



Designing Digital Arabic Worksheets for Vocabulary Practice: A Descriptive Study

Kiki Cahya Muslimah^{1*}, Anwar Sanusi², Mochamad Syaifudin³,
Mohammad Affan⁴

¹Universitas Muhammadiyah Surabaya, Surabaya, Indonesia

²Universitas Jambi, Muaro Jambi, Indonesia

³Institut Agama Islam Al Khoziny, Sidoarjo, Indonesia

⁴King Saud University, Riyadh, Saudi Arabia

[1kiki.cahya.muslimah@um-surabaya.ac.id](mailto:kiki.cahya.muslimah@um-surabaya.ac.id)¹, anwarsanusi@unja.ac.id²
mochamadtole81@gmail.com³, 4446109872@student.ksu.edu.sa⁴

*Correspondence

DOI: 10.38073/lughawiyat.v9i2.4229

Received: 2 January 2026

Revised: 11
September 2026

Accepted: 21 September 2026

Published: 10 October 2026

Abstract

Vocabulary mastery is a fundamental component of learning Arabic as a foreign language, particularly at the primary education level. This study aims to describe the design and implementation of Digital Arabic Worksheets for Arabic vocabulary practice and to examine their verbal and visual representations through the lens of Dual Coding Theory. Employing a qualitative descriptive approach, the study was conducted at Muhammadiyah 1 Wringinanom Elementary School, Gresik. Data were collected through non-participant classroom observations, semi-structured interviews with an Arabic language teacher, and documentation of Digital Arabic Worksheets designed using the Canva platform. Data were analyzed through data reduction, data display, and conclusion drawing, with the worksheets coded deductively according to their instructional functions, task formats, verbal representations, visual representations, and integration of verbal and visual elements. The findings reveal that the Digital Arabic Worksheets comprised ten types: Hijaiyah letter introduction, Hijaiyah letter rewriting, word construction, letter–word matching, Arabic vocabulary reading, gap filling, Hijaiyah letter games, transliteration, Arabic numeracy, and vocabulary coloring. These worksheets integrated Arabic vocabulary with meaningful visual representations through varied task formats, while their implementation showed that students demonstrated active engagement and meaningful responses during classroom activities. From a theoretical perspective, the findings demonstrate how verbal–visual integration can be examined through Dual Coding Theory in the design of Arabic vocabulary worksheets. The study contributes a ten-type classification of Digital Arabic Worksheets and identifies verbal–

How to Cite this Article

Muslimah, K. C., Sanusi, A., Syaifudin, M., & Affan, M. (2026). Designing Digital Arabic Worksheets for Vocabulary Practice: A Descriptive Study. *Lughawiyat: Jurnal Pendidikan Bahasa Dan Sastra Arab*, 9(2), 280–298. <https://doi.org/10.38073/lughawiyat.v9i2.4229>

visual integration as a central design principle for developing cognitively informed digital materials for primary-level Arabic vocabulary practice.

Keywords: *arabic worksheets, vocabulary learning, dual coding theory, arabic education, primary school learners.*

Introduction

Vocabulary mastery is a central pillar in second and foreign language learning worldwide. Extensive research in second language acquisition consistently shows that vocabulary knowledge provides an essential foundation for understanding linguistic input and producing meaningful language. Without sufficient vocabulary knowledge, learners may experience difficulties in comprehending both spoken and written texts, even when they possess a basic command of grammar (Nation, 2013). Research on vocabulary learning further indicates that intentional vocabulary-learning activities can contribute substantially to vocabulary development, although their effectiveness depends on the nature and quality of the learning activities provided (Webb, 2023). For this reason, vocabulary learning should not be treated as a supplementary component of language education, but as a core element that requires systematic and meaningful instructional support.

In the context of Arabic as a foreign language, vocabulary acquisition presents distinct challenges. Arabic has orthographic, phonological, and morphological characteristics that differ substantially from those of Indonesian, which may create difficulties for Indonesian learners in recognizing, producing, and associating Arabic word forms with their meanings. These differences suggest that Arabic vocabulary instruction needs to extend beyond rote memorization and provide learners with meaningful opportunities to establish connections between linguistic forms and their meanings. Previous research on foreign-language vocabulary learning has shown that learning can be supported when linguistic information is accompanied by concrete or visual representations. For example, combining foreign-language vocabulary with gestures and pictures has been found to enhance vocabulary memory among young learners over an extended period (Andrä et al., 2020). Such findings suggest that vocabulary learning can benefit from instructional approaches that strengthen the mental association between words and meaningful representations.

