

Discussion on the Teaching Mode of Complex Function and Integral Transformation

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Abstract: Many concepts and theories of complex variable function are the extension of the theory of real variable function in the field of complex number. Complex variable function and integral transformation mainly study the correlation between complex variables. Their research theories and methods are not only widely used in mathematics, but also play an important role in engineering technology, such as electromagnetism, hydrodynamics and so on. This paper mainly studies how to prepare well before class, stimulate students' interest in class, and continue students' interest in learning after class, so as to stimulate students' learning enthusiasm, cultivate students' good learning habits, and further improve the quality of teaching.

Keywords: Complex variable function and integral transformation; Teaching methods; Learning interest

1. Introduction

Advanced mathematics mainly discusses the theory of real variable function, and many concepts and theories of complex variable function are in the field of complex number, which generalizes the theory of real variable function. The function of complex variable mainly studies the correlation between complex variables. The integral transform mainly studies Fourier transform and Laplace transform. Functions of complex variables and functions of real variables are interdependent and independent. In the process of learning, we should not only be good at comparing the differences, but also grasp the common characteristics, so as to integrate.

The theory and method of complex variable function not only has a wide range of applications in mathematics, but also plays an important role in engineering technology, such as electromagnetics, fluid mechanics and so on. Integral transformation is an important calculation method in engineering technology, which can transform the function between two variables. In many engineering colleges, complex function has become a required course in electronic information engineering, computer science and engineering, optoelectronic engineering and other majors. The basic theories and methods of complex function and integral transformation mastered by students can provide the necessary theoretical basis for the study of related professional courses. However, during the learning process, many students extended the fear of difficulties in advanced mathematics to this course. Many students failed to grasp the relevant theoretical knowledge in time, and could not understand the key and difficult points in the classroom through self-study or practicing related exercises in time due to inertia. Over time, students' learning enthusiasm is getting worse and worse, which is mainly reflected in the low proportion of students' autonomous preview before class, inability to concentrate on listening in class and lack of learning initiative after class.

So how to make students not only master the basic theories and methods of the course, but also fully participate in classroom teaching activities and continue to actively explore knowledge after class in the limited class hours? How to stimulate students' interest in learning in three aspects before, during and after class will be the main content of this paper.

2. Research Contents

2.1. How to Prepare Well Before Class

As the saying goes, "a good beginning is half the success", pre class preview plays a key role in

classroom effect. Due to the large number of courses for sophomores and the fear of difficulties for cumbersome knowledge points and abstract theorems, many students hardly pay attention to the link of preview before class. But if you want to achieve "twice the result with half the effort" in the classroom, pre class preview is essential. For example, before class, use the website platform to help students recall relevant contents in higher mathematics, such as the limit, differentiability and continuity of univariate and multivariate functions, and let students preview in advance through the network platform to mobilize students' enthusiasm to explore new knowledge by using known knowledge. For example, elementary functions are very familiar to students in higher mathematics, Students will use the knowledge they have learned to explore the elementary functions with the same definition in complex variable functions, so as to form a positive feedback and improve students' interest in learning the course.

Students' pre class preparation plays a key role in the classroom effect. In addition, teachers' pre class preparation also directly affects the teaching effect. A good lesson preparation teacher should not only constantly study the teaching materials, integrate various mathematical ideas, decompose the teaching content according to the knowledge points, focus on the required knowledge, have the knowledge related to this course, but also be familiar with the specific application of the knowledge points of complex variable function and integral transformation in the related professional courses. In addition, we must have a serious and responsible teaching spirit and a student-centered teaching idea.

2.2 How to Stimulate Students' Interest in Class

In order to make students interested in complex variable functions and integral transformations, we should catch students' eyes from the beginning. In the classroom, teachers should not only teach basic knowledge points and related proofs, but also link the complex variable function with integral transformation and various disciplines. For example, the application of analytic functions in plane vectors field problems and the application of complex potential functions in physics, the application of conformal mapping in electric field and so on. In communication engineering, Fourier transform and Laplace transform can transform differential equations into elementary equations to solve, especially students majoring in computer science can try to use matlab programming to realize Fourier transform and Laplace transform, so as to connect their major with this course. In teaching activities, teachers should always take students as the main body and play the role of a needle. Only when teachers and students interact can they stimulate students' interest in learning.

The teaching method of teachers is a key factor to determine the classroom efficiency. First of all, the language of teachers' explanation should be reasonable and concise; According to the content of the lecture, the speed of speaking should be adjusted according to the students' understanding, leaving students with a certain process control of thinking and digestion; The intonation should highlight the corresponding key and difficult points; In the process of teaching, teachers can appropriately introduce the deeds of relevant scientists and encourage students to constantly overcome difficulties and overcome themselves. Good blackboard writing can effectively highlight the core teaching content, reflect the clear thinking of problem solving, and also help students take notes and use both hands and brain to achieve good teaching effect.

2.3 How to Continue Learning Interest after Class

Maintaining the same enthusiasm for learning after class is the key to learning a course well. First of all, exercise after class is a very important part of the learning process. Through carefully prepared exercises, such as adding some related problems that can be solved with the content learned in class and closely combined with practice, students can fully understand the blind spots, difficulties and practical applications in learning; Students can summarize and refine relevant knowledge points and chapters through precise exercises and teachers' combing and explanation. Secondly, the function of complex variable and integral transformation usually take the final examination result as the main basis for the final score, so most students only pay attention to the paper score, ignoring the use of the nature of the course in professional courses. In order to solve the shortage of a single assessment method, we include the students' usual learning process into the assessment: first, after class, we use the website platform to present the content that cannot be

presented in the classroom, such as the stories of many famous mathematicians, the practical application of complex variable functions in different projects, and so on, so that students can learn online through the network platform, so as to broaden the scope of learning; The second is to incorporate students' performance and cooperation in the classroom into the process assessment, accumulate classroom points, and improve students' participation in the classroom, so as to achieve better learning results.

For a course, different teaching methods of teachers will produce different classroom effects. More importantly, as the main body of the classroom, students' learning style will also have a significant impact on the classroom effect. In addition to the careful preparation before class, the smooth teaching in class and the teaching reflection after class, it is also very necessary for teachers to give a good lesson. Reflect on the teaching philosophy and methods, teaching methods, and deficiencies in the teaching process, and constantly improve, so as to improve the teaching level.

3. Research Significance

Mathematics curriculum not only has knowledge, ideas and methods, but also contains rich cultural connotation. The formation of any subject concept is completed through the efforts of one or even several generations, including complex variable function and integral transformation. In the process of teaching, teachers can appropriately introduce the deeds of relevant scientists and encourage students to constantly overcome difficulties and overcome themselves. For example, when learning the Cauchy cussa theorem, it was introduced that scientist Cauchy also studied hard in turbulent times. When reviewing Euler's formula, it was introduced that Euler was blind and still insisted on the spirit of mathematical research for 17 years. Let students realize in the process of learning that whether in life or scientific research, the environment is not always satisfactory, and they will always encounter various setbacks and difficulties. We must have a strong heart to overcome difficulties and overcome ourselves.

4. Conclusion

Teaching is inseparable from teachers' teaching and students' learning. This paper mainly studies three aspects in the learning of complex variable function and integral transformation: how to prepare well before class, how to raise interest in class, and how to continue learning interest after class, so as to stimulate students' learning enthusiasm for the course of complex variable function and integral transformation, develop good learning habits, and further improve their academic performance. When students can cooperate with teachers to actively complete relevant tasks in three aspects: before class, during class and after class, the enthusiasm of students to participate in the classroom will be greatly improved, and the pass rate will also be greatly improved.

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