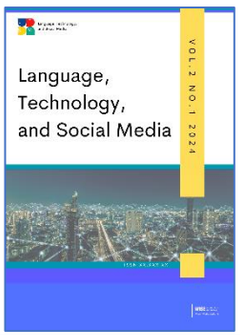

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Muhammad Subkhi Hidayatullah ✉, and **Divara Aulia Haning Tyas** ✉

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Research Article

Enhancing Arabic Vocabulary Mastery through Digital Literacy: Overcoming Challenges and Implementing Effective Strategies

Muhammad Subkhi Hidayatullah*, and Divara Aulia Haning Tyas

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Abstract

This study explores the implementation of digital literacy-based learning strategies in Arabic vocabulary (*mufrodat*) education, aiming to enhance students' comprehension and proficiency. Despite its potential, several challenges impede effective application, including limited access to technology and infrastructure, inadequate digital literacy skills, insufficient authentic assessment methods, and lack of support and guidance from educators. To address these challenges, this study recommends improving technological access and infrastructure, enhancing digital literacy skills through targeted training and workshops, developing authentic assessment methods, and providing comprehensive support and guidance for teachers. The implementation of these solutions necessitates collaboration among government bodies, educational institutions, teachers, and students. This study significantly contributes to the field of Arabic language education by integrating digital literacy, thereby enhancing the overall quality of education. The findings provide valuable insights for educators in designing effective learning strategies, for policymakers in formulating supportive educational policies, and for researchers in conducting further studies on digital literacy and Arabic language learning. The study underscores the importance of digital literacy in modern education and its role in fostering improved learning outcomes.

Keywords: Arabic learning**;** Arabic vocabulary; Mastery Digital literacy; *Mufrodat*; Learning Strategies, Educational Technology

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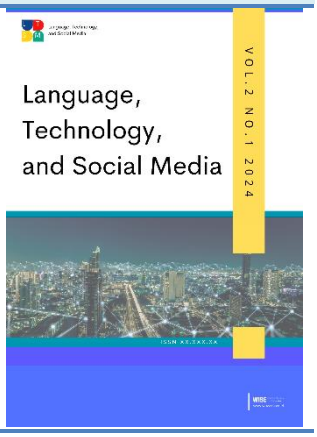

INTRODUCTION

In the continuously evolving digital era, information and communication technology has significantly transformed the paradigm of education [1]–[3]. Digital literacy has now become an essential skill that students must possess to access, analyze, evaluate, and use information effectively from various digital sources [4]–[6]. Digital literacy-based learning aims to provide students with opportunities to develop themselves as competent communicators across multiple contexts, cultures, and media through the empowerment of their multiple intelligences [7]–[9].

Digital literacy encompasses not only the technical ability to use digital devices but also the capacity to understand and utilize information obtained from various digital sources. According to Cucu Afriliandhi [10], digital literacy is the ability to understand and use information in various forms accessed through computers. This includes skills in accessing information, evaluating the accuracy and relevance of information, and the ability to apply that information in specific contexts. Therefore, digital literacy has become a key competency that students must possess in this digital age.

In the context of Arabic language learning, mastery of *mufrodat* (vocabulary) plays a crucial role in understanding and applying the Arabic language broadly [11]–[13]. *Mufrodat* is the foundational element in language mastery, as vocabulary is the basis of all other language skills, such as reading, writing, listening, and speaking [14]–[16]. However, vocabulary learning is often perceived as complex because it involves memorizing and understanding a substantial amount of vocabulary. Digital literacy-based learning strategies offer a more interactive, visual, and diverse approach that can help students overcome this complexity [17].

Several previous studies have examined various aspects of digital literacy-based learning and Arabic language learning, particularly vocabulary. María Cristina Martínez [18] in his research on digital literacy stated that digital competence includes not only the use of technological devices but also critical thinking and collaboration. This aligns with Lukman Hakim [19] view, which emphasizes the importance of digital literacy in facing the challenges of 21st-century education. According to Astuti, digital literacy helps students not only access information but also develop critical thinking and creativity skills [20].

Zainul Arifin research discussed the pros and cons of digital literacy in Arabic language learning in the millennial era [21]. Abd Basir stated that digital literacy could enhance interaction and collaboration among students but also pose challenges such as distractions and focus disruptions [22]. Therefore, it is important to develop learning strategies that maximize the benefits of digital literacy while addressing existing challenges.

