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Research on University Teaching Information Management under the Mode of "Internet + Higher Education"

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Abstract: This paper discusses the implementation path and strategy of teaching information management in China's colleges and universities under the "Internet plus higher education" model. Analyzed the limitations of traditional teaching management models and proposed that educational informatization is the key to improving teaching quality and efficiency. We have studied the application of information technology in teaching, such as online learning platforms and virtual reality technology, as well as the construction of a theoretical framework and technical system for teaching information management, with the aim of optimizing teaching management and improving educational quality. At the same time, a set of teaching information management technology system has been proposed, including demand research, data management, teacher training, etc., to support the modernization and informatization development of higher education.

1. Introduction

Colleges and universities need to manage a large amount of teaching information, and the traditional management mode is easy to cause information loss and error leakage. At the same time, the traditional evaluation method relies on students 'feedback questionnaires and teachers' subjective judgment, which cannot provide objective evaluation results. Teaching management in colleges and universities need to invest a lot of manpower and material resources and financial resources, in the actual allocation, however, these resources often cannot meet the demand of teaching management, especially in emerging colleges and universities and economic underdeveloped areas, resource allocation is nervous, which led to the low efficiency of teaching management, difficult to achieve the teaching goal.

Under the condition of increasingly fierce competition in higher education, Hainan universities need to actively implement the national education policy, make full use of free trade port

construction, "based on Hainan, service of the south China sea", adhere to the "Internet + higher education" education mode, through continuously strengthening information construction and improve the level of teaching management to improve their core competitiveness[1]. Through information means, universities can not only better grasp the situation of teaching resources, timely adjust teaching resources allocation strategy, meet the needs of cultivating high-quality talents, cultivate international vision, humanistic quality, service consciousness, innovative and entrepreneurial spirit; cultivate middle and high-end talents with management ability, practical ability and social responsibility, but also can get rid of the bondage of traditional educational concepts for many years, and establish a teaching management mechanism suitable for the development of domestic colleges and universities with Hainan characteristics[2].

To sum up, it is imperative to carry out the research on the teaching information management under the new mode of "Internet + higher education" and provide the feasible mode of information teaching management[3]. Improving the efficiency and quality of teaching management in colleges and universities by optimizing teaching management, formulating information implementation law and improving the rules of teaching information management in colleges and universities is helpful to promote the modernization of education and improve the teaching ability and level of colleges and universities. Therefore, the research and practice of teaching information management in colleges and universities under the new mode of "Internet + higher education" is of great social and practical significance[4].

2. Specific Research Content

2.1. The Influence and Evaluation of Informatization on Teaching Management and its Effectiveness

Our team studies the current teaching management practices and investigates the teaching management modes and limitations of higher education institutions[5-6]. We explore the integration of information technology in the teaching process and analyze the impact of 'Internet +' on higher education, including the study of online learning platforms, educational applications, virtual reality, mixed learning methods, and the use of other emerging technologies in teaching management[7]. Our objectives are to evaluate the effectiveness of IT-based teaching management in improving teaching quality, promoting student engagement, enhancing learning outcomes, and optimizing resource allocation. Additionally, we aim to assess the impact of technical interventions on a learner-centered approach, individualized learning, and a collaborative learning environment.

2.1.1. Status Quo and Limitations of Teaching Management

In the current field of higher education, the teaching management mode has made a certain degree of progress and effect[5]. However, there are still several limitations, mainly reflected in information asymmetry, low decision-making efficiency and unequal resource distribution. The existence of these problems seriously restricts the further improvement and development of the quality of higher education. Specifically, information asymmetry leads to the lack of effective communication and information sharing between teachers and students, which makes it difficult to achieve the best effect of teaching activities. It is difficult for teachers to accurately understand students' needs and feedback, and it is also difficult for students to obtain enough teaching resources and information. This information asymmetry seriously affects the teaching quality and learning effect.

Moreover, due to low decision-making efficiency and insufficient response speed and flexibility of teaching management, it is difficult to quickly respond quickly to the changing educational

environment and the diversification of students' needs. This inefficient decision-making process not only wastes valuable time and resources, but also may lead to the lag and inadaptation of teaching management measures, thus affecting the improvement of education quality.

Finally, the uneven distribution of resources is also an important issue. The uneven distribution of resources not only exacerbates educational inequity, but also makes it difficult for some schools and students to obtain adequate educational resources and support. This unbalanced phenomenon of resource allocation not only affects the fairness of education, but also further aggravates the difference of education quality, making some students unable to enjoy high-quality educational resources[6].

