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PRELIMINARY STUDIES: NEEDS FOR SMARTJAWI APPLICATION FOR CHILDREN AGED 4-5 YEARS OLD IN ISLAMIC EDUCATIONAL INSTITUTIONS

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Abstract:

The lack of engaging and developmentally appropriate educational materials remains one of the key problems in teaching Jawi to young children. Many Islamic educational institutions still rely on traditional methods such as the use of textbooks and writing exercises that are mechanistic and less child-centred. Such methods are seen as not in line with contemporary pedagogical needs, especially among early learners who require more holistic and enjoyable learning experiences. In order to address this issue, this study examined the perceptions of Islamic preschool educators on the importance of Jawi education and the potential for technology integration in improving Jawi literacy among children. Through semi-structured interviews with three educators, the findings show that Jawi is recognized as an important medium for preserving Islamic heritage and Malay cultural identity. However, educators expressed several challenges including limited teaching resources, different levels of students' literacy, and less interactive pedagogical approaches. Participants showed strong interest in using digital applications that are user-friendly, game-based, and supportive of pre-comprehensive teaching strategies. This study proposes that interventions such as Jawi Apps may act as an innovative approach to address Jawi literacy challenges

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and strengthen the teaching practices more effectively in Malaysian Islamic preschools.

Keywords:

Children; Islamic Preschool; Language; Literacy

Introduction

The Malaysian education system has historically used Jawi script as an important medium for the dissemination of knowledge since the era of the Malay Sultanate (Lubis et al., 2006). During this period, Jawi emerged as the main and primary writing system, facilitating Islamic religious education, administrative affairs and literacy aspect in general. However, the onset of colonial rule brought about major transformations to the educational curriculum, thus diminishing the official position of Jawi script in formal education setting. Before colonization, Jawi script served as the main writing system within the Malay community (Seock, 1990) and was widely used as the language of instruction in madrasahs, pondoks, and mosques, making these institutions the main centers of education and learning at the time. Mastery of Jawi script became an essential literacy skill for the Malay community since all religious texts, including in fiqh, theology, hadith, and interpretation of the Quran, were written in this script.

Nowadays, the teaching of Jawi continues to be implemented at the preschool level, particularly in Islamic schools, where children aged 4-5 years are closely guided in Jawi learning activities. For instance, The Tunas Islam Childcare Center (PASTI) demonstrate evidence of the integration of Jawi education through their Islamic religious teaching for preschool learners (Mashitoh, 2017). Similarly, Jawi education in private Islamic preschools continues to maintain the script as the fundamental medium in understanding Islamic principles and reading the Quran (Ceriaazzarah, 2025). In this context, the development of digital applications such as SmartJawi becomes relevant to support the teaching of Jawi as an interactive, enjoyable and engaging learning experiences, while ensuring that children can master the basics of Jawi literacy systematically and effectively in Islamic educational environment.

Literature Review***Historical of Jawi Education in Malaysia***

Changes in educational practices in Malaya began when British colonial government took control in the nineteenth century. During this period, English and Rumi script became the main instructional tools in schools that functioned under the colonial educational system (Lee et al., 2020; Tan, 2015). While Malay-medium educational institutions continued to exist, the usage of Jawi script gradually became less significant. Under this time Jawi experienced limited usage because religious educational institutions known as madrasahs became the main preservers of the traditional Islamic learning system instead.

The Government of Malaya started creating a structured national education system after gaining independence in 1957. The Razak Report (Ministry of Education Malaysia, 1956) highlighted the necessity for a streamlined national education framework. However, there are no specific reference in maintaining or spreading the use of Jawi script. The Jawi script con-

tinued to be present in primary-school curriculum but was mainly taught through Malay Language and Islamic Education classes. In 1983, Rumi script gained its position as the standard script of national education. Consequently, the decline in Jawi education extended throughout the educational system after 1983 and its presence afterward was mainly found in Islamic Education classes. As a result of the limited exposure to Jawi script, it influences gradually becomes diminished especially among the students who are not enrolled in religious studies courses. This phenomenon contributed to the continual decline of literacy competency and overall usage in the education and social setting.

The government of Malaysia recognized the integral role of Jawi script as part of Malay civilization and heritage. Hence, efforts were made to reinstate Jawi script as a vital component of the Malay's culture and tradition in 2019 by the Malaysia's Ministry of Education. In 2019, Jawi script has been reintroduced in the National Schools and National-Type Schools at the primary level under Malay Language curriculum. The integration of the Jawi script into the national education curriculum was aimed to introduce the important aspect of Malaysia's cultural and linguistic heritage towards the contemporary youth. However, the efforts have faced heated criticisms regarding the teaching of Jawi in National-Type Chinese Schools and National-Type Tamil Schools as part of the curriculum. Since these schools embraced the teaching of Jawi as optional for the students.