This study offers novelty in several important aspects. Firstly, by focusing on digital literacy-based learning strategies in vocabulary learning, it specifically highlights the challenges faced in implementing these strategies, which have not been extensively discussed in previous studies. Secondly, this study uses a comprehensive literature review method to identify and analyze the existing problems, providing a thorough and data-based overview. Thirdly, this study not only identifies the issues but also provides practical recommendations that educators can use to address these challenges.

This study is crucial for several reasons. Firstly, its relevance to the digital era underscores the need for educators to understand how digital literacy-based learning strategies can be effectively applied in vocabulary learning. Secondly, this study is expected to provide guidance for educators in improving the quality of Arabic language learning through the integration of digital literacy,

ultimately enhancing students' understanding, motivation, and academic performance. Thirdly, by identifying the challenges faced, this study can help educators develop effective solutions to overcome obstacles in digital literacy-based vocabulary learning.

One of the main challenges in implementing digital literacy-based learning strategies is the limited access to and infrastructure for digital technology. Some students may not have stable internet access or adequate devices to access digital learning materials. This can hinder students' ability to use digital resources and participate effectively in vocabulary learning. Additionally, limited digital literacy skills also pose a barrier to effectively utilizing digital literacy tools. Many students may not be familiar with using digital technology or lack sufficient knowledge in leveraging available digital literacy tools.

The lack of authentic assessment also presents a challenge in implementing digital literacy-based learning strategies. Some digital literacy tools may not accurately evaluate students' abilities in mastering vocabulary and concepts. Therefore, it is necessary to develop adequate assessment methods to measure students' achievements authentically. Furthermore, insufficient support and guidance from teachers or lecturers in using technology and integrating it into learning can also hinder the effective implementation of these strategies.

By considering the background, relevant previous studies, novelty, and importance of this study, it is hoped that the results of this study can provide significant contributions in the field of Arabic language learning, particularly in the context of digital literacy. This study is expected to provide educators with guidance in developing and implementing effective digital literacy-based learning strategies, as well as providing solutions to address the challenges in students' vocabulary learning.

METHODS

Type of Research

This study is a library research using a descriptive analytical approach. This approach was chosen to identify, analyze, and describe the problems that arise in the implementation of digital literacy-based learning strategies in *mufrodat* learning for students. Library research allows the researcher to delve into various relevant literature sources to obtain a comprehensive understanding of the topic under study.

Determination of Topic and Research Questions

The research topic was determined based on the importance of digital literacy in modern education, particularly in the context of *mufrodat* (vocabulary) learning in Arabic language education. The research questions focused on: (1) What are the challenges faced in implementing digital literacy-based learning strategies in *mufrodat* learning for students? (2) How can these challenges be overcome to effectively implement digital literacy-based learning strategies in *mufrodat* learning for students?

Research Process

Figure 1. Research Process

The research process involves several key stages. First, a preliminary study is conducted through literature review to understand the concepts of digital literacy and *mufrodat*, and to identify potential challenges in their implementation. Second, data is collected from various relevant literature sources such as books, journals, articles, and research reports that discuss digital literacy and *mufrodat* learning. Third, the collected data is analyzed to identify patterns, themes, and problems in the implementation of digital literacy-based learning strategies in *mufrodat* learning. Last, a research report is compiled, encompassing significant findings and relevant recommendations based on the data analysis.

Data Collection and Retrieval

Data for this study was collected through library research, including books, scientific journals, articles, and research reports. Books utilized discuss digital literacy, Arabic language teaching methods, and learning strategies. Scientific journals accessed are related to the research topic to obtain current research findings and expert opinions. Articles and research reports from various credible online sources were also sought to provide additional data and broader perspectives.

Data Analysis

The collected data was analyzed using a descriptive analytical method. The analysis process includes categorizing data based on main themes related to digital literacy and *mufrodat* learning, describing key findings related to challenges and problems in implementing digital literacy-based learning strategies, and interpreting the data to understand the implications of these findings and to identify potential solutions for overcoming the challenges faced.

RESULTS AND DISCUSSION

This study aims to answer two main questions: (1) What challenges are faced in implementing digital literacy-based learning strategies in *mufrodat* (vocabulary) learning for students? and (2)

How can these challenges be overcome to effectively implement digital literacy-based learning strategies in *mufrodat* learning?

Challenges Faced

Based on the literature analysis, several main challenges in implementing digital literacy-based learning strategies are identified as follows:

1. Limited Access and Infrastructure

   Limited access and infrastructure pose significant challenges in implementing digital literacy-based learning. When students lack adequate internet access or digital devices, their ability to utilize digital resources and participate in mufrodat (vocabulary) learning is significantly hindered. These access limitations can be attributed to various factors, including economic, geographic, and uneven infrastructure policy.