2.1.2. The Integration of Information Technology in Teaching

This study explores the integration of information technology in the teaching process, with special attention to the application of many emerging technologies including online learning platforms, educational applications, virtual reality technology and hybrid learning methods[7]. The application of these technologies has not only greatly enriched the traditional teaching methods, but also significantly improved the students' interest and participation in learning. Through these technologies, students can learn anytime and anywhere, breaking the limitation of time and space, and making learning more flexible and convenient[8-9].

Specifically, this study first with a detailed survey of online learning platforms. These platforms provide various course resources through the Internet, enabling students to acquire knowledge without geographical restrictions. In addition, educational applications have also played an important role in the teaching process. These applications are often designed to be vivid and interesting, and are able to attract students' attention and improve their learning motivation. Virtual reality technology provides students with an immersive learning experience, enabling them to feel the content of learning personally, so as to better understand and master the knowledge.

The hybrid learning method combines the advantages of traditional classroom teaching and online learning to meet the learning needs of different students through flexible course arrangement and personalized learning paths. This learning method not only improves students' learning efficiency, but also cultivates their independent learning ability. Overall, the application of these emerging technologies makes the teaching process more diverse and efficient, providing students with a richer and more interesting learning experience.

2.1.3. Effectiveness Assessment

In this study, an empirical analysis was used to explore the effectiveness of information-based teaching management in several key areas. Specifically, this paper evaluates the practical effects of information technology in improving teaching quality, promoting student engagement, enhancing learning outcomes, and optimizing resource allocation. Through detailed data analysis and case study, it is found that information technology plays a vital role in improving the refinement and intelligent level of teaching management.

With the help of advanced information technology tools, teachers can track students 'learning progress more accurately and monitor students' learning status in real time, so as to adjust teaching strategies in time to ensure that the teaching content and methods can better meet the needs of students. This timely feedback and adjustment mechanism makes the teaching process more flexible and efficient, and thus significantly improves the overall teaching effect.

In addition, IT provides students with a more personalized and flexible learning experience. Through intelligent learning platforms and online resources, students can choose the appropriate learning content and methods according to their own learning pace and interests, so as to better

master the knowledge and improve the learning effect. The application of information technology makes the learning resources more abundant and diversified. Students can access the required learning materials anytime and anywhere, which greatly improves the convenience and autonomy of learning.

2.2. Construction of the Theoretical Framework and Technical System of Teaching Information Management in Colleges and Universities

2.2.1. Theoretical Framework

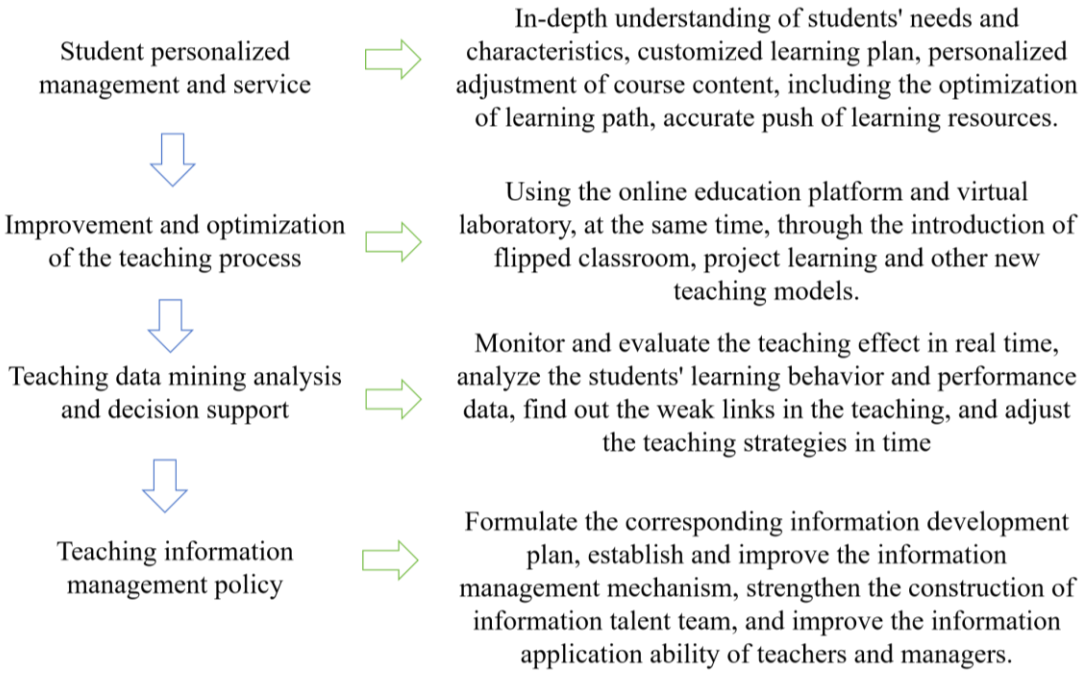

Figure 1: Theoretical framework of teaching information management in colleges and universities.