As an integral component of the Islamic education system, the Jawi script rose to prominence but simultaneously underwent important changes within the educational context of Malaysia. In contemporary Malaysia, the goal of ensuring that Jawi is taught remains of high educational priority due to the script's value in upholding and preserving the Malay culture, especially considering the profound impact of colonial-era educational changes. Society and the state in Malaysia must work towards the preservation and instruction of the Jawi script, for doing so safeguards important elements of the culture and language from the potential threat of erosion.

The Introduction of Jawi Education in Malaysian Preschools

The structured knowledge, skills and values system of Jawi education serves as both a core element in the national education system and as an essential part of the Islamic Education Curriculum. Preschool functions as the first formal education instruction to introduce fundamental concepts which include Jawi literacy. Proficient Islamic Education educators instruct Jawi at this level where they directly determine which skills students need to learn in order to read and write the Jawi script effectively. The effectiveness of learning Jawi script depends heavily on the teaching approaches such as the teaching methods that educators apply alongside the motivating educational materials. Jawi literacy development closely corresponds to Islamic Education comprehension. Hence, according to Man (2007), students must receive early exposure to systematic instruction of Jawi script.

Maternal Jawi literacy represents both a core academic ability and a crucial factor for accomplishing excellent results in Islamic Education classes. According to Diah and Zin (2013) Jawi literacy creates a fundamental entry point to study subjects more deeply since students gain capability to handle religious texts along with Islamic classical literature as well as traditional sources of knowledge. The skills to read and write Jawi script form an essential base that determines how successfully students can understand Islamic teachings. Jawi literacy maintains its significance because numerous Islamic Education resources are presented in Jawi script (Ali & Abdullah, 2015). The writing of traditional Islamic texts such as Quranic exegeses, Hadith

collections together with Islamic jurisprudence has relied upon Jawi script throughout history. A continuous link between history suggests that students need to master Jawi proficiency to access valuable contemporary and historical Islamic knowledge resources.

There are multiple components which make up the Jawi curriculum for preschool children (refer to Figure 1) in the context of Jawi learning in preschool. These components are very important because the students must learn to identify and create Jawi letters, link the writing components together and perform reading and writing practices (Diah et al., 2011). Straightforward steps of implementation must be established to facilitate early Jawi writing skill among children. The author Ismail (2001) explains that even though Jawi serves as an essential school curriculum subject, the children still experience poor mastery due to restricted learning opportunities. Ahmad (2008) observed that selected kids aged nine encounter specific difficulties when learning to write Jawi characters. This proves that young students need better teaching techniques, longer lesson times and more interactive teaching methods because of the difficulties they faced in learning Jawi.

Table 1: The Component of Jawi Education in Malaysian Preschool Standard Curriculum for Children 4-5 Years Old

| Focus | Content Standard | Learning Standard |
|----------------------|---|--|
| | PI 6.1: Recognizes Jawi letters | PI 6.1.1: Pronounces the Jawi letters |
| PI 6.0 Jawi Learning | PI 6.2: Reads words containing two open syllables | PI 6.2.1: Segments Jawi letters that are combined with the vowel letter alif |
| | PI 6.3: Writes Jawi letters | PI 6.3.1: Coordinates eye-hand movement through sketching shapes, patterns, and lines from right to left |

Source: Ministry of Education Malaysia (2017)

Numerous studies have indicated that children require extensive practice to develop their abilities, and the process of learning to write in Jawi should begin at the early stages of their education journey. In this regard, educational approaches for young children must incorporate suitable and engaging techniques to enable them to become familiar with the letters and in acquiring the writing skills (Diah & Zin, 2013). At this critical stage, there is a need to identify appropriate teaching strategies to nurture Jawi literacy, where children are to be anchored in the script and in keeping their interest in learning. Researchers aimed to develop effective and quality teaching aids that will help children appreciate the reading and writing of Jawi script. Thus, the researchers worked with three objectives:

1. To identify the challenges faced by educators in implementing Jawi learning activities.
2. To examine the currently employed teaching methods by educators in Jawi teaching instruction.
3. To explore educators' perspectives on the significance of Jawi learning through the use of Jawi learning applications.

The Importance of Using Technology in Early Childhood Education

Developing Jawi literacy among preschool children is an integral aspect of Islamic education targeting children aged four and five. In this digital age, interactive educational applications enhance children's engagement, understanding, and excitement for learning. With this in mind, the creation of SmartJawi as a digital educational resource is a purposeful development to assist both teachers and learners in a more effective and enjoyable mastery of Jawi letters.

Research conducted by Papadakis et al. (2021) shows that the motivational and conceptual understanding of foundational skills can be improved through educational technology, specifically robotics and interactive learning tools. This serves as one of the primary motivators for developing SmartJawi as an interactive application designed for more effective and enjoyable teaching of Jawi letters.