   Economic factors play a crucial role in technology access. Students from low-income families often cannot afford digital devices such as computers, tablets, or smartphones necessary for online learning. Additionally, the high cost of internet subscriptions can also be a barrier for families with limited income. In situations where financial priorities are directed towards basic needs like food, housing, and healthcare, investing in educational technology often does not become a primary concern. As a result, many students face significant digital divides, ultimately impeding their academic progress.

   Geography also influences access limitations. In many rural and remote areas, technological infrastructure like internet networks is often less developed compared to urban areas. Students living in these regions frequently encounter slow or even nonexistent internet connections. Moreover, the long distances from technological hubs make the distribution of digital devices more challenging and expensive. In some cases, local governments may lack sufficient resources to develop the necessary technological infrastructure, leaving many students without adequate access.

   Uneven infrastructure policies also contribute to access limitations. Governments play a critical role in ensuring that all regions, both urban and rural, have equal access to educational technology. However, in practice, policies often focus more on urban areas with larger populations and higher priority. This focus results in rural and remote areas receiving less attention in technological infrastructure development. This disparity creates an educational digital divide, where urban students have a greater advantage over their rural counterparts.

   These access and infrastructure limitations have significant impacts on mufrodat learning. Students without adequate internet and digital device access cannot access online learning materials, attend virtual classes, or use learning applications that help them master new vocabulary. Additionally, these limitations hinder students' ability to participate in collaborative and interactive learning activities, which are often integral components of digital literacy-based learning strategies. Consequently, students with limited access tend to fall behind in their academic achievements compared to those with full access to technology.

   To address these challenges, a holistic approach involving various stakeholders, including governments, educational institutions, the private sector, and communities, is required. Governments need to allocate sufficient budgets for developing technological infrastructure in remote and rural areas. Additionally, subsidy policies or financial aid for

low-income families can help reduce the cost burden of digital devices and internet subscriptions. Educational institutions can also play a role by providing technology facilities accessible to all students, such as computer labs or device loan programs.

The private sector can contribute through corporate social responsibility (CSR) initiatives by donating digital devices or developing digital literacy training programs for students and teachers. Communities can also play a part by raising awareness of the importance of digital literacy and supporting local efforts to improve technology access. With a coordinated and comprehensive approach, access and infrastructure barriers can be overcome, ensuring all students have equal opportunities to benefit from digital literacy-based learning and effectively develop their mufrodat skills.

2. Limited Digital Literacy Skills

Limited digital literacy skills are one of the main challenges in implementing digital literacy-based learning strategies. Digital literacy not only involves basic skills in using technological devices but also encompasses more complex competencies such as the ability to navigate the internet, evaluate digital information, and effectively use learning applications. Digital literacy is defined as the ability to understand, evaluate, and use information obtained through digital media. This encompasses a range of technical and cognitive skills necessary to function effectively in the digital world. Digital literacy involves the ability to search for, evaluate, and create information using digital technology, as well as the ability to understand and use computer software and hardware.

Operating digital devices such as computers, tablets, and smartphones is fundamental to digital literacy. Students must be able to turn on, operate, and understand the basic functions of these devices. Without these skills, students will struggle to access the digital resources necessary for learning. The ability to effectively navigate the internet is a key component of digital literacy. This includes skills for using search engines, understanding website structures, and navigating between different web pages. Students must be able to efficiently find the information they need and understand how the internet works in general.

In an era of abundant information, the ability to evaluate digital information is crucial. Students must be able to assess the credibility and accuracy of the information they find on the internet. This includes the ability to recognize trustworthy sources, understand bias, and distinguish between fact and opinion. Many digital applications and platforms are designed to support learning. Students must be able to use these applications effectively to access course materials, communicate with teachers and classmates, and complete tasks and projects. Understanding how to use various digital learning tools, such as language learning applications, online collaboration tools, and task management software, is essential.

One of the biggest obstacles is the lack of adequate training for students and teachers in using digital technology. Many schools do not have the resources to provide comprehensive training on digital literacy. Without proper training, students will not have the necessary skills to use digital technology effectively. Students who are not familiar with digital technology may have difficulty adapting to new learning methods that utilize technology. They may feel overwhelmed by the multitude of tools and applications they need to learn. This can lead to anxiety and reluctance to use technology in their learning.

