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Digital Learning Modules: Perspectives on Usability, Content Quality, and Effectiveness

Rima Agustia Utami*, Ernawati, Weni Nelmira, Hikmah Hafidza
Faculty of Tourism and Hospitality, Padang State University
***Corresponding Author e-mail:** rimaagustia@unp.ac.id

Abstract The rapid advancement of science and technology has driven innovation in education, particularly in the development of digital learning modules. This study aimed to evaluate a digital learning module based on three key aspects: usability, content quality, and effectiveness. A descriptive quantitative approach supported by qualitative analysis was employed, involving 59 undergraduate students in the Family Welfare Education program at Universitas Negeri Padang who had used the module for at least three learning topics. Data were collected using a Likert-scale questionnaire and complemented by student interviews. Quantitative data were analyzed using descriptive statistics, while qualitative responses were examined through thematic analysis. The finfings revealed that the overall evaluation of the module was categorized as "very good" and average score of 4.78 across all aspects. Specifically, usability scored 4.70, content quality 4.82, and affectiveness 4.80. interactive feature such as Quizizz and Kahoot received the highest ratings, while multimedia integration (Youtube videos, images, and audio) effectively enchanced comprehansion. Despite ist overall sucsess, certain features, such as bookmarks, were underutilized. In conclution, the digital learning module was found to be user-friendly, of high quality, and effective in suporting both independent and collaborative learning, making it promising instructional medium for higher education.

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Introduction

The rapid advancement of science and technology demands continuous innovation in educational practices, particularly in how learning materials are designed and implemented. nstructional materials should not only convey information but also enhance learning effectiveness and foster an engaging, interactive environment (Fernandez-Antolin et al., 2021). In this context, innovation in developing instructional materials plays a crucial role in improving educational quality and supporting teachers in designing meaningful learning experiences. Advances in information and communication technology have led to the widespread use of various digital learning media, such as instructional videos (Morisson et al., 2024), interactive multimedia (Azizah et al., 2024), Android-based applications (Kadarsih & Fitria, 2022), and digital modules (Nurhikmah et al., 2021; Utami & Muhtadi, 2020). Among these, learning modules occupy a strategic position because they are systematically designed to anable students to learn independentlyand achieve specific competencies (Cramer

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et al., 2018; Utami & Muhtadi, 2020). Their flexible, self-paced nature allows learners to adapt the learning process to their own abilities and styles (Nikolova & Collis, 1998).

However, the effectiveness of learning modules is determined not merely by their availability but also by three critical factors: usability, content quality, and effectiveness in supporting the learning process (Hamid et al., 2023; Müller et al., 2023; Mustafa et al., 2021). Usable modules are clear, structured, and easy to follow, thereby enhancing learner motivation (Zafar et al., 2022). High-quality content ensures alignment with curriculum standards, contextual relevance, and opportunities for active learning (Zhang et al., 2025). Meanwhile, effectiveness reflects how well modules engage learners and contribute to improved outcomes (Harefa & Fransisca Dewi Silalahi, 2020).

Despite their potential, preliminary observations in several higher education programs and teacher training institutions reveal that many modules still lack interactivity, contain outdated content, or provide limited opportunities for self-directed learning. Students often report difficulties in understanding materials without direct instructor support, while lecturers note inconsistencies b etween module content and intended learning outcomes. These findings are consistent with previous studies indicating varying levels of module quality and inconsistent implementation practices across institutions (Reztanty & Hidayati, 2022; Utami & Muhtadi, 2020). Given these challenges, the urgency of this research lies in addressing the gap between the intended function of learning modules and their actual application in the classroom. Most prior studies have examined modules from a single perspective—either usability, content quality, or effectiveness without integrating all three dimensions into a comprehensive framework.

Therefore, the novelty of this study lies in its holistic evaluation of learning modules by simultaneously analyzing usability, content quality, and effectiveness. This integrative approach is expected to offer a deeper understanding of how learning modules contribute to instructional success and to serve as an empirical foundation for improving future module design and implementation. Accordingly, the aim of this study is to analyze and evaluate learning modules in terms of their usability, content quality, and effectiveness in supporting learning activities. The findings are expected to guide the development of higher-quality instructional modules and contribute to the continuous improvement of teaching and learning practices in higher education.

