

Research on the Application of New Media Technology in College Physics Teaching

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Abstract: Physics is a basic subject with a high degree of abstraction, and it is an indispensable and important course for science and engineering majors in universities. College physics teaching is mainly concentrated in the classroom, yet, in the limited teaching time, students find it difficult to fully understand the relevant teaching content, which not only affects their follow-up study but also greatly hits the student's confidence in physics learning, thus, college physics teaching reform is imperative. This paper will briefly explain the relevant concepts of new media technology, then analyze the advantages of its application in college physics teaching, and finally explore the application strategies of new media technology in college physics teaching. This aims to improve the effect and quality of classroom teaching, improve students' physics learning ability and level, and enhance the core literacy of disciplines by integrating new media technology into college physics teaching, as well as to lay a solid foundation for the study of professional knowledge.

Keywords: New media technology; University physics; Teaching strategy

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1. Introduction

With the rapid development of information technology, new media has revitalized various industries and increasingly plays a key role in education, offering new directions and technical support for teaching reform. New media technology has the characteristics of interaction, effectiveness, and diversity. Integrating new media technology into classroom teaching is an important part of education modernization and an important trend of teaching reform. In college physics teaching, the use of new media technology in teaching can provide students with novel learning experiences, break the restriction of time and space, greatly improve the quality and efficiency of teaching, stimulate students' enthusiasm for physics learning, consolidate the grasp of physics knowledge, and play an important role in cultivating high-quality physics talents.

2. New media technology related concepts

With the continuous improvement of the level of social informatization, media technology ushered in a new

opportunity for development, thus new media came into being. It relies on a variety of emerging technologies such as digital technology, network technology, and mobile communication technology, and integrates the single function of traditional media in the past, to form an organic system to protect social information production and dissemination. The new media technology in the education industry mainly includes two aspects: the configuration of new media hardware facilities and the application ability of new media software. The former provides the corresponding material basis for teaching activities. Without the hardware conditions, the application of new media would be impossible^[1]. The latter not only puts forward higher requirements for teachers but also is a powerful driving force for them to improve their skills related to new media.

Therefore, the development of new media technology is of great significance to the transformation and upgrading of the traditional education industry. While carrying out teaching practice, we should conform to the trend of new media technology and seize its key to empower ourselves. On the one hand, we should deeply understand the development status quo and future trend of new media technology, and closely combine it with the development of the education industry. New media technology transcends the boundaries of time and space, links horizontal reality with vertical history, and provides a new vision for the development of the education industry. On the other hand, to improve the overall media literacy of teachers, the application of new media is not only reflected in the classroom but permeates all aspects of life. Only by fully grasping its essence can it play a positive role and contribute to the development of the education industry. A deep understanding of the connotation of the honeycomb growth of new media technology and combining it with the reform and development of the education sector will not only help to further stimulate the technology factor, but also improve the teaching level and teaching ability, to optimize the teaching results^[2].

3. The advantages of the application of new media technology in college physics teaching

3.1. Highlight the dominant position of students

Traditional physics teaching often takes the teacher as the main body and adopts the one-way knowledge teaching mode of “I talk, you listen; I write, you read.” Students passively accept the existing program set by the teacher, which is easy to cause the problem of solidified thinking. If this goes on for a long time, students will be lazy in thinking, completely passively accept the one-way input of external information, and have no way to take the initiative in the learning process. However, the interactivity, openness, and real-time of new media technology provide new conditions and means for the development of teaching practice, which is conducive to broadening students’ horizons, increasing their insight, and presenting them with a more diversified and richer physical world. Thus, in the learning process, students can think consciously and actively, and absorb new knowledge with critical thinking. Through new media technology, they realize their subject status while exerting their initiative, they can use advanced technological means as a learning tool to improve learning efficiency and lay the foundation^[3] for building a richer knowledge system^[3].

3.2. Create a good learning environment

Different from traditional physics teaching, the objectives of today’s physics learning can be vividly displayed through new media technology, and the visual and auditory feelings of students can be triggered by intuitive and vivid expressions, to better understand the relevant content. Compared with the fixed formulas in textbooks and on the blackboard, students need to feel the charm of physics itself and be able to take the

initiative to explore and learn. “An animated demonstration of the reflected routes of light” is more attractive than “a straight line with arrows” and students are more willing to go out of the textbook to dig into physics. In this kind of learning atmosphere, teachers and students can form a positive interaction, to create a relaxed and lively, serious learning environment. This is not only conducive to students’ learning but also conducive to the new physics classroom model ^[4]. New media technology not only provides material means for students’ physics learning but also stimulates their learning interest. Thus, they realize that the purpose of physics study is not only to get a high score on the exam but also to see the changes and development of the whole world through feeling the mystery of physics.

