



EXPLORATION on the Construction of First-Class Specialty of Surveying and Mapping Engineering in Guizhou Colleges and Universities

Yong Lei^{1,*}, Yan Qiu², Jibo Liu¹, Chuanjian Ren¹, Lihui Wang¹

¹Guizhou University of Engineering Science, College of Mining Engineering, Bijie, Guizhou, 551700, China

²Guizhou University of Engineering Science, College of Foreign languages, Bijie, Guizhou, 551700, China

*546743737@qq.com

Abstract. According to the release of surveying and mapping engineering specialty in Guizhou undergraduate university, combined with the characteristics of surveying and mapping engineering specialty in Guizhou Institute of Engineering Applied Technology, this paper explores from the aspects of talent training plan revision, syllabus revision, teaching staff construction, curriculum construction, teaching style construction, study style construction and so on, in order to improve the training quality of surveying and mapping engineering professionals. Take the school-level first-class specialty as an opportunity to create conditions for provincial-level first-class professional construction, improve the school-running quality of surveying and mapping engineering, and train all-round development of surveying and mapping professionals in Guizhou Province.

Keywords: surveying and mapping engineering; first-class specialty; talent training program; improvement of teaching quality.

1 Introduction

Guizhou University, Guizhou Institute of Engineering Applied Technology and Anshun College are the only undergraduate colleges majoring in surveying and mapping engineering in Guizhou Province. In 2020, the surveying and mapping engineering major of Guizhou University was added to the provincial first-class major, and the national first-class major was declared in 2023, leading the surveying and mapping colleges and universities of Guizhou Province to develop together. At the end of 2021, Guizhou Institute of Engineering Applied Technology listed surveying and mapping engineering as a first-class major for construction. The construction of the first-class specialty of surveying and mapping engineering aims to improve the teaching quality and train excellent surveying and mapping talents to meet the needs of social and economic development. In order to improve the teaching quality of sur-

veying and mapping engineering specialty in Guizhou Province and meet the demand for surveying and mapping engineering professionals in Guizhou Province, the surveying and Mapping Engineering Teaching and Research Department of Guizhou Institute of Engineering Applied Technology takes the construction of the school's first-class specialty as an opportunity, combined with the actual situation of the school, starting with the 2023 talent training plan and the revision of the syllabus, comprehensively implement the teaching concept of OBE. The construction is carried out from the aspects of curriculum construction, teaching staff, teaching methods, practical teaching, scientific research, innovative education and quality control. Actively strive for school policy and financial support, with UAV and other emerging technologies as the support, based on engineering survey, combined with mine survey, deformation monitoring and satellite positioning and navigation technology, to cultivate the feelings of surveying and mapping, with the ability of project design, project implementation, mine surveying and mapping. To train high-quality applied surveying and mapping professionals with certain innovative spirit for Bijie high-quality development demonstration area and even Guizhou Province in basic surveying and mapping, natural resources investigation, construction and transportation, coal mining, disaster prevention and other fields.

2 Revision of the Training Plan

The training plan is the basic basis of personnel training and the basic criterion to measure the quality of professional teaching. Professional construction must meet the requirements of the talent training program. Therefore, a reasonable talent training program with its own characteristics is a necessary guarantee for professional construction.

2.1 Version 2019 Satisfaction with the Training Program

In order to grasp the actual situation of the school's 2019 training plan, our school has developed a corresponding questionnaire survey for senior students majoring in surveying and mapping engineering, graduates and surveying and mapping enterprises and institutions in Guizhou Province, and the overall satisfaction is high. Employers, enterprises and institutions see Table 1, graduates see Table 2, and students see Table 3.

Table 1. your overall satisfaction with the 2019 version of the training plan for surveying and mapping engineering major of Guizhou University of Engineering Science (employer, industry association version).

Option	Subtotal	Proportion
Satisfied	21	100%
General	0	0%
Not satisfied	0	0%
The number of people to fill in this question is valid.	21	100%

Table 2. your overall satisfaction with the 2019 version of the training plan for surveying and mapping engineering major of Guizhou University of Engineering Science (Alumni).

Option	Subtotal	Proportion
Satisfied	36	92.31%
General	3	7.69%
Not satisfied	0	0%
The number of people to fill in this question is valid.	39	100%

Table 3. your overall satisfaction with the 2019 version of the training plan for surveying and mapping engineering major of Guizhou University of Engineering Science (Students).

