Research and Practice of Scientific Research Team Management Mode in Undergraduate Graduation Design

Wei ZHANG¹,²,a,* , Yi-bing SHI¹,²,b and Yan-jun LI¹,²,c

¹Center for Information Geoscience, University of Electronic Science and Technology of China, Chengdu, Sichuan, China
²School of Automation Engineering, University of Electronic Science and Technology of China, Chengdu, Sichuan, China

a weizhang@uestc.edu.cn, b ybshi@uestc.edu.cn, c yjli@uestc.edu.cn

*Corresponding author

Keywords: Graduation Project Design, Research Group Management, Initiative Ability, Compound Talented Persons.

Abstract. Undergraduate graduation design is not only an important procedure of college students to achieve basic professional training, fulfill the train objectives, and comprehensively improve the quality of human resources, but also a good way to test the students' practical skills and research capabilities. After analyzing the current situation of the college graduation design management, a way which is based on research group management to improve the quality of the graduate design is presented in this paper. It can fully make use of the teaching resources, maximize the initiative ability of the college student, and cultivate high-quality compound talented persons.

Introduction

In the increasingly fierce competition in the form of higher education, higher college education that wants to win in the competition, must regard cultivating strong social adaptability, which consists of not only understanding the professional basic theory and basic skills, but also mastering a variety of modern tools as training objectives, and guide students to "serve the society, adapt to society, and win the society". Graduation design is the most important teaching link. It cultivates students' comprehensive ability to apply the knowledge and skills to solve the practical problems, strengthen students' social adaptation, in many ways such as training college students to seek the truth, improve the social consciousness, train the basic scientific research skills, and improve the comprehensive quality and practical ability, has become an irreplaceable role.

At present, the quality and the overall level of undergraduates design in science and technology prevent a downward trend. How to ensure the quality of the science-engineering students' graduation design and how does the teaching link play a key role in cultivating talents, have become one of the important issues of improving the quality of undergraduate teaching. In this paper, according to the experience of the authors and his research team in the practice of undergraduate graduation design teaching for many years, and the first-line and profound analysis of the major problems affecting the quality of graduation design, the authors put forward a kind of graduation design team guidance method, which is based on research group, and shares high-quality educational resources.

1. An Analysis of the Current Condition of the Graduation Design

The graduation design should provide hands-on and practice opportunities for students to cultivate the students’ ability, and make students around the task assignment. Based on accessing, processing, finishing materials, analysis and scientific research, students can finally achieve the ability to solve problems independently. But at this stage of graduation design, there are many problems due to various reasons, which mainly reflect in six aspects such as the quality consciousness, teaching
management, funding and experimental conditions, teachers and students. This paper focuses on the last two problems in our best abilities. (1) First of all, from the perspective of the teachers, some teachers at this stage only simulate the proposition based on the design requirements of the outline, which the involved practical problems is less. The teachers provide the details of the task and design instructions and specific design requirements. As long as finishing the design data and relevant design conditions, students can complete the design. This graduation design is equivalent to a mechanical exercise under the predetermined conditions. In addition, in order to complete the task assigned by the school, some teachers have to spend much time on the papers and research projects. Therefore, the guidance time of the graduation design is relatively short. Although the students dabble the real issue, the research is not thorough and specious. Ability has not been really improved. And the effect is not good. (2) From the view of students, some students are not active enough to learn and are lack of energy. Some students use the relatively free school graduation time looking for work, preparing for the civil service exam, which leads to less time in graduation design. Because an offer has been got and lack of motivation, some students copy or tamper with the others’ design results before final project defense.

2. Introduction to Management Model of Research Group

The management mode of the research group in higher education mainly appears through the process of graduate education, which is actually a kind of scientific research projects to support the integration of teaching methods. It is closely around the subject, through interdisciplinary plan and complement each other's teaching activities, training students to master and understand the knowledge and team working ability. The graduate graduation design based on research group management refers to a group of students who take part in the graduate graduation design. At the same time, the graduate research team is also introduced into the whole process of graduation design, which is under the guidance of the teacher team. For the specific research projects, each member of the team's knowledge and skills work together to solve problems and achieve common goals.