In order to build a comprehensive theoretical framework of information management in colleges and universities, we must comprehensively consider multiple key dimensions, including but not limited to student personalized management and service, improvement and optimization of teaching process, teaching data mining analysis and decision support, as well as teaching information management policies and strategies. In this theoretical framework, the first priority is to be student-centered, to fully consider and meet the diverse needs of students, so as to provide a personalized learning experience. This means that we need to advocate and apply advanced educational concepts and teaching methods, and constantly optimize the teaching process, in order to improve the overall teaching quality. (Figure 1)

In order to achieve this goal, we should pay attention to the following aspects. First, we need to deeply understand the needs and characteristics of students, and provide them with tailored learning programs through personalized management and services. This not only includes the personalized adjustment of the course content, but also includes the optimization of the learning path and the accurate push of learning resources. In this way, we can ensure that each student can learn in an environment that best suits them to maximizing their potential.

Secondly, the improvement and optimization of the teaching process is an important part of constructing the theoretical framework of university information management. We need to constantly explore and apply new teaching methods and technologies to improve the teaching effect. For example, using online education platforms and virtual laboratories can provide students with a

richer and more flexible learning experience. At the same time, by introducing new teaching modes such as flipped classroom and project-based learning, students' interest in learning can be stimulated, and their independent learning ability and practical ability can be improved.

In addition, the theoretical framework also emphasizes the use of data mining and analysis techniques to monitor and evaluate teaching effects in real time and provide a scientific basis for teaching improvement. In this way, we can ensure that teaching activities are always in optimal condition and can be adjusted and improved in time to meet the changing educational needs and challenges. Data mining technology can help us extract valuable information from large amounts of teaching data to support teaching decisions. For example, by analyzing students' learning behavior and performance data, we can find the weak links in teaching and adjust the teaching strategies in time to improve the teaching effect.

At the same time, the formulation of scientific and reasonable teaching information management policies and strategies is also an important part of the theoretical framework. These policies and strategies aim to provide guidance and support for the comprehensive development of teaching information management in colleges and universities, and ensure that universities can make full use of information technology to improve the efficiency and effect of teaching and management. Through the implementation of these policies and strategies, universities can better cope with the challenges of the information age and enhance their competitiveness and influence.

For example, colleges and universities can formulate corresponding information development plans and clarify the goals and tasks of information construction. At the same time, colleges and universities should also establish and improve the information management mechanism, including information project management, information resource management, information security guarantee and other aspects of the system and norms. In addition, colleges and universities should also strengthen the construction of information talent team, improve the information application ability of teachers and managers, and provide strong talent support for information management.

In short, this theoretical framework aims to provide a comprehensive, systematic and scientific guidance program for information management in universities by comprehensively considering multiple key dimensions, so as to realize the optimization of teaching and management, and finally achieve the goal of improving the quality and efficiency of education. Under the guidance of this theoretical framework, colleges and universities can better adapt to the development trend of the information age, provide students with more high-quality education services, and cultivate more high-quality talents with innovative ability and practical ability for the society.

2.2.2. Technology System

In the process of constructing the technical system architecture, the university information management actively adopts and integrates the advanced information technology, and is committed to realizing the intelligent processing of teaching routine affairs such as students' course selection, attendance attendance and performance management. This initiative not only greatly improves work efficiency, but also reduces the possible errors caused by human factors at the source. At the same time, through the carefully constructed network learning platform and personalized learning support system, universities have created a flexible and resource-rich learning environment for students to meet their personalized and independent learning needs. It is particularly important that the introduction of personalized teaching and guidance system can customize exclusive learning plans and resources for students according to their specific learning conditions and needs, so as to effectively improve learning efficiency and learning satisfaction.

In addition, the technical system also makes full use of the data analysis technology to carefully monitor the teaching process, and accurately evaluate the teaching effect, so as to provide teachers with timely and effective feedback and improvement suggestions for them. With the help of the

power of big data and artificial intelligence technology, universities can also deeply analyze teaching management data, mine teaching rules, predict teaching trends, and provide strong data support for the management to make scientific decisions. For example, by analyzing students' learning data, universities can find out which teaching methods are more effective and which course contents need to be improved, so as to continuously optimize the teaching process.

In terms of the management of teaching resources, the information management of colleges and universities realizes the centralized management and efficient sharing of teaching resources by establishing a unified resource database. Teachers can easily obtain and use a variety of teaching resources, including courseware, videos, exercises, etc., which not only improves the utilization rate of teaching resources, but also enriches the teaching means and content. At the same time, students can also access these resources anytime and anywhere through the network learning platform, for independent learning and review.

