

Identification and Validation of Key Digital Literacy Indicators among Faculty Members for Ensuring the Quality of Online Education

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ABSTRACT

The purpose of this study was to identify and validate key indicators of digital literacy among faculty members in ensuring the quality of online education. The research was applied in purpose, mixed-method in nature, and sequential exploratory in design. In the qualitative phase, thematic analysis was conducted with 14 faculty members holding doctoral degrees in Higher Education Management and Distance Education, selected through purposive theoretical sampling. Data were collected via semi-structured interviews and analyzed using three-step coding (open, axial, selective). The quantitative phase employed a descriptive-correlational method involving all 376 faculty members of Mohaghegh Ardabili University in 2025, using a census sampling method. Data were collected through a researcher-made questionnaire based on qualitative findings and analyzed using confirmatory factor analysis within a structural equation modeling (SEM) framework. Overall, the key digital literacy indicators of faculty members for ensuring online education quality were categorized and validated under five components: educational technology, instructional design, information management, effective interaction, and professional ethics. Based on the findings, identifying and validating these indicators can enhance the quality of online education and improve the effectiveness of teaching-learning processes. Integrating these indicators into educational planning can foster faculty professional development and ensure sustainable quality in virtual education.

Keywords: Key Indicators, Digital Literacy, Online Education, Faculty Members

Introduction

The present study aimed to comprehensively identify and validate the key indicators of digital literacy among faculty members to ensure the quality of online education. Adopting an applied research purpose and a mixed-methods design, the study followed a sequential exploratory approach. In the qualitative phase, thematic analysis was employed to uncover foundational indicators.

Methodology

The participants comprised 14 educational sciences experts holding Ph.D. degrees in Higher Education Management and Distance Education Planning, selected through purposive theoretical sampling until data saturation was achieved. Semi-structured interviews served as the primary data collection instrument, and data were analyzed using a rigorous three-stage coding process (open, axial, and selective coding) to extract core themes. In the quantitative phase, a descriptive correlational design was utilized to test and validate the constructs identified qualitatively. The statistical population included all 376 faculty members of Mohaghegh Ardabili University in 2025. Due to the population size, census sampling was applied, and all faculty members completed a researcher-developed questionnaire derived from the qualitative findings. Confirmatory factor analysis (CFA) within the framework of Structural Equation Modeling (SEM) was conducted to examine construct validity and reliability.

Findings

The results indicated that the key indicators of digital literacy for faculty members could be organized into five main dimensions: educational technology, instructional design, information management, effective interactions, and professional ethics, all demonstrating significant factor loadings ($p < 0.05$). Educational technology encompassed competencies in learning management systems, multimedia content creation, and emerging digital tools. Instructional design emphasized scenario-based learning, active learning strategies, formative and summative assessments, and multimedia integration. Information management highlighted advanced search skills, source evaluation, citation accuracy, and data synthesis. Effective interactions included facilitating discussions, providing timely feedback, managing intercultural communication, and resolving conflicts. Professional ethics involved intellectual property compliance, confidentiality, educational equity, continuous professional development, and maintaining digital well-being.

Conclusion

The findings underscore that the development and validation of these indicators provide a structured framework for enhancing the effectiveness and sustainability of online education. Integrating these indicators into faculty development programs and institutional planning can significantly improve teaching quality, foster active student engagement, and ensure ethical and equitable learning environments. Consequently, this study offers a comprehensive, evidence-based roadmap for higher education institutions aiming to strengthen digital competencies among faculty and promote sustainable quality assurance in virtual learning environments.

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