Kalogiannakis et al. (2021) underscored bolstering student engagement through a gamification approach to teaching science. For SmartJawi, this means incorporating age-appropriate game elements where motivation is needed during reading and writing activities. On the other hand, Papadakis et al. (2018) explored interventions utilizing computers and tablets to facilitate comprehension skills of preschool children. Once again, this justifies the rationale for systematically incorporating digital tools like SmartJawi in early educational settings.

Besides, Jawi education could not be strengthened up if the teachers are not exposed to gamification as emphasized in research by Zourmpakis et al. (2022). This signifies the need for teacher training in conjunction with SmartJawi in Islamic educational contexts. SmartJawi is not only a tool for technology in education, but a material for teachers to make the classroom become more interactive.

The research suggests that preschoolers' attention and understanding can be improved with the implementation of a safe interactive educational technology, with an emphasis on the appropriate and effective usage of educational technology by the teachers. This necessitates that preschool educational institutions are provided with SmartJawi for children ages 4-5. Additionally, Islamic educational institutions can be supplied with SmartJawi as an adaptive, comprehensive and holistic educational technology.

Method

Design

This study utilized a qualitative approach to better understand the participants' experiences, viewpoints, and contexts (Merriam & Tisdell, 2016; Creswell & Poth, 2018). Contextual and rich data was captured by utilizing the semi-structured interview technique, whereby the researcher posed a few guiding questions, but participants were still able to respond fully and elaborately due to the open and flexible nature of the questions and based on their life experiences (Kvale & Brinkmann, 2009). This made it possible for the researchers to fine-tune questions on the spot, thus obtaining greater insights about preschool educators' perceptions on the teaching and learning processes at Islamic early education institutions.

The nature of the study remained exploratory and did not aim to generalize or test any hypotheses at this stage. Therefore, the analysis did not require expert validation given that there is an audit trail, including code, and transparent analytical memos (Frieze, 2019), which the software ATLAS.ti provides. This software was used based on the premise that for exploratory research, the analysis is primarily the work of the researcher, and in the absence of external validation,

self-reflection and triangulation of the data would suffice (Nowell et al, 2017). Moreover, ATLAS.ti allows the researcher to maintain analytical consistency and traceability through operational decision logs and thematic networks (ATLAS.ti, 2023). Therefore, this approach sounds valid and is appropriate to the field of research. Analytical approach in this instance refers to the interpretative epistemological approach which privileges contextual and subjective meanings attributed to the phenomenon.

Selection of Sample

Purposeful sampling led to the selection of three preschool educators for this initial study. Educators' experience within early childhood education alongside their willingness to provide in-depth information were among the selection criteria. Two educators worked at private Islamic preschools in Kelantan, and the other worked in Perak. Presuming differences in educational settings and contexts, this selection aimed for a wider variety of perspectives. Despite the selection of a small number of participants, the study was primarily designed to collect exploratory initial qualitative data, to understand participants' needs, attitudes, and experiences in depth. It was not designed to make broader population generalizations (Moser & Korstjens, 2018). Engaging in interviews with all three educators provided opportunities to enhance the richness and contextual detail to inform the development of the SmartJawi application prior to a more extensive study (Creswell & Poth, 2018). Moreover, the interviews were significant in contextualizing and refining the learning aspects in Islamic early childhood education settings.

Research Instrument

Researchers utilized the Interview Instrument: Needs Analysis to create the "SmartJawi Application: Interactive Learning Materials for Preschool Children Aged 5-6 Years". The instrument of this study has been validated by two officially appointed experts in the field. The results of the agreement analysis between the experts using the Cohen's Kappa index show a perfect agreement value of 1.00. This value confirms that both experts fully agree on the suitability and accuracy of the items in the instrument used. This instrument comprises three components as shown in Table 2 below:

Table 2: Items of Interview Instrument

| No. | Item |
|-----|---|
| 1. | Identifying Jawi learning challenges |
| 2. | Assessing current teaching methods |
| 3. | Identifying the importance of Jawi Learning through the integration of Jawi Application |

Data Collection

Data were collected through semi-structured interviews, which allowed the researcher to tailor questions as the conversation progressed with the study participants. The questions were designed to explore the educators' experiences with preschool curriculum, challenges faced, and their perspectives on the teaching approaches used. All interview sessions were recorded with the participants' permission and subsequently transcribed for systematic analysis. Each study participant was formally appointed using the Participant Appointment Form coded KIAS HEA/HEA/0.6/00/13 (refer to Appendices A), to ensure compliance with ethical procedures and formal documentation in this study.