In terms of student services, university information management also provides online consulting services and intelligent question and answer systems, through which students can quickly get answers to questions in study and life. This not only improves the efficiency of student service, but also enhances students' satisfaction and sense of belonging. In addition, universities also use information technology for campus safety management and facility maintenance, to ensure the safety and stability of the campus environment.

3. Implementation Plan

3.1. Demand Research

Our research team investigated the current situation and development trend of teaching information management in colleges and universities both domestically and internationally. We statistically analyzed the development of higher education and the application of existing teaching information management systems. Additionally, we summarized the practical cases and successful experiences of teaching information management across different colleges and universities. We analyzed the latest research results, technologies, and methods in the field of teaching information management in universities worldwide to understand the market demand and innovation trends. Furthermore, we conducted research on relevant policies, regulations, and standards to comprehend the requirements and support policies of education departments and industries for teaching information management in colleges and universities. Our research team also analyzed the key issues and needs of teaching management in higher education. We gained an in-depth understanding of teachers' and students' expectations, needs, and usage habits related to teaching information management. Furthermore, we evaluated the advantages, challenges, opportunities, and potential of the research through a SWOT analysis.

3.2. Data Collection and Analysis

Through the use of big data, artificial intelligence and machine learning and other advanced technologies, all kinds of data in the teaching management of colleges and universities are extensively and deeply collected and analyzed. This includes, but is not limited to, students 'learning data, teachers' teaching data, and the use of curriculum resources. Through a detailed analysis of these data, we can reveal the regularity features, and identify the existing problems and deficiencies. This process can not only help to improve the efficiency and quality of teaching management, but also provide strong decision support for the teaching information management of colleges and universities, so as to promote the continuous progress and development of education.

3.3. Construction of Information Management Platform

The research team formulated the overall structure and functional requirements of the teaching information management system in universities, and defined the objectives and service objects of the system. At the same time, we design and develop the system prototype adapted to the teaching information management in colleges and universities, covering the teaching plan management, course resource management, teacher management, student management and learning evaluation and other functions. We conduct system modeling and data process analysis to determine the core modules and data interaction process of the teaching information management system. We also develop and integrate teaching resources, including courseware, textbooks, exercises, etc., to ensure the scalability and intelligence of the system.

3.4. Use Cloud Storage Technology to Manage Teaching Resources

At present, in teaching management, there are various teaching resources required by colleges and universities and complex sources, including text, image, animation, sound and video and other file types. These resources have a wide range of contents, covering student learning materials, teachers' teaching materials, office management materials, as well as social resources and electronic book resources. Cloud storage is a distributed file storage system developed based on cloud computing technology. It has the characteristics of super-large scale, virtualization, flexible expansion ability, high reliability and low cost, and can effectively solve the problems of large-scale resource storage and processing. The application of cloud storage technology in the teaching management of colleges and universities can effectively collect, store, manage and apply all kinds of teaching resources, improve the sharing of resources, realize the reasonable allocation of resources, meet the learning needs of students, so as to improve and develop the teaching information and digital construction of the school. In addition, cloud storage technology can also reduce the investment of universities in computers and related equipment, and provide services to users through the network platform, which not only saves a lot of equipment costs, but also reduces the cost of daily update and maintenance.

3.5. Teacher Training and Support

In the practice of teaching information management in colleges and universities, we pay special attention to the training and support of teachers. By providing a range of well-designed training courses and rich teaching resources, we are committed to helping teachers master the skills and methods of Internet teaching, thus significantly enhancing their teaching ability. In addition, we also set up a platform for teachers to communicate and share, encouraging them to actively share their teaching experience and teaching material resources, so as to promote mutual learning and resource sharing among teachers. Through these measures, we hope to further promote the process of teaching informatization in colleges and universities, and improve the quality and effect of teaching.

3.6. Practice and Assessment

We carry out pilot practice activities in the selected cooperative universities, and test the effectiveness and feasibility of the methods and strategies proposed in this paper through in-depth evaluation and continuous improvement of the practical operation of teaching information management in universities. In this process, we actively collect the feedback of the majority of users and participants, and understand the implementation of management and existing problems in the practical application of teaching information management in detail, so as to carry out continuous

improvement and optimization work. Through these efforts, we can ensure that teaching information management can run efficiently and smoothly, and truly achieve the goal of improving teaching quality and management efficiency.

4. Conclusion

This paper studies the university teaching information management under the "Internet plus higher education" model, points out the limitations of the traditional model, and emphasizes the importance of education informatization to improve teaching quality and efficiency. We have constructed a student-centered theoretical framework and technological system for teaching information management, including demand research, data management, teacher training, etc., to support the modernization of higher education. This article designs a system framework that utilizes cloud storage technology to improve resource management efficiency, and emphasizes teacher training to enhance teaching quality and ensure efficient operation of teaching information management.

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