3.3. Enrich the classroom teaching mode

New media technology provides a means for the diversification of teaching modes, which is conducive to enriching teaching practice and enhancing the positive effect of physics teaching. While continuously carrying out innovative research, teachers actively explore the use of new media technology to reform the teaching mode. Based on fully reflecting and improving the traditional teaching mode, the diversified teaching mode is endowed with new connotations. Today’s world is changing rapidly, which contains rich physical connotations ^[5]. The traditional teaching mode tends to use text symbols to describe its physical principle, while the new media technology can demonstrate its production principle, formation process, and effect through sound, image, and animation. Teachers are no longer limited to the teaching mode of one-way communication but hope to stimulate students’ interest in active learning through new media technology and form efficient interaction between teachers and students. In specific teaching practice, it can not only enrich students’ physics knowledge but also improve teachers’ teaching ability. Therefore, new media technology is not only a means of classroom teaching transformation and upgrading but also provides a strong spiritual force for physics learning.

4. The application strategy analysis of new media technology in college physics teaching

4.1. Change teaching ideas and improve teachers’ information literacy

Traditional college physics teaching tends to use blackboard writing or simple electronic courseware for teaching. Some teachers lack the consciousness of innovation and are unwilling to leave their “comfort zone.” They still use the old teaching methods and do not pay enough attention to the application of new media technology. This also shows, to a certain extent, that some college physics teachers have low information literacy and lack the innovation consciousness and useability of new media technology. Therefore, colleges and universities should strengthen teacher training, change the old teaching ideas, deeply understand the essence and connotation of new media technology, and take the initiative to use and innovate new media technology in college physics teaching. At the level of teachers, they should establish the concept of new media teaching, consciously improve their ability to use new media technology, deeply integrate it into college physics teaching practice, and promote the digital transformation of college physics teaching ^[6]. For example, teachers should recognize the equality and openness of new media technology, and spontaneously innovate teaching links such as teacher-student interaction forms, teaching methods, and role positioning.

Colleges and universities should strengthen the training of teachers in new media technology teaching. Schools can set up special teaching courses on new media technology according to the teaching characteristics

and teaching needs of physics teachers, to help teachers systematically understand the basic principles of new media technology, explore the methods of different types of technology, and deeply understand the application of new media technology in the theoretical teaching and experimental teaching of college physics. Colleges and universities should strengthen the capital investment in the construction of new media hardware and software facilities, and provide sufficient equipment support for college physics teachers ^[7].

4.2. Innovate teaching methods to stimulate students' interest in learning

Flipped classroom is a newly emerging teaching model in recent years. Teachers upload teaching videos and relevant materials to the online teaching platform before class, so that students can learn by themselves according to their learning plan, time arrangement, and learning progress, and complete the learning tasks assigned by teachers. During classroom teaching, teachers focus on solving the problems and key knowledge encountered by students in the process of the preview. This form of teaching transfers the decision to the hands of students, fully respects the dominant position of students in the classroom, narrows the distance between teachers and students, and improves teaching efficiency.

In college physics teaching, on the one hand, teachers can briefly divide the knowledge points from textbooks, record six to eight minutes of videos according to the knowledge points, and upload them to the learning platform. At the same time, teachers can upload related teaching materials and lecture videos together to help students better understand the content of the videos ^[8]. On the other hand, students can study according to their own specific learning needs. There are a lot of abstract concepts and contents in college physics. In the face of a large number of students, classroom teaching cannot focus on teaching according to the specific weaknesses of each student. When students understand difficult situations, they can only rely on their understanding or ask after class, which will affect the learning effect and efficiency to some extent ^[9]. They can combine their knowledge blind spots and weak points and watch them repeatedly until they understand and master them. When they have questions, students can ask them by leaving messages on the Internet. Teachers should pay attention to students' dynamics at any time to answer them. They can collect more questions asked by students and explain them again in class, which not only improves teaching efficiency but also greatly reduces teachers' teaching pressure.

4.3. Enrich teaching methods and provide a novel learning experience

College physics has its unique abstractness and professionalism. When conducting theoretical teaching, teachers can introduce virtual reality technology, virtual enhancement technology, and other high and new technologies to implement multi-modal teaching. Through pictures, audio, models, and even virtual space, teachers can mobilize students' multiple senses, intuitively and vividly demonstrate relevant concepts and contents to students and deeply master theoretical knowledge. Colleges and universities can introduce virtual reality technology into college physics teaching by building virtual laboratories.

