

Application of Physics Education Information Based on the Concept of Core Literacy

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Abstract: With the promotion and implementation of the new educational reform in the new period, new requirements are put forward for the cultivation of students' core literacy. In the reform, information should be applied to physics education as an important measure to cultivate college students' core literacy. This paper expounds the application of domestic and foreign informatization in physics education, and explores the significance and effective measures of physical education informatization based on the concept of core literacy.

1. Introduction

Since the 21st century, with the rapid development of information science and technology, information technology is subtly influencing and changing the current way of education today. The development and application of information technology plays a role in promoting education reform and innovation, and promotes the construction of scientific, digital and humanization of education system. Apply information to physics teaching, innovate teaching methods, enrich teaching content, take information technology as the driving force to cultivate innovative talents, and help cultivate the educational goal of cultivating students' innovative spirit to be implemented. As an important educational goal in China's new talent training strategy, core literacy requires emphasis on cultivating students' judgment ability, analysis ability and problem solving ability on the premise of students mastering basic knowledge. Under the background of all-inclusive information, how to improve students' core literacy in physics classroom teaching has become a new problem under the background of the new educational reform in the new era. According to his own physics classroom teaching practice, the author analyzes how to cultivate students' core literacy in the process of physics classroom teaching through information means, and points out the corresponding measures.

2. Research background elaboration

2.1 The application and exploration of informatization in teaching

In some foreign developed countries, the development of information technology is relatively advanced, the popularization speed is relatively fast, and the awareness of the important role of information technology in teaching is early.

The United States is the first country in the world to realize education informatization. Since the 1990s, the US government has begun to attach importance to the role of informatization in education. In the 1990s, the British government adopted information technology courses in

information education, and this course was popularized among the compulsory courses in British primary and secondary schools.

In China, the rise and popularization of the Internet are relatively lagging behind, and the integrated development of information technology and education started late. With the promulgation of the Outline of Basic Education Curriculum Reform in 2001, the real application of information technology and education and teaching are clearly pointed out in the document that the application of information technology in the field of education should be popularized by the help of the unique advantages of information technology. Since then, all disciplines have begun to explore the integration and development of information technology and disciplines, among which physics has especially benefited a lot. Under the background of the new educational reform guided by the Outline of the National Medium-and Long-term Education Reform and Development Plan (2010-2020), based on the concept of core literacy education, the subject of university physics education informatization has been paid wide attention, and the exploration of this topic is in full swing.

2.2 Analysis of the status quo of core literacy at home and abroad

2.2.1 Research on core EU literacy

Core literacy and lifelong learning strategy are the two basic points of the EU's education plans and policies after the 21st century. In 2006, the European Council passed a proposal on core literacy. The subject of core literacy in the EU consists of eight core literacy, such as active literacy and cultural literacy, which is described from the three dimensions of knowledge, skill and attitude. The eu's education and training policies and programs have a unified "top-level design".

2.2.2 The Australian Core Literacy Study

Since the '2080s, Australia has launched its largest education curriculum reform. The Melbourne Declaration provides strategic thinking and overall goals for the future of education in Australia, summarizing seven general competencies and three interdisciplinary themes.

2.2.3 Research on core literacy in other countries

In 2004, Finland incorporated the concept of "Core Literacy" into the National Core Curriculum for Basic Education. In 2007, the New Zealand Ministry of Education issued a draft curriculum, which proposed that basic values education should be integrated into the teaching of all disciplines in the school. In 2010, the Singapore Ministry of Education released the "21st Century Literacy Framework" for Singapore students.

2.2.4 Research on core literacy in China

With the introduction of the Core Literacy of Chinese Students (Draft), the development of students' core literacy has become the most concerned topic in education. According to the Opinions on Comprehensively Deepening the Curriculum Reform issued by the Ministry of Education, six core qualities of students have been determined through research, including 18 basic points. Based on the characteristics of physics discipline, the concept of physics core literacy is expounded, which is the quality internalized by students with the nature of physics discipline through physics learning. The core literacy of physics discipline is composed of physical concept, scientific inquiry, scientific thinking, scientific attitude and responsibility.

3. The integration of physics teaching in colleges and universities, so that the core literacy takes root

3.1 Characteristics of physics in teaching in colleges of higher learning

Physics has always been a major problem in the teaching of colleges and universities. The characteristics of physics in institutions of higher learning are high comprehensive ability, especially logical thinking ability, practical ability and analytical and reasoning ability, which bring certain challenges to the practical teaching of physics teachers to a certain extent. Physics of the main teaching goal is through the physics study, cultivate students' logical thinking ability, and can use physical knowledge to explain the physical phenomenon in life, physics compared with other subjects is difficult, but for university students is a significant subject.

The application of informatization in physics teaching has broadened the teaching method for physics teaching and brought new teaching ideas for physics teaching. Integrating information into physics teaching plays a vital role in improving the core quality of students' physics discipline, and lays a solid foundation for students to go to the society and better adapt to the society.

