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Application of Smart Classroom Teaching Mode in University Financial Engineering Classroom

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Abstract: The traditional teaching model has struggled to meet the needs of talent cultivation in the new era. As a comprehensive course, financial engineering requires more teaching model reforms to improve teaching quality and students' professional literacy. The smart classroom education model, a product of modern educational informatization, has brought new development opportunities for financial course teaching in colleges and universities. Based on this, this paper mainly discusses the construction and application of smart classrooms for financial engineering in colleges and universities, hoping to provide useful references for relevant educators.

Keywords: Smart classroom; Colleges and universities; Financial engineering

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1. Introduction

In 2022, the Ministry of Education explicitly stated the need to actively explore new mechanisms for the integrated development of information technology, intelligent technology, and education-teaching, and to deeply promote the construction of "smart classrooms". As a new teaching model based on advanced information technology, smart classrooms rely on technologies such as the Internet and cloud computing to advance the intelligent development of education-teaching, thereby improving the quality and efficiency of classroom instruction. In recent years, with the continuous deepening of educational reforms, the smart classroom teaching model has become a key research area for college educators and an important driving force for advancing educational reforms in higher education institutions.

2. Overview of smart classroom

2.1. Concept of smart classroom

The smart classroom is distinct from traditional classroom models. Some scholars, from an educational perspective, argue that the essence of education lies in cultivating students' qualities and comprehensive abilities, with a focus on reforming teaching content to develop students' critical thinking skills—that is,

enhancing students' wisdom as the goal of teaching work [1]. Another group of scholars, from the perspective of informatization, believes that the core of teaching reform lies in the form and means of teaching to achieve intelligent teaching. These two perspectives complement and depend on each other. Building a smart classroom based on modern information technology provides a platform for the reform of teaching content while also realizing the intelligent transformation of teaching.

2.2. Smart classroom model

The construction of a smart learning environment is not only a crucial foundation for implementing smart education but also a core link in cultivating talents with critical thinking and innovative abilities. Guided by the concept of smart education, smart classrooms are dedicated to fully stimulating students' subjective initiative through diverse teaching strategies [2]. In classroom learning, students can continuously explore their potential, flexibly apply knowledge, and expand their wisdom through exploration and practice, achieving the internalization of knowledge and the improvement of abilities. In this process, teachers must first create a smart learning environment, integrate various digital resources, actively innovate teaching methods, help students solidly master knowledge, enhance practical and innovative abilities, and grow into composite talents meeting the needs of social development.

2.3. Innovations of the smart classroom

Although both smart classrooms and traditional classrooms take knowledge transmission as the foundation of teaching activities, they fundamentally differ in teaching objectives. Traditional classrooms focus on knowledge transfer, while smart classrooms focus on students' long-term development, aiming to cultivate thinking abilities, enhance wisdom levels, and promote students' all-around growth. To achieve this goal, teachers need to innovate teaching methods and use multiple teaching strategies to facilitate the transformation of knowledge into wisdom [3]. The rapid development of information technology provides technical support for the implementation of smart classrooms. Guided by the concept of smart classrooms, teachers integrate information technology into teaching, innovate in curriculum design, teaching platform construction, and other aspects, cultivate students' innovative spirit and critical thinking, help students cope with the challenges of the era, and achieve the coordinated development of individuals and society.

3. Elements of smart teaching

3.1. Teaching objectives

The core of constructing a smart teaching model lies in clarifying teaching objectives to drive multi-dimensional teaching innovations. In classroom teaching, teaching objectives guide the optimization and transformation of the teaching process. By analyzing the internal connections between internet information and classroom teaching, the re-mining of teaching value is achieved. At the same time, a smart teaching model is formed around three stages: pre-class, in-class, and after-class. In different teaching scenarios such as SPOC (Small Private Online Course) and flipped classrooms, these models learn from and develop synergistically with each other [4]. The optimization of classroom structure also revolves around teaching objectives. It is necessary to clearly define the roles and functions of teachers, students, and online learning resources, and build an organic integration of online and offline teaching ecosystems. The innovation of classroom structure and the reconstruction of teaching processes are both guided by teaching objectives, exploring effective ways to integrate information technology into classroom teaching,

establishing practical teaching models, and promoting the implementation of smart teaching models.

