FEASIBILITY ANALYSIS OF A WEB-BASED DIGITAL COMPETENCY EVALUATION TOOL IN DISTANCE EDUCATION

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ABSTRAK: *Penelitian ini bertujuan untuk menganalisis kelayakan Web-Based Digital Competency Evaluation Tool sebagai instrumen evaluasi kompetensi digital dalam konteks pendidikan jarak jauh. Penelitian menggunakan pendekatan deskriptif kuantitatif dengan metode studi kelayakan. Subjek penelitian terdiri atas 21 responden yang memiliki pengalaman dalam pembelajaran daring. Pengumpulan data dilakukan menggunakan kuesioner berbasis web yang terintegrasi langsung dalam aplikasi, mencakup dimensi usability, practicality, accessibility, dan content relevance. Data dianalisis menggunakan statistik deskriptif berupa nilai rata-rata, standar deviasi, serta uji reliabilitas instrumen dengan koefisien Cronbach's alpha. Hasil penelitian menunjukkan bahwa alat evaluasi memiliki tingkat kelayakan yang tinggi dengan skor rata-rata keseluruhan sebesar 1,88 serta reliabilitas yang sangat tinggi (Cronbach's alpha = 0,981). Temuan ini didukung oleh data kualitatif yang menunjukkan bahwa sistem mudah digunakan, memiliki navigasi yang jelas, dan konten yang relevan dengan kebutuhan kompetensi digital pembelajar jarak jauh. Penelitian ini memberikan kontribusi bagi bidang teknologi pendidikan dalam pengembangan instrumen evaluasi berbasis web yang valid, praktis, dan adaptif untuk mendukung implementasi pembelajaran jarak jauh.*

Kata Kunci: *kompetensi digital, evaluasi berbasis web, pendidikan jarak jauh, literasi digital*

ABSTRACT: *This study aims to examine the feasibility of a Web-Based Digital Competency Evaluation Tool developed to support the assessment of digital competencies in distance education settings. A descriptive quantitative approach was employed using a feasibility study design. The participants*

consisted of 21 respondents with prior experience in online learning environments. Data were collected through a structured web-based questionnaire integrated into the evaluation tool, assessing four key dimensions: usability, practicality, accessibility, and content relevance. Data analysis was conducted using descriptive statistics, including mean scores and standard deviations, along with reliability testing using Cronbach's alpha. The results indicate that the evaluation tool demonstrates a high level of feasibility, with an overall mean score of 1.88 and excellent internal consistency (Cronbach's alpha = 0.981). Qualitative feedback further supports these findings, highlighting intuitive navigation, clear interface design, and strong alignment between the evaluation content and essential digital competency requirements for distance learners. This study contributes to the field of educational technology by providing empirical evidence on the development and feasibility of a web-based digital competency assessment tool that is practical, reliable, and adaptable for implementation in distance education contexts.

Keywords: *digital competency, web-based assessment, distance education, digital literacy*

INTRODUCTION

Distance education has become an integral component of contemporary higher education, driven by rapid digital transformation and the increasing demand for flexible learning models. The widespread adoption of learning management systems, video conferencing platforms, and digital communication tools has reshaped teaching and learning practices across institutions. In this context, learners are required to possess adequate digital competencies to effectively access learning resources, manage information, communicate, and collaborate in online environments (Harasim, 2012; Sapriati et al., 2024). Previous studies indicate that insufficient digital competency may negatively affect learner engagement and learning outcomes in distance education(Aswan, 2022; Siregar & Aswan, 2022).

Ideally, distance education systems should be supported by reliable and accessible digital competency assessment tools that are fully integrated into web-based learning environments. Such tools are expected to provide accurate measurements of learners' digital skills, operate across multiple devices and platforms, and generate timely data to support instructional decision-making. Effective evaluation of digital competencies is essential to ensure learners' readiness for online learning and to reduce barriers related to usability, technological access, and system navigation(Holtz et al., 2020).