The goal of exploration and practice of graduate graduation design based on research group management is that combining with professional features, integration of scientific research, relying on the scientific research project, to break the disciplines of compartmentalization, to create interdisciplinary and disciplinary training environment, and to make a beneficial attempt to further deepen the reform of practice teaching for engineering students. At the same time, in order to give full play to the subjective initiative of graduate students, it is very important to build a good interaction between the teachers' research group, the graduate research group and the undergraduate design student group. And to improve the graduate research ability, organization and management ability and communication skills are in the process of graduation design. In the comprehensive reform of undergraduate training mechanism, the overall quality of graduate students is also comprehensively improved at the same time.

3. Practice of Management Mode of Research Group

University of Electronic Science and Technology of China regards electronic information science and technology as the core, engineering-based, and combination of science and engineering, science, engineering, management and literature coordinate development of multidisciplinary research university. It is the national "985 Project" and "211 Project" key construction university directly under the Ministry of Education. There are a lot of excellent teachers and all kinds of experimental equipment, which attach great importance to graduation design. The logging technology and instrument research team including author since 2006, has been for five consecutive years to guide the undergraduate students in research team practice. And their graduation design in content and selection, experiment and research, the structure and format of documents, and the application and annotation have been fully upgraded. Some students' performance in graduate design process is
outstanding, so they win the opportunities of China Oilfield services to Limited by Share Ltd on-site debugging project, and play a positive role in improving the overall quality of the graduation design, which cultivate students' innovation ability. It is welcomed by the students. At the same time, the graduate students also receive a great exercise. Under the guidance of the teachers, and constantly progress, they become the project leader and organizer, and complete from soldiers to the group leader's role changing. It improves the overall quality for them and lays the foundation for them growing into leadership and inter-disciplinary talents.

Figure 1. The Implementation Plan of Undergraduate Graduation Project based on Research Group Management.

The implementation plan of undergraduate graduation project based on the research group management is shown in Figure 1.

(1) First of all, according to the number of students who participate in the graduation design and the specific circumstances of the students, the teacher group decomposes the current specific research projects. Then the research team defines the specific responsibilities of each teacher. Meanwhile, according to the research situation of graduate students, the team arranges personnel reasonably and builds the graduate group. Normally, the graduate group is mainly made up of students in the grade three;

(2) The teacher group, the graduate student group, and the undergraduate student group participate in the graduation design meeting. According to the specific circumstances of the undergraduate students, strengths and interests, they identify sub topics and sub task books. Each sub project
corresponds to a graduate student and a graduate student and defines the goals and tasks. The research team should make some rules to specify the undergraduate students. Then they have to obey arrangement and management, and work according to the prescribed time.

(3) In the whole process of graduation design, the research team gives undergraduate students a full range of guidance and monitoring. The timely weekly progress meeting, the monthly progress meeting, and the mid-term inspection are held to communicate with each other. At the same time, it is necessary to focus on research and actively carry out academic exchanges. In some cases, the research team provides some opportunities to exercise in the enterprise for students with outstanding performance, and together with graduate students to complete the actual research task.

(4) Under the guidance of the teachers, the students summarize the project and write the graduation thesis. In this process, the graduate group controls and manages undergraduate students. Because the selected graduate group is generally made up of students in grade three, in the process of undergraduate graduation thesis, their master's thesis is basically completed. They have accumulated a certain amount of writing experience, and have a profound understanding of paper's writing form and standard. They can share the work of teachers, at the same time, which can provide standardized writing template in the initial stage of graduation design writing, and avoid some low and common errors. It lays a good foundation for improving the quality of graduation thesis.

(5) Final project defense. In the process of graduation design, the undergraduate students will participate in the weekly progress meeting, the monthly progress meeting and the academic meeting on time. From the practical point of view, the students involving in the management of research group, their respondent performance is better and score is relatively higher.

Summary and New Expectation

According to analyze the implementation of the graduation design work in recent years, we find that the graduation design results a great relationship between "soft" and "hard" power. Here "soft" strength refers to the excellent teachers, and "hard" refers to the strength of research and experimental conditions. Therefore, the undergraduate graduation design training model is more suitable for a research university with certain scientific research strength. In future work, the authors and our research team will continue to ensure the smooth and effective implementation of management methods and mechanism; research the leading role of teachers' innovative ideas and consciousness; study the flow law of knowledge, skill and cooperation among the three parties in the process of graduation design. In the end, we hope that through the practice of 2-3 years we can sum up the experience and form the systematic thought and method, which will play a positive role in deepening the reform of practical teaching and improving the quality of personnel training.

References