At the primary education level, these considerations are particularly relevant because learners are still developing the cognitive resources needed to process unfamiliar and abstract linguistic information. Students in the present study were approximately 11–12 years old, a developmental period associated with increasing capacity for logical and abstract thinking while concrete experiences continue to play an important role in learning. Accordingly, visual representations and concrete referents can provide meaningful bridges between unfamiliar linguistic forms and the concepts they represent. In Arabic vocabulary learning, this consideration is important because learners may encounter unfamiliar orthographic forms whose meanings cannot be readily inferred from

the written form alone. Thus, learning activities that connect Arabic words with relevant visual representations may provide additional support for vocabulary comprehension and recall (Andrä et al., 2020).

However, the use of visual support does not mean that vocabulary learning should rely on isolated word–picture associations alone. Vocabulary-learning research indicates that word-focused activities, including repetition and intentional learning tasks, can facilitate vocabulary development, but their contribution depends on the design, frequency, and meaningfulness of the learning activities (WEBB et al., 2020). This suggests the need for learning materials that combine vocabulary exposure with varied opportunities for recognition, production, association, and contextualized practice. In the primary-school context, such variation is also important for maintaining learners' participation and providing opportunities to encounter vocabulary in different forms.

Advances in digital technology have created new opportunities to address these instructional needs. Digital learning materials can integrate written words, images, color, and varied learning activities within a single instructional resource. Recent international research has indicated that appropriately designed digital media can support learner engagement and vocabulary learning when technology is integrated with sound pedagogical principles (Hasan et al., 2022). Digital environments therefore offer opportunities to move beyond conventional word lists by presenting vocabulary through multiple forms of representation and by providing learners with varied opportunities to interact with target words.

Nevertheless, the availability of digital technology alone does not guarantee effective vocabulary learning. Previous scholarship emphasizes that learning outcomes are influenced not simply by the medium used, but also by the quality of instructional design and the extent to which learning materials support meaningful cognitive processing (Webb, 2023). Digital materials therefore need to be designed according to pedagogical and cognitive principles rather than treated merely as technological alternatives to printed materials. In this respect, the organization of verbal and visual information becomes an important consideration in designing digital materials for vocabulary learning.

Dual Coding Theory (DCT), proposed by Allan Paivio, provides a relevant theoretical framework for examining such integration. DCT proposes that human cognition involves interconnected verbal and non-verbal representational systems. Verbal information can be processed through linguistic representations, while non-verbal information can be processed through imagery and other forms of representation (Paivio, 1990). When verbal and visual representations are meaningfully connected, learners may have multiple representational routes through which information can be encoded and subsequently retrieved. Applied to vocabulary learning, this perspective suggests that presenting an Arabic word together with a semantically relevant image can help establish a connection between the linguistic form and its meaning. Consequently, the pedagogical value of a digital worksheet should be considered not only in terms of its technological format but also in terms of how its verbal and visual elements are organized.

Research on multimedia learning provides related evidence concerning the importance of coordinating verbal and visual information. Multimedia learning can support understanding when words and visual representations are appropriately coordinated and when unnecessary cognitive processing is minimized (Mayer & Moreno, 2003). Similarly, recent vocabulary-learning research suggests that learning activities involving multiple forms of representation can provide additional support for vocabulary processing and learning (Mahmudah et al., 2025). These findings reinforce the importance of carefully organizing verbal and visual elements rather than simply adding images to digital learning materials. Thus, DCT offers a useful analytical perspective for examining whether visual elements in digital vocabulary materials function as meaningful representations of vocabulary rather than merely as decorative features.

The relevance of this perspective is particularly important in Arabic vocabulary learning. For beginning and primary-level learners, Arabic words may represent unfamiliar linguistic forms, particularly when learners are still developing familiarity with the Arabic writing system. Text-only presentation may therefore provide limited contextual information for establishing meaning. Meaningful images, illustrations, colors, and task formats can provide additional representational support by connecting Arabic linguistic forms with recognizable objects, actions, or concepts. From a DCT perspective, the combination of verbal and visual representations can therefore be examined as part of the instructional design of Arabic vocabulary materials rather than simply as an aesthetic feature.

Within this study, Digital Arabic Worksheets refer to interactive PDF-based learning materials designed using Canva that combine Arabic vocabulary, visual representations, and learner activities. These worksheets enable teachers to organize vocabulary materials according to particular learning objectives, learner characteristics, and instructional contexts. Through visual layouts, relevant images, and varied task formats, digital worksheets can provide structured opportunities for vocabulary recognition, production, association, and practice. Importantly, the worksheet format also makes it possible to examine different types of vocabulary activities and how verbal and visual representations are incorporated into each activity. Thus, digital worksheets are positioned in this study not merely as digital products, but as pedagogical materials whose design can be examined from both instructional and cognitive perspectives.

