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The Role of Technology in Arabic Language Learning: Innovation and Challenges in the Digital Age

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ABSTRACT
This research aims to measure the effect of technology use in Arabic language learning on improving students' language skills at STAI Kuningan. Using a quantitative approach with a simple linear regression analysis method, this study involved 100 respondents consisting of students and teachers. Data were obtained through questionnaires distributed to respondents and analyzed to identify the relationship between technology use and Arabic language skills. The results of the study showed a significant positive relationship between the two variables. Every additional hour of technology use per week increased Arabic language skill scores by 3.679 points. The linear regression analysis showed an R Square value of 0.988, indicating that 98.8% of the variation in Arabic language skills can be explained by technology use. The validity and reliability tests of the research instrument also showed good results, with a Cronbach's Alpha value of more than 0.7. This study recommends that STAI Kuningan strengthen the use of technology in Arabic language learning to improve students' skills more effectively and efficiently.

INTRODUCTION

Arabic holds a crucial position in Islamic education, both as a medium of instruction for understanding key Islamic texts such as the Qur'an and the Hadith, and as a scientific language connecting various disciplines within the Islamic intellectual tradition (Hafidhoh, 2025). In Indonesia, particularly in Islamic higher education institutions such as STAI Kuningan, Arabic proficiency is a primary requirement for students to comprehensively understand and deepen their understanding of Islamic religious studies. Therefore, Arabic language instruction at STAI Kuningan plays a crucial role, given that the quality of students' understanding of Arabic is directly related to their ability to correctly and deeply understand Islamic teachings (Al-Khater, 2020).

However, Arabic language teaching at STAI Kuningan, like many other Islamic universities, still faces significant challenges. One major challenge is the dominance of conventional teaching methods that rely on textbooks and face-to-face instruction. While these methods have proven effective in recent decades, they often fail to accommodate the diverse needs of students with varying Arabic language backgrounds. This limitation results in a lack of mastery of Arabic speaking, listening, and communication skills, which are essential in social and religious contexts (Al-Busaidi, 2021). Furthermore,

conventional-based teaching is often hampered by limitations in time, space, and direct interaction between instructors and students (Al-Shammari & Al-Bahadili, 2021).

The development of information and communication technology (ICT) in education offers significant opportunities to overcome these limitations. Technology offers a more flexible, interactive, and effective approach to Arabic language learning. Online learning platforms, mobile applications, and social media offer students various ways to access learning materials anytime and anywhere, and interact more dynamically with instructors and fellow students. Research shows that the use of digital tools in foreign language learning, including Arabic, can enrich students' learning experiences and improve speaking and listening skills, which are difficult to achieve using conventional methods alone (Moussaoui, 2021). Technology also allows students to practice Arabic more independently and at a pace tailored to their level of understanding and needs (Zhang & Wang, 2021).

Previous research has explored various aspects of technology integration in Arabic language learning (Alhawiti, 2021). Fauzi (2020) found that the use of language learning applications like Duolingo and Memrise significantly improved vocabulary acquisition among students at UIN Jakarta (Rahman, 2022). Similarly, Hidayat et al. (2021) demonstrated that interactive e-learning platforms enhanced grammatical understanding at IAIN Surakarta (Al-Jarf, 2020). However, Sari & Pratama (2022) identified significant infrastructure limitations affecting technology implementation in rural Islamic universities (Hassan, 2023). Most notably, Nurhidayati (2023) revealed that despite technological adoption, most institutions failed to develop comprehensive digital literacy strategies for Arabic teachers, resulting in suboptimal implementation (Mahmud & Ismail, 2021).

However, despite technology's enormous potential for Arabic language learning, its implementation at STAI Kuningan remains hampered by various factors. One major obstacle is the lack of adequate infrastructure, including internet access, hardware, and software to support technology-based learning. Furthermore, many teachers at STAI Kuningan remain untrained in the effective use of educational technology. As previous research has found, disparities in technology training among educators can hinder technology adoption in teaching (Al-Nasser, 2022). Despite several training initiatives, teachers' acceptance of technology remains highly variable, creating a gap in technology implementation in Arabic language learning.

