Application Research of Digital Educational Resources in University Classroom Teaching

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Abstract: Digital educational resources serve as vital vehicles for the realization of educational digitization. The application of digital educational resources holds significant practical significance as it can enhance the quality and efficiency of education, improve teaching standards, and foster students' proactive learning in the context of creating efficient classrooms. This paper employs a questionnaire survey approach to gain insights from the perspective of university students into the application of digital educational resources in university classroom teaching. Specifically, it delves into the current state of digital educational resource utilization, students' usage preferences, diverse learning requirements, efficacy, satisfaction, and an analysis of issues encountered during their application. The aim is to offer fresh insights and decision-making references to boost the effective utilization of digital educational resources, promote student-driven learning, optimize the teaching process, and enhance teaching quality.

1 Introduction

Currently, the wave of digitization is spearheading the transformation and innovation in education, giving rise to a new paradigm of digital education. Digital educational resources not only cater to the diverse learning needs of students, enhancing their comprehensive competence but also serve as a means to elevate the skillset of educators, optimize the educational teaching processes, and enhance the quality of education[1].

In the context of higher education, several pivotal junctures emerge:

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<th>Year</th>
<th>Reform Milestones</th>
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<tr>
<td>2003</td>
<td>Initiated the construction of national quality undergraduate courses, promoting the sharing of high-quality course resources.</td>
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<tr>
<td>2016</td>
<td>Announced the first batch of &quot;National Quality Resource Sharing Courses.&quot;</td>
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<tr>
<td>2018</td>
<td>Initiated the accreditation of &quot;National Quality Online Open Courses.&quot;</td>
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<td>Published the &quot;Educational Informatization 2.0 Action Plan,&quot; highlighting the establishment of a &quot;Internet Plus Education&quot; mega-platform, the enhancement of the public service system for digital educational resources, and the implementation of the Educational Resource Sharing Program.</td>
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<td>2021</td>
<td>Issued the &quot;Guidance on Advancing the Construction of New Types of Educational Infrastructure to Build a High-Quality Education Support System,&quot; including digital resources as one of the six key directions.</td>
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<td>2022</td>
<td>Unified under the category of &quot;National First-Class Course Construction,&quot; comprising five types: top-tier online courses, virtual simulation experimental teaching top-tier courses, and top-tier courses for social practice.</td>
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It is evident that digital educational resources have evolved into a crucial instrument in the realm of...
informatized education and teaching[2]. Consequently, conducting research on the application of digital educational resources within university classrooms holds significant practical significance in optimizing teaching effectiveness[3].

2 Overview and Theoretical Foundations of Digital Educational Resources

2.1 Overview of Digital Educational Resources

2.1.1 Meaning of Digital Educational Resources
Digital educational resources, abbreviated as digital resources, refer to materials that have been digitized and are accessible to a wide audience of educators, students, and learners through multimedia teaching equipment, computers, tablets, mobile devices, and network environments[4]. These resources include, but are not limited to, online courses, digital textbooks, e-books, teaching presentations, instructional cases, virtual experiments, and various other educational materials. The primary characteristics of digital educational resources are their digitization, network connectivity, integration, and reusability. They exhibit features such as immediacy, diversity, shareability, interactivity, and editability.

2.1.2 Classification of Digital Educational Resources
Digital educational resources can be broadly categorized into three types: digital educational content, digital educational tools, and digital educational platforms. The Ministry of Education has outlined six categories of educational resources in the "Technical Specifications for the Construction of Modern Distance Education Resources" (draft for comments): media materials, test questions, courseware and online courseware, literature, cases, and online courses.

2.2 Relevant Theoretical Foundations of Digital Education

2.2.1 Humanism Theory
Humanism theory emphasizes the centrality of human development and promotes self-directed learning, autonomous knowledge construction, and collaborative learning. It emphasizes the discovery of individual creative potential and underscores emotional education.

2.2.2 Cognitive Learning Theory
Cognitive learning theory highlights the idea that processing information changes human behavior patterns. It underscores that students are the agents of learning activities, with teachers taking on a guiding role, and media serving as intermediaries for mutual communication, rather than mere information conduits[5,6].

