to the process assessment, rather than assessing students with a final theoretical paper. The evaluation of the scores is mainly based on the usual unit test, the inter-class training operation assessment, and the student team awareness assessment. Teaching practice is an important part of the practical teaching of measurement, and its performance evaluation is carried out separately. In doing so, the position of the teaching internship in the performance evaluation of the measurement course is improved, and the practice teaching is strengthened, which is very obvious for the improvement of the operation skills and overall quality of the students.

5.3. Promote the development of teaching activities using modern educational technology

The teaching team's teachers have combined their own actual production of multimedia courseware with different styles and rich content. The improvement of teaching methods has enabled the use of a large number of video and image materials, greatly updating the teaching content, making many boring abstract concepts and theories appear in an intuitive and visual form, increasing the vividness of the teaching content and inspiring the students. Learning interest, received good results.

6. Conclusion

Practice shows that higher vocational colleges and enterprises are highly integrated to carry out application-oriented talent training, reforming from the aspects of curriculum system and teaching

content, practical teaching, teaching methods and means, and paying attention to process assessment, so that the training objectives are consistent with the employment standards. Professional settings are consistent with business needs, and skills training is consistent with job requirements. These three unanimity are the important foundations for realizing the training objectives of applied and skilled talents in higher vocational colleges.

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