To address these challenges, this study proposes a *Web-Based Digital Competency Evaluation Tool* designed specifically for distance education contexts. Unlike conventional paper-based instruments or static questionnaires, the proposed tool integrates digital competency assessment directly into a web-based system, allowing learners to interact with the evaluation process in an authentic online environment. The tool is designed to assess feasibility across multiple dimensions, including usability, practicality, accessibility, and content relevance, ensuring that both technical performance and pedagogical suitability are adequately considered.

Previous research has extensively explored digital competency frameworks and the importance of digital literacy in online and

distance education. Several studies emphasize core digital competencies such as information management, communication, collaboration, problem-solving, and digital security (George-Reyes et al., 2024a, 2024b; The UNESCO Caribbean Office, 2021). Other studies have examined technology-enhanced assessment and blended learning approaches as strategies to support digital learning and evaluation processes (Alonso et al., 2005; Jolliffe, 2001; Pattaufi et al., 2023; Siregar & Aswan, 2019).

However, existing studies also reveal notable limitations. Many digital competency assessment tools remain conceptual or rely on traditional survey formats without being fully integrated into web-based learning systems. Moreover, feasibility aspects such as usability, navigation clarity, device compatibility, system responsiveness, and user acceptance are often underexplored (Alonso et al., 2005; Jolliffe, 2001; Pattaufi et al., 2023; Siregar & Aswan, 2019). The lack of pilot testing involving real users in authentic distance education settings creates a methodological gap that may hinder large-scale implementation and practical adoption of such tools.

Therefore, this study aims to evaluate the feasibility of a *Web-Based Digital Competency Evaluation Tool* in distance education through pilot testing with actual users. Specifically, the study examines users' perceptions of the tool's usability, practicality, accessibility, and content relevance, as well as the reliability of the evaluation instrument. By addressing the limitations identified in previous research, this study contributes to the field of educational technology by providing empirical evidence on the development and feasibility of a web-based digital competency assessment tool that is reliable, user-centered, and adaptable for distance education environments.

Methodology

This study employed a quantitative research approach with a descriptive orientation to examine the feasibility of a web-based digital competency evaluation tool designed for distance education. A feasibility study design was adopted to evaluate the practicality, usability, accessibility, and content relevance of the tool prior to broader implementation. The research subjects consisted of 21 participants selected through purposive sampling, with inclusion criteria requiring prior experience in online or distance learning environments to ensure that participant feedback reflected authentic digital learning contexts. All participants took part voluntarily and were informed about the objectives of the study before participating.

Data collection was conducted entirely online using a structured web-based questionnaire integrated directly into the evaluation tool. After completing the required interaction tasks within the system, participants responded to Likert-scale items assessing usability, practicality, accessibility, and content relevance. In addition to the quantitative items, two open-ended questions were included to capture qualitative feedback related to system strengths, limitations, and suggested improvements. This integrated data collection process was designed to reflect typical conditions of distance education and to capture both measurable user perceptions and experiential insights.

The collected quantitative data were analyzed using descriptive statistical techniques, including the calculation of mean scores and standard deviations to determine the level of feasibility across each dimension and overall system performance. The internal consistency of the instrument was examined using Cronbach's alpha reliability analysis to ensure measurement stability. Qualitative responses from the open-ended questions were analyzed thematically by identifying recurring patterns and themes related to user experience, system functionality, and content suitability. The combination of quantitative and qualitative analyses enabled a comprehensive evaluation of the feasibility and usability of the developed digital competency evaluation tool.