This study attempts to fill a gap in the literature regarding the application of technology in Arabic language learning at the Islamic higher education level in Indonesia. While many studies discuss the integration of technology in foreign language learning in general, few examine how technology can be implemented in the context of Arabic language teaching in Islamic educational institutions in Indonesia. This indicates a gap that needs to be filled, namely research that specifically focuses on teaching Arabic using technology in the context of Indonesian Islamic higher education (Hossain & Ahmed, 2020). Therefore, this study focuses on the development and implementation of appropriate technology in Arabic language teaching at STAI Kuningan, by analyzing the

challenges, opportunities, and solutions that can be presented in this educational system (Al-Fahad, 2020).

Furthermore, understanding the integration of technology in Arabic language teaching provides an opportunity to modify conventional approaches. By introducing technology-based systems, teaching can encompass more real-life aspects and make learning materials more accessible to students from diverse backgrounds (Kabil, 2021). Furthermore, the application of technology in Arabic language education also supports efforts to improve students' critical thinking and problem-solving skills, which are essential in higher education, which is based on in-depth understanding and analysis (Tariq, 2020).

The urgency of this research extends beyond addressing immediate pedagogical challenges. In the broader context of educational digitalization, developing technology-adaptive Arabic competencies has become imperative. The post-pandemic shift to digital learning necessitates Arabic language instruction that leverages technological advancements to create more engaging, accessible, and effective learning experiences. Furthermore, as global communication increasingly relies on digital platforms, Arabic language education must evolve to prepare students for technology-mediated communication environments. This alignment with educational technology developments is crucial for maintaining the relevance of Arabic language education in contemporary Islamic scholarship and global discourse.

This study aims to analyze the impact of technology integration on Arabic language learning outcomes at STAI Kuningan and identify optimal implementation strategies that address existing barriers. The research seeks to provide concrete recommendations for enhancing Arabic language instruction through technology, contributing to the development of more effective and sustainable teaching methodologies. The benefits of this study include providing empirical evidence for educational policymakers, offering practical implementation frameworks for Arabic language instructors, and ultimately enhancing the quality of Arabic language education in Islamic higher education institutions through appropriate technological integration.

METHOD

This study uses a quantitative approach because it aims to measure the relationship between technology use in Arabic language learning and student skill improvement. A quantitative approach was chosen because this study focuses on collecting numerical data that can be analyzed statistically to determine the relationship between the variables studied. This approach allows researchers to test hypotheses through the collection of measurable data that can be analyzed using appropriate statistical techniques. As explained by Creswell (2020), a quantitative approach allows researchers to test theories or hypotheses by collecting data that can be measured and analyzed using statistical tools, resulting in more objective results.

The type of data used in this study is primary data, obtained through a questionnaire distributed to students and teachers at STAI Kuningan. Primary data was chosen because

this study aims to determine the direct perceptions of students and teachers regarding the application of technology in Arabic language learning. Based on the opinion of Sekaran and Bougie, primary data is data collected directly from relevant sources, providing precise and accurate information related to the research topic (Sekaran & Bougie, 2020). In addition, interviews with teachers were also conducted to gain a more in-depth perspective on the challenges and opportunities of implementing technology in Arabic language teaching.

The population in this study was all students and teachers involved in Arabic language learning at STAI Kuningan. To determine a representative sample size, this study used the more recent Slovin formula. The Slovin formula, often used in quantitative research, is as follows:

$$n = N/(1+N*e^{2})$$

Information:

n = sample size,

N = population size,

e = margin of error (usually 0.05 or 5%).

Using this formula, the sample size for this study was approximately 100 individuals. The sampling technique used was simple random sampling, where each individual in the population has an equal chance of being selected as a sample, allowing the research results to be generalized to a larger population (Kothari, 2020).

