

RESEARCH ON THE TRAINING OF MATHEMATICAL MODELING TEACHERS FROM THE PERSPECTIVE OF EMERGENCE GENERATION THEORY

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There are still many problems although more and more attention has been paid to the training of teachers engaged in mathematical modeling. In this paper, it puts forward three directions including theory turn, methodology turn and value orientation turn for the training of mathematical modeling teachers on the basis of comprehensively examining the complexity of the analysis of mathematical modeling teachers, the complexity of research methods and the complexity of the interpretation of structure. It forms a mathematical model of teacher training to improve the effectiveness of teacher training through the construction of logical modules, process modules and functional modules.

Questions raised

Up to now, mathematical modeling education is still "the flower in water, the moon in mirror" in the stage of basic education. The reason is that the majority of front-line teachers have not received systematic training on "mathematical modeling", and there is a lack of effective theoretical guidance, textbooks and teaching strategies for reference in relevant teaching.

Complexity of teacher training in mathematical modeling

There are the following representational complexities concerning teacher training in mathematical modeling.

Complexity characterization of phenomenon analysis

Complexity characterization of research methods

The complexity representation of result interpretation

Three Directions of Teacher Training in Mathematical Modeling

It guides the training of mathematical modeling teachers in a scientific way of explanation by studies the training of mathematical modeling teachers from the perspective of emergent generation theory, which needs to realize three transformations.

Theoretical turn

The cognition of difference in modeling process makes it more implicit to solve mathematical modeling problems with appropriate methods. Therefore, teachers should pay more attention to the transformation of theoretical knowledge and the construction of cognitive mechanism in the teaching process of mathematical modeling.

Methodological turn

The focus of teachers' teaching is no longer the acquisition of students' knowledge, but the improvement of students' quality and ability and the cultivation of higher-order thinking as the teaching of mathematical modeling broadens and breaks the traditional teaching mode of mathematics.

Change of value orientation

We should build the teacher-student relationship of mutual promotion and mutual progress in the learning situation, and develop students' democratic and equal consciousness by breaking the traditional teacher-student communication mode of the inequality and asymmetry in the traditional teaching.

Construction of training mode for mathematical modeling teachers

In this study, it takes three types of cohesion modules including logic, process and function by combining with the particularity of mathematical modeling teachers according to the tightness of the internal elements of the module.

Construction of logical modules

We provide stable institutional guarantee, organizational structure and good team building atmosphere for the training of mathematical modeling teachers by using logical modules at the macro level.

Construction of procedural modules

We should carry out the activities of district teaching and research and school teaching and research groups in multiple levels and multi-dimensions with modeling teaching units as the guide, classroom mathematics as the drive at the meso level.

Construction of functional modules

The first is the ability to reconstruct the problem and obtain effective information. The second is the ability to simplify the relationship between variables by using mathematical tools and technical means. The third is the ability to make the best of the situation and use teaching to generate teaching objectives.

Summary

It should be pointed out that there is a lack of teaching materials for front-line mathematics teachers, especially teaching materials suitable for mathematical modeling teaching in junior middle school. At present, there is still a lack of content structure system of modeling course in line with professional reality and teachers' requirements. It is also the direction that the field of mathematical modeling needs to make efforts in the future that the research groups of mathematical modeling teachers need to be further enriched and the research on the teaching and application laws of mathematical modeling needs to be further studied.

References

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