In the Indonesian context, previous studies have demonstrated growing interest in technology-supported Arabic language instruction. The use of Plotagon Story, for example, has demonstrated the potential of visual and narrative digital media to create a more communicative environment in Arabic language learning (Thohir et al., 2021). Research on deep-learning-based digital quizzes has also highlighted the importance of designing digital learning media that considers learners' cognitive and affective dimensions (C. Muslimah et al., 2025). These studies demonstrate that digital technology can provide alternative learning environments for Arabic instruction, but they primarily focus on particular digital platforms or media formats rather than on the systematic design of digital worksheets for vocabulary practice.

Other recent studies provide additional insights into the role of visual and contextual resources in Arabic learning. Research on linguistic landscapes in Arabic writing instruction through a project-based learning approach, for instance, highlights the relevance of visual context and the linguistic environment in the language learning process (K. C. Muslimah et al., 2024). Although the study focuses on writing rather than vocabulary, its attention to visual context provides a conceptual basis for considering how visual resources can be incorporated into vocabulary materials to connect linguistic forms with meaningful contexts.

At the same time, research has emphasized that the successful integration of digital media depends on teachers' pedagogical competence and their understanding of learners' characteristics. The effectiveness of Arabic language learning is influenced by teachers' ability to adapt instructional strategies and learning media to learners' needs and characteristics (Sultan et al., 2025). This finding is particularly relevant to primary-school Arabic instruction, where the selection of task formats, visual representations, and levels of linguistic complexity needs to correspond with learners' developmental characteristics. Consequently, the design of Digital Arabic Worksheets should be understood as a pedagogical process involving decisions about learning objectives, task functions, learner characteristics, and verbal visual representation, rather than merely a technical process of producing digital materials.

Despite the growing use of digital media in Arabic vocabulary learning, several gaps remain in the existing literature. Previous studies have largely examined the effectiveness or learning outcomes of particular digital media, including interactive digital media, Kahoot!, and Canva-based visual media (Ibrah & Rizki, 2026; Yunanta, 2022; Zaki, 2025). While these studies provide evidence concerning the potential of digital media for Arabic learning, they provide less attention to how digital learning materials are systematically structured as worksheets for vocabulary practice.

Previous research has also paid limited attention to classifying different digital worksheet activities according to their instructional functions and task formats. Furthermore, the integration of verbal and visual representations within digital Arabic worksheets has received limited explicit analysis through the perspective of Dual Coding Theory. These gaps indicate the need for research that examines not only whether digital media are effective, but also how digital vocabulary-learning materials are designed, what types of activities they contain, and how verbal and visual representations are organized within them.

Addressing these gaps, the present study focuses on the systematic design and classroom implementation of Canva-based Digital Arabic Worksheets for vocabulary practice in a primary-school context. Specifically, the study identifies and classifies ten types of Digital Arabic Worksheets according to their instructional functions and task formats and examines their verbal and visual representations through the lens of Dual Coding Theory. The study also describes how these worksheets are implemented in authentic Arabic vocabulary-learning activities. In this way, the study responds to the limitations of previous research by shifting attention from the effectiveness of a particular

digital platform toward the design characteristics, instructional functions, and cognitive organization of digital worksheets.

Method

This study employed a qualitative descriptive approach to examine the design and implementation of Digital Arabic Worksheets for Arabic vocabulary practice in a primary school context. This approach was selected because the study aims to describe instructional processes, learning practices, and participants' experiences within their natural educational setting rather than test hypotheses or establish causal relationships (Doyle et al., 2020; Kim et al., 2018). The design enabled a systematic examination of how digital worksheets were designed, implemented, and used by teachers and students in Arabic language learning.

This study was conducted at Muhammadiyah 1 Wringinanom Elementary School in Gresik Regency, East Java, Indonesia. The school was purposively selected as an information-rich research site because Arabic vocabulary instruction at the school incorporates teacher-designed digital worksheets, including Canva-based materials, providing a relevant context for examining how digital worksheets are designed and implemented in vocabulary learning. Although the school is located in a rural area, its teachers actively utilize digital technology to support language instruction and develop students' Arabic skills through visually oriented and technology-supported learning activities. This combination of a rural educational setting and teachers' active use of digital instructional technology makes the school particularly relevant for examining how digital worksheets can be designed and implemented under authentic primary school conditions.

The site therefore provides a meaningful context for analyzing the relationship between worksheet design, visual and verbal representations, and vocabulary practice from the perspective of Dual Coding Theory. The study was conducted within regular classroom instruction without any manipulation of classroom conditions, ensuring that the data reflected naturally occurring teaching and learning practices (Doyle et al., 2020). This approach aligns with qualitative research principles that emphasize the importance of context as a central element in data interpretation (Sharan B. Merriam, 2016).