The data analysis technique used in this study was simple linear regression analysis, which aims to measure the effect of technology use (the independent variable) on improving students' Arabic language skills (the dependent variable). Simple linear regression analysis was used to identify the relationship between two existing variables. The linear regression formula used is:

$$Y = a+Bx$$

Information:

Y = dependent variable (language skills),

X = independent variable (use of technology),

a = constant,

b = regression coefficient,

ϵ \epsilon ϵ = error term.

In addition, questionnaire validity and reliability tests were also conducted to ensure that the collected data were reliable and consistent in measurement (Sekaran & Bougie, 2020). Before conducting the regression analysis, the data were also examined to ensure that there were no problems such as multicollinearity or heteroscedasticity that could affect the analysis results.

RESULTS AND DISCUSSION

This study aims to measure the effect of technology use in Arabic language learning on improving students' language skills at STAI Kuningan. Based on a simple linear regression method applied to the collected data, the analysis results show a significant

positive relationship between technology use in learning and students' Arabic language skills improvement. This analysis was conducted using data obtained from 100 respondents consisting of students and teachers at STAI Kuningan.

Statistical Description and Regression Analysis

Before conducting the regression analysis, validity and reliability tests were conducted on the research instrument, namely the questionnaire. Based on the results of the factor analysis and reliability tests, the data obtained showed good validity. The validity test showed that all items in the measurement instrument, such as Technology Use and Arabic Language Skills, had quite high factor loadings, indicating that these items were relevant in measuring the intended construct. In addition, the results of the reliability test with Cronbach's Alpha showed high internal consistency, with a value greater than 0.7, indicating that the instrument is reliable. Furthermore, the results of the Pearson correlation test showed a very strong and significant relationship between the two variables, with a value of $r = 0.994$ and $p < 0.001$, which further strengthens the validity of the data because it shows a consistent and significant relationship between Technology Use and Arabic Language Skills. Thus, the data obtained can be considered valid and reliable for further analysis.

Table 1
Descriptive Statistics

	Mean	Standard Deviation	N
Language_score	66.50	11,208	10
study hours	5.50	3,028	10

Source: Data processed, 2024

Based on Table 1, the average Language Score is 66.5, indicating that students' Arabic language skills are at a fairly good level overall. The standard deviation for the Language Score is 11.208, indicating a significant variation among students in terms of language skills. Meanwhile, the average Study Hours is 5.5 hours per week with a standard deviation of 3.028, indicating that most students spend a fairly varied amount of time studying, but most focus on the use of technology in learning Arabic. The total sample analyzed was 10 respondents for both variables.

Table 2
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	46,267	.903		51,219	.000
	study hours	3,679	.146	.994	25,270	.000

a. Dependent Variable: Language_score

Source: Data processed, 2024

The results of the linear regression analysis in Table 2 show that Technology Use (Study Hours) has a very significant positive influence on Arabic Language Skills. The constant value (46.267) indicates that without technology use, the Arabic language score is predicted to be 46.267. Every additional hour of technology use per week will increase the Arabic language skill score by 3,679 points (study_hours coefficient). The very high Beta value (0.994) indicates a large influence of the Technology Use variable on Arabic Language Skills, with a t-value of 25.270, indicating that this coefficient is very significant. In addition, the significance value (Sig.) which is smaller than 0.001 confirms that the relationship between these two variables is very statistically significant, which means that Technology Use plays an important role in improving students' Arabic language skills.

Table 3. Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.994a	.988	.986	1,322

a. Predictors: (Constant), study hours

Source: Data processed, 2024

The results of the linear regression analysis in Table 3 show that there is a very strong relationship between Technology Use (Study Hours) and Arabic Language Skills, with an R value of 0.994. The R Square value of 0.988 indicates that 98.8% of the variation in Arabic Language Skills can be explained by Technology Use, indicating that this regression model is very good at predicting language skills. In addition, the Adjusted R Square of 0.986 indicates that even though this model has several predictors, the results are still very good without any overfitting problems. With a Standard Error of the Estimate of 1.322, the predictions of this model have an average error of around 1.322 points, indicating a relatively small prediction error. Overall, these results confirm that technology use plays a significant role in improving students' Arabic language skills.