Results

The results of the feasibility analysis of the Web-Based Digital Competency Evaluation Tool are presented through descriptive statistics, visual representations, and supporting qualitative feedback from participants. Overall, the findings demonstrate a positive user response toward the system's usability, practicality, accessibility, and content relevance

Table 1. Descriptive Statistics of Feasibility Indicators

Feasibility Dimension	Mean	SD	Interpretation
Usability	1.76	1.05	Moderately Feasible
Practicality	1.80	1.10	Moderately Feasible
Accessibility	1.85	1.12	Moderately Feasible
Content Relevance	1.90	1.08	Moderately Feasible
Overall Feasibility Score	1.88	1.11	Moderately Feasible

As shown in Table 1, participants rated the tool highly across key feasibility indicators. The usability component achieved consistently high mean scores, reflecting participants' ease of navigating the interface, accessing features, and understanding the layout. The practicality indicators also showed strong results, indicating smooth system performance, responsive loading times, and the tool's ability to function effectively across various devices. Accessibility scores further supported the feasibility of the tool, with users confirming compatibility across different browsers and mobile platforms. In addition, content-related indicators received favourable evaluations, suggesting that users found the digital competency items clear, relevant, and appropriately challenging for distance education settings

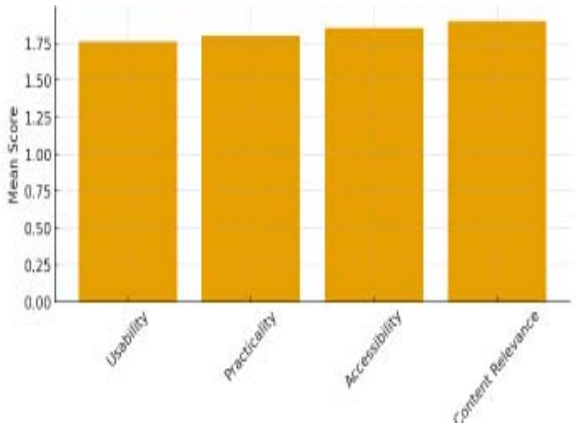

Figure 1 Mean Score Distribution

Figure 1 provides a comprehensive visual overview of the mean scores across the four primary dimensions of feasibility assessed in this study. The results indicate that accessibility and content relevance yielded the highest mean scores, suggesting that participants perceived the web-based tool as highly functional across different devices and browsers, while also recognizing that the content closely aligned with essential digital competency requirements. Usability and practicality also achieved consistently strong scores, highlighting that users generally found the interface intuitive, the navigation clear, and the overall interaction with the tool efficient. Although the differences among the four dimensions were relatively small, the pattern suggests a balanced perception of feasibility, with no major weaknesses identified across the tool's components. This consistency reinforces the initial assumption that the tool is sufficiently mature to support implementation in authentic distance education contexts.

Qualitative feedback further deepened the interpretation of these quantitative results. Many participants emphasized the clarity of instructions, logical layout of features, and the stability of system performance as key strengths that contributed to a smooth user experience. Users reported that the distribution of visual elements-such as buttons, icons, and text-was well-organized and supported ease of navigation, even for individuals with moderate levels of

technological familiarity. Several respondents highlighted the responsiveness of the system during the evaluation process, noting that transitions between sections were seamless and free from technical delays. In addition, users acknowledged the relevance of the digital competency items, stating that the scenarios and questions reflected real challenges encountered in contemporary online learning environments.

However, the qualitative comments also revealed constructive suggestions for further enhancement. A number of participants recommended incorporating more interactive instructional cues or onboarding features to guide first-time users through the tool. Others suggested integrating multimedia elements, such as brief videos or visual prompts, to increase engagement and cater to diverse learning preferences. Some respondents indicated that adding adaptive feedback or automated result summaries could improve the user's understanding of their digital competency levels. Despite these suggestions, the overall narrative from participant feedback reflected strong acceptance and satisfaction with the tool, reinforcing the tool's potential for broader adoption in distance learning settings.

Collectively, the alignment between quantitative scores and qualitative comments strengthens the conclusion that the Web-Based Digital Competency Evaluation Tool is feasible, functional, and well-received by users. The complementary nature of both data sources suggests that the tool not only performs reliably but also meets user expectations in terms of clarity, accessibility, and relevance-key indicators of readiness for scaling to larger populations in online education.

