Several Problems in Multimedia Technology in Advanced Mathematics Teaching

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Abstract: The application of multimedia technology in advanced mathematics teaching has become a tendency, and it meets with some dispute during the process of application. In this article, we will analyse the position and superiority of multimedia technology in advanced mathematics teaching, and traditional teaching and traditional teaching. Besides, we will also study the problems about how to make the proper application of multimedia technology in advanced mathematics teaching

Keywords: Advanced mathematics; Multimedia technology, Auxiliary teaching.

I. Introduction

Along with the development of the computer software and hardware technology, multimedia technology with its unique charm is widely used in the teaching platform, it integrates clear images, authoritative characters, rich colors, graphics, audio-visual, animation, etc. into one, and makes the mediatechnology as cognitive tools for learners and the tools to change teaching methods for teachers, impacting on the traditional teaching model. However, excessive use of multimedia in recent years has caused many disputes. Huisheng-Guan who is the expert of Steering Committee in Ministry of Education in the computer curriculum said "Consecutive four-year slide teaching has seriously caused students’ visual fatigue ... ...” particularly, there are constant computes after introducing the multimedia technology in advanced mathematics teaching. Through questionnaire investigation and discussion to our students, we have found some problems in application of multimedia technology. Therefore, we have always been studying how to understand the position of multimedia technology in advanced mathematics teaching, and how to make the proper application of multimedia technology in teaching. We are going to examine issues within the new frontier of integrating technology into mathematics education. We present an approach on how to teach mathematics courses by integrating meaningful multimedia technology to foster the learning process.

II. The Course Content And Features Of Advanced Mathematics Show That Multimedia Technology Is Only An Auxiliary Means Of Teaching

Advanced Mathematics is an important basic course for the colleges of science and engineering, finance and economics etc. non-mathematics. It includes Functions, Limits and Continuity, The Derivative, The Integration, ordinary differential equation, Vectors and Analytic Geometry, Derivatives, Integration and Series, with the level of knowledge increasing in order and linking together. The goal of mathematics teaching is to train students’ thinking ability and analytical ability to the phenomenon using mathematical tools. It emphasizes to master the important basic concepts, the basic operations, and focus on the application of theoretical knowledge. It provides basic knowledge and skills to otherprofessional education, while different specialties needdifferent mathematical tools and application methods. Conversely, other professional content guide the idea and thescientific method of the study in Advanced Mathematics, and deepen the Advanced Mathematics. We will improving the teaching effectiveness only if we study characteristics of the course carefully and do not use multimedia teaching blindly.

Advanced Mathematics is the classical theory, and it has formed the mature systems theory and the customary teaching style. The teaching process is used to the design ideas that we train solving techniques from theoretical discussion and theorem formula verify, according to the established method.

Through the necessary training of abstraction, logic, and application, students will be gradually trained to use mathematical ideas and methods to solve practical problems. However, the traditional deduction can not be replaced by multimedia teaching, which set up layers of doubt, inspiring and guiding, then a little bit of showing thinking.

Teaching is the process of emotional communication, teacher's language, expressions, gestures, and body language can greatly act emotions of the students. Teacher’s, eyes, expressions, posture, gestures can affect mood and attitude of students, then hint and infect the mood of the students, these are helpful to teaching information acquisition, processing and storage, and can stimulate the students motivation to learn. Through the responses of students in teaching, we give students prompt timely, or make the necessary
guidance, this two-way communication process is essential to teaching. These are multimedia technology
can not match.

Reasonable and standard writing on the blackboard can promote students to receive knowledge; it
can also encourage students to develop good study habits and rigorous style of work. Teacher’s handsome
fonts, smooth handwritten symbols, the elegant mapping is a good example of students to learn. But the
mathematical operations and assessment process are completed in the paper finally. These subtle actions can
not be exhibited in the multimedia teaching process. Therefore, multimedia technology is only teaching aids,
the excessive use of multimedia will weaken the thought and practical ability of students. The aim of using
multimedia is to fill up a deficiency of traditional teaching aids, and makes teachers playing a leading role.

III. Multimedia Technology In Higher Mathematics Teaching Compared With Traditional
Teaching

A. The advantages of multimedia teaching

Multimedia teaching has expanded the amount of knowledge and information in the classroom, and
also has improved teaching efficiency. Teachers can design beforeclass, and make the most of teaching
contents into the courseware, so that the teacher in the classroom save a lot of time and effort writing on the
blackboard. For example, when explain the definite integral, the definition account for halfpages in
length, the teacher should take up a lot of time writing on the blackboard[5]. However, we can achieve its
effect through one page using PowerPoint courseware. It saves time and strength which pay on writing on the
blackboard. Teachers can make great effort to explain. It not only wins the valuable class time, but also
allows time for a better communication and discussion between teachers and students, and teaching more
content within the limited time, so the teaching process is easy and efficient[1].

The strong function of graphics and animation. Lots of graphics are used in advanced mathematics.
Some certification process also requires the combination of digits and graphics. Some graphics are hard to be
drawn on the blackboard. Or because of the limitation of time and writing on the blackboard, graphics may not
be drawn according to standards. But multimedia technology is able to show various graphics visually and
intuitively, and even the formation of the geometry. So the multimedia technology has many image display
functions that can not be compared with the traditional teaching. For example, we will use the graphics of
space curve and space surface in multi-function calculus, curve and surface integral. For another example,
function of the power series expansion and Fourierseries need the help of graphics. Especially in analytic
geometry,

geometry enclosed by rotate surface or space curved can be perfectly showed through animation.
Multimedia courseware is illustrated, accurately and intuitively, easy to understand, and increases vivid
feeling of the classroom. And then, it attracts more attention of students, and greatly stimulates the positivity
and initiative of the students’ ability of thinking.