The participants consisted of one Arabic language teacher and 50 sixth-grade primary school students from two classes, aged approximately 11–12 years. The teacher was responsible for designing and implementing the Digital Arabic Worksheets, while the students used the worksheets during Arabic vocabulary practice activities. The 50 students comprised all students enrolled in the two selected sixth-grade classes. The classes were purposively selected because they were directly involved in Arabic vocabulary learning using the digital worksheets, consistent with the use of purposive sampling to identify information rich cases relevant to the phenomenon under investigation (Campbell et al., 2020). The researcher did not participate in teaching or worksheet implementation but observed the learning process and documented how the teacher and students used the worksheets during vocabulary activities. This purposive

selection ensured that the participants had direct experience with the instructional practice under investigation.

The research procedure was carried out in three main stages. The first stage involved the design of the Digital Arabic Worksheets by the Arabic language teacher. The teacher designed the worksheets based on the vocabulary learning objectives, the cognitive characteristics of primary school learners, and the principles of integrating verbal and visual representations. The worksheets included various vocabulary exercises, such as vocabulary introduction, word picture matching, gap filling tasks, and simple visually based activities to support meaning comprehension. At this stage, the researcher observed and documented the design process without directly participating in the development of the worksheets.

The second stage involved the implementation of the digital worksheets in Arabic language instruction. The designed worksheets were used as a medium for vocabulary practice during classroom learning activities. The teacher integrated the worksheets into instruction through both individual and group tasks, providing guidance as needed based on students' learning needs. The implementation took place within regular classroom settings to ensure that students' interactions with the media could be observed authentically.

The third stage consisted of observing and documenting the learning process. At this stage, the researcher examined how the digital worksheets were used during instruction, how students responded to and engaged with the activities, and how the teacher facilitated the use of the media. This observational approach enabled the researcher to capture classroom dynamics directly and within their authentic context.

Research data were collected using multiple techniques. First, classroom observations were conducted to examine the implementation of the Digital Arabic Worksheets in vocabulary instruction, including students' interactions with the media and the teacher's scaffolding strategies. The observations were non participatory in order to avoid disrupting the learning process. Second, semi structured interviews were conducted with the Arabic language teacher to obtain insights into the rationale behind the worksheet design, experiences with media use, and the teacher's perceptions of the worksheets' contribution to vocabulary learning. The semi structured format allowed for in depth yet flexible data collection.

Third, documentation was collected, including the designed digital worksheets, samples of students' completed work, and relevant instructional records. Documentation served to corroborate findings from observations and interviews while providing concrete evidence of the form and characteristics of the media examined. The use of multiple data collection techniques was intended to provide a more comprehensive understanding of the phenomenon and support triangulation across data sources (Doyle et al., 2020).

Data analysis followed the stages of data reduction, data display, and conclusion drawing (Matthew B. Miles, A Michael Huberman, 2014). Observation, interview, and documentation data were transcribed, organized, and coded according to an a priori analytical framework derived from the study objectives and the principles of Dual Coding

Theory. The initial coding categories covered (1) worksheet type and instructional function, (2) verbal representations, (3) visual representations, (4) integration of verbal and visual representations, and (5) classroom implementation.

The ten worksheet types were classified deductively based on their instructional functions and task formats: Hijaiyah letter introduction, Hijaiyah letter rewriting, word construction, letter–word matching, Arabic vocabulary reading, gap filling, Hijaiyah letter games, transliteration, Arabic numeracy, and vocabulary coloring. Each worksheet was then analyzed for the presence, function, and integration of verbal and visual elements, while observation and interview data were used to describe how the worksheets were implemented in classroom practice. The coded data were presented in descriptive narratives and comparisons across the ten worksheet types, and conclusions were drawn by triangulating observation, interview, and documentation data.

To ensure data trustworthiness, this study employed source and method triangulation by comparing data obtained from observations, interviews, and documentation. In addition, the researcher conducted repeated checks of the data and analytical interpretations to ensure consistency and accuracy. These procedures are consistent with the emphasis on methodological transparency and rigor in qualitative descriptive research (Doyle et al., 2020; Kim et al., 2018). These procedures align with the principles of trustworthiness in qualitative research, which emphasize credibility, transferability, and dependability of the data (Lincoln & Guba, 1985).