Data Analysis

The data obtained were analysed using a descriptive analysis approach to provide a clear understanding of the information collected. Interview transcripts were carefully reviewed to identify key themes that emerged from discussions with study participants. This analysis process involved categorizing data according to the study objectives, allowing researchers to identify patterns, relationships, and interrelationships in the study findings. To increase the accuracy and systematicity of the analysis, ATLAS.ti software was used to digitally manage, tag, and organize the data. Thematic analysis methods were applied to highlight important patterns in the participants' responses, thus facilitating researchers to conclude findings that were relevant to the needs of developing the SmartJawi application in Islamic early childhood education institutions.

Findings

Identifying Jawi Learning Challenges

The interviewees revealed three primary challenges to teaching and learning Jawi in preschool as shown in Figure 1 below:

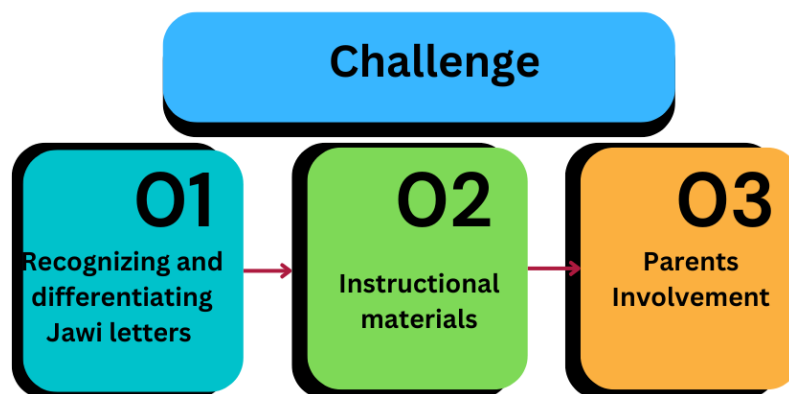


Figure 1: The Challenges in Jawi Education

Children found it challenging to distinguish between several Jawi letters that share similar shapes according to Participant 1 (ب (ba), ت (ta), ث (tsa), and ج (jim) and ح (ha), خ (kho)). Reading and writing errors occurred frequently because of this common misunderstanding. The traditional teaching materials including flashcards and textbooks continue to be used by schools per Participant 2 while children today more frequently demand interactive digital educational methods. The use of unengaging materials led children to lose their interest in Jawi studies. Participant 3 reported that parents did not provide adequate home assistance to their children for Jawi practice. The teaching of Jawi occurred exclusively within educational institutions since many Rumi parents allocated priority to Rumi reading and writing abilities. A joint effort between educators and parents together with education establishments becomes vital to handle this problem and improve Jawi learning engagement and efficacy.

“One of the main challenges in teaching Jawi in preschool is the difficulty of children in recognizing and distinguishing Jawi letters that are almost similar in shape. For example, the letters ب (ba), ت (ta), ث (tsa) or ج (jim), ح (ha), خ (kho) often confuse them. Children are still in the early stages of recognizing letters, so when

the shapes of letters look almost the same, they easily make mistakes in reading and writing.” – Participant 1

“I found that the lack of interactive and interesting teaching materials is a challenge in ensuring that children are interested in learning Jawi. Many of the materials available are traditional such as flashcards and textbooks, but children today are more inclined towards digital or interactive learning.” – Participant 2

“The big challenge I would like to highlight is the lack of parental support in helping children practice Jawi at home. Many parents emphasize reading and writing skills in Roman but pay less attention to Jawi. This causes children to only learn Jawi at school but not practice it at home.” – Participant 3

Assessing Current Teaching Methods

The analysis of the interview data indicates that educators employ several methods (refer to Figure 2) to instruct preschool children in Jawi, enhancing their comprehension and proficiency.