Option	Subtotal	Proportion
Satisfied	63	80.77%
General	14	17.95%
Not satisfied	1	1.28%
The number of people to fill in this question is valid.	78	100%

2.2 Determination of Training Objectives

The training goal of surveying and mapping engineering specialty of Guizhou University is to meet the needs of national future construction for surveying and mapping talents, and to train senior engineering and technical personnel with a sense of social responsibility and international vision, innovative consciousness and engineering practice ability, teamwork and management coordination ability, morally, intellectually, physically, and aesthetically^[1].

Have a solid mathematical foundation, humanities and social science knowledge, professional application ability, computer application ability, systematically master the basic theory and basic skills of surveying and mapping, cutting-edge surveying and mapping technology, accept scientific thinking and engineering practice training. Can be engaged in national basic surveying and mapping, urban planning and construction, natural resources, emergency management and other national economic and social service departments engaged in surveying and mapping engineering technology and related fields of production, design, development, research, teaching and management and other aspects of high-quality applied professional and technical personnel^[2].

Guizhou Institute of Engineering Applied Technology is a local and applied undergraduate university. the overall talent training goal of the school is to adhere to the orientation of local, applied and open school. to build a regional first-class applied university with distinctive characteristics as the pursuit of value, to serve local economic and social development as the root, to build a university satisfactory to the people as the mission, to cultivate moral, intellectual, physical, aesthetic and labor development in an all-round way. It has good moral quality, social responsibility and innovative spirit, solid basic knowledge, strong learning ability, practical ability,

communication ability and cooperation ability, and can serve the high-quality applied talents needed by local economic and social development. Combined with the orientation of the talent training goal of the school, the training goal of surveying and mapping engineering specialty is revised as follows: this major is based on Bijie, facing Guizhou and radiating the whole country. Cultivate moral, intellectual, physical, aesthetic and labor development in an all-round way, have good morality and self-cultivation, abide by laws and regulations, and meet the requirements of national basic surveying and mapping development and surveying and mapping geographic information construction in the new era. Have surveying and mapping feelings, systematically master the basic knowledge, basic theory and basic skills of surveying and mapping engineering, full of innovative consciousness and practical ability. Can engage in education, scientific research, management, production, design, technical research and development in various departments of the national economy in the fields of national basic surveying and mapping, geographical national condition monitoring, planning and supervision, surface and underground engineering surveying, resource exploration and development, surveying and mapping management, etc. engineers who can expand their knowledge and capabilities through continuing education or other lifelong schools to adapt to surveying and mapping disciplines and professional development.

2.3 Determination of Characteristic Courses

The characteristic course of surveying and mapping engineering major of Guizhou University is "introduction to surveying and Mapping" (bilingual), which is characterized by bilingual teaching, which reflects the level of teachers and students of Guizhou University and meets the characteristics of Guizhou University. In order to refine its own characteristics, Guizhou Institute of Engineering Applied Technology plans to set up the course of Digital Topographic surveying as a cooperative course between the school and enterprises. It is jointly built by the school, Guizhou Tiantong Science and Technology Co., Ltd., an industry-university-research cooperative unit, and Bijie Urban and Rural Planning surveying and Mapping Institute, and employs senior engineers to provide services for the teaching of Digital Topographic surveying by using the manpower, equipment and projects of the enterprise. We should construct the professional characteristics of our school and train engineers who can meet the needs of society and adapt to the development of surveying and mapping discipline and professional development.

2.4 Construction of Curriculum System

According to the unified arrangement of the school, combined with the reality of surveying and mapping engineering, the curriculum system is divided into general education compulsory courses (40 credits), general education elective courses (at least 14 credits), professional compulsory courses (45.5 credits), professional education electives (at least 24 credits), professional quality development courses (at least 6 credits), second classroom (8 credits), practical teaching (32.5 credits). In addition to the 10

core courses such as introduction to surveying and Mapping stipulated by the state, the courses of surveying and mapping engineering drawing, mine surveying and deformation monitoring are added as science courses to meet the requirements of the National Standard for Teaching quality of undergraduate majors in ordinary Colleges and Universities^[3].

