

The Connection of Mathematics between Senior High School and University

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Abstract

Mathematics in University is the extension of mathematics in senior high school. Mathematics knowledge, learning methods and teaching methods of senior high school have certain influence on the learning of mathematics in university. The teaching of math in university should better link up math in senior high school. This paper analyses the differences of math between senior high school and university in terms of teaching content, teaching methods and learning methods, and puts forward some suggestions on how to deal with the problem of linking math in university with math in senior high school.

Key words

Mathematics in Senior High School, Mathematics in University, Difference, Teaching Content, Methods of Learning

I. Introduction

Mathematics is a basic and instrumental subject in the development of modern science and technology. Mathematics is a compulsory and basic course for majors of science and engineering in colleges and universities. It is the basis for students to learn follow-up professional courses. It plays a very important role in training students' ability of logical reasoning, operation and solving practical problems. Most mathematics courses in university are offered in the first year. Most students are accustomed to the way of teaching in senior high school and usually they study math in university according to the previous way. However, the teaching of math in university is faster, more theoretical and abstract, which is quite different from that of senior high school. Therefore, it is difficult to adapt themselves to the learning of math in university for many freshmen. So it is the key to make a good connection between mathematics in senior high school and in university to improve the quality of teaching in university.

1. Differences of math between senior high school and university

A. Differences in Teaching Contents

Mathematics in senior high school mainly includes set, function, geometry, inequality and so on. This stage of teaching focuses on the cultivation of students' ability of logical thinking, basic computing, reasoning and certification. Mathematics in university mainly includes limit theory, calculus of function, determinant, matrix, mathematical statistics, random variables and so on. It is highly abstract. Therefore, teachers mainly aim at cultivating students' ability of abstract thinking, logical analysis, comprehensive application and innovation in the process of teaching. The difference between them in teaching objectives is one of the root causes of the cohesion problem.

B. Differences in Teaching Contents

There is discontinuity of mathematics education between senior high school and university. The knowledge of mathematics in senior high school is relatively less theoretical. Most of them don't need logical reasoning for long time. There are less teaching contents and clear objectives. In class, doing exercise takes lots of time in teaching. But mathematics in college is the opposite. The mathematical knowledge in university is more theoretical, abstract and widely applied. The theoretical knowledge of teaching content is very important. Logical deduction and complicated

calculation take up most of the time for teaching. Because of the rapid progress, the background of intuition and problems is often ignored in teaching content.

C. Differences in Teaching Methods

Teachers in Senior high school teach math mainly by combining teaching with exercising. Most of math teachers teach new knowledge by means of inspiration, questioning and discussion in group. Most of the new knowledge will be taught in half of the teaching time, the remaining time is mainly used to help students understand and master the new knowledge through examples and exercises. At the same time, there are many tests in senior high schools, so teachers can get many information on students' learning in time. In the University, there is a large amount of teaching information in class, and teachers always speak in all times. There is little interaction between teachers and students, and are few questions and exercises for students.

D. Differences in Learning Styles

The number of students in each class in senior high school is relatively small, teachers can pay attention to every student in class and communicate with students frequently. Students are adapted to passive and indoctrinated learning. The learning methods and problem-solving ideas are mainly provided by teachers and the most of students rely on teachers to summarize knowledge, and lack the ability of self-learning. In the teaching of math in university, teachers seldom manage students. The learning of math mainly depends on students' consciousness. In the process of learning, there are few exercises, examinations and tests, and students can not get timely feedback on their own learning.

2 The Way to Connect with mathematics between senior high school and university

A. Reform of Education Model

A lot of experience and lessons tell us that only by systematically planning the education model and establishing a scientific and complete education system we can avoid the problems of convergence at different stages of education. We should not only emphasize the reform of basic education, ignore the development of higher education. We also should not only focus on the reform of the two at the same time, overlook the convergence of educational models. Nowadays, many colleges and universities begin to actively study the ideas and modes of higher education in

Europe and America. These achievements have provided effective guidance for the natural transition and connection from basic education stage to higher education stage.

B. Reform of teaching methods

Firstly, in the teaching of senior high school, teachers should take students as the main body, pay attention to guiding students to carry out independent learning, and strengthen the cultivation of students' thinking mode and comprehensive ability. Secondly, in the university, teachers should point out the problems that should be paid attention in learning, guide students how to study by themselves. They may introduce extra-curricular books and reference books, and ask senior students to talk about their experience about learning. Teachers should pay attention to guiding students to form their own learning habits and methods, adapt themselves to the study of mathematics in university as soon as possible. Thirdly, teachers in university can consciously continue the teaching methods of senior high schools to teach the content of the initial chapters, and strive to clarify the key points and refine the difficulties. Then gradually increase the teaching content, speed up the teaching progress, organize students to discuss key issues, and solve students' problems in learning through QQ, WeChat and live webcast. After a period of training, students have adapted to the characteristics of learning in university, thus they can complete a smooth transition from secondary education to university education.

C. Pay attention to the cohesion of teaching content

Teachers in university should pay close attention to the reform of mathematics and be familiar with the content of mathematics teaching in senior high school. In recent years, some original contents have been deleted from the teaching contents of math in senior high school. At the same time, some contents related to mathematics in university have been added. Teachers should understand the changes of these contents. In the process of introducing new knowledge □ teachers can compare the content of math in senior high school with that of university, and build a platform for new knowledge and old knowledge to help the students to study.

D. Effective Guidance for Learning

Teachers should instruct students to preview before class and review after class, so as to change students' understanding that they want to master all knowledge only by listening in class. Teachers should also guide students to learn reading, especially definitions, theorems and inferences, must be carefully deliberated word by word. Students should understand that remembering a proposition is not a true understanding of that. Teachers can organize students to carry out discussion, thematic study and unit summary to help them overcome excessive dependence on teachers.

II. Conclusions

In a word, in order to realize the smooth transition of math learning from senior high school to university, it is very necessary to do a good job of linking them up. We should analyze various factors from the current teaching situation and explore specific ways to link up the math teaching of senior high school and college, so as to improve the quality of math teaching of college, enhance students' enthusiasm in learning, improve students' ability of comprehension and application, and pave the way for students to study follow-up courses better.

References

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