
Challenges and Countermeasures of University Mathematics Education Under New Media Environment

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Abstract – With the development of information technology, new media has become an important platform for information communication in today's society. Due to the characteristics of new media technology, such as real-time, digitalization and interactivity, it has brought many challenges as well as positive influences on college students' mathematics education. This paper investigates the situation of new media-assisted teaching in yanbian university by means of questionnaire survey, analyzes the challenges faced by university mathematics education under the new media environment, and proposes countermeasures on this basis, highlighting the significance of new media-assisted teaching in the era. In order to promote the quality of college students' mathematics education in the new media environment, it provides a reference for teaching strategies.

Keywords – New Media, College Math Education, Survey Analysis, Challenges, Strategy.

I. INTRODUCTION

New media is a form of communication and media that provides information and entertainment to users by using digital technology, network technology and mobile technology, through channels such as Internet, wireless communication network and limited network, as well as terminals such as computers, mobile phones and digital TV sets. With large amount of information, rapid dissemination, rich content, rapid sharing, information and knowledge acquisition channels are characterized by diversified and rapid development. College students, especially those born in the 1990s, are the most extensive audience of new media. At present, new media has become one of the important channels for college students to receive information and acquire knowledge. Therefore, under the new media environment, traditional methods and carriers of university mathematics education have been greatly challenged ^[1].

II. INVESTIGATION AND ANALYSIS OF NEW MEDIA-ASSISTED TEACHING

In order to understand the influence of new media on contemporary college mathematics education, this paper takes yanbian university students as the research object to carry out a questionnaire survey on the current situation of college students' use of new media, the current situation of new media's use in teaching, and the influence of new media in teaching and learning. A total of 81 questionnaires were sent out on the questionnaire star platform, 81 of which were actually collected. The questionnaire data were intuitively presented in the form of tables in the questionnaire star, and the following conclusions were drawn through the analysis of the survey data.

1. Investigation and Analysis of College Students' use of New Media

According to the survey, 92.59% of college students with a general understanding of the new media, See TABLE 1, the popularity of electronic products laid a firm foundation for college students to use new media technology, new media is the important way of information for college students at the same time, among the

learning methods in the new media environment, autonomous learning through online courses takes the lead with a proportion of 77.78%. See TABLE 2. However, there are also some problems. 82.72% of the students' first reaction is to search with search engines when they encounter questions in the learning process. See TABLE 3. In the long run, the dependence on new media will reduce students' independent thinking ability.

Table 1. Survey statistics of new media understanding.

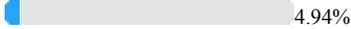
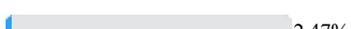
Option	Number	Proportion
A. Know very well	4	 4.94%
B. General understanding	75	 92.59%
C. Don't understand	2	 2.47%

Table 2. Survey statistics of learning styles in new media environment.

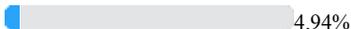
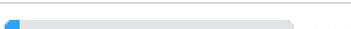
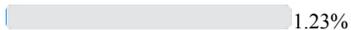
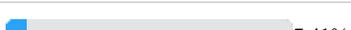
Option	Number	Proportion
A. Use your mobile phone to study	4	 4.94%
B. Independent learning through online courses	63	 77.78%
C. Watch learning blogs	4	 4.94%
D. All three are commonly used	10	 12.35%

Table 3. Survey statistics of solutions when in doubt.

Option	Number	Proportion
A. Search the library	1	 1.23%
B. Search with a search engine	67	 82.72%
C. Ask the teacher for advice	6	 7.41%
D. Post help on BBS and blog	2	 2.47%
E. Communicate with classmates	5	 6.17%

2. Investigation and Analysis of the use of new media in Teaching

According to the survey, 87.65% of teachers use new media for teaching in the teaching process, See TABLE 4. among which the main teaching tools are projector PPT and online video teaching, respectively reaching 95.06% and 69.14%. See TABLE 5. Meanwhile, the results of students' preferred learning style are shown in TABLE 6. More students choose traditional blackboard teaching, which shows that new media will face many challenges if they want to truly integrate into college education.

Table 4. Statistical data of whether teachers use new media for teaching.

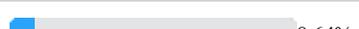
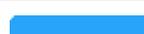
Option	Number	Proportion
A. Yes	71	 87.65%
B. Very little	7	 8.64%
C. No	3	 3.7%

Table 5. Survey statistics of teaching tools used by teachers.

Option	Number	Proportion
A. The projector plays PPT and so on	77	 95.06%
B. Online video teaching	56	 69.14%
C. Write teaching journal, blog regularly for students to ask questions and answer questions	18	 22.22%
D. Basic need not	3	 3.7%

Table 6. Survey statistics of teaching patterns.