3 Revision of the Syllabus

Syllabus is the guiding document of course teaching and the basis of course teaching. In order to improve the quality of personnel training, according to the unified requirements of the school, the formulation of the teaching syllabus of surveying and mapping engineering major shall be drawn up by the person in charge of the course, discussed by the surveying and mapping teaching and research department, submitted to the teaching steering committee of the college for approval and implementation. In order to ensure the seriousness of the syllabus, it is necessary to upload it to the school educational administration system and modify it with the consent of the school. In order to put the syllabus into practice, the syllabus should be designed according to the number of class hours stipulated in the training plan and a teaching unit every 2 hours, so as to ensure the implementation of the teaching task.

4 The Construction of Teaching Staff

The contingent of teachers is the key to ensure the quality of teaching and the core of professional construction. In order to increase the number of professional teachers, improve the structure of teachers, establish a high-level team of teachers, and improve teachers' teaching level and practical ability, the teaching and research office actively encourages teachers to participate in scientific research projects and improve teachers' scientific research ability and innovative consciousness. At the same time, we should pay attention to the construction of teachers' morality and style and improve teachers' moral accomplishment.

4.1 Introduction of Talents

It is very difficult to introduce PhD majors in surveying and mapping engineering, which leads to a serious shortage of surveying and mapping engineering teachers in schools. In order to solve the problem of weak teachers in surveying and mapping engineering, one master teacher was introduced into the surveying and mapping teaching and research department in 2021 and two postgraduates were introduced in 2023, which enriched the teaching staff of the surveying and mapping teaching and research department to a certain extent and made the number of teachers in the surveying and mapping teaching and research department reach 8. Basically meet the needs of teaching. At the same time, apply to the school to introduce 2 postgraduates again in 2024 to make the number of full-time teachers meet the needs of the "Na-

tional Standard for Teaching quality of undergraduate majors in ordinary Colleges and Universities".

4.2 Improvement of Academic Qualifications

In order to improve the educational level of teachers in the surveying and mapping teaching and research department, the college makes full use of the favorable conditions of counterpart support from China University of Mining and Technology (Beijing) to actively organize teachers to study for doctorates. At present, a teacher from the Department of surveying and Mapping is studying for a doctorate at China University of Mining and Technology (Beijing).

4.3 Integrate into the Industry

In order to master the cutting-edge knowledge of the surveying and mapping industry and let teachers understand the needs of the industry and enterprises, the surveying and Mapping Teaching and Research Department of our college actively joined the Mine surveying Branch of the Chinese Society of surveying and Mapping, Guizhou surveying and Mapping Geographic Information Society and Guizhou surveying and Mapping Geographic Information Industry Association. Actively participate in the activities held by societies and associations, understand the needs of the industry, promote the major of surveying and mapping engineering in the school, and build a bridge between the school and the industry.

4.4 Social Services

Social service is one of the basic functions of colleges and universities and the basic means for colleges and universities to gain a foothold. The surveying and mapping teaching and research office has made full use of its own professional advantages, greatly expanded the channels to serve the local areas, and became a member of the expert database of Bijie Public Resources Trading Center and a series of senior professional title evaluation experts of Bijie Human Resources and Social Security Bureau. And assist Bijie Urban and Rural Planning surveying and Mapping Institute to complete the development plan of surveying and mapping geographic information industry in Bijie City during the 14th five-year Plan.

5 Laboratory Construction

The laboratory is the place for students to carry out experimental practice teaching, and the laboratory equipment is the basic guarantee for students to improve their practical skills^[4]. In order to improve the practical ability of the students majoring in surveying and mapping engineering, in 2022, the surveying teaching and research office expanded the general surveying laboratory, rebuilt the precision engineering surveying laboratory, and built a new intelligent surveying and mapping laboratory. In

2023, the surveying and mapping teaching and research office expanded the general survey laboratory again and built a new covert engineering survey laboratory. A total of 4 million yuan was invested in the construction of the laboratory in two years, which greatly improved the students' practice conditions. it provides equipment guarantee for improving students' practical ability.

6 Curriculum Construction

Course construction is the foundation of the first-class specialty construction of surveying and mapping engineering. The foothold of teaching lies in the curriculum, and personnel training must be based on the curriculum, so carrying out curriculum construction, improving the quality of courses, eliminating "water courses" and building "golden courses" is the primary task to improve the quality of personnel training. it is also the primary task of professional construction. The construction of first-class majors must establish a perfect curriculum system, including theoretical courses and practical courses, and pay attention to the renewal and optimization of curriculum content in order to adapt to the development of the times and the progress of technology. At the same time, we should pay attention to the mutual infiltration and convergence of curriculum content to form a systematic curriculum system.