3.2. Teaching subjects

In the traditional teaching model, the main subjects of teaching are primarily students or teachers. The "cramming" teaching model has led to dilemmas such as reduced student interest in learning and painful teaching experiences for teachers. Smart teaching defines the teaching subjects as a three-element composite subject of "teachers + students + smart systems". Based on opening up a shared platform for teaching resources and facilities, interactions between teachers and students have become more frequent. The development of smart teaching has enabled teachers to become the leaders and guides of the classroom, respecting individual differences among students in the teaching process, enriching teaching content, and innovating teaching models. At the same time, smart teaching can awaken students' subjective awareness. Students can cooperate with teachers' arrangements, use smart platforms to exert their initiative, and adjust their learning status [5]. The smart system serves as a bridge connecting students and teachers, capable of monitoring teaching conditions and providing personalized learning plans for students. The three-element subject of "teachers + students + smart systems" complements each other and forms the core force for the establishment and application of the smart teaching model.

3.3. Teaching platforms

To build a smart teaching platform, systematic evaluation and screening of learning platforms and teaching aids are required. For mainstream learning platforms such as the Excellent Course Alliance, iCourse, and China University MOOC, evaluation dimensions including intelligent management, precise learning situation analysis, and flexible interaction should be used to select learning support platforms that align with teaching standards [6]. For big data personalized teaching systems such as Zhixue Network and Xuexitong, as well as smart teaching aids like Lanmoyun Class Mobile Teaching Assistant, teaching aids suitable for online-offline hybrid teaching models should be selected based on the diversity of service functions and the functionality of functional modules. Using these high-quality resources as a foundation and relying on artificial intelligence and big data technologies, a new type of teaching hardware and software support system for colleges and universities should be built. This system should feature intelligence, precision, and personalization, integrate physical and virtual classrooms, and empower the implementation of smart teaching.

4. Application status of smart classrooms in financial engineering courses

4.1. Specific discipline "4+N" characteristics of smart classrooms for financial engineering

Compared with traditional classroom teaching models, smart classrooms exhibit four common characteristics: data-driven scientific decision-making, real-time evaluation and feedback, three-dimensional communication and interaction, and intelligent resource delivery. Currently, research on smart classrooms focuses on constructing discipline-specific teaching models [7]. Due to differences in characteristics, teaching methods, and evaluation methods across disciplines, financial engineering courses have also developed personalized smart teaching models: leveraging diverse teaching resources (integrating text, images, and videos) to strengthen teaching content; using multimedia to present knowledge in rich media formats; creating immersive teaching scenarios; overcoming abstract concepts through modeling; and digitally implementing experimental processes to improve the accuracy and reproducibility of experiments [8]. This model significantly enhances teaching effectiveness and helps students better understand and master financial engineering knowledge.

4.2. Challenges in applying smart classrooms to financial engineering classroom teaching

At the level of teaching activities, the teaching activities in the financial engineering design plans of some teachers still follow the traditional teaching activity design, lacking innovative application of advanced teaching software and equipment. In terms of teaching services, some teachers only scratch the surface in their application of intelligent platforms. They merely upload financial engineering learning resources to the intelligent platforms without truly recognizing the value of online learning and collaboration [9]. In addition, the communication and learning data of students on online platforms can be saved and analyzed through intelligent terminals to generate quantifiable data reports, which in turn provide a basis for teachers' teaching and research as well as teaching improvement. However, some teachers do not make full use of this advantage, and their teaching evaluations are limited to the assessment of teaching content and methods.

5. Construction strategies for smart classroom teaching models in financial engineering

5.1. Improving the teaching process of financial engineering smart classrooms based on intelligent platforms

Financial engineering is an interdisciplinary subject. To create a suitable smart classroom, it is necessary to leverage intelligent platforms, design teaching links around the disciplinary characteristics of financial engineering, and implement this concept in every stage of teaching [10]. The financial engineering curriculum system is systematically divided into three modules: basic theory, financial instruments, and technical applications. Each module relies on intelligent platforms to implement differentiated teaching strategies, effectively promoting the comprehensive improvement of teaching effects.

In the basic theory teaching module, the content primarily focuses on compatible theoretical knowledge. To help students access richer learning resources and broaden learning channels, teachers use online platforms such as China University MOOC and iCourse to push targeted materials. At the same time, hybrid teaching environments integrating online and offline modes are built through teaching software like Chaoxing Xuexitong and Zhixue Network [11].

The financial instruments module aims to guide students to apply mathematical knowledge to master valuation and pricing methods for various financial instruments and formulate trading strategies. Considering the abstract nature and high difficulty of understanding this knowledge, teachers use the graphic data processing functions of smart blackboards to transform complex financial models and trading principles into intuitive graphics and data.

