Original Research Article

An investigation into the acceptance of digital transformation of teaching materials among college students in Guangxi region: A case study of universities in Guilin city

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Abstract: This study examines the trend of digital transformation in university teaching materials and investigates the acceptance of digital teaching materials among students in Guilin universities through questionnaires and semi-structured interviews. The findings reveal that the majority of students with experience using digital teaching materials exhibit a positive attitude toward them, demonstrating a high level of acceptance, particularly in terms of improving learning efficiency and facilitating interactive communication. However, challenges persist in practical use, including poor technical adaptability and a lack of prominent personalization in the design of teaching material content. Finally, based on the survey results, corresponding suggestions for transformation pathways are proposed.

Keywords: University teaching materials; Digital transformation of teaching materials; Acceptance

1. Introduction

In higher education, digital technologies are transforming traditional pedagogical approaches, enhancing educational quality and efficiency. Digital technologies enhance higher education with interactive, multimedia-rich teaching materials (Li et al., 2024), yet traditional textbooks remain dominant, and student acceptance poses a challenge. In Guilin, a key educational hub in Guangxi, universities adopting digital resources face issues like outdated formats and technological delays, with limited research on student attitudes (Geng, 2014). This mixed-method study investigates acceptance among Guilin students via surveys and interviews, aiming to identify barriers and propose strategies for effective digital transformation in higher education.

2. Digital textbooks in higher education

Digital textbooks represent an advancement in educational resources, transforming traditional content into interactive, multimedia-rich formats using modern technology (Chen, 2012). Unlike digitized paper texts, they integrate videos, audio, and animations to enhance comprehension, offering high interactivity, ease of updating, and effective visualization. They support personalized learning through tailored content and instant feedback (Li, 2023) and are accessible across devices, proving essential in online and blended learning environments (Li et al., 2024).

The acceptance of digital textbooks among university students depends on factors analyzed through the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). TAM highlights perceived usefulness and ease of use as key drivers of adoption, while UTAUT adds social influence and facilitating conditions. Challenges to their integration include inadequate interactivity in content design (Gao, 2023) and insufficient teacher training in digital pedagogy (Bin, 2024). Addressing these barriers is critical to fostering an effective digital learning environment. This paper examines these factors to propose strategies for enhancing the adoption and integration of digital textbooks in higher education.

3. Research design and implementation

This study employed a mixed-method approach, integrating a questionnaire survey and in-depth interviews, to evaluate digital textbook acceptance among 308 undergraduate and graduate students from four universities in Guilin, Guangxi. The questionnaire, adapted from Davis's (1989) Technology Acceptance Model (TAM), assessed perceived usefulness, ease of use, behavioral intention, and overall attitude using a five-point Likert scale, with open-ended questions providing qualitative insights.

4. Results

4.1. Basic situation

Survey and interview data reveal that awareness of digital textbooks among college students in Guilin remains limited, with only 53% (163 individuals) reporting familiarity, 23% "very familiar" and 30% "familiar." This modest awareness reflects a reliance on traditional paper-based materials and inadequate institutional promotion. Usage is correspondingly low, with just 11% (34 individuals) frequently employing digital textbooks, while 65% (200 individuals) rarely do so. Key barriers to adoption include technical difficulties (e.g., device incompatibility and unstable networks), health concerns such as eye strain, and poor user experience stemming from unintuitive interfaces and lack of personalized content or feedback. Student A1 highlighted the adaptation time and lack of promotion, noting, "I rarely hear classmates or teachers mention digital textbooks," while A5 emphasized health impacts, stating, "Prolonged use causes eye strain," and A7 critiqued the absence of tailored content. These remarks underscore the conservative attitudes and experiential shortcomings hindering uptake.

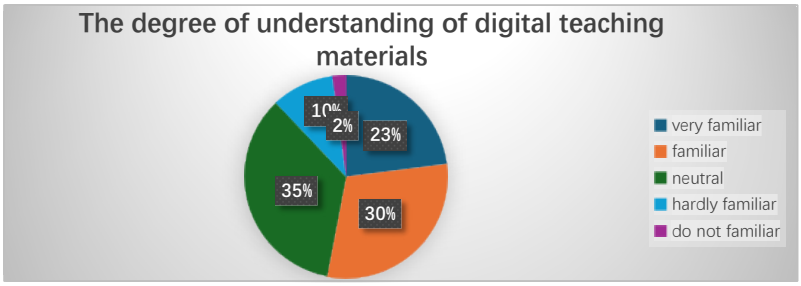

Figure 1. The degree of understanding of digital teaching materials.

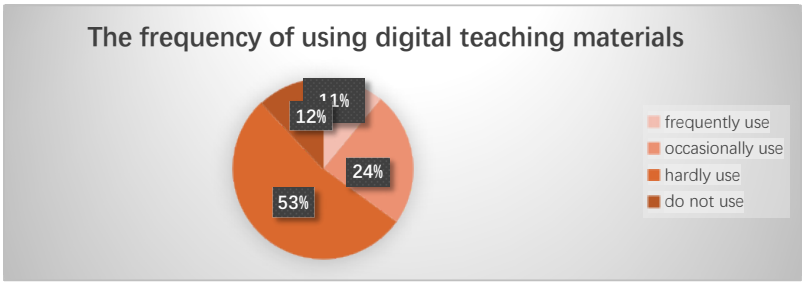

Figure 2. The frequency of using digital teaching materials.