Digital literacy is also affected by socioeconomic disparities. Students from less privileged economic backgrounds may not have the same access to high-quality digital devices and internet. This can lead to a digital literacy gap, where students from wealthier backgrounds have better skills in using technology compared to students from less affluent backgrounds.

Schools and governments need to provide comprehensive digital literacy training for students and teachers. This training should cover all aspects of digital literacy, from basic device usage to more complex information evaluation skills. Digital technology must be systematically integrated into the school curriculum. This includes the use of digital tools in various subjects and project-based learning that leverages technology. To address socioeconomic disparities, governments and educational institutions must strive to provide equitable access to digital devices and the internet. Subsidy programs or digital device loan schemes can help students from low-income families gain the access they need.

Flexible learning approaches that allow students to learn at their own pace and style can help reduce anxiety and adaptation difficulties. Teachers should be trained to use various teaching methods that support the effective use of technology. With collaborative efforts from various stakeholders, students' digital literacy skills can be enhanced, enabling them to optimally utilize digital technology in vocabulary learning and other fields of study.

3. Lack of Authentic Assessment

The lack of authentic assessment is one of the main challenges in implementing digital literacy-based learning strategies. Authentic assessment, which reflects students' abilities in real-world contexts, is crucial to ensure that the learning conducted is genuinely effective and relevant. However, many existing digital literacy tools have not been able to provide adequate methods to measure students' achievements authentically. Authentic assessment is an evaluation process that assesses students' abilities through tasks that replicate real-world situations. This method differs from traditional assessments, which usually involve multiple-choice tests or essays that only measure basic recall or understanding. Authentic assessment involves various forms of evaluation such as projects, portfolios, presentations, and performance tasks that require students to apply their knowledge and skills in practical contexts. The importance of authentic assessment lies in its ability to provide a more comprehensive and in-depth picture of students' competencies and prepare them for real-world challenges beyond the academic environment.

Many digital literacy tools available today are not equipped with features that allow for effective authentic assessment. Most of these tools focus on providing learning materials and exercises but lack in terms of evaluation that reflects students' abilities holistically. For example, language learning applications may offer multiple-choice exercises or word matching tasks, but they do not assess students' ability to use vocabulary in the context of real conversations or writing. This creates a gap between the skills measured by these tools and the actual abilities needed by students in everyday life. To address this limitation, there needs to be an effort to develop more adequate and authentic assessment methods. This can be done in several ways: Task-based assessment can be employed, where students are given tasks that must be completed in real-world contexts, such as writing reports, giving presentations, or producing specific products. This type of assessment requires students to

integrate and apply various skills and knowledge they have learned. Project-based assessment is also effective for measuring students' abilities over the long term. Through projects, students can demonstrate their progress in various aspects, such as critical thinking, creativity, and collaborative skills. Projects also allow students to work independently or in groups, reflecting real-world work situations.

Portfolios are another way to authentically assess students' abilities. A portfolio is a collection of students' works that show their progress and achievements over a certain period. Portfolios allow students to reflect on their learning and provide teachers with a clearer picture of students' abilities and progress. Performance assessment is also important, involving direct observation of students' skills while performing specific tasks. For example, in language learning, students can be assessed based on their speaking, listening, reading, and writing abilities through activities conducted directly in the classroom or via digital platforms.

Implementing authentic assessment in digital learning requires support from various stakeholders, including educational technology developers, teachers, and policymakers. Educational technology developers must design tools and applications that facilitate various forms of authentic assessment. Teachers need to be trained to use these tools effectively and integrate authentic assessment into their teaching practices. Additionally, policymakers must support the use of authentic assessment through regulations and the provision of adequate resources. The use of digital platforms that support authentic assessment is also key to overcoming this challenge. Platforms such as Learning Management Systems (LMS) can be designed to include features that support projects, portfolios, and performance assessments. Moreover, these platforms can be used to collect and analyze assessment data, providing better feedback to students and teachers about learning progress.

The lack of authentic assessment in digital literacy-based learning strategies is a significant challenge, but it can be addressed through the development and implementation of more comprehensive and relevant assessment methods. By integrating task-based, project-based, portfolio, and performance assessments, and leveraging supportive educational technology, we can ensure that digital learning not only imparts knowledge but also measures and develops the skills students need in real life. Support from technology developers, teachers, and policymakers is crucial in realizing effective authentic assessment and providing optimal benefits for students' learning.