The technical applications module emphasizes practical operations, requiring students to use computers to apply previously learned theoretical knowledge and tools to real-world scenarios. After completing experiments, students upload results through software such as the Chaoxing Learning Platform to achieve digital storage of experimental achievements [12]. Meanwhile, using the platform's interactive features, students can communicate in real time with teachers to promptly solve challenges encountered in practice.

5.2. Optimizing teaching services for financial engineering smart classrooms based on intelligent cloud services

Smart education adheres to the heuristic teaching philosophy, taking the cultivation of students' critical thinking abilities as a key goal. It emphasizes teaching according to aptitude, tailoring learning paths for each student to

achieve personalized education. This forward-looking concept can fully mobilize students' learning enthusiasm, guide them to deeply analyze complex issues in financial markets, and help them formulate effective solutions for market participants. The smart classroom for financial engineering relies on intelligent cloud services to empower teaching from multiple dimensions and continuously improve the quality of teaching services [13]. The online platform of intelligent cloud services features a resource management and application function, which integrates massive financial engineering course resources covering theoretical explanations, case studies, and other aspects. These diverse resources strongly support teachers in lesson preparation and teaching, as well as students in autonomous learning, fully meeting the diversified needs of both teaching parties. The micro-lecture management and application function of teaching software such as Chaoxing Xuexitong breaks through the time and space limitations of traditional teaching. Students can use fragmented time to take online courses anytime, anywhere, greatly enhancing the flexibility and autonomy of learning.

The online learning and service functions of the intelligent cloud platform promote real-time interaction between teachers and students in class, creating a lively classroom atmosphere. The personalized intelligent push function delivers exclusive after-class review materials based on students' learning status and characteristics. The multi-dimensional intelligent evaluation function not only enables intelligent grading of students' homework and exams but also provides precise explanations for students through big data analysis. These functions work synergistically to significantly improve the quality of teaching services, ensuring that all aspects of teaching are closely centered on students' all-around development.

5.3. Improving the evaluation process of financial engineering smart classrooms based on intelligent terminals

Smart classrooms have revolutionized traditional teaching and evaluation models. Teaching evaluation is no longer limited to assessing students at the end of a course but is deeply integrated into every teaching link, forming a dynamic and continuous system. In the construction of financial engineering smart classrooms, intelligent terminals play an indispensable role, not only improving the teaching evaluation process but also providing strong support for enhancing teaching quality.

As the core equipment for data collection, intelligent terminals comprehensively capture multi-dimensional data in financial engineering smart classrooms, including teaching activity trajectories, details of teacher-student interactions, and classroom participation. These data are transmitted to intelligent platforms such as smart blackboards, where they undergo in-depth mining and analysis through built-in algorithms and analytical models. The scientific and systematic analysis results provide a quantitative basis for classroom evaluation by teachers and students, helping both parties gain a more comprehensive and objective understanding of classroom teaching and promoting the deepening of smart classroom evaluation [14].

In the entire evaluation system, the teacher terminal, student terminal, and management terminal each play a unique role based on their functional positioning: Teacher terminal: Integrates functions such as intelligent recording, teaching evaluation, and micro-lecture production. Through intelligent recording, teachers can review the entire teaching process, reflect on the effectiveness of teaching methods, and achieve iterative optimization of teaching strategies. Student terminal: Supports functions such as learning task receipt, personalized learning planning, and classroom feedback. Students can customize learning plans according to their progress and characteristics. Through classroom feedback, they can promptly share learning experiences and questions with teachers, providing directions for adjusting teaching strategies. Management terminal: Undertakes important responsibilities such as classroom evaluation, class management, and teaching quality control. By aggregating and analyzing multi-

source data, the management terminal grasps classroom teaching dynamics at a macro level, optimizes teaching resource allocation, and lays a foundation for continuous improvement of teaching quality [15]. The teacher terminal, student terminal, and management terminal collaborate to build a comprehensive and three-dimensional evaluation system for financial engineering smart classrooms based on intelligent terminals. This makes teaching evaluation more scientific and objective, providing data support for continuous teaching improvement.

6. Conclusion

With new technologies and concepts, the smart classroom teaching model can reshape existing classroom teaching content and methods, enhancing students' enthusiasm and initiative in learning. In the financial engineering courses of colleges and universities, multiple parties should collaborate to promote the construction of smart classrooms, optimize teaching processes, improve the teaching quality of financial engineering courses, and advance the innovative reform of higher education teaching.

Disclosure statement

The author declares no conflict of interest.

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