4.2. Perceived ease of use

Survey results reveal that students experienced with digital textbooks generally view their ease of use positively, particularly in information presentation and accessibility. Notably, 80% of students found the content clear and comprehensible, reducing cognitive load and enhancing learning efficiency (**Figure 3**). Students A2 and A5 praised interactive features like virtual experiments and scenes, noting their role in connecting theory to practice. Accessibility was also well-regarded, with only 26% reporting resource access issues, and students

valuing the convenience and variety of resources. However, 70% to 80% highlighted operational complexity and a suboptimal user experience, with student A4 noting, "The school and teachers did not provide specific instructions on how we should operate the textbook ourselves." This underscores the need for improved technical support and training to optimize the digital textbook experience.

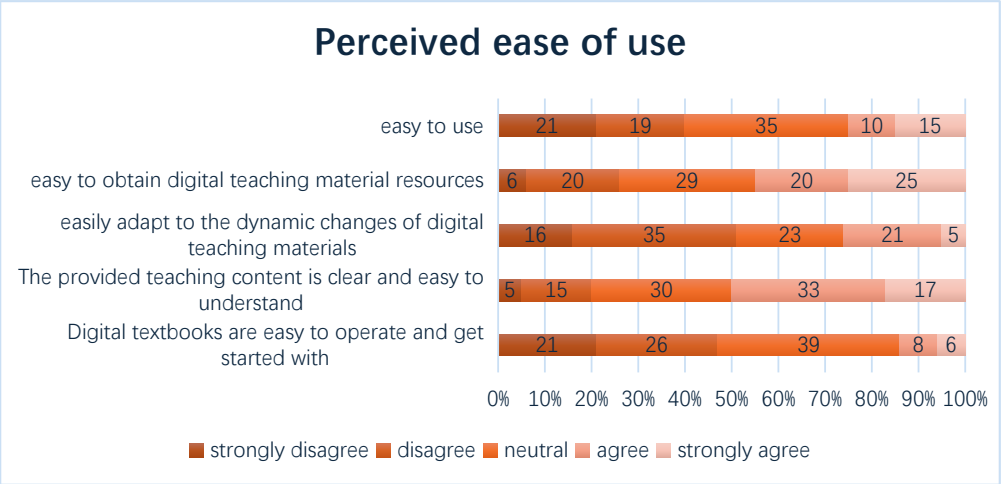

Figure 3. Perceived ease of use.

4.3. Perceived usefulness

Survey results reveal that students experienced with digital textbooks generally view their ease of use positively, particularly in information presentation and accessibility. Notably, 80% of students found the content clear and comprehensible, reducing cognitive load and enhancing learning efficiency (**Figure 4**). Students A2 and A5 praised interactive features like virtual experiments and scenes, noting their role in connecting theory to practice. Accessibility was also well-regarded, with only 26% reporting resource access issues, and students valuing the convenience and variety of resources. However, 70% to 80% highlighted operational complexity and a suboptimal user experience, with student A4 noting, "The school and teachers did not provide specific instructions on how we should operate the textbook ourselves." This underscores the need for improved technical support and training to optimize the digital textbook experience.

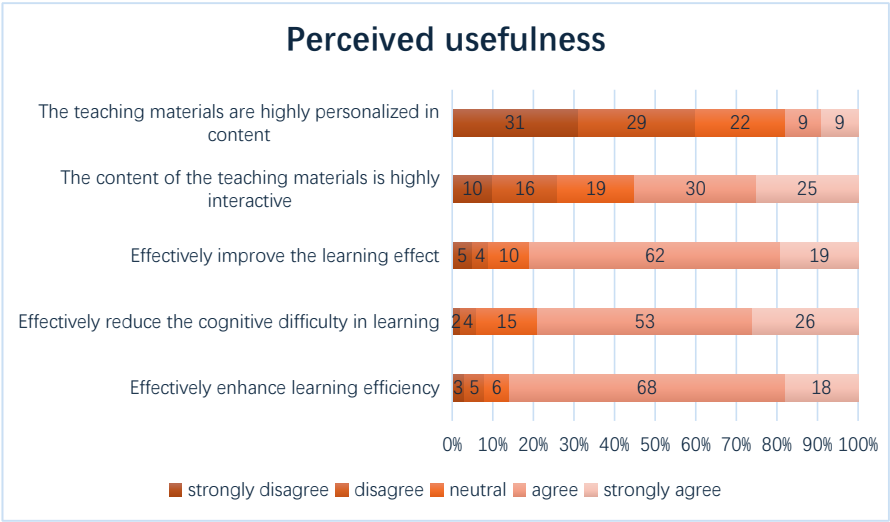

Figure 4. Perceived usefulness.

5. Implementation strategies for digital textbooks

Universities should optimize digital education platforms by enhancing technical performance and establishing dedicated support teams to ensure seamless functionality for faculty and students. Integrating interactive features, such as online assessments and real-time feedback, boosts engagement, while systematic training programs enhance digital literacy and self-directed learning, promoting widespread adoption of digital textbooks. Additionally, digital textbook design should prioritize interactivity and personalization, incorporating elements like virtual experiments, multimedia content, and progress tracking to create immersive, tailored learning experiences. Regular updates align content with curricula and emerging trends, maintaining relevance and effectiveness.

Moreover, to refine instructional design, universities should implement robust feedback mechanisms, including surveys and student participation in development processes. Data-driven analysis of academic performance and usage patterns further informs enhancements, ensuring digital textbooks support educational outcomes effectively.

6. Conclusion

This study investigates digital textbook acceptance among Guilin college students, revealing their recognized benefits in enhancing learning efficiency and interactivity, yet noting suboptimal usage and satisfaction. It proposes enhancing technical support, designing personalized materials, and improving engagement and feedback mechanisms. The findings provide generalizable insights for digital textbook adoption across China.

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