4. Lack of Support and Guidance from Teachers

The lack of support and guidance from teachers in using technology and integrating it into the learning process is a significant challenge in implementing digital literacy-based learning strategies. Many teachers may not possess sufficient digital competence to effectively guide students in using technology. Digital competence encompasses the ability to operate hardware and software, as well as skills in utilizing various applications and digital learning platforms. These skills also include navigating the internet, evaluating digital information, and using digital tools to design and deliver instructional materials. Without adequate competence, teachers will struggle to integrate technology into their curriculum and teaching methods, thereby preventing students from fully benefiting from the technology.

One solution to overcoming teachers' limited digital competence is through ongoing training and professional development. Such training should be designed to enhance teachers' technical skills and introduce them to innovative teaching methods that utilize technology. However, training programs are often inadequate or not widely available. Some teachers may only receive basic training that does not sufficiently meet their needs for teaching with technology. Moreover, training that is neither continuous nor well-structured can lead to teachers being unable to keep up with the rapid advancements in technology.

Teachers also require access to various digital educational resources to support their teaching. These resources include hardware such as computers and tablets, software and learning applications, as well as digital content like modules, videos, and interactive teaching materials. However, not all schools or educational institutions have the budget or policies that support the provision of these resources. As a result, teachers may have to use personal resources or seek less optimal alternatives, which can subsequently affect the quality of education.

In addition to technical support and resources, institutional support and policies are also crucial in aiding teachers to integrate technology into their teaching. Schools and educational institutions need to have clear and supportive policies regarding the use of technology in the teaching and learning process. This includes policies on the use of digital devices in the classroom, internet access, and data protection and student privacy. Supportive policies may also include incentives for teachers who actively adopt technology in their teaching, such as awards or professional recognition.

Teachers can also gain support through collaboration with colleagues and participation in communities of practice. Such collaboration enables teachers to share experiences, resources, and effective teaching strategies using technology. Communities of practice, whether online or offline, can provide a platform for teachers to learn from each other and receive constructive feedback. Additionally, collaboration with educational technology experts or trainers can offer insights and assistance needed to overcome technical and pedagogical challenges.

To address the lack of support and guidance, an integrated approach to the use of technology is essential. This includes developing a curriculum that incorporates the use of technology as an integral part of the learning process, rather than as an add-on or supplementary component. Teachers need to be involved in the planning and development of this curriculum so they can adjust their teaching methods to meet the needs of students and the demands of current technology. An integrated approach also involves using technology to support various aspects of learning, from planning and delivering instruction to assessment and feedback.

The lack of support and guidance from teachers in using technology is a complex and multifaceted challenge in implementing digital literacy-based learning. Overcoming this challenge requires collaborative efforts from various stakeholders, including the government, educational institutions, and the teacher community. Ongoing training, access to digital educational resources, supportive policies, and teacher collaboration are crucial steps to ensure that teachers have the competence and support needed to effectively integrate technology into teaching. Consequently, students can optimally utilize technology to enhance their skills and academic achievements.

Ways to Overcome Challenges

The research also identifies several solutions to overcome the existing challenges:

1. Improving Access and Infrastructure
   Governments and educational institutions need to collaborate to improve access and infrastructure for digital technology, including providing adequate devices and internet access for students. This can be achieved through subsidy programs, providing Wi-Fi hotspots in specific areas, or offering learning devices for free or at affordable prices.
2. Developing Digital Literacy Skills
   Training and workshops are necessary to enhance digital literacy skills for both students and teachers. These training programs should cover the use of digital literacy tools, information evaluation, and the application of technology in learning contexts. Training can be conducted by schools, educational institutions, or through online platforms.
3. Developing Authentic Assessment Methods
   Developing authentic assessment methods is crucial to ensure students' ability to master vocabulary and concepts. Methods can include project-based assessments, interactive online tests, or portfolio-based assessments that comprehensively measure students' abilities. These assessments should be designed to reflect students' abilities in relevant situations and contexts.
4. Intensive Support and Guidance from Teachers
   Teachers should be provided with adequate training in digital literacy and technology-based learning strategies. Additionally, educational institutions must provide continuous support for teachers in the form of guidance, resources, and professional learning communities to share best practices. Support should also include access to digital learning materials and evaluation tools.

Discussions

Several relevant studies have been conducted on digital literacy and Arabic language learning, but there are significant differences with this study. For instance, Zainul Arifin [21] researched digital competence, including the use of technological devices, critical thinking, and collaboration, but did not specifically discuss implementation in the context of *mufrodat* learning. Lukman Hakim [19] also highlighted the importance of digital literacy in facing 21st-century educational challenges, but did not provide an in-depth analysis of digital literacy-based learning strategies for *mufrodat*. Windi Chaldun [23] discussed the pros and cons of digital literacy in Arabic language learning, focusing more on interaction and collaboration in the millennial era without specifically addressing the challenges and solutions in implementing digital literacy-based learning strategies for *mufrodat*. Chaldun's research provided insights into potential distractions and focus disruptions from technology use but did not offer practical solutions to these issues.

