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EXPLORATION OF METHODS OF APPLICATION OF MODERN ELECTRONIC INFORMATION TECHNOLOGIES IN THE TEACHING OF THE SUBJECT "BASICS OF PHYSICS"

ИССЛЕДОВАНИЕ МЕТОДОВ ПРИМЕНЕНИЯ СОВРЕМЕННЫХ ЭЛЕКТРОННЫХ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ В ПРЕПОДАВАНИИ ПРЕДМЕТА «ОСНОВЫ ФИЗИКИ»

Abstract. This study explores the use of electronic information technology in the subject "Basics of Physics" and the development of an "online and offline hybrid teaching model" organization and implementation plan.

Аннотация. В данном исследовании исследуется использование электронных информационных технологий по предмету «Основы физики», а также разработка плана организации и реализации «гибридной онлайн- и офлайн-модели обучения».

Keywords: Educational Technology, Modern Information and Communication Technology, Teaching Model, Educational Reform, Physics

1. Advantages of electronic information technology

"Basics of Physics" introduces students to many definitions and principles related to natural phenomena. Describes visible and invisible physical phenomena in nature and teaches students to view the world from a scientific perspective. However, teachers have not made it possible until now when they explain these theories of knowledge. They often lack appropriate resources to help students understand content closely related to images, sounds, etc., which often delays course progress [1]. Teachers use electronic information technology Physics teachers can freely show students amazing physical phenomena and analyze physical laws from different angles according to teaching needs. Allow students to gain more knowledge at the same time and learn more over time.

2. Application direction

The first is experimental research. Electronic information technology has changed the traditional education model and created necessary conditions for the

development of modern educational technology. For example, in the "Brownian Motion" class, the teacher conducts long-term experiments for students. Students not only have to do a lot of preparation work before class, but also electronic information technology must also be used to create experiments, which requires an experimental process [2]. This will help students understand "What is Brownian motion?" quickly and clearly.

The second option is to study independently. Physics teachers can consider supplementary knowledge texts as one aspect of helping students harness the power of new technologies in their own review processes (e.g., when reviewing subject knowledge). "Electromagnetism" teachers can prepare short video lectures for students in advance, a video collection that explains how to apply electromagnetic knowledge.

The third point is the expansion of classroom teaching. Using electronic information technology, physics teachers can also start to create online learning platforms to extend the educational benefits of modern technology to all areas of students' lives and help students discover new physics learning content.

3. Organization and implementation plan of hybrid teaching model

Based on the teaching characteristics of "Basics of Physics" in colleges and universities, this study analyzes the students' situation and formulates teaching plans and teaching points. The following learning formats are designed: Teachers focus on the diverse independent learning of each student. Teachers pay equal attention to theory and practice, and students use various online media resources for learning. Includes electronic textbooks, audiovisual media, and other online media. Teachers play an active role in guiding, supporting and promoting student learning [3]. The model requires students to make informed choices from a variety of available resources, and this study will conduct a variety of original research for each chapter. Groups work together to discuss and create an overview of each stage of learning, summarizing the key points and questions of the chapter, taking detailed notes on difficult knowledge points, and with this in mind, perform assigned tasks carefully and independently.

This study introduces offline and online hybrid teaching models, and how to implement the small-project modular experimental teaching reform action plan and its modular teaching reform based on modern educational technology. This is mainly reflected in the teaching of theoretical courses, including the use of specific methods before, during and after class (Figure 1.1).

