

Research on the Training System of Young Mathematical Modeling Instructor

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ABSTRACT. *The training of young mathematical modeling instructors cannot be “one size fits all”. It is the key and difficult point to construct a training system by using limited resources to make a differential training for those teachers who have different abilities, knowledge backgrounds and needs. This paper builds a set of “modular” training system, namely “quick integration module”, “technical assistance module”, “simulation competition module” and “continuous learning module”, each module is independent of each other and has different levels to meet the training needs of young modelling instructors with different characteristics.*

KEYWORDS: *Mathematical modeling; Young teacher; Training system*

1. Introduction

Mathematics, computational science and the computers are becoming more and more widely used in various disciplines and fields. Mathematical model have become an important tool for scientific research in various disciplines including social sciences. The requirements of mathematics ability of college students in various subject areas are also getting higher and higher. Mathematical modeling is a bridge to solve practical problems with mathematics and it is the only way for mathematics to go to application[1].Correspondingly, The number of student groups in mathematical modeling competitions in colleges and universities are becoming more and more large, [2]and the cultivation of college students' mathematical modeling ability becomes more and more important.

The mathematical modeling competition represented by the National College Students Mathematical Modeling Competition and American College Students Mathematical Modeling Competition is an important platform for cultivating and measuring the mathematical modeling ability of college students.Relying on all kinds of college students' mathematical modeling competitions and building competition teams are important to train students' modeling ability. Colleges and universities pay more attention to the mathematical modeling competition, more and more college students participate in the mathematical modeling competition, which puts higher requirements on the ability of mathematical modeling instructors.[3]The young mathematical modeling instructor have more energy, great potential and strong plasticity. They are the cornerstone of the future of the mathematical modeling instructors team. The high-level young mathematical modeling instructors are also the guarantee for the continuous improvement of the mathematics modeling team in colleges and universities. Therefore, improving the ability of young mathematical modeling instructors is an important part of the mathematical modeling work in colleges and universities.[4]

The existing researches on the training of mathematics modeling instructors are generally studied from the perspective of self-learning and the older leads the newer and other specific training measures. These measures generally have universal applicability and do not form a systematic training system. The young teachers' own level and knowledge structure are quite different, and all young teachers are trained in a fixed mode, which wastes resources and lacks pertinence. How to use limited resources and build a system to train teachers with different characteristics is the main purpose of this research. Based on the teaching and research section of mathematical modeling of Tianjin Agricultural College, this paper summarizes the ability and quality of modeling teachers by studying the teaching behavior and teaching philosophy of excellent modeling teachers. Combined with the needs of the young modelling instructors, we will further explore the capacity building mechanism of young modeling instructors .A multi-level modular youth modeling instructor training system was constructed, enabling young mathematics teachers to grow into excellent youth modeling teachers faster.

2. The Main Characteristics of Young Modeling Instructors

Individual differences are the main characteristics of young modelling instructors. Individual differences are obvious, different teachers have different needs for growth and progress and the focus of training should not be the same. Therefore, the training of young teachers cannot be “one size fits all”. The key and difficult point of young modelling instructors’ training is using limited resources to make a differential training for those young modelling instructors who have different abilities, knowledge backgrounds and needs.

Take the teaching and research section of mathematical modeling of Tianjin Agricultural College as an example, all modeling instructors have postgraduate qualifications and master's degree or above. In this survey, 83.3% of the teachers participated in the modeling competition in the student era, and they have already understood the mathematical modeling knowledge before joining the modeling teaching and research section, more than 70% of the teachers who have just joined the mathematical modeling research section have a common problem that is “when they instructing students , they are not know where the difficulties are”, about 30% of the teachers believe that they have lacked knowledge ability when they first joined the mathematical modeling team, In the questionnaire for self-growth, more than 85% of the teachers think that the old colleagues give a lot of help, the same proportion of teachers think that practice and direct guidance to students is the most helpful to them, 71.43% of the teachers think that the network is also very helpful. It can be seen that the newly added youth modeling instructors have different understandings of modeling and their own level of competence, but there is a consensus on the factors that enhance their ability, mainly focusing on the three aspects of old teachers help, practice and network.

3. Building a Modular Training System

According to the various needs of young teachers, a modular training system was constructed. The modules are independent of each other and have different levels of hierarchy to accommodate the training needs of young modeling instructors with different characteristics.

The system is divided into four main modules that are independent of each other. These modules are progressively distributed according to the mathematical modeling guidance of young teachers, namely “quick integration module”, “technical assistance module”, “simulation competition module” and “continuous learning module”.

1) Quick Integration Module. The main training form is a senior teacher lecture that aim at the current situation of the school's mathematical modeling competition and the level and characteristics of the students of the school, help the newly joined young teachers to quickly become familiar with the environment of modeling and guiding work in the school.

2) Technical Assistance Module. The main training forms are senior teachers 'lectures, pairing with old and new teachers. Focusing on the key difficulties in the modeling competition and guiding students' skill problems, helping young teachers improve their modeling level and mastering the methods of modeling guidance as soon as possible.

3) Simulation Competition Module. The main training form is organizing a simulation competition for teachers of modeling and teaching section, mainly to help teachers who know less about the competition, quickly familiar with the process, form and key points of the competition; Help the teachers who are familiar with the competition continuously improve their competitive skills and maintain the competitive state. It can be combined with student simulation training.

4) Continuous Learning Module. The main training form is the Internet form such as WeChat public account. The mathematics modeling teaching and research section is responsible for the operation and update, and continuously pushes high-quality modeling related news or excellent papers to help new and old teachers continue to grasp the hotspots, characteristics and difficulty changes of the modeling competition proposition.

4. Conclusion

For young modelling instructors, the new modeling team needs to complete all the modules, and then they can select the corresponding modules to repeat and continue the exercises according to the weaknesses of their knowledge and skills. The modeling teach and research section can also rely on the training module to master the capabilities and characteristics of the young modeling instructors, and carry out targeted training or organize specialized training in a timely manner, fully demonstrating the flexibility and pertinence of the modular training

system. As for the general problems such as “teacher's morality” which are generally concerned, I think it should be put into the training system of young teachers in schools, so I won't go into details.

Young modeling instructors are the future of modeling work. The constant introduction of enthusiastic, high-level young teachers is the key to maintaining the vitality of the modeling work. Therefore, construction of a suitable young modeling instructors' training system is essential for the rapid growth of young teachers themselves, and is crucial to the improvement of the instructor team's strength, and is also crucial to the development of the school's modeling and guidance work.

References

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