Super link function. If requiring knowledge in front as a prelude before introduction of new concepts
or new theorems are given, or in mathematics proof, multimedia courseware can be switched to the relevant
chapters by means of hyperlinks. At exercise class, by using the function of multimedia hyperlinks, we can
connect the important concepts, typical examples into a network structure, make the various knowledge
points to form a whole system, and master the relationship between the preceding and the following. This is
unmatched by writing on the blackboard.

Combination with mathematical software, it is convenient for mathematical modeling and numerical
analysis, and developing students’ ability to innovate. Combining mathematical knowledge and their
professional, through using mathematical software, we can build up students’ interest in learning and
motivation, and improve students’ ability of mathematical modeling and using computer to solve the problems
of mathematical modeling.

B. The advantages of traditional teaching

It is convenient for the teaching interaction and emotional communication. By observing students’
face lectures, teachers can understand the students’ mastery of knowledge, with auxiliary simple question to
examine whether students understand fully. Two-way communication and interaction make the teaching
content coordinated with classroom atmosphere.

It is easy to control the rhythm of teaching. Teachers explaining as writing, students will have
enough time to think. It allows students to think synchronously with writing on the blackboard and follow the
teacher’s ideas[2], ensuring students’ thinking continuously.

The process of explanation is flexible. In the process of explanation, teachers can change methods
properly according to the students’ reaction[3]. From a sudden inspiration in teaching, teachers can play
timely. In particular, because of strong correlation of every chapter in advanced mathematics, teachers can
extract knowledge points to illustrate the problems flexibly. For example, when explaining the Fourier series, we choose special point to take into number, and obtain convergent sum of constant term series. Flexible teaching will make classroom lively.

C. Using the multimedia technology reasonably to improve teaching quality

Select the appropriate knowledge points. The mathematicsteacher is supposed to have a deep understanding of subject and content of the courseware, and pick the proper knowledge point during the courseware development. When explaining some contents, there will be a lot of text description, and with regard to some contents having to be written and be brushed immediately after writing, the advantages of multimedia will be fully reflected. For example, when explaining the definition of the second surface integral, the oriented surface, the introduction of projection, the introduction of the definition and the writing of the definition etc., it can fully show up the effect by using multimedia at one go. It will play a multiplier effect by selecting the appropriate knowledge points to use the multimedia rather than entirely depending on the multimedia, and will greatly improve the classroom effectiveness.

Combined with the traditional teaching methods, Themultimedia application is combined with the blackboard-writing. The blackboard has strong real performance and can be brushed immediately after writing and explaining, you can better control the teaching rhythm, so it has many advantages that can not bereplaced by multimedia courseware. As for the key and difficult points of the mathematics, except for the demonstration in the courseware, it needs further detailed explanation on the board, don't overlook the role of the blackboard and chalk. Furthermore, the use of multimedia should be combined with the body language. Teaching is a complex and delicate process, a flexible gesture or a favorable smile of the teacher will play a negligible role in enhancing the teaching effectiveness, and the form of appropriately using the body language and interactively posing in the teaching can active the class atmosphere and make up for the lack of multimedia teaching.

Focus on the innovation and extension of the multimedia technology. Only if developing and producing the excellent multimedia courseware can the modern educational technology give full play to the role in teaching, which requires teachers to be proficient in general computer operation, have solid mathematics knowledge and teaching skills, and combine multimedia technology with advanced mathematics teaching, so as to use the courseware to teach the students' knowledge accurately and effectively. As an extension of multimedia technology, by combining the multimedia technology with network technology to develop the virtual teaching system, which goes beyond the time and space constraints, you can browse the teaching community, download the courseware, and access to counseling and learning materials outside of the classroom teaching after class[1]. The electronic books of school library can also be connected to the network, in order to share information, enhance learning efficiency, and stimulate student interest and enthusiasm for learning, to play the role that traditional teaching cannot match.

In the national long-term education reform and development plan, it clearly pointed out that the higher education must adapt to the goals of national economic and social development, and regard the reform and innovation as a powerful force of the higher education development. Moreover, the reform and innovation of the university is bound to bring the innovative teaching methods. So apply the modern teaching methods to make the media technology and the course content, course structure, curriculum resources, curriculum implementation and other elements of mathematics form a harmonious and interactive organism, must able to play a huge advantage in Advanced Mathematics teaching and improving the teaching quality.

IV. Conclusion

The introduction of multimedia technology leads several problems in multimedia technology in advanced mathematics teaching, the needs of the new situation of social development, yet there is still a long way to go to put its potentials to full play as it has led to many challenges for both teachers and students and it has caused a lot of difficulties regarding teaching materials and methods, learning materials and styles, and the real integration of multimedia technology into English teaching in colleges’ classroom. Suggestions on making the bright prospect come true involve attaching more importance to teachers’ education and development, provoking students’ learning potential and triggering their initiatives, perfecting the integration of multi-media teaching and traditional classroom teaching, and setting up a practical and effective system of teaching evaluation and management.

References

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