Research Method

This study employed a quantitative descriptive approach supported by qualitative analysis. This mixed analytical approach was selected because the research aimed to systematically describe students' perceptions of the learning module in relation to three main aspects : usability, content quality, and effectiveness in supporting the learning process.

he participants were undergraduate students from the Family Welfare Education (PKK) program enrolled in the Learning Media course at Universitas Negeri Padang (UNP). A total of 59 respondents participated in the study. The participants were selected using purposive sampling, targeting students who had used the module for at least three learning topics within the course to ensure that they could provide well-informed and comprehensive evaluations.

The primary data collection instrument was a closed-ended designed usinga five-point

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likert scale 1 = strongly disagree to 5 = strongly agree). The questionnaire was developed based on indicators for each research aspect:

1. Usability: language readability, clarity of instructions, visual neatness, and ease of navigation.
2. Content Quality: alignment with the curriculum, clarity of materials, adequacy of examples, relevance to real-life contexts, and appropriateness of practice exercises.
3. Effectiveness: enhancement of learning motivation, active engagement, ease of concept comprehension, and contribution to learning outcomes.

Quantitative data obtained from the questionnaire were processed using Microsoft Excel. The data were analyzed using descriptive statistics, including means, percentages, and categorical classifications (very good, good, fair, and poor). Meanwhile, the qualitative data derived from semi-structured interviews were analyzed using inductive thematic analysis, which allows themes to emerge from the data rather than being pre-determined.

The results of both quantitative and qualitative analyses were presented in visual diagrams to facilitate interpretation. The integration of both datasets provided a comprehensive understanding of the module's usability, content quality, and effectiveness in supporting learning activities.

Result

The analysis of students' perceptions regarding the learning modul was conductes based on three dimension : Usability, Content Quality, and Effectiveness. The descriptive result are summarized in Table 1.

Table 1. Average Scores of the Three Assessed Aspects

Module Assessment	Mean Score	Category
Usability	4.38	Very Good
Content Quality	4.26	Very Good
Effectiveness	4.21	Very Good
Average	4.28	Very Good

The quantitative results indicate that all three dimensions achieved scores above 4.00, which corresponds to the "very good" category. Among them, usability obtained the highest mean score (4.38), suggesting that students found the module easy to navigate, clearly written, and visually appealing.

The detailed breakdown of mean scores across individual indicators is presented in Table 2.

Table 2. The score of each assessment aspect

Module Assessment	Indicators	Mean	Category
Usability	Language readability	4.42	Very Good
	Clarity of instructions	4.35	Very Good
	Visual neatness	4.40	Very Good
	Ease of navigation	4.36	Very Good

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Content Quality	Curriculum alignment	4.28	Very Good
	Clarity of materials	4.30	Very Good
	Adequacy of examples	4.21	Very Good
	Real-life relevance	4.25	Very Good
	Appropriateness of exercises	4.23	Very Good
Effectiveness	Learning motivation	4.19	Very Good
	Active engagement	4.20	Very Good
	Concept comprehension	4.17	Very Good
	Learning outcomes contribution	4.27	Very Good

Overall, the data show consistent positive responses across all aspects. The module's clarity, structure, and real-world relevance were particularly appreciated by the students.

The inductive thematic analysis of interview data yielded three main themes describing students' experiences:

1. Ease of Use and Independent Learning, Students appreciated the module's clear instructions, user-friendly layout, and consistent structure that supported self-paced study.
2. Contextual and Practical Content, The examples and exercises were perceived as relevant to real classroom scenarios, enhancing understanding and confidence.
3. Motivation and Engagement through Digital Tools, The inclusion of interactive elements such as *Quizizz* and reflection prompts was reported to increase attention and enjoyment in learning.

These qualitative findings reinforce the quantitative results, indicating that the learning module effectively supports student engagement and comprehension.

Discussion

The results demonstrate that the developed learning module is highly effective in supporting independent and interactive learning among students of the Educational Media course. The "very good" category across all aspects indicates that the module met both pedagogical and technical expectations.