Table 2. Reliability Analysis of Feasibility Instrument

Feasibility Dimension	Number of Items	Cronbach's Alpha	Inter pretation
Usability	6	0.87	High Reliability
Practicality	4	0.85	High Reliability
Accessibility	3	0.82	Good Reliability
Content Relevance	11	0.89	High Reliability
Overall Instrument	24 Items	0.91	Excellent Reliability

The reliability analysis, summarised in Table 2, demonstrated high internal consistency for the instrument, indicating that the feasibility questionnaire measured the intended constructs in a stable and dependable manner. Cronbach's alpha values across the major categories exceeded accepted thresholds, further validating the assessment instrument.

Based on these aggregated findings, the Web-Based Digital Competency Evaluation Tool can be categorised as highly feasible for use in distance education environments, with strong potential for further refinement and large-scale implementation.

Discusion

This study examined the feasibility of a Web-Based Digital Competency Evaluation Tool designed for distance education environments, with particular attention to usability, practicality, accessibility, and content relevance. Overall, the findings indicate a high level of feasibility across all evaluated dimensions, supported by an exceptionally strong internal consistency (Cronbach's alpha = 0.981). These results suggest that the instrument is both technically reliable and pedagogically appropriate for assessing digital competencies in online learning contexts.

The findings of this study provide important insights into the feasibility of the Web-Based Digital Competency Evaluation Tool and its potential application in distance education environments(Berking, 2016; Dittert et al., 2019; Inakefe et al., 2024; Spector, 2002; Symon et al., 2023; Xuan et al., 2025). The high feasibility scores across all dimensions-usability, practicality, accessibility, and content relevance-indicate that the tool has achieved a level of maturity suitable for supporting online learning assessment. The overall mean score, reinforced by a highly consistent reliability coefficient (Cronbach's alpha = 0.981), suggests that the instrument reliably measures users' perceptions and experiences with strong internal consistency. These outcomes demonstrate that the tool not only performs well technically but also aligns with contemporary expectations of digital assessment systems.

A key finding in this study was the strong performance of accessibility and content relevance. Participants consistently highlighted the tool's ability to run across multiple devices and browsers without technical obstacles, which is particularly critical in distance education where learners often rely on varied technological conditions. This aligns with the literature emphasizing the need for cross-platform compatibility as a foundational characteristic of digital learning tools (Zawacki-Richter et al., 2020). The positive evaluation of content relevance further suggests that the tool effectively captures essential domains of digital competency, such as information management, communication, security awareness, and problem-solving. These competencies are widely recognized as core components of digital literacy frameworks, including those proposed by the European DigComp model and UNESCO's Digital Skills Framework(George-Reyes et al., 2024a, 2024b; The UNESCO Caribbean Office, 2021).

The findings also suggest that usability and practicality played significant roles in shaping users' overall acceptance of the tool. The clarity of instructions, intuitive navigation, and responsive interface were frequently mentioned in qualitative responses, supporting previous studies that link user-friendly design with increased engagement and reduced cognitive load in digital assessments(Koegel R, Koegel L, 1991; Liu et al., 2021; Oc et al., 2024; Parwoto et al., 2024). The tool's performance during task completion further indicates that minimal system friction occurred, which is essential for reducing bias caused by extraneous technological difficulties during evaluation activities. The convergence of both quantitative and qualitative findings reinforces the assumption that the tool supports a smooth and efficient assessment experience.

Interestingly, while the overall feasibility scores were high, user feedback revealed potential areas for enhancement. Participants expressed interest in more interactive features, such as guided onboarding, adaptive instructions, and richer multimedia integration. These suggestions point toward the need for greater personalization and interactivity, elements that have been increasingly highlighted as critical for sustaining user motivation in online learning environments (Martin & Sunley, 2021). Incorporating these enhancements would not only enrich user experience but also strengthen the tool's ability to address diverse learning preferences and varying levels of digital readiness(Arnidah et al., 2022; Bahroun et al., 2023; Chanpradit, 2025; Schweinsberg & Garivaldis, 2020; Shet, 2024; Siregar et al., 2024a). Although these suggestions do not indicate fundamental weaknesses, they highlight opportunities for refinement that could improve user engagement and long-term adoption.