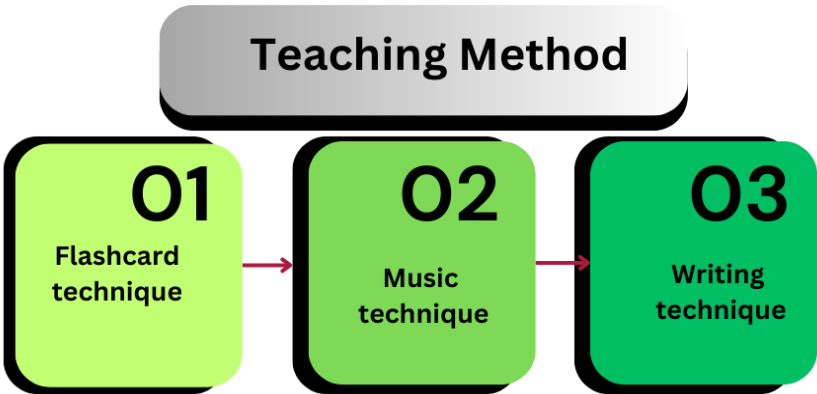


Figure 2: The Methods Utilised in Jawi Education

The flashcard method used by Participant 1 allowed the presentation of each Jawi letter with proper pronunciation to students before their responsive repetition. The introduced method successfully speeded up the students' ability to memorize letters and their recognition. The singing and song method was chosen by Participant 2 because its pleasant melody enables Jawi letter memorization in children. Musical learning techniques were more effective for preschool children thus making this approach both enjoyable and efficient for learning. Participant 3 executed the sequential writing approach that began with errors introductions followed by dot writing practice inside boxes and ending with syllable and phrase development. The system allowed learners to develop their Jawi writing skills by following a structured teaching approach. The tested approaches showed educational methods vary in effectiveness for engaging children with Jawi writing learning.

“I would like to share about the flashcard method that I use in teaching Jawi to children. This method is very effective because it helps children recognize and memorize Jawi letters faster. I will show one card at a time and say the letter clearly, then the children will repeat it.” – Participant 1

“I always use singing and song methods to teach Jawi. Children find it easier to remember something if it is presented in the form of an interesting song. For example, I have a special song to identify Jawi letters with an easy-to-memorize melody.”
– Participant 2

“I use the step-by-step writing method in teaching Jawi. I will start by introducing the letter shapes separately, then the children will write them in boxes guided by dots. Once they are proficient, I will move on to practicing writing syllables and words.” – Participant 3

Identifying the Importance of Jawi Learning Through the Integration of Jawi Application

The implementation of Jawi applications in education is seen as an innovation that can enhance learning efficacy (refer to Figure 3).

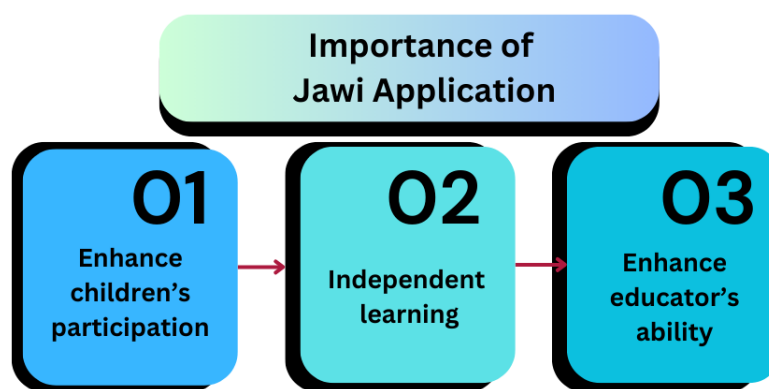


Figure 3: The Importance of Jawi Application

The research data shows Participant 1 stating that this educational platform increases student involvement in Jawi learning because its engaging game elements and colorful design elements. A modern educational preference exists for learners who demonstrate near-constant interest in technology applications for learning purposes. Participant 2 stated that Jawi application creates a setting which allows children to self-study during after-school hours for reviewing lessons autonomously without relying entirely on their educator. The independent study opportunity of Jawi through the application leads students to master it better. The Jawi application enables educators to conduct their lessons effectively and interactively through its functions for letter recognition and writing instruction and classroom game activities according to Participant 3. Teaching materials accessible through Jawi applications provide benefits to students who additionally help lecturers structure lessons to become more effective and engaging.

“I think that using Jawi applications can increase children's interest in learning Jawi. We know that children today are more inclined towards technology, so if we use applications that are interactive, colorful, and have game elements, they will be more interested in learning.” – Participant 1

“I also see that the Jawi application can help children study independently outside of school hours. With this application, they can review lessons at any time without being completely dependent on the educator.” – Participant 2

“I would like to emphasize that the use of Jawi applications can help educators deliver lessons more effectively and interactively. This application can be used as a teaching aid, for example in letter recognition activities, writing exercises, and interactive games.” – Participant 3

Discussion

Teaching Jawi Script to preschoolers has been recognized as a great contributor to the foundational literacy skills for young learners and early learning recognition and mastery of Jawi letters. Well mastered early Jawi instruction tends to strengthen the comprehension aspect of the language as well as the integration of the reading and writing skills while also achieving the goal for Islamic education. However, there tends to be great obstacles in strengthening Jawi learning for preschoolers in early learning Malaysian educational setting. One such primary obstacle is the inability of young learners to properly and accurately identify and differentiate the Jawi letters shapes. This issue has also been highlighted in the study by Mohamad & Baharudin, 2023. This confusion is caused by several Jawi letters having similar shapes that only differ by the presence of a few dots. This is the case in ب and ت, and ث, or ج and ح and خ. These similar shapes lead to confusion in learners, especially those who are encountering the Jawi script for the very first time. As a result, children can learn to pronounce Jawi more effectively with systematic exposure to sounds, repeated practice of pronunciations, and contextual visuals as reinforcement. This is due to the design of a curriculum with phonological methods, interactive activities, and technological aids (Ahmad et al., 2023; Amarah et al., 2025).