Results and Discussion

Results

The results section documents field findings obtained through participatory observations, product documentation, and semi structured interviews with the Arabic language teacher at Muhammadiyah 1 Wringinanom Elementary School, Gresik Regency. All digital worksheets analyzed in this study were designed using the Canva platform by the teacher researcher and implemented in classroom instruction as a medium for vocabulary practice. The findings are presented in two main parts: (1) a description of the classification and characteristics of the digital worksheet designs, and (2) findings related to the implementation process and students' responses to the use of the digital worksheets.

1. Characteristics of Digital Arabic Worksheet Design

Based on documentation and analysis of the designed digital worksheet products, the Digital Arabic Worksheets were developed as vocabulary practice media that intentionally integrate verbal and visual elements. All digital worksheets were created using the Canva platform, which was selected for its flexible visual design features, ease of access for teachers, and its capacity to integrate Arabic text and graphical elements in a balanced and effective manner.

Each worksheet was organized around explicit learning objectives, target vocabulary items, and structured activities progressing from vocabulary exposure to practice and reinforcement. The objectives were aligned with the intended vocabulary learning function of each worksheet. Visually, Arabic vocabulary items were presented alongside relevant illustrations. These images served as semantic representations of the target words rather than merely decorative elements, helping students associate word

forms with their meanings. Thus, the worksheet designs integrated verbal and visual representations in ways intended to support vocabulary meaning construction.

Product analysis identified ten types of Digital Arabic Worksheets, classified deductively according to their instructional functions and task formats. The classification was established through the analytical framework of the study and then applied to the documented worksheet products. The ten types were: (1) Hijaiyah Letter Introduction, (2) Hijaiyah Letter Rewriting, (3) Word Construction, (4) Letter–Word Matching, (5) Arabic Vocabulary Reading, (6) Gap Filling, (7) Hijaiyah Letter Games, (8) Transliteration, (9) Arabic Numeracy, and (10) Vocabulary Coloring. Each type was subsequently analyzed in terms of its instructional function, task characteristics, and integration of verbal and visual representations.

1.1. Hijaiyah Letter Introduction Worksheets

This type of worksheet was designed to introduce Hijaiyah letters individually. The design features large-scale letters with dotted-line patterns for tracing activities, instructions for letter thickening, and examples of the letters used in simple words.

In practice, tracing activities provided opportunities for students to practice letter formation while recognizing the visual forms of Hijaiyah letters. The teacher reported that these activities helped students become more familiar with Arabic script and supported their visual recognition of Hijaiyah letters.

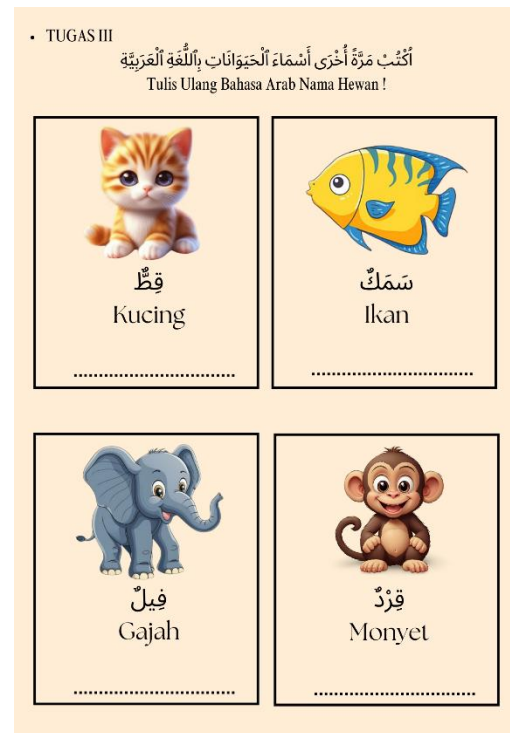
1.2. Hijaiyah Letter Rewriting Worksheet

This worksheet provides blank spaces for rewriting Hijaiyah letters in different positional forms, including initial, medial, and final positions.

Figure 1. Hijaiyah Letter Introduction Worksheet



Figure 2. Hijaiyah Letter Rewriting Worksheet



The examples used feature the letter م in various positions within simple vocabulary items. The examples feature the letter م in various positions within simple vocabulary items. Classroom observations showed that the activity provided repeated practice in recognizing and reproducing different letter forms. The teacher also reported that regular practice helped students improve their familiarity with variations in Arabic letter formation.

1.3. Word Construction Worksheets

In this worksheet type, letters are provided separately (for example, أ س د), and students are asked to arrange them into a meaningful word (أسد). This activity combines letter decoding with word construction. Classroom observations indicated increased group discussion when the activity was conducted collaboratively. The task also requires students to understand the rules of letter connection in Arabic script.

