CHAPTER I
INTRODUCTION

This chapter presents the Research Background,Problems Identification,Scope and Limitation of the Study,Research Questions,Research Objectives,Significances of the Study,and Novelty of the Research.

1.1 Research Background

1.1.1 Expected situation

In the current booming development of informatization and digitization, the field of higher education is highly anticipated, indicating a leap in teaching quality and efficiency through digital teaching tools and methods. Alison Clark Wilson's (2021) research reveals that the education industry is eagerly looking forward to digital teaching breaking the time and space constraints of traditional teaching, providing students with a more flexible and personalized learning journey. Mei X, Ase E, and Medgard M (2019) further elaborate that digital means should make knowledge dissemination more efficient, and access to learning resources should no longer be limited by geography, thereby greatly improving the accessibility and efficiency of education. Mandou Aleneci (2023) emphasizes that digital transformation is the core force driving the transformation of higher education institutions, and the integration of Industry 4.0 technology requires universities to adapt to this transformation in multiple aspects. It is hoped that digital technology can lead educational innovation and improve teaching quality.

It is expected that the rapid development of digital technology, especially the wide application of the Internet, big data and artificial intelligence, will bring new tools and platforms to the field of education. Napon Vanapiron and Paitong Pimdi (2022) depict a vision for 21st century education that heavily relies on information and communication technology (ICT), where the combination of digital learning environments (DLE) and virtual classrooms (VC) will create

innovative ways of learning. At the same time, with the increasing expectations of contemporary students for educational methods, they crave more real-time interaction and personalized elements. Digital teaching has emerged to meet this demand, aiming to enhance classroom interactivity and student participation through digital tools such as online discussion forums and real-time voting.

1.1.2 Actual situation and existing problems

However, the practical application of digital teaching in higher education has not fully met the above expectations. Although digital technology has brought unprecedented convenience to education, its effective integration and application still face many challenges. The efficient knowledge dissemination and resource acquisition expected by MeiX, AsE, and Medgard M (2019) are influenced by multiple factors such as technological limitations, teacher digital literacy, and student adaptability in practical operations. Erika E. Smith (2023) points out the value of social media in learning, but also reveals the potential distractions and shallow learning issues it may bring.

In addition, the interactivity and participation of digital teaching have not generally improved as expected. Although Lin Minghang's (2017) research indicates the advantages of digital learning in enhancing learning motivation and outcomes, it has been found in practice that some students find it difficult to effectively participate in digital teaching activities due to a lack of self-discipline or digital skills. Meanwhile, uneven distribution of digital teaching resources is also a major issue, as some regions and universities struggle to provide high-quality digital learning environments due to limited resources.

More importantly, digital teaching has not completely solved all the problems in traditional teaching. For example, although online exams provide convenience, they also raise new issues such as cheating risks and technical failures (Fu Shuya and Li Zhen, 2024). The gap between these actual situations and expectations reveals that digital teaching still needs to be further explored and optimized in higher education.

1.1.3 Proposed solutions for this gap

Faced with the challenges and gaps of digital teaching in higher education, this study proposes a series of solutions. Firstly, strengthen the digital literacy training of teachers, enhance their ability to integrate and apply digital technology, and ensure that digital technology can effectively serve teaching. Secondly, design more attractive digital teaching activities that combine students' actual needs and interests to enhance their participation and learning motivation. At the same time, we will strengthen the balanced distribution of digital teaching resources and ensure that more regions and universities can enjoy the dividends brought by digitalization through policy guidance and financial support.

Compared with previous research, the innovation of this study lies in not only focusing on the application of digital teaching technology itself, but also deeply analyzing its problems and challenges in practical applications; Proposed specific solutions and attempted to verify their effectiveness through empirical research; At the same time, this study also focuses on the sustainable development of digital teaching, exploring how to construct a long-term digital teaching mechanism to cope with the changes and challenges in the future education field. Through this series of research and practice, this study aims to provide new ideas and paths for the in-depth development of digital teaching in higher education.