College physics theory teaching and experiment teaching are two closely related courses. Students only engage in theoretical instruction, and the sources for relevant experiments are limited to courseware and their imagination, which is insufficient for a comprehensive understanding. Through the virtual platform, students can watch physical experiments, summarize physical theoretical knowledge from the experiments, stimulate students' interest in learning, and fully mobilize their learning enthusiasm and initiative in the in-depth exploration of physical knowledge. The advantage of using virtual reality technology to demonstrate physical experiments for students is that it creates a simulated physical experiment scene for students, which can not

only allow students to watch closely in a safer environment but also try it by hand regardless of cost ^[10,11].

4.4. Integrate network resources to enrich classroom teaching content

When teachers teach students under the guidance of textbooks, they often take textbooks as the whole theoretical basis, but the knowledge in textbooks is limited. With the continuous change in students' learning needs, the limitations of textbooks are gradually highlighted. Teachers can make full use of the advantages of new media technology, give full play to the characteristics of large amount, strong timeliness, and high sharing of network resources, and integrate relevant materials on the network platform into classroom teaching as important teaching resources to enrich teaching content and broaden students' physical vision ^[12]. Teachers should strengthen the ability of network information integration, in the face of a large number of materials, can distinguish the true and false, and then choose the right content according to the teaching needs, to make up for the deficiencies in the teaching materials ^[13]. It should be noted that colleges and universities should avoid copyright issues when building online physical databases, schedule network information security of online resource platforms, and provide a stable and safe network environment for students ^[14].

5. Conclusion

To sum up, physics is an important subject that reflects the development and changes of the world. In today's ever-changing world, it has been given a higher level of tasks and connotations. College physics teachers should embrace the advent of the information technology era with a positive attitude, realize that the integration of new media technology into college physics teaching is of great significance in improving teaching quality, and make full use of new media technology to promote the optimization and upgrading of college physics teaching, to provide students with high-quality, efficient and high-level college physics theoretical teaching ^[15]. It is hoped that more physics talents with solid theoretical knowledge and practical ability can be cultivated.

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Zhang J, 2022, New Media Technology in The Application of the Physics Teaching in Colleges and Universities to Explore. *Science and Technology, the Wind*, 2022(19): 127–129.
- [2] Cheng D, 2019, Application of New Media Technology in College Physics teaching. *Heilongjiang Science*, 11(23): 90–91.
- [3] Guo Q, Wei D, Hou D, et al., 2020, A Preliminary Understanding of the Application of New Media Technology in College Education and Teaching. *Education and Teaching Forum*, 2020(39): 369–370.
- [4] Zhang C, 2021, The Application of New Media in College Physics Teaching. *Academy*, 14(33): 41–43.
- [5] Liang R, 2023, Exploration on the Reform of College Physics Teaching in the Era of Media Integration. *Guangxi Physics*, 44(04): 60–61 + 122.
- [6] Yin X, Liang Y, Tang Y, 2021, On the Effective Application of Multimedia Technology in College Physics Teaching.

New Curriculum Research, 2021(36): 26–27.

- [7] Xiao X, Mao H, 2021, Innovative Application of Multimedia Technology in Physics Teaching in Colleges and Universities. *China High Tech*, 2021(21): 123–124.
- [8] Liu S, 2021, Exploration on the Reform of College Physics Teaching in the Era of Media Convergence. *Questions and Research*, 2021(25): 101–102.
- [9] Li Y, 2020, Analysis on the Influence of New Media on the Teaching Mode of Physics Education in Colleges and Universities. *Modern Vocational Education*, 2020(32): 178–179.
- [10] Yao X, 2019, Discussion on the Influence of New Media on the Teaching Mode of College Physics Education. *Journal of Jiangxi Electric Power Vocational and Technical College*, 32(04): 61–62.
- [11] Zhang J, 2024, Exploration and Practice of College Physics Teaching Reform under New Media Environment. *News Research Guide*, 15(03): 142–144.
- [12] Yang R, 2022, The Mixed Teaching Reform of College Physics in the Era of Internet +. *China Education Innovation (Beijing) Culture Media Co., LTD., China Global Culture Press, Proceedings of the 2022 Modern Education Curriculum Construction and Teaching Reform Forum (2), Daqing Normal University.*
- [13] Liu X, 2022, Analysis on the Reform of College Physics Teaching under the Background of “Internet Plus.” *Journal of Yanbian University of Education*, 36(03): 103–105.
- [14] Xu X, 2019, Analysis of the Impact of New Media on the Teaching Mode of Physics Experiment Education in Universities. *Think Tank Times*, 2019(17): 89–90.
- [15] Jiang F, Wu J, Feng X, et al., 2024, Exploration and Practice of University Physics Experiment and Simulation Virtual Teaching and Research Room under the Background of “Internet +.” *The Wind Science and Technology*, 2024(13): 140–142.

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