6.1 First-Class Curriculum Construction

The course "Digital Topographic surveying" is the core course and the basic course of surveying and mapping engineering. In order to improve the teaching quality of the course, the surveying and Mapping Engineering Teaching and Research Department concentrates all the efforts of the teaching and research department and takes the course of Digital Topographic surveying as a pilot to carry out first-class course construction. According to the characteristics of the course "Digital Topographic surveying", the course is divided into three modules: basic knowledge of surveying and mapping, control surveying and topographic mapping. Three teachers are teaching respectively, making full use of the intelligent classroom of the school. The teaching mode of group teaching is adopted and the whole scene is recorded. The teaching and research department polishes the course teaching according to the video, completes the course teaching task well, and obtains the school "gold class" project.

6.2 Ideological and Political Construction of Curriculum

Ideological and political curriculum is the inevitable requirement of training socialist successors, and it must go hand in hand with the ideological and political course^[5]. In order to cultivate students' professional self-confidence and achieve the goal of educating people, the surveying and Mapping Teaching and Research Office conducts research, integrates the long history of surveying and mapping in ancient China and the survey of Mount Qomolangma into the course of introduction to surveying and Mapping, integrates the development process of Beidou and the Galaxy event into the

course of GNSS principles and its Application, applies for and obtains the establishment and successful conclusion of the ideological and political construction project of the school curriculum, and leads the ideological and political construction of the curriculum.

6.3 Course Teaching Reform

With the development of the network, students' basic professional knowledge can be obtained from the Internet, which leads to students' lack of enthusiasm in class, and obvious lack of initiative and enthusiasm in learning. Under the guidance of the syllabus, by means of reforming teaching methods, for the purpose of students' mastery of knowledge points, to make full use of modern educational theories, to cultivate students' initiative and enthusiasm in learning, and to complete teaching tasks through curriculum teaching reform, to achieve the purpose of course teaching.

7 The Construction of Study Style

The effect of students' learning mainly lies in students, and one of the main means to improve teaching quality is to improve students' enthusiasm and initiative in learning. In order to improve the motivation of students' learning, the surveying and Mapping Teaching and Research Office has taken corresponding measures to deal with it after research, and achieved certain results.

7.1 Professional Education

From freshman entrance education to curriculum ideological and political education, they are all cultivating students' professional self-confidence, their recognition of the major and their love for the major. Only when students have a correct understanding of the university and the recognition of their major can they come out of the joy or loss after the college entrance examination, calm down and study seriously, and they can have the initiative to study and improve the style of study.

7.2 Mobilization for Postgraduate Entrance Examination

Make full use of the favorable factors of the zero breakthrough in the postgraduate entrance examination of surveying and mapping engineering majors, let the students who have succeeded in the postgraduate entrance examination preach for their brothers and sisters, let them see the success of their brothers and sisters, see the rewards of their hard work, and enhance their motivation for learning.

7.3 Special Lectures

Making use of the strength of the industry-university-research cooperation unit of our university, we invite experts, leaders and visiting professors of the indus-

try-university-research cooperation unit to give lectures for the students, so as to let the students understand the needs of the society for the specialty. let students know the relationship between learning effect and their future life path, and improve their learning initiative.

8 Quality Monitoring

Quality control is an important guarantee for first-class professional construction. It is necessary to establish a perfect quality monitoring system, including the monitoring and evaluation of teaching quality, the evaluation of students' comprehensive quality and so on^[6]. At the same time, we should pay attention to the analysis and feedback of quality monitoring data, find problems in time and take measures to improve and improve teaching quality.

9 Summary

Colleges and universities revise the talent training plan to meet the needs of the society, revise the curriculum outline to meet the reality of the school, improve the teaching quality of curriculum construction, introduce talents to strengthen the strength of teachers, strengthen the construction of laboratories to improve the foundation of practical teaching, and carry out the construction of study style to promote students' active learning. The construction of the first-class specialty of surveying and mapping engineering needs to promote the work in many aspects in an all-round way, paying attention to the construction and development of talent training plan and syllabus, the construction of teaching staff, the construction of practical conditions, the construction of style of study and the improvement of quality control. Through continuous efforts and improvement to improve the quality of teaching and personnel training quality for the surveying and mapping industry and social and economic development to make greater contributions.

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