1.4. Letter–Word Matching Worksheets

This worksheet type focuses on matching initial letter sounds with illustrated words (for example, س → سمك). Field data indicate that this activity helps strengthen both phonemic and graphemic awareness and clarifies distinctions between similar letter sounds.

Figure 3. Word Construction Worksheet



Figure 4: Letter–Word Matching Worksheets



1.5. Arabic Vocabulary Reading Worksheets

These simple reading worksheets combine written words with corresponding images (for example, بَيْتٌ paired with an image of a house). Observational data show that students demonstrated greater confidence in reading words when visual support was

provided. Teachers also used these worksheets to facilitate guided and repeated reading activities.

1.6. Gap Filling Worksheets

Gap filling activities, such as completing missing letters (for example, كُرَيُّ for كُرْسِيٌّ), were used to assess students' levels of orthographic awareness and lexical memory. This type of exercise revealed areas of confusion, particularly with letters that have similar dot positions, thereby serving as a useful diagnostic indicator for teachers.

Figure 5: Arabic Vocabulary Reading Worksheets



Figure 6: Gap Filling Worksheets



1.7. Hijaiyah Letter Game Worksheets

Games such as crosswords, mazes, and word searches were adapted for Arabic vocabulary learning. These gamified activities were the most engaging for students; when completed in groups, they created a lively learning atmosphere and significantly increased social interaction.

1.8. Transliteration Worksheets

These worksheets support the transition from the Latin alphabet to the Hijaiyah script (for example, Bi → ب). The findings indicate that this type of worksheet is particularly useful for students who are more familiar with the Latin alphabet, as it helps minimize initial phonetic barriers.

Figure 7: Hijaiyah Letter Game Worksheets



Figure 8: Transliteration Worksheets



1.9. Arabic Numeracy Worksheets

These numeracy worksheets using Arabic numerals were designed to introduce and reinforce students' understanding of Arabic numbers (الأرقام العربية) while simultaneously developing basic arithmetic skills. The worksheets integrate numeracy learning with mastery of Arabic numeral symbols, enabling students not only to practice simple mathematical concepts but also to recognize numerical representations within the Arabic writing system used in language learning contexts.

1.10. Vocabulary Coloring Worksheets

These worksheets combine aesthetic elements with simple calligraphic forms of Arabic vocabulary designed for coloring. The activities provide opportunities for students to attend to Arabic letter forms while engaging in a visually oriented task. Coloring activities may also provide opportunities for fine-motor practice and focused engagement

among young learners (Carsley & Heath, 2019; Giménez-Calvo et al., 2023). In this study, the coloring worksheets were used primarily to reinforce students' familiarity with Arabic letter shapes and vocabulary forms.

Figure 9: Arabic Numeracy Worksheets

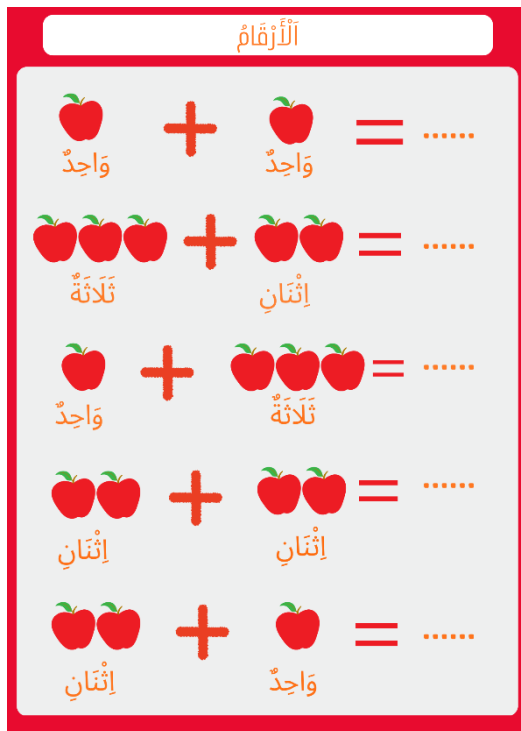
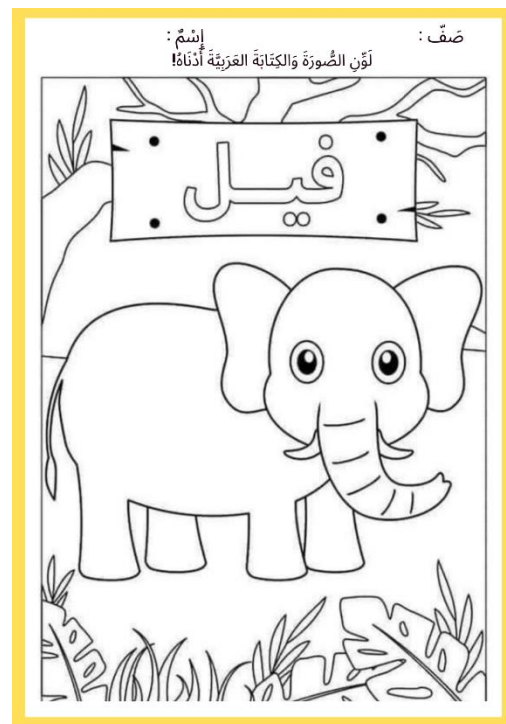