3.2 The important significance of informatization for cultivating physical core literacy

The integration of information and physics teaching is not only satisfied with the effective application of multimedia technology in the actual education process, but also should use the information platform to break through the difficulties and heavy problems in the traditional teaching, further enrich the classroom teaching, and improve the effectiveness of classroom teaching. Informatization undertakes the educational goal of cultivating the core quality of physics major in colleges and universities. Next, the article will combine the core quality of physics to explain the importance of integrating informatization into physics teaching in universities to cultivating students' core quality.

4. The implementation path of the information application of physical education based on the concept of core literacy

In the process of traditional physics teaching, physics knowledge and related principles in most cases is through the teacher "preaching" teaching method to students, in most cases do not need students to deep thinking, at the same time missed the opportunity to cultivate students' active thinking ability, in the university teaching classroom, "preaching" teaching mode is out of date, cannot adapt to the learning needs of college students. Based on this, the information should be integrated into the physics teaching of colleges and universities, innovate the physics teaching methods of colleges and universities, rely on the information teaching platform, carry out teaching in the form of education that leads to problems, create a good learning atmosphere for students to actively learn, and realize the teaching goal of improving students' core quality of physics.

4.1 Use information teaching resources to design situational teaching methods to cultivate students' physical concept and ability of core physical literacy.

The key to learning around the problem is that students can put forward relevant problems combined with the problem situation and build a problem system. The following teaching content will be built on the basis of providing reasonable problems for students. Therefore, teachers should make full use of the valuable educational resources on the Internet, set the problems reasonably, and carry out situational education according to the specific courses and students' knowledge mastery. First of all, the university physics relative to ordinary high school physics on the mastery of knowledge is

abstract, but because students to understand intuitive contact and master far greater than abstract things, so the teachers in the design situation problem, with the help of network resources, with more direct real examples and physics related practice application to complete the scheme design, more conducive to students directly analysis and understanding. Secondly, with the help of network resources, through science and technology, abstract knowledge points can be designed for students to analyze and understand the principle of intuitively. Third, college students on social hot issues, network new things has a strong interest, so the teacher in the design problem to choose the recent social hot spots, the most cutting-edge science and technology scenario problem design, play to the role of network resources maximization, stimulate the enthusiasm of students learning physics, promote students' learning initiative. Third, due to the differences in students' ability to understand and analyze problems, teachers should choose the content that most students can accept when designing the level depth of situational problems, and follow the principle of multimodal style in the display method of situational problems. The invariable display method will bring students a sense of boredom. For example, when learning "Dynamics", teachers can make full use of the way of animation display to show the electromagnetic phenomenon and the law of operation work, so that students can better understand the abstract physical phenomena.

4.2 Use information-based teaching means to deepen teaching guidance and cultivate students' scientific inquiry and thinking ability of physical core literacy.

Situational problem learning emphasizes the main learning position of students, but this does not mean that teachers can "ignore", leave the classroom to students to play, teachers should play the role of "guide". Students often study physics, usually the questions raised in class are not all need group discussion, do not pay attention to the summary of physical knowledge. Therefore, teachers should reasonably use information teaching means, deepen teaching guidance, and cultivate students' scientific inquiry ability. First of all, the students design scenario process, is the process of students to explore knowledge, but also the process of students build self knowledge system, teachers should give students enough time to think, simple use of classroom time is obviously not enough, teachers can take relevant learning materials through class WeChat group, class, class public number, let students preview in advance, to lay a good foundation for efficient classroom. Secondly, when students have group discussions, they should not only stay on the surface of the problem. Teachers should guide students to search for the information related to the knowledge with the help of the information platform, and further summarize the knowledge after the effective extraction and screening of the information. Third, when students report and display their learning results, teachers can guide students to use the form of mind map to display, so that teachers can help students to sort out and supplement the knowledge points more intuitively.

4.3 Use the information platform to innovate the teaching evaluation, and cultivate the students' scientific attitude and responsibility ability of physical core literacy

Different from the traditional evaluation method of achievement determination, problem-based teaching pays more attention to students' mastery of physics knowledge and pays more attention to the cultivation of students' core literacy. Entering the university class, students' attitude towards learning lacks the sense of urgency in high school, their overall attitude is lax, and their thirst for knowledge is also reduced. As university teachers, they should make full use of the information platform, observe the learning situation of students in the form of dynamic development through innovative teaching evaluation means, and implement the educational evaluation means in the whole process of students' learning, so as to mobilize the enthusiasm of students in learning physics courses. For example: in the actual classroom teaching, teachers can use the cloud platform intelligent system, statistics students

learning resource utilization, group discussion participation, personal questions, problem solving information, so that teachers can to students learning situation and to master the knowledge evaluation, evaluation results as an important reference for subject evaluation. Another example: teachers can put the homework into the cloud platform system, and evaluate the homework in the way of group mutual evaluation, so that students can find their own learning shortcomings through mutual evaluation, and then stimulate students to learn physics knowledge in a disguised way.

5. Conclusions

Under the background of core literacy, the application of physics teaching informatization not only improves the teaching efficiency, but also enriches the teaching content, and plays a decisive role in the formation of college students' core literacy. For students, the fear of learning university physics is eliminated, and students can participate in the actual classroom learning with a thirst for knowledge. However, as far as the current actual situation looks, it is still difficult, the application of information and the university physics teaching work has a long way to go, still need our university physics teachers to continue to summarize and explore.

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