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# The Mediating Role of Digital Skills in the Relationship Between Artificial Intelligence Literacy and the Quality of Educational Services (Case Study: Farhangian University)

Asadolah Khadivi[1], Mahdi Parvinzadeh[2], Saeed Arefnejad[3]

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## Abstract

**Purpose:** This study aims to examine the mediating role of digital skills in the relationship between artificial intelligence (AI) literacy and the quality of educational services at Farhangian University.

**Methodology:** The present study is applied in purpose and descriptive-correlational in method, utilizing structural equation modeling (SEM). The population consisted of all full-time faculty members and lecturers at Farhangian University of East Azerbaijan Province, totaling 500 individuals. Based on SEM guidelines, a sample of 240 participants was selected through stratified random sampling. Data were collected using questionnaires on AI literacy (Ma & Chen, 2024), digital skills (Rodríguez, van Oosten & Igartu, 2018), and educational service quality (Aboubakr & Bayoumy, 2022; Alayoubi, Al Shobaki & Abu-Naser, 2020). Data analysis was performed using SPSS 26 and AMOS software.

**Findlings:** The results indicate that the conceptual model demonstrates a good fit. The coefficients of determination were 0.49 for AI literacy, 0.83 for digital skills, and 0.67 for educational service quality, reflecting strong effects of these variables. Hypothesis testing further revealed statistically significant relationships among AI literacy, digital skills, and educational service quality.

**Value:** This study provides innovative insights into the roles of AI literacy and digital skills in higher education and offers guidance for educational policymakers to bridge existing gaps and enhance service quality.

**Keywords:** ***Artificial Intelligence Literacy, Digital Skills, Quality of Educational Services, Farhangian University***

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1. Associate Professor, Department of Educational Administration , Farhangian University ,Tehran.Iran(Corresponding Author)khadivi@cfu.ac.ir
2. Lecturer, Medical Philosophy and History Research Center, university of Medical Sciences,Tabriz, Iran
3. Assistant Professor,Department of Social Sciences and Regional Studies, Educational Studies of Institute, Tehran, Iran

## Extended Abstract

**Introduction:** In recent years, the growing demand for higher education has led to a significant increase in the number of educational institutions. However, concerns regarding the quality of services in these institutions have made it imperative for higher education institutions to be accountable and to strengthen public trust in the level of their offerings. Continuous quality improvement has therefore become an essential requirement. In Iran, policymakers have consistently emphasized the enhancement of educational quality, although the country's higher education system still lags behind global benchmarks. Within this context, key factors such as artificial intelligence (AI) literacy and digital skills play a fundamental role in enhancing service quality. Understanding the impact of these factors—and specifically the mediating role of digital skills in the relationship between AI literacy and the quality of educational services—is the primary focus of the present study.

**Purpose:** The study aims to determine the mediating role of digital skills in the relationship between artificial intelligence literacy and the quality of educational services at Farhangian University.

**Methodology:** The present study is applied in purpose and descriptive-correlational in method, employing structural equation modeling (SEM) for data analysis. The population comprised all full-time faculty members and lecturers at Farhangian University in East Azerbaijan Province, totaling 500 individuals. Following SEM guidelines, a sample of 240 participants was selected through stratified random sampling. Data were collected using standardized questionnaires on AI literacy (Ma & Chen, 2024), digital skills (Rodríguez, van Oosten & Igartu, 2018), and educational service quality (Aboubakr & Bayoumy, 2022; Alayoubi, Al Shobaki & Abu-Naser, 2020). Data analysis was performed using SPSS 26 and AMOS software to evaluate both measurement and structural models.

**Findings:** Structural equation modeling was conducted using AMOS to examine the conceptual model and assess its fit. The results indicated that the model demonstrated good fit indices, confirming the suitability of the hypothesized relationships. Figure 1 illustrates the standard conceptual model of the study, highlighting the direct effects of AI literacy on educational service quality and the indirect effects mediated by digital skills.