Option	Number	Proportion
A. Traditional blackboard teaching	42	 51.85%
B. New media (demonstration software) teaching	39	 48.15%

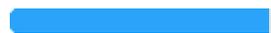
3. Investigation and analysis of the influence of new media in teaching and learning

According to the survey, 83.95% of the students think that new media provides general help for learning, and occasionally check some materials. See TABLE 7. New media provides college students with a variety of professional and non-professional knowledge, effectively expanding the scope of students' knowledge, and playing a positive role in the construction of students' reasonable knowledge structure, but there are also some disadvantages that cannot be ignored. See TABLE 8.

Table 7. Survey statistics of new media's help in learning.

Option	Number	Proportion
A. Very big, has become the mainstream way of self-study	10	 12.35%
B. Generally, look up some information occasionally	68	 83.95%
C. Hardly any help	2	 2.47%

Table 8. Survey and statistics on the disadvantages of new media-assisted teaching.

Option	Number	Proportion
A. Due to the dependence on new media, students' independent thinking and research ability are reduced and weakened.	74	 91.36%
B. The page-turning presentation of new media (such as PPT) may easily lead to incoherence in students' thinking and affect their understanding of learning content.	75	 92.59%
C. The rapid and convenient use of new media easily leads to the lack of time for students to connect with each other, hindering the construction of their knowledge system.	72	 88.89%
D. The teaching information of new media courseware of demonstration type is too large, students don't have too much time for independent thinking, they just passively accept it.	64	 79.01%

III. CHALLENGES FACED BY UNIVERSITY MATHEMATICS EDUCATION UNDER THE NEW MEDIA ENVIRONMENT

New media provides a wide variety of information knowledge, broadened horizons of the individual, the teachers' teaching way has changed greatly, thanks to its participatory, timeliness, fast speed, diversity, richness, and brings great convenience to the study life of college students at the same time, for the mathematics education of college students also poses a great challenge.

1. *From the Perspective of Teachers, the Sharing and Timeliness of new media Weaken the Authority of Teachers*

Traditional university mathematics education process, teachers as the leading of knowledge ^[2], is the principal part of teaching activities, students as the recipient of knowledge, to acquire knowledge and information is relatively single, just from the teacher taught in class or learned from books, so students have great respect for teachers and absolute trust, because this is the only source of information for them. With the progress and development of society and the arrival of new media technology era, new media provides students with all kinds of information. It can be said that students can find the answer to any question on the Internet. When teachers explain knowledge, they already know something ahead of time or they know more about it than what the teacher taught them. Therefore, teachers' previous status will be threatened. In teaching activities, students will not pay attention to the teacher or even follow the teacher's guidance because they have already known the answers to questions in advance.

2. *From the Perspective of Teaching, the Rapidity and Flexibility of new media reduce the Quality of Teaching*

When new media technology is gradually introduced into college mathematics education, it brings great convenience to teachers and basically gets rid of chalk and blackboard. In the process of mathematics teaching, teachers can use demonstration software (such as PPT) to demonstrate knowledge points. For abstract multidimensional geometric graphics, mathematical teaching software (geometric artboard, super artboard, GeoGebra, etc.) or mathematical software (MATLAB, etc.) can be used to demonstrate, so as to facilitate students' intuitive understanding; Some key points and difficult points can be clearly marked so that students can grasp the core of knowledge faster. There is no denying the positivity of these factors, but on the other hand, they also bring negative effects. Huang rong huai, professor and doctoral supervisor of Beijing normal university, said at the seminar, "the digital learning environment under the background of new media still focuses on supporting low-order cognitive goals such as 'recall, understanding and application', and is not conducive to cultivating higher-order cognitive goals such as 'analysis, evaluation and creation' of learners." The "piling up" of multimedia presents content hinders students' "digestion" of content ^[3]. Huang rong huai found that in teaching, teachers often simply present knowledge points in books or contents on the blackboard on teaching equipment, which leads to learners having no time to connect and compare knowledge, thus students' cognitive activities are easily hindered. At the same time, in the process of proving some mathematical theorems, the demonstration software presents the page-turning content, which directly shows the ideas and methods of proving, which is not conducive to students' thinking and solutions. In contrast, the process of deducing theorems and formulas by blackboard writing is easier for students to remember deeply. According to front-line teachers, they believe that the combination of traditional

teaching and blackboard writing can make students keep up with teachers' ideas in class. Therefore, in order to make students better learn and use their brains, they sometimes use the traditional chalk blackboard writing mode [4]. In addition, Teachers' familiarity, mastery, application and innovation of new media will affect the quality and effect of teaching. However, the speed of teachers' own development is far from keeping up with the pace of new media development. They have a weak awareness of new media and are poor in using technology.