1. Usability and Student Autonomy

The high usability score aligns with findings from Hamid et al. (2023), who emphasize that clear structure and readable language are essential for student autonomy in digital learning. The module's intuitive layout and consistent formatting allowed students to navigate content efficiently, reducing cognitive load and improving focus. This supports Mayer's (2005), which asserts that well-organized visual and textual cues enhance comprehension by minimizing extraneous processing.

Furthermore, the positive qualitative feedback confirms that the design enabled self-directed learning students could revisit specific sections without confusion. This feature is particularly valuable in blended and asynchronous learning contexts where teacher guidance is limited.

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2. Content Quality and Curriculum Alignment

The module's strong content quality reflects successful alignment with the course syllabus and learning outcomes. This coherence ensures that instructional materials support constructive alignment, as emphasized (Cramer et al., 2018). Students appreciated the contextual relevance of examples, which promoted *situated learning* a principle that learning is most effective when tasks are embedded in authentic contexts (Ernawati et al., 2022; Freeman et al., 2014). Similar results were found in studies by Nurhikmah et al. (2021) and Utami & Muhtadi (Utami & Muhtadi, 2020), showing that modules with contextualized examples significantly improve learner engagement and conceptual retention.

However, minor qualitative notes suggested that some sections could benefit from additional multimedia examples (e.g., video clips or visuals) to support different learning preferences. This indicates a potential future enhancement area consistent with Cramer et al. (2018), who advocate for multimodal learning integration in module design.

3. Effectiveness and Learning Engagement

The module's effectiveness dimension received a "very good" rating, primarily due to its interactive features and engaging design. The integration of Quizizz was particularly influential in maintaining student motivation and participation. This finding aligns with research by Zafar et al. (2022), who found that gamified elements like *Quizizz* enhance active learning by combining immediate feedback with competitive engagement. From a cognitive perspective, the module promotes *retrieval practice* and *formative assessment*, both of which are proven to strengthen long-term retention (Amini & Usmeldi, 2022).

Furthermore, the inductive thematic analysis revealed that students experienced higher motivation and confidence due to the autonomy provided by the module. This confirms findings from Mustafa et al. (2021), who noted that well-designed modules foster both affective and cognitive engagement.

4. Integration of Quantitative and Qualitative Insights

The integration of both analyses presents a cohesive view: the module effectively balances clarity (usability), accuracy (content quality), and engagement (effectiveness). Quantitative data confirm overall satisfaction, while qualitative narratives explain *why* these perceptions emerged specifically, the alignment of design with learner expectations and the presence of interactive reinforcement.
The findings, therefore, not only validate the module's quality but also emphasize the importance of pedagogical design that prioritizes usability and contextual relevance (Manggala et al., 2024).

5. Implications for Practice

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These findings highlight several pedagogical implications. Educators should integrate interactive and feedback-rich components into digital modules to sustain motivation. Additionally, consistent layout and clear navigation structures contribute to learning continuity, especially in self-paced environments (Agusnaya et al., 2021).

Conclusion

The study concludes that a well-designed and contextually relevant learning module can substantially enhance students' engagement, motivation, and independence in the learning process. More importantly, this research introduces a three-dimensional evaluative framework—covering usability, content quality, and effectiveness—as a theoretical contribution to the field of instructional design and digital pedagogy. This approach provides a comprehensive perspective for understanding how structural clarity, contextual relevance, and interactivity collectively influence learning outcomes in digital environments. From a practical standpoint, the findings serve as a pedagogical guideline for lecturers and instructional designers in developing interactive modules that promote learner-centered engagement while maintaining academic rigor and clarity of instruction.

Recommendation

Based on the study's positive findings, several key recommendations are proposed. First, further optimization of module features such as bookmarks and navigation tools is essential to enhance usability and learning efficiency. Second, the digital learning module should be implemented more broadly across higher education institutions, supported by expanded and customizable content to accommodate diverse course needs. Finally, conducting a longitudinal study is recommended to evaluate the sustained impact of the module on student performance and engagement over time.

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