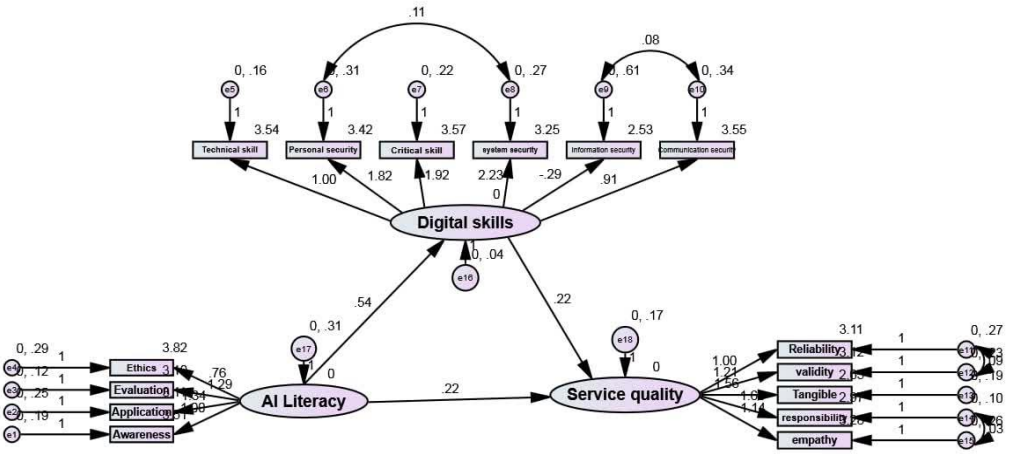


**Figure 1. Conceptual Model of Research in Standard Mode**

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This model illustrates the relationship between AI literacy and the quality of educational services, with digital skills functioning as a mediator. Its hierarchical structure highlights AI literacy as a foundational element that underpins other components, while educational service quality represents the outcome. Analysis indicates that digital skills—including the practical application of AI tools—translate AI literacy into actionable capabilities. These skills enhance service quality through rapid responses, accurate assessments, and personalized support. Furthermore, digital skills increase accessibility and tangibility of tools, thereby fostering trust. Critical competencies such as information analysis and accountability emerge from digital skills, enabling learners to evaluate and provide constructive feedback on educational services. This feedback loop facilitates continuous improvement, underscoring the essential role of digital skills in effectively applying AI literacy to enhance education quality.

To assess the explanatory power of AI literacy, digital skills, and the quality of educational services, the coefficient of determination ($R^2$) was calculated. The analysis revealed $R^2$ values of 0.49 for AI literacy, 0.83 for digital skills, and 0.67 for educational service quality, indicating strong and significant explanatory power for these variables.

To evaluate the fit of the conceptual model, multiple categories of fit indices were employed. Comparative fit indices included TLI, CFI, IFI, RFI, and NFI; absolute fit indices comprised RMR, AGFI, and GFI; and parsimonious fit indices included RMSEA, CMIN/DF, PRATIO, PNFI, and PCFI, along with explained variance ($R^2$). All indices confirmed that the model achieved a desirable and appropriate fit. Consequently, it can be concluded that the conceptual model is robust, providing a solid foundation for analyzing the results and testing the research hypotheses.

**Table 1. Relationship Between Variables Affecting Service Quality**

| **Direction of the route** | | **Standard coefficient** | **Standard error** | **Critical ratio** | **Significance level** |
|---|---|---|---|---|---|
| **from** | **to** | | | | |
| AI Literacy (Independent) | Digital Skills(Independent/Dependent) | 0.829 | 0.060 | 6.685 | 0.001 |
| | Service Quality (Dependent) | 0.494 | 0.054 | 5.235 | 0.001 |
| Digital Skills (Independent/ Dependent) | Service Quality (Dependent) | 0.671 | 0.090 | 5.941 | 0.001 |

The findings presented in Table 1 indicate that the relationships between the variables are significant at the $p < 0.05$ level, and the critical ratio values exceed 1.96. Therefore, the corresponding hypotheses are confirmed, implying that, at a 0.05 significance level, the relationship between the independent variable (AI literacy), the mediating variable (digital skills), and the dependent variable (educational service quality) is statistically significant.

**Table 2. Indirect Effect of Independent Variable on Dependent Variable**

| Direction of the route | Standard coefficient | Confidence coefficient 0.95 | |
|---|---|---|---|
| | | Low | High |
| AI Literacy ⟶ Digital Skills ⟶ Service Quality | 0.55 | 0.32 | 0.48 |

As shown in Table 2, approximately 55% of the effect of AI literacy on the quality of educational services is transmitted through the enhancement of digital skills. This result highlights the important mediating role of digital skills in conveying the impact of AI literacy on the quality of educational services.

**Conclusion:** The results of the study indicate that AI literacy plays a crucial role in enhancing digital skills and improving the quality of educational services at Farhangian University. AI literacy not only directly strengthens educational processes but also exerts an indirect and significant impact on learning outcomes through the enhancement of digital skills.

**Value:** This study provides a foundational and pioneering framework for shaping future educational strategies and policies in higher education. It can play a key role in the development of sustainable, responsive, and technology-driven educational systems.

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