In addition, children's mastery of Jawi script also has learning issues, stemming from the letters changing shape depending on the position of the letter in a word, beginning, middle, or end. For example, the letter ك morphs into different shapes: ك, ك, or ك. New learners of the script may struggle to recognize these variants. In contrast to Rumi script, which is visually static, the Jawi script's changing forms present added challenges. Young children, in particular, do not possess the higher cognitive skills necessary to manage the advanced skills required. Thus, the government needs to integrate interactive, child-friendly technology in the beginner stages of Jawi mastery, drawn from the principles of modern pedagogy. More traditional methods do not engage with children, which affects the phonetic and visual Jawi script mastery. Ahmad et al. (2025) and Rahim et al. (2024) also describe this gap in modern learning environments.

Moreover, the absence of suitable interactive teaching resources for various developmental stages of children also impedes mastery of Jawi. Sapii et al. (2020) states that the advancement of digital learning software concerning the Jawi script remains limited, with attention predominantly directed toward teaching the Malay language in the Rumi script. Consequently, this disproportionate focus has resulted in insufficient digital educational materials devoted to the Jawi script, thereby diminishing students' opportunities to engage with contemporary, innovative, and contextual learning experiences.

In contrast to the advancements in interactive and engaging applications for learning the Rumi script, digital innovation for the Jawi script remains rudimentary and underdeveloped. This limitation not only impairs the instructional efficacy but also dampens the enthusiasm of students to learn Jawi. Therefore, in order to strengthen the skills of reading, writing, and spelling in Jawi script, there is the need to develop more engaging, intuitive, and gamified learning applications. Hence, improvements in national policies are necessary to promote the extensive use of technology in preschool education so that the young population may develop digital,

creative, and interactive learning abilities for 21st-century skills (Anadolu et al., 2023; Chen & Lin, 2025; Kulaksız & Toran, 2022).

Conclusion

Efforts to strengthen Jawi learning at the preschool level (Ghazali et al., 2025a; 2025b; 2025c), including in Islamic educational institutions, require a continuous commitment to preserving the Malay-Islamic cultural heritage. Jawi writing is not just a written communication tool, but rather a symbol of identity that has been widely used in religious texts, official documents and literary works for centuries. Early Jawi education is very important as a foundation for literacy and as a medium for cultivating cultural awareness among the younger generation. However, the lack of appropriate teaching aids affects the effectiveness of the teaching process. Therefore, future studies need to focus on the integration of technology, including the development of interactive applications that combine animation, audio and gamification elements. This approach has the potential to improve letter recognition, spelling and writing skills in a more fun and effective way.

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References

- Ahmad, M. A. (2008). *Mastery of Jawi writing among Year Three students*. Retrieved December 22, 2010, from www.scribd.com/doc/18584642/kajian-jawi
- Ahmad, A., Mohd Lazim, N. A. & Che Din, S. (2025). Elements of Multimedia Used in the Jawi Mobile Application. *Ideology Journal*, 10(1), 196-205. DOI:10.24191/ideology.v10i1.757.
- Ahmad, S. Z., Aurani, J., Mazlan, U. H., & Nurhalik, M. S. (2023). Bijak Jawi: An interactive multimedia reading tool using phonic 'makhrāj' technique for preschool children. *Journal of Advanced Research in Computing and Applications*, 11(1), 9–16.
- Ali, A. R., & Abdullah, B. (2015). *Philosophy of Jawi education in empowering Islamic civilization in Malaysia*. Proceedings of ICIC2015 - International Conference on Empowering Islamic Civilization in the 21st Century, Universiti Sultan Zainal Abidin, Malaysia, September 6–7, 2015. ISBN: 978-967-13705-0-6.
- Amarah, A., Siti Nor Asyura, N., Norhayatie, I., Wan Nur Idayu, & Hanna, H. (2025). *Phonic visuals approach in overcoming difficulties in reading Jawi for primary school students*. International Journal of Modern Education (IJMOE), 7(24). <https://doi.org/10.35631/IJMOE.724097>
- Anadolu, C. E., Sardin, S., Pramudia, J. R., Sukmana, C., & Ferianti, F. (2023). Educational technology in early childhood education: A systematic literature review. *The Eurasia Proceedings of Educational and Social Sciences*, 35, 38-45. <https://doi.org/10.55549/epess.799>
- ATLAS.ti. (2023). *ATLAS.ti 23 user manual*. Retrieved on November 9th, 2025, from <https://atlasti.com/manuals/atlas-ti-desktop-win/manual/>
- Ceriaazzarah. (2025, February 21). Introduction to Jawi script. *Instagram*.