3. From the Perspective of Students, the Diversity and Richness of new media Reduce Students' thinking Ability

The rapid development of new media technology has broadened the channels for individuals to receive information, expanded their knowledge field and broadened their horizon. The massive amount of information in the new media environment accelerates people's access to information. However, some college students are overly dependent on the new media environment. For example, when confronted with questions in the process of learning mathematics, most students first think of using search engines to search without thinking about the information provided. In the long run, students will gradually become more dependent on it, and more seriously, their independent thinking ability will gradually decline. Problems are the heart of mathematics, cultivating students' independent ability to solve mathematical problems is the core of mathematics education, and solving mathematical problems and students' independent thinking ability is inseparable, for example, Confucius thought that "learning without thinking is useless, thinking without learning is dangerous," more prominent in the supreme position of thinking in learning [5]. Just like the world-renowned French mathematician Descartes, he developed the habit of independent thinking at ordinary times, which enabled him to get inspiration from life when encountering problems, thus discovering the important tool of plane rectangular coordinate system. At the same time, there is a large amount of information on the Internet, we can not guarantee its reliability and accuracy, therefore, we blindly reference, may produce wrong judgment and ideas, which will bring negative impact on ourselves.

IV. INTEGRATE MULTIPLE TEACHING METHODS TO REALIZE THE DEVELOPMENT AND INNOVATION OF UNIVERSITY MATHEMATICS TEACHING METHODS

Combined with the challenges faced by college mathematics education under the new media environment, this paper explores the contemporary teaching methods and realizes the innovation of traditional college mathematics education strategies.

1. Establish and improve the online Mathematics Learning Platform to achieve Multi-function

The establishment of a multi-functional mathematics online learning platform is the key to the combination and application of the network and mathematics teaching. Students can not only learn mathematics through the online learning platform, but also interact with teachers online to timely solve difficult problems [6]. As classroom teaching is restricted by time and space, the utilization and management of college students' spare time becomes particularly critical. Mathematics online learning platform can not only make up for the shortcomings of classroom teaching but also extend and supplement extracurricular activities. Students can preview, summarize, review, communicate and reflect on the platform according to their own time. Teachers can also recommend relevant video websites and resources on the platform for students to help them have a deeper understanding of knowledge. In addition to the application of teaching platform, it can also set up after-class exercises and two-way interaction

of testing, so that students can complete teaching exercises, paperless tests and make a good summary of results.

2. The University Increases the Construction of new media Digital Resources

With the development of information technology, the rise of the Internet of things and cloud computing, big data comes into people's lives. We should make use of new media and big data technology to continuously enrich our teaching resources. Giving full play to the advantages of massive resource sharing, So as to make up for the limited and insufficient teaching resources of the school ^[7]. For example, the university mathematics teaching team will actively build its own MOOC course resources, carry out teaching design based on classroom cloud, and take teacher's comments and students' mutual comments into the final course scores. Since the content of college courses is more flexible than that of middle schools, the evaluation can be carried out from the aspects of students' thinking ability, application ability and innovation ability ^[8]. According to the ministry of education "undergraduate teaching quality assurance standards for ordinary institutions of higher learning", the training standards formulated by schools for talent training objectives can be targeted for evaluation. It reflects the diversification of evaluation methods and evaluation subjects. To examine students' ability of flexible application and analysis rather than rote memorization. At the same time, through the sharing of massive resources, students can have more options, so that students can flexibly improve their own mathematical knowledge structure.

3. Interspersing History Studies to Cultivate Students' Mathematical Spirit

Under the new media environment, the development of university mathematics education is quite different from that of traditional mathematics education. No matter the application of network resources or the diversity of methods, mathematics education has a new development and presents in a more novel way. It is more necessary for teachers to make a good change in thinking, so that the new media environment can facilitate the development of mathematics professional education and make the university mathematics professional education to a higher level ^[9]. In the teaching process, teachers can intersperse the explanation of the history of mathematics in a planned and purposeful way. It can not only break the routine boring theoretical knowledge class, but also enable students to discover the beauty of mathematics through in-depth understanding of the history of mathematics, so as to enhance their interest in mathematics. Traditional mathematics classroom focuses on the teaching of theory and knowledge, but ignores moral education and aesthetic education^[10]. With the rapid development of new media, in order to cultivate comprehensive talents with all-round development of morality, intelligence, physique, aesthetics and labor, the cultivation of students' core qualities in mathematics discipline has attracted wide attention. Through students' understanding of the history of mathematics, it can guide students to establish scientific consciousness and spirit, and help to cultivate students' ability of scientific research.

V. CONCLUSION

It is an inevitable trend for new media technology to enter university mathematics education, which is the requirement of digital economy era. However, in the process of teaching activities, there are many problems and challenges. If there is no correct coping strategy, new media technology cannot play a role in promoting, and will disrupt the normal teaching process and reduce the quality of classroom teaching, which is not conducive to the cultivation of professional talents in colleges and universities. Only by understanding and dealing with these challenges, can we give full play to the advantages of new media assisting college mathematics teaching, enhance the teaching effect of college mathematics classroom, and improve the teaching quality of college mathematics

classroom.

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