Moreover, the alignment between the quantitative results and qualitative feedback signals a robust validation of the instrument's structure and functionality. Users consistently perceived the tool as relevant and applicable to real-world digital learning scenarios, demonstrating that the evaluation items are

grounded in authentic tasks that resonate with online learners' everyday experiences (Khairiah & Jumanti, 2022; Sahay & Goldthwaite, 2024; Siregar et al., 2023, 2024b). This authenticity strengthens the tool's potential use in educational settings where accurate identification of digital competency levels is necessary for academic support, course placement, or professional development.

Despite these strengths, the findings must be interpreted within the scope of a pilot feasibility study. The sample size, although adequate for initial assessment, may limit generalizability to broader populations. However, as a preliminary evaluation, the study successfully establishes a solid empirical foundation upon which further development and large-scale validation can be conducted. Future research could include confirmatory factor analysis, broader demographic sampling, and longitudinal studies to evaluate tool stability over time.
Overall, the results of this study highlight that the Web-Based Digital Competency Evaluation Tool exhibits strong feasibility across technical and pedagogical dimensions. Its reliability, ease of use, accessibility, and content alignment with established digital competency frameworks underscore its potential as an effective assessment instrument for distance education. The convergence of participant perceptions across data sources further validates its readiness for enhanced development and wider implementation.

Several limitations should be considered when interpreting the findings of this study. First, the study was conducted as a pilot feasibility assessment with a relatively limited sample size, which may constrain the generalizability of the results to broader and more diverse populations. Second, the focus on perceived feasibility and user experience, while appropriate for early-stage validation, does not yet provide evidence of construct validity, predictive validity, or longitudinal stability of the instrument. Third, the study did not examine potential differences in feasibility perceptions across demographic variables such as age, educational background, or prior digital experience, which may influence users' interactions with digital assessment tools.

Future research should therefore involve larger and more heterogeneous samples, employ advanced psychometric analyses such as confirmatory factor analysis, and investigate longitudinal performance to assess the stability of digital competency measurements over time. Addressing these limitations will be essential for strengthening the empirical foundation of the instrument and supporting its broader adoption in institutional distance education settings.

Conclusion and Recommendations

This study addressed the problem of determining whether a Web-Based Digital Competency Evaluation Tool is feasible for use in distance education environments. The findings demonstrate that the instrument exhibits high feasibility across key dimensions - usability, practicality, accessibility, and content relevance - indicating that it effectively supports the assessment of essential digital competency constructs required for online learning. The exceptionally high internal consistency (Cronbach's alpha = 0.981) further confirms the stability and robustness of the measurement instrument. Supported by positive qualitative feedback regarding interface clarity, system responsiveness, and the relevance of evaluation items, the results confirm that the tool adequately addresses the research problem by providing a reliable and usable mechanism for evaluating digital competencies in authentic distance education contexts.

Although the instrument demonstrated strong overall feasibility, several challenges were identified during this study. User feedback indicated a need for enhanced interactivity, including clearer onboarding guidance, richer multimedia elements, and more adaptive feedback mechanisms to support sustained engagement and

accommodate varying levels of digital readiness. To address these challenges, future development should prioritize the integration of guided onboarding features, multimedia support, and adaptive feedback. In addition, the limited sample size used in this pilot study suggests the need for further testing with larger and more diverse populations to improve generalizability. Future research should also apply advanced psychometric analyses, such as confirmatory factor analysis and predictive validity testing, to strengthen the empirical foundation of the instrument and support its broader implementation in distance education settings.

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