Figure 10: Vocabulary Coloring Worksheets



2. Classroom Interaction and Learning Dynamics

In practice, the digital worksheets were implemented across [X] observed classroom sessions through a gradual instructional sequence consisting of oral introduction, teacher demonstration, worksheet completion, and feedback. Worksheets requiring fine-motor precision, such as tracing and letter rewriting, were generally completed individually, whereas collaborative activities, such as word construction and language games, were conducted in groups. For example, during word-construction activities, students worked together to arrange individual Arabic letters into meaningful words and discussed possible word formations with their peers. These observations indicate that task characteristics influenced the way students interacted with the worksheets.

The teacher played a central role throughout the implementation by explaining tasks, identifying students' errors, and providing immediate oral feedback. Worksheet results were also used as formative assessment to identify vocabulary items requiring further reinforcement. The teacher reported that printed outputs from Canva facilitated documentation and instructional follow-up. Classroom observations further showed that the use of visual elements, color, and varied task formats encouraged students to attend to the activities and ask questions. Some students who were initially less active became more involved during visually rich and game-based activities.

Most students appeared enthusiastic when using the digital worksheets, particularly those incorporating games and colorful visual elements. This observation was

reflected in students' active participation, willingness to complete the activities, and interaction during group tasks. Differences in students' vocabulary mastery were also observed. Students tended to recognize and read basic vocabulary more readily when words were accompanied by relevant images, while gap-filling and word-construction activities provided opportunities for the teacher to identify students' difficulties with Arabic letter forms and word formation.

Several implementation challenges were also observed. Limited access to devices and internet connectivity created difficulties when the worksheets were used online. The teacher addressed these constraints by rotating device use and providing printed versions of the digital worksheets. Students also initially needed guidance in operating the digital materials; after repeated teacher support, they became more familiar with the digital procedures.

Discussion

The discussion section interprets the empirical findings by relating them to recent international literature on vocabulary learning, cognitive theory, and digital instructional media design. The discussion is organized into three thematic strands: (A) the theoretical foundations and implications of Dual Coding, (B) practical instructional design using Canva, and (C) the role of activity variation and gamification in vocabulary learning.

A. Dual Coding as the Cognitive Foundation of Digital Worksheet Design

The discussion of the findings is grounded in Dual Coding Theory proposed by Allan Paivio, which posits that learning becomes more effective when information is processed through two distinct yet complementary cognitive systems, namely the verbal system and the visual system (Paivio, 1990). In the context of Arabic vocabulary learning, Arabic text functions as a verbal representation, while visual illustrations serve as nonverbal representations that support meaning construction.

The results of the study indicate that Digital Arabic Worksheets integrating Arabic vocabulary with visual illustrations supported students' recognition and recall of vocabulary during classroom activities. Activities such as word-picture matching, tracing Hijaiyah letters with visual cues, and coloring calligraphic vocabulary items combined verbal and visual representations, consistent with the principles of Dual Coding Theory (Paivio, 1990). These findings can also be interpreted in light of Piaget's theory of cognitive development, particularly the concrete operational stage, in which children develop more logical thinking but continue to benefit from concrete objects, experiences, and visual representations when dealing with concepts that are less directly observable. Given that the participants were sixth grade students aged approximately 11–12 years, they can be understood as being at a transitional point between concrete and formal operational thinking rather than being uniformly situated in a single developmental stage. Thus, the use of relevant visual representations may provide concrete referents that help students connect Arabic linguistic forms with their meanings.

Recent literature in the field of multimedia learning provides strong empirical support for these findings. Mayer emphasizes that effective multimedia instruction must integrate text and visual elements in a coordinated manner in order to reduce cognitive load and enhance meaning processing (Mayer & Moreno, 2003). Furthermore, recent meta analyses indicate that image-based multimedia glosses have a significant positive impact on vocabulary learning, particularly among learners at primary and secondary levels (Mahdi et al., 2024).

Critically, the findings of this study indicate that the effectiveness of dual coding depends not merely on the presence of images, but on the relevance and proximity of visual elements to the accompanying text. Visuals that function solely as decoration without a semantic relationship to the vocabulary items may instead increase cognitive load. Therefore, the design of digital worksheets must consider principles of visual selectivity to ensure that dual coding operates optimally.