Implementation Plan of the "Basics of Physics" Subject

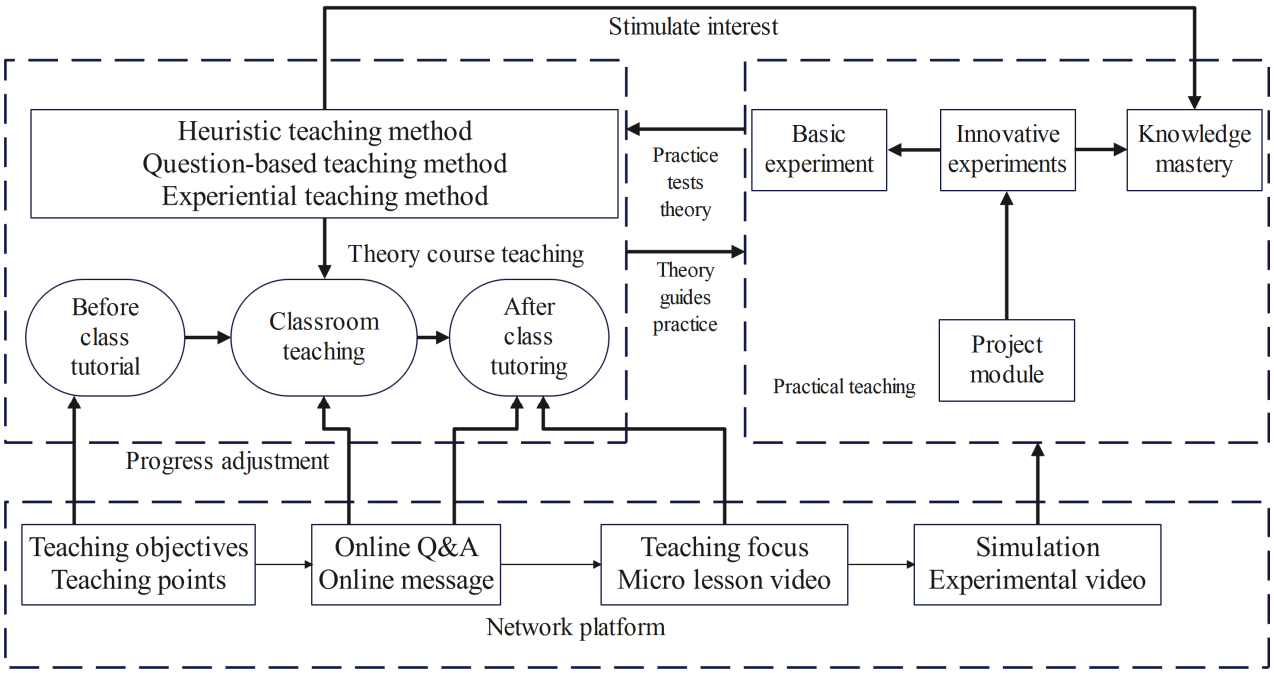

Figure 1.1 –"Basics of Physics" subject teaching model reform plan

The figure above illustrates how educational reform is implemented, "Theoretical Topics Divided into Subtopics" Details:

First, the before class preview session. Pre-class teachers will distribute the preparation materials for this unit before each class. They will also convert the learning objectives, lesson plans, and key and difficult teaching points into micro videos and multimedia, and then forward them to their students through the online platform. During class, teachers can focus on the content of each module and provide an overview before class, asking specific questions to help students participate in class, improve concentration and start learning to help their students improve their performance in class.

The second is review after class. After teaching the course each week, the teacher will post review content after class for that week. This content contains educational points, primarily providing exercises and homework after school. This provides necessary supplementary explanations of course content to further consolidate and refine the learning content. Students' ability to apply learned knowledge and use knowledge to solve problems can help students identify and close gaps and provide knowledge background. In addition, students can also use the review function of the online education platform to collect and retain knowledge points [4]. After completing each chapter, the teacher will publish an analysis of the key points and difficulties in teaching the lesson. And create mini lectures to analyze important and difficult issues in detail. Students

can watch it several times and then go home and leave messages to ask questions. Teachers can give problem-centered answers to questions that have been asked many times, focusing on detailed answers.

The third class is a review class after the course. We provide feedback on questions and answers and adjust the pace. In traditional education, answering questions may not be practical due to time and space constraints. Create an after-class discussion forum where students can share their thoughts and questions with the teacher at any time. Teachers can answer students' learning questions and other students at any time through the online platform, and frequently asked questions can also be shared. Teachers can also adjust lesson plans in a timely manner based on students' feedback and information, depending on the course time, effectively utilizing students' free time and maximizing students' advantageous position in the education process [5]. The new teaching model is student-oriented, teacher-student interaction and mutual teaching, which helps to improve the quality of teaching.

4. Application method

The first is to optimize experimental teaching. When teaching the "Spring Oscillator" part, physics teachers can use "DIS Experimental Technology" to demonstrate physical laws, allowing students to free their hands when observing experimental phenomena without having to rush to record experimental data, so they can view it in class at any time data content.

The second is mixed mode classroom teaching. When assigning pre-study tasks to students, physics teachers can provide a variety of pre-study plans and reasonably divide the content that students need to learn by themselves into several small videos or several short "PPT" files.

To sum up, in today's era when information-based teaching methods are constantly updated and enriched, electronic information technology can bring many new excitements to college physics classroom teaching. When physics teachers apply electronic information technology, they can focus on experimental inquiry learning, review courses and extended learning, and use "DIS Optimized Experiment" teaching to innovate teaching methods to ensure that teaching is reasonable and appropriate based on reality.

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