1.1.4 Preliminary research

In the preliminary research, practical teaching applications for online exams were mainly carried out based on the Rain Classroom online teaching platform. Comparing the scores of medical immunology students in the same major under the traditional exam and the new model, it can be seen that there is a significant improvement in students' scores under the new model. Through questionnaire surveys and exam score analysis (Figure 1.1), it can be seen that online exams can fully mobilize students' learning autonomy and enthusiasm, effectively guide students to systematically sort out and deeply think about teaching content, achieve effective improvement in students' scores, and provide good training for students' ability to adapt to the new exam model, promoting the development of medical immunology professional quality. The online examination mode also provides new

ideas for teachers' new work mode. With the development of the internet, online education is receiving increasing attention in universities. More and more major exams are being conducted online, which has promoted the development of online exams. The technology support for proposition, question distribution, and score evaluation has become more and more abundant, and the online exam model is becoming more mature. The adoption of online examination mode is not only of great significance for students, but also for teachers, adapting to online education and combining online examination mode can help achieve better educational results. Published papers on related research results.(Fu Shuya and Li Zhen. Application and Reflection on Online Examination of Medical Immunology in Undergraduate Teaching [J]. Chinese Science and Technology Journal Database (Full Text Edition) Education Science, 2024 (1): 0049-0051)

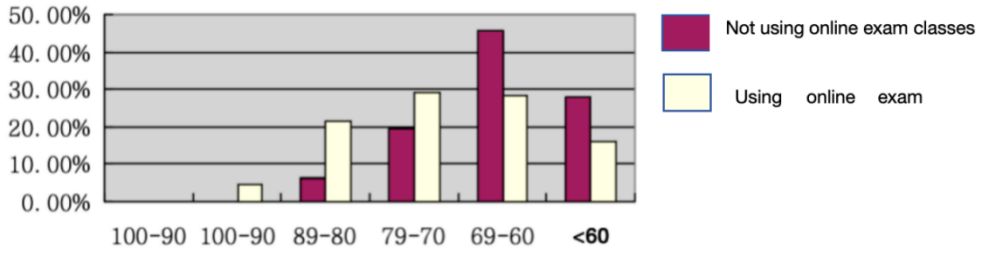

Figure1.1 Comparison of grades between using online exams and not using classes

In summary, the topic of this study, "Preliminary Exploration and Practice of Effectively Utilizing Digital Teaching in Higher Education," has significant practical significance and far-reaching impact. It not only helps promote the innovative development of higher education and improve teaching quality and efficiency; It also helps to enrich teaching methods and tools, promote the scientific and personalized evaluation of education, and facilitate international educational exchanges and cooperation. With the continuous advancement of technology and the deepening expansion of applications, digital teaching will play a more important role in the field of education, making greater contributions to cultivating talents who can adapt to the future society.

1.2Problems Identification

Based on the background of the problem, the problem identification in this study is:

1.2.**1**Unequal access to technology: Not all students have access to digital products that use digital technology, and the effectiveness of using different digital products varies. For example, students who use tablets use interactive software in the classroom more conveniently than those who use mobile phones. Having two digital products makes it faster to access information instantly, which may lead to a digital divide.

1.2.2 Insufficient classroom immersive experience: In the digital teaching environment, students' immersive experience may be insufficient. Teachers may be distracted by the use of digital technology, and students may also be distracted by teachers' attention to the operation of digital devices, leading to a decrease in classroom learning effectiveness.

1.2.3 Teacher role changes: Digital education may require teachers to change their teaching methods and roles, and some teachers may find it difficult to adapt to this transformation.

1.2.4 Skills and knowledge updates: Digital education may have an impact on teachers' teaching methods and students' learning habits, requiring teachers to constantly learn and adapt to the development of new technologies, while students also need to cultivate digital literacy to meet the requirements of digital learning.

1.2.5 The challenge of curriculum design: Transforming traditional courses into digital formats may require in-depth curriculum design and teaching strategy adjustments, which may pose higher requirements for teachers.

1.3 Scope and Limitation of the Study

Based on the identification of the above issues, there are some considerations that can prevent the problem from expanding, leading to uncertainty or confusion in the discussion topic. This study aims to explore in depth the application value, implementation strategies, and profound impact of digital teaching in higher education. In this study, innovative applications of digital teaching models were investigated. Therefore, the evaluation of this study only focuses on the value,

operability, and effectiveness of digital teaching in higher education.

1.4 Research Questions

Based on the above background, the following research questions can be proposed.

1.4.1 What is the application value of digital teaching in higher education?

1.4.2 What are the challenges of implementing digital teaching in the current higher education field?

1.4.3 Is there a difference in student performance between students who learn online and students who learn traditionally?

1.4.4 How can digital teaching promote educational equity, diversity of teaching methods, and scientific evaluation of education?

1.4.5 What are the advantages and disadvantages of digital teaching for students' learning and academic performance?

1.4.6 What are the advantages and disadvantages of digital education for teachers' career development and teaching?

1.5 Research Objectives

Based on the problem described in the above statement, the goal of this study is to:

1.5.1 Deeply understand the application value of digital teaching in higher education:

This study aims to comprehensively analyze the application value of digital teaching in higher education, with a specific focus on how it improves teaching quality and efficiency, and how it adapts to the learning needs of students in the digital age through personalized learning experiences and innovative teaching models. Through empirical research, we aim to reveal the specific role of digital technology in enhancing course interactivity, flexibility, and student satisfaction, thereby promoting the modernization of educational content and forms.