- Chen, Y., & Lin, D. (2025). Digital tools in early childhood education: Opportunities, barriers, and management implications — A comparative study of urban and rural public kindergartens in Guangdong Province. *Journal of Educational Theory and Practice*, 2(3), Article 578.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications.
- Diah, N. M., & Zin, N. A. M. (2013). *Methods of teaching and learning basic Jawi for pre-school children*. ESTEEM Academic Journal, 9(2), 28–38.
- Diah, N. M., Ismail, M., Hami, P. M. A., & Ahmad, S. (2011). *Assisted Jawi-Writing (AJaW) software for children*. IEEE Conference on Open Systems (ICOS2011), Langkawi, Malaysia.
- Friese, S. (2019). *Qualitative data analysis with ATLAS.ti* (3rd ed.). SAGE Publications.
- Ghazali, A., Mat Yusoff, M. A., Suhaimi, A. S., Hasim, H., Mansor @ Nordin, A., Mohamed, N. I., Handayani, S. W., & Mohamad Ashari, Z. (2025a). *From Aliff to Ya: Exploring the challenges of Jawi literacy in early learners and how to cope it*. *International Journal of Academic Research in Progressive Education and Development*, 14(2), 825–838. <https://doi.org/10.6007/IJARPED/v14-i2/25396>
- Ghazali, A., Mat Yusoff, M. A., Suhaimi, A. S., Hasim, H., Mansor @ Nordin, A., & Mohamed, N. I. (2025b). *Comparative analysis of digital learning applications in Jawi literacy development among Malaysian preschoolers*. *International Journal of Academic Research in Progressive Education and Development*, 14(1), 2501–2516. <http://dx.doi.org/10.6007/IJARPED/v14-i1/25104>
- Ghazali, A., Mat Yusoff, M. A., Suhaimi, A. S., Hasim, H., & Mohamed, N. I. (2025c, June 19–21). *A preliminary studies: Needs for SmartJawi application to preschool children in Islamic educational institutions*. Paper presented at the International Conference on Islamic Manuscripts 2025, Dewan Hassanal Bolkiah, Brunei Darussalam.
- Ismail, M. R. (2001). Jawi writing and its issues in Malaysian education. Retrieved on March 12th, 2025, from www.scribd.com/doc/2582591/tulisanJawi
- Kalogiannakis, M., Papadakis, S., & Zourmpakis, A.-I. (2021). Gamification in science education: A systematic review of the literature. *Education Sciences*, 11(1), 22. <https://doi.org/10.3390/educsci11010022>
- Kang, K. S. (1990). *Development of Jawi writing in Malay society*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Kulaksız, T., & Toran, M. (2022). Development of pre-service early childhood teachers' technology integration skills through a praxeological approach. *International Journal of Educational Technology in Higher Education*, 19, Article 36. <https://doi.org/10.1186/s41239-022-00344-8>
- Kvale, S., & Brinkmann, S. (2009). *InterViews: Learning the craft of qualitative research interviewing* (2nd ed.). Sage Publications.
- Lee, M. H., & Wong, S. L. (2020). *The role of vernacular schools in Malaysia's multicultural education system*. *Journal of Southeast Asian Studies*, 51(3), 345–360.
- Lubis, M. B., Salleh, F., Ali, H., Ismail, H., & Sudin, S. F. (Eds.). (2006). *Jawi writing: A collection of studies*. University Publication Centre (UPENA).
- Noor, S. M. (2017). PASTI Negeri Perlis upholds the Jawi script. *Berita PAS*. Retrieved on February 21st, 2025, from <https://berita.pas.org.my/pasti-negeri-perlis-martabat-tulisan-jawi/>
- Man, C. S. C. (2007). *Approach to Jawi teaching*. Kuala Lumpur: Dewan Bahasa dan Pustaka.

- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.
- Ministry of Education Malaysia. (1956). *Razak Report 1956*. Kuala Lumpur: Ministry of Education Malaysia.
- Ministry of Education Malaysia. (2019). *Implementation of Jawi script introduction in the Malay language subject curriculum for Year 4 students in national-type schools starting in 2020*. Putrajaya: Ministry of Education Malaysia.
- Ministry of Education Malaysia. (2012). *National Education Policy*. Putrajaya: Ministry of Education Malaysia.
- Ministry of Education Malaysia. (2017). *Standard Curriculum and Assessment Document: National Preschool Standard Curriculum (Revised 2017)*. Putrajaya: Curriculum Development Division.
- Mohamad, N. F. D., & Baharudin, H. (2023). Challenges faced by Agama Fardu Ain class educators in religious primary schools in teaching Jawi script. *Artikulasi Membina Ummah*, 9(1), 59–69.
- Moser, A., & Korstjens, I. (2018). Series: Practical guidance to qualitative research. *Sampling, data collection and analysis, European Journal of General Practice*, 24(1), 9–18. <https://doi.org/10.1080/13814788.2017.1375091>
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16, 1–13. <https://doi.org/10.1177/1609406917733847>
- Papadakis, S., Kalogiannakis, M., & Zaranis, N. (2018). The effectiveness of computer and tablet assisted intervention in early childhood students' understanding of numbers: An empirical study conducted in Greece. *Education and Information Technologies*, 23(5), 1849–1871. <https://doi.org/10.1007/s10639-018-9693-7>
- Papadakis, S., Vaiopoulou, J., Sifaki, E., Stamovlasis, D., & Kalogiannakis, M. (2021). Attitudes towards the use of educational robotics: Exploring pre-service and in-service early childhood teacher profiles. *Education Sciences*, 11(5), 204. <https://doi.org/10.3390/educsci1105020>
- Rahim, S. N. A. & Hamzah, R. (2024). E-Jawi: Digital Learning Tool for Jawi Character Recognition. *Journal of Computing Technologies and Creative Content*, 1(1), 55-58. <https://ejournal.unikl.edu.my/index.php/JTeC/article/view/662>
- Shapii, A., Mahayuddin, Z. R., & Othman, S. (2020). Jom Jawi: Improving Jawi language proficiency among primary school students using interactive media. *Jurnal Dunia Pendidikan*, 2(3), 212–230.
- Tan, C. K. (2015). *Education and identity: Vernacular schools in Malaysia*. Oxford University Press.
- Vaiopoulou, J., Papadakis, S., Sifaki, E., & Kalogiannakis, M. (2022). Classification and evaluation of educational apps for early childhood: Security matters. *Education and Information Technologies*, 28, 2547-2578. <https://doi.org/10.1007/s10639-022-11289-w>
- Yaacob, A. J., Awang, A. R., Sulaiman, M. F., & Misdi, M. Y. (2016). The lost gem: Learning calligraphy and Jawi writing. In *Empowering Local Mind in Art Design & Cultural Heritage: 3rd ISME International Colloquium 2016* (pp. 367-380). Universiti Teknologi MARA, Melaka.
- Zourmpakis, A.-I., Papadakis, S., & Kalogiannakis, M. (2022). Education of preschool and elementary teachers on the use of adaptive gamification in science education. *International Journal of Technology Enhanced Learning*, 14(1), 1-16. <https://doi.org/10.1504/IJTEL.2022.120556>

ATTACHMENT A



كَلِةِ السَّلَاطِنِ اِسْمَاعِيْلِيَّةِ اَلْمَدِيْنَةِ اَلْعِلْمِيَّةِ
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Puan Amnie Asbah
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32610 Seri Iskandar
Perak

السلام عليكم ورحمة الله وبركاته

Puan,

LANTIKAN SEBAGAI PANEL TEMU BUAL BAGI PENYELIDIKAN

Merujuk kepada perkara di atas, sukacita dimaklumkan bahawa sebuah penyelidikan sedang dijalankan oleh pensyarah kami yang diketuai oleh Encik Muhammad Nur Azam bin Ghazali, di bawah Skim Geran Penyelidikan KIAS bertajuk:

Pembangunan Aplikasi SmartJawi: Bahan Pembelajaran Interaktif untuk
Kanak-kanak 5-6 Tahun

Sehubungan dengan itu, pihak kami dengan berbesar hati melantik puan sebagai panel temu bual berdasarkan pengetahuan dan pengalaman puan dalam bidang berkaitan. Temu bual ini akan diadakan pada tarikh yang telah ditetapkan iaitu pada 05 Ramadan 1446H bersamaan 06 Mac 2025. Bagi sebarang persoalan yang timbul, boleh dirujuk kepada Encik Muhammad Nur Azam bin Ghazali melalui talian 012-8993165.

Diharapkan kepakaran dan pengalaman puan dapat dikongsikan sehingga penyelidikan ini selesai dengan jayanya. Segala perhatian dan kerjasama yang diberikan oleh pihak puan amatlah dihargai.

Sekian, terima kasih.

Yang benar,


DR. NURUL AKMA BT MOHAMED
Timbalan Rektor (Hal Ehwal Akademik dan Penyelidikan)

s.k: Pengarah Pusat Pengurusan Penyelidikan
Fail Projek



كَلِةِ السَّلَاطِنِ اِسْمَاعِيْلِيَّةِ اَلْمَدِيْنَةِ اَلْعِلْمِيَّةِ
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السلام عليكم ورحمة الله وبركاته

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Fail Projek



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Guru
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16070 Bachok
Kelantan

السلام عليكم ورحمة الله وبركاته

Puan,

LANTIKAN SEBAGAI PANEL TEMU BUAL BAGI PENYELIDIKAN

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