2.2.3 Constructivist Theory
Constructivist learning theory emphasizes the active, constructive role of learners in the learning process. It contends that teaching is not the mere transmission of knowledge but the facilitation and transformation of knowledge[7,8]. Therefore, teaching should utilize learners' existing knowledge and experiences as the starting point for constructing new knowledge and experiences.

2.2.4 Multiple Intelligences Theory
The multiple intelligences theory posits that intelligence is diverse, with individuals possessing at least seven different types of intelligence, including linguistic intelligence, logical-mathematical intelligence, musical intelligence, spatial intelligence, bodily-kinesthetic intelligence, interpersonal intelligence, and intrapersonal intelligence[9]. It asserts that intelligence is a collection of independent abilities, each existing in its own distinct way.

3 Current Status of Digital Educational Resource Usage in University Classrooms

This survey was conducted among students from the College of Economics and Statistics at Zhejiang Gongshang University Hangzhou College of Commerce. We randomly selected over 20 classes and distributed approximately 1,177 online questionnaires. We collected 925 valid responses, achieving an effective response rate
of 78.6%, surpassing the 70% minimum requirement. The survey findings serve as a basis for our research conclusions and provide insights for optimizing the teaching process.

3.1 Utilization of Digital Educational Resources and Terminals

The survey shows that most university students primarily use smartphones (47.24%) and computers (34.97%) to access digital educational resources. They favor online digital courses, digital courseware, digital material videos, test question banks, exercise banks, and digital books, with 53.37% using them frequently and 13.5% on a regular basis. Digital course videos (60.12%) are the most commonly used resource, followed by digital courseware and test question banks or exercise banks (14.11%). Digital textbooks (9.82%) and digital material videos (1.84%) are also used.

3.2 Locations and Times for Utilizing Digital Educational Resources

University students mainly use digital educational resources in their dorms or homes (46.63%), classrooms (23.93%), and self-study rooms (28.22%). They typically use these resources after classes and on weekends. Most students spend about 2 hours daily, with a few dedicating around 4 hours.

3.3 Motivations for University Student Usage

Daily use of digital educational resources is primarily driven by the need to consolidate classroom knowledge (78.53%) and expand their knowledge (62.58%). Self-improvement (55.21%) and group assignments (54.6%) also play a significant role. Students have various demands, including high-quality educational resources (80.37%), an adequate exercise bank (69.94%), a novel case repository (66.26%), and a regularly updated digital educational platform (56.44%)[10].

3.4 Effectiveness of Digital Educational Resource Usage

According to the data, students believe that the use of digital educational resources enhances learning outcomes, increases motivation to learn, broadens knowledge, enhances enjoyment, and boosts confidence. Only a small number of students find the use of digital educational resources less effective.

4 Challenges in Using Digital Educational Resources in University Classrooms

4.1 Limited Integration with Teaching

Teachers often use digital resources as supplementary materials, but their full integration into the teaching process is lacking. Teachers must invest significant time and effort to build course materials independently.

4.2 Information Isolation on Digital Platforms

The absence of a unified educational platform results in information isolation. Course resources cannot be easily shared or efficiently utilized. Frequent textbook updates also increase the workload.

4.3 Poor Student User Experience

Uneven digital infrastructure and inadequate teacher-student support lead to an unsatisfactory student user experience. Switching between online assignments and offline exams is challenging, and many assignments lack interactivity, reducing student engagement.

4.4 Lack of Evaluation Mechanisms

There's a lack of evaluation mechanisms for teachers using digital resources. Many instructors stick to traditional materials, hindering timely updates. Students struggle to find relevant course materials through digital platforms.

5 Improvement Directions for Digital Educational Resource Application in University Teaching

5.1 Align Resources with Disciplines and Teaching Goals

Integrate resources considering the unique needs of different subjects and tailor content to match specific
learning objectives.

5.2 Build Comprehensive Digital Resource Repositories

Create centralized repositories that contain multimedia course materials, teaching plans, assessments, and assignments, promoting resource sharing among faculty.

5.3 Enhance Student Experiences with Big Data

Utilize multimedia technology to offer engaging content and use data analytics to provide personalized support, feedback, and resources to students.

5.4 Implement Intelligent Monitoring and Evaluation

Set up an integrated monitoring and evaluation system to ensure quality, gather feedback, and continually optimize digital educational resources.

Digital educational resources are advancing education and will continue to evolve to enhance student learning and development.

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References