Based on the results of the analysis conducted, it can be concluded that the Use of Technology has a very significant influence on students' Arabic Language Skills. Validity and reliability tests show that the research instrument has good validity and high internal consistency, with a Cronbach's Alpha value of more than 0.7, which indicates that the data obtained is reliable. The results of the Pearson correlation test confirmed a very strong and significant relationship between the two variables, with a value of $r = 0.994$ and $p < 0.001$. In addition, linear regression analysis shows that every additional hour of technology use per week will increase the Arabic language skill score by 3,679 points, with an R Square value of 0.988 indicating that 98.8% of the variation in Arabic language skills can be explained by technology use. This model also shows that technology use plays a major role in improving students' Arabic language skills, with a relatively small prediction error (Standard Error of the Estimate = 1.322), which further strengthens the importance of technology use in Arabic language learning. Overall, these findings confirm that the Use of Technology significantly improves students' Arabic language skills.

Visualization of Results

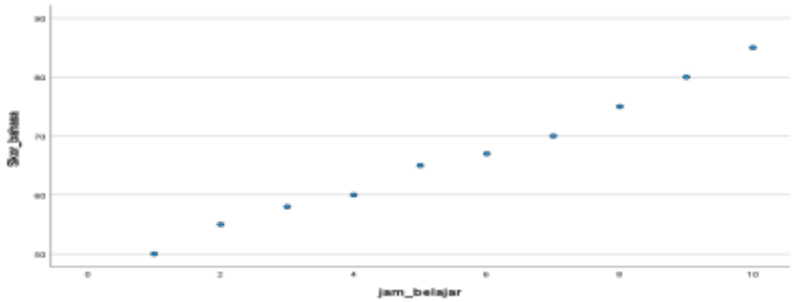

Figure 1. Scatterplot
Source: Data processed, 2024

To provide a clearer picture of the relationship between technology use and Arabic language skill improvement, the scatterplot results displayed in Graph 1 show a very clear positive relationship between Technology Use (Study Hours) and Arabic Language Skills. The more hours spent studying using technology, the higher the students' Arabic language skill scores . The points on the graph show an almost linear pattern, with Arabic Language Scores increasing significantly as Study Hours increase. This indicates a strong relationship between the two variables, supporting the finding that technology use in learning can improve Arabic language skills.

Table 4
Technology Usage Data and Arabic Language Skills

Technology Use (Hours per Week)	Arabic Language Skills (Score)
1	50
2	55
3	58
4	60
5	65
6	67
7	70
8	75
9	80
10	85

Source: Data processed, 2024

Table 4 shows data on technology use (in hours per week) and Arabic language skill scores obtained from respondents involved in this study. These data demonstrate a direct relationship between technology use and language skills.

Based on the analysis, it can be concluded that the use of technology in Arabic language learning at STAI Kuningan has a significant impact on improving students' language skills. The results of a simple linear regression showed a positive relationship between the two variables, indicating that technology plays an important role in improving the quality of Arabic language learning. Therefore, it is recommended that

STAI Kuningan increase the use of technology in the Arabic language learning process to support the development of students' language skills more effectively.

CONCLUSION

The research findings indicate that technology use significantly enhances Arabic language skills among students at STAI Kuningan, with a strong positive correlation demonstrated by a linear regression analysis showing that each additional hour of technology use per week raises students' skill scores by 3.679 points. The model explains 98.8% of skill variation ($R^2 = 0.988$), supported by high data reliability (Cronbach's Alpha > 0.7) and a strong Pearson correlation ($r = 0.994$, $p < 0.001$). These results underscore the major role of technology in improving Arabic proficiency, and it is recommended to increase technology integration in language learning. Future research could explore which specific types of technological tools and digital interventions are most effective in different aspects of Arabic language acquisition to tailor instructional strategies further.

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