1.5.2 Revealing the challenges faced by implementing digital teaching in the field of higher education:

This study will systematically identify and analyze the main challenges encountered in the implementation of digital teaching in the current higher

education field, including but not limited to technical barriers, insufficient teacher training, differences in student digital literacy, and unequal resource allocation. Through case studies and expert interviews, we aim to propose targeted strategies and recommendations to overcome these challenges and promote the effective implementation of digital teaching.

1.5.3 Optimize digital teaching models to meet diverse student needs:

This study will explore a series of innovative strategies and practical cases on how to optimize digital teaching models to meet the needs of different backgrounds and student groups. By comparing and analyzing the effects of different teaching modes, combined with student feedback and learning effectiveness data, we aim to build a more inclusive, flexible, and adaptable digital teaching framework to ensure that every student can benefit from it.

1.5.4 Exploring the Promoting Role of Digital Teaching in Educational Equity, Diversified Teaching Methods, and Scientific Evaluation:

This study will delve into how digital teaching promotes balanced distribution of educational resources, narrows educational gaps, and enriches learning experiences by introducing diverse teaching methods such as flipped classrooms and project-based learning. At the same time, we will also explore how to use digital technology to collect and analyze learning data, achieve scientific education evaluation, and more accurately reflect students' learning progress and achievements.

1.5.5 Evaluating the Dual Impact of Digital Teaching on Student Grades and Academic Performance:

This study will quantitatively and qualitatively evaluate the positive and negative impacts of digital teaching on student achievement and academic performance. By analyzing multidimensional data such as students' academic performance, learning attitudes, and engagement, we aim to uncover the potential of digital teaching in improving students' learning outcomes, while also addressing potential issues such as excessive reliance on technology leading to distraction or shallow learning.

1.5.6 Analyze the advantages and disadvantages of digital education on teachers' professional development and teaching:

This study will explore the impact of digital education on teachers' professional development and teaching from multiple perspectives, including teacher professional growth, teaching skill improvement, and changes in work burden. Through methods such as teacher interviews and questionnaire surveys, we aim to reveal the opportunities (such as teaching innovation, convenient resource access) and challenges (such as technological adaptation to pressure, extended working hours) that digital education brings to teachers, and propose corresponding support measures to promote the sustainable development of teachers.

1.6 Significances of the Study

The expected benefits of this study are as follows.

1.6.1 Theoretical benefits.

The results of this study are expected to provide the application value, implementation strategies, and profound impact of digital teaching in higher education, and provide new ideas and paths for the development of higher education.

1.6.2 Actual benefits.

a) For the sake of the teacher.

The results of this study can serve as a new digital educational learning model that can be applied to classroom learning activities 。

b) For students

Through this study, new learning methods have been provided for students. Not only does it enrich the teaching content, but it also enhances the attractiveness and effectiveness of the learning experience. Providing a rich learning experience can stimulate students' interest and motivation in learning, thereby improving learning outcomes. During the learning process, students need to be proficient in using digital learning tools and learning cutting-edge knowledge, so that they can combine these knowledge and skills to cultivate

comprehensive problem-solving abilities.

c) For the sake of the school.

Through this study, it is hoped that schools used as research venues can obtain more information, and the optimization strategies proposed in the study can provide guidance and suggestions for schools to improve their existing teaching models.

d) For other researchers

The recommendations or designs of some teaching resources proposed in this study can be integrated into a resource package for teachers to use.

1.7 Novelty of the Research

Firstly, this study focuses on the application value, implementation strategies, and impact of digital teaching models in the field of higher education, which can help promote innovative development in education. A systematic digital teaching model is developed by combining digitalization with teaching methods, learning data collection and analysis, interaction design, etc. The study explores how to improve student participation and learning satisfaction through online discussion boards, real-time voting, virtualization technology, etc. It attempts to collect and analyze learning data through digital teaching platforms, conduct scientific educational evaluations, and guide students' learning. This is an innovation of traditional educational evaluation methods. The study considers the application of interaction design theory in digital teaching to optimize user interface and user experience, and improve student participation. Research utilizes learning analytics theory and data analysis techniques to understand learners' behavior and learning processes, in order to optimize educational experiences and outcomes. These innovative points reflect the in-depth exploration of research at both theoretical and practical levels, aiming to improve the quality and efficiency of education through digital teaching models, while providing new perspectives and methods for students, teachers, and educational institutions.