Several relevant studies have been conducted on digital literacy and Arabic language learning, but there are significant differences with this study. For instance, Rudy Bagus Wicaksono [24] researched digital competence, including the use of technological devices, critical thinking, and collaboration, but did not specifically discuss implementation in the context of *mufrodat* learning. Susanto [25] also highlighted the importance of digital literacy in facing 21st-century educational challenges, but did not provide an in-depth analysis of digital literacy-based learning

strategies for *mufrodat*. This study offers novelty in several crucial aspects. Firstly, it focuses on digital literacy-based learning strategies in *mufrodat* learning, specifically highlighting the challenges faced in implementing these strategies. This aspect has not been extensively discussed in previous research, providing new contributions to the literature.

Secondly, this study employs a comprehensive literature review method to identify and analyze existing problems, offering a thorough and data-based overview of the issues. This approach provides a detailed and data-driven understanding of the topic. Thirdly, this study not only identifies the problems but also provides practical recommendations that educators can use to address these challenges. The recommendations include improving access and infrastructure, developing digital literacy skills, creating authentic assessment methods, and providing intensive support and guidance from teachers. These solutions are expected to help educators implement digital literacy-based learning strategies more effectively. Fourthly, this study is relevant to the current digital era, where digital literacy is a crucial skill that students must possess. The research aims to guide educators in improving the quality of Arabic language learning through the integration of digital literacy, ultimately enhancing students' understanding, motivation, and academic performance.

Implications of the Research

This study has several important implications for educators, policymakers, and researchers in the field of Arabic language education and digital literacy. Firstly, the research findings can be used by educators to design more effective learning strategies by leveraging digital technology. Secondly, policymakers can use the research findings to develop policies that support the improvement of access and infrastructure for technology in schools. Thirdly, researchers can use this study as a basis for further studies on digital literacy and Arabic language learning.

CONCLUSION

This study reveals that digital literacy-based learning strategies in Arabic vocabulary learning can enhance students' understanding and skills; however, several challenges must be addressed, including limited access and infrastructure, limited digital literacy skills, lack of authentic assessment, and insufficient support and guidance from teachers. To overcome these challenges, the study recommends improving access and technological infrastructure, developing digital literacy skills through training and workshops, creating authentic assessment methods, and providing intensive support and guidance for teachers. Implementing these solutions requires collaboration among the government, educational institutions, teachers, and students. This study makes a significant contribution to the field of Arabic language learning, particularly in the context of digital literacy, and is expected to improve the quality of education through technology integration. The findings of this study can be used by educators to design more effective learning strategies, by policymakers to develop policies that support the enhancement of access and technological infrastructure in schools, and by researchers for further studies on digital literacy and Arabic language learning.

LIMITATIONS

The main limitations of implementing digital literacy-based learning strategies in Arabic vocabulary education include inadequate access to technology, limited digital literacy skills, and the lack of authentic assessment methods. These challenges hinder effective learning and require improvements in infrastructure, teacher training, and assessment tools to enhance vocabulary mastery.

AUTHOR INFORMATION

Corresponding Author

Muhammad Subkhi Hidayatullah – Arabic Education Study Program, UIN Raden Intan Lampung (Indonesia);
orcid.org/0009-0005-9743-217X
Email: muhammadsubkhi02@gmail.com

Author

Muhammad Subkhi Hidayatullah – Arabic Education Study Program, UIN Raden Intan Lampung (Indonesia);
orcid.org/0009-0005-9743-217X
Divara Aulia Haning Tyas – English Education Study Program, Universtias Lampung (Indonesia);
orcid.org/0009-0000-7484-3623

AUTHOR CONTRIBUTION

M.S.H. was responsible for conceptualizing the study, conducting data collection, performing the initial analysis, and drafting the manuscript. D.A.H.T. contributed to the development of the methodology, supervised the data analysis, and undertook the critical review and editing of the manuscript. Both authors have read and approved the final version of the manuscript for publication.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors used Napkin AI during the preparation of this work to create images. After utilizing the tool, the authors thoroughly reviewed and edited the content as necessary and assumed full responsibility for the publication's content.

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