Accordingly, the Canva-based Digital Arabic Worksheets examined in this study can be viewed as a practical implementation of Dual Coding Theory in Arabic language learning. This contributes theoretically by demonstrating that a classical cognitive theory remains relevant and applicable within contemporary educational technology contexts.

B. Teachers as Instructional Designers on the Canva Platform

The use of Canva as a platform for designing Digital Arabic Worksheets indicates a shift in teachers' roles from passive consumers of instructional materials to active instructional designers. Canva offers a design ecosystem that allows teachers to create, modify, and adapt visual learning materials without requiring professional graphic design expertise. This finding illustrates that accessible technology can significantly expand teachers' pedagogical capacity.

The results show that teachers utilized Canva to manage Arabic text layout, font size, illustration integration, and consistency of colors and symbols. This flexibility enabled teachers to adjust worksheet designs according to students' proficiency levels and specific learning objectives. Recent studies on the development of e-worksheets suggest that Canva based instructional materials demonstrate high levels of validity and practicality and contribute to increased student engagement (Hamidah et al., 2025).

From a materials development perspective, the practice of teacher designed materials facilitated by Canva aligns with the view that materials created by teachers themselves tend to be more contextualized and relevant than commercially produced, ready made resources (Hughes et al., 2011). Teachers possess first hand knowledge of learners' needs, difficulties, and characteristics, allowing worksheet designs to be more responsive and adaptive to the learning context.

Nevertheless, this approach also requires teachers to develop new competencies, particularly in design literacy and an understanding of multimedia learning principles. Research on teacher training in digital instructional design indicates that enhanced instructional design competence has a significant impact on media quality and instructional effectiveness (Liu, 2022).

Accordingly, Canva functions not merely as a technical tool but as a pedagogical medium that enables the integration of teacher creativity with evidence based principles of language learning. This reinforces the argument that the effectiveness of digital media is determined primarily by the quality of instructional design rather than by the technology itself.

Therefore, the primary novelty of this study lies in its systematic classification of ten types of Canva based Digital Arabic Worksheets designed and implemented in a primary school context. This classification is not only conceptual in nature but is also grounded in empirical evidence from authentic classroom practice, giving it strong practical value for Arabic language instruction.

C. Activity Variation, Gamification, and Affective Engagement

The variation of activities embedded in the Digital Arabic Worksheets, particularly game-based and creative activities, was associated with sustained classroom engagement. Worksheets involving Hijaiyah letter games, word searches, and vocabulary

coloring attracted noticeable student participation during classroom activities. These observations suggest that activity variation can support students' affective engagement in vocabulary learning, particularly in the primary school context.

This finding is consistent with research on digital game-based learning, which suggests that game-oriented activities can enhance motivation and active learner engagement in language learning (Kazu & Kuvvetli, 2023). In vocabulary learning, repeated exposure through varied and meaningful activities may also help prevent monotony and support learning; however, the present study did not measure long-term vocabulary retention. The potential contribution of meaningful repetition to retention is therefore interpreted here based on previous research rather than as a direct finding of this study (Dewaele & Wu, 2021).

Research on emotional design in digital learning environments further suggests that enjoyable learning experiences can support learning processes (Mutlu-bayraktar, 2024). In the present study, this perspective is reflected in sustained classroom engagement, as students appeared more involved during activities that incorporated games, colors, and varied visual elements. However, because engagement was assessed through classroom observation rather than a standardized engagement scale, the findings should be interpreted as observational evidence of classroom engagement, rather than evidence of measured cognitive or affective change.

Nevertheless, gamification should remain pedagogically grounded. Game-based activities need to be aligned with clearly defined vocabulary objectives so that playful elements support rather than distract from learning. In this study, the variation of worksheet activities provided different opportunities for vocabulary practice, with game-based activities contributing to observable classroom participation. Future experimental or mixed-methods studies could examine whether these activities produce measurable effects on vocabulary retention, motivation, and learning outcomes over longer periods.

Conclusion

This study concludes that Digital Arabic Worksheets designed as vocabulary practice media exhibit systematic, contextual, and cognitively aligned design characteristics suitable for primary school learners. The worksheets integrate verbal elements in the form of Arabic vocabulary items with meaningful visual representations and are structured across diverse exercise types, ranging from Hijaiyah letter introduction and word construction to language games and numeracy activities using Arabic numerals. The classification of ten worksheet types demonstrates that digital worksheet design is not uniform, but adaptive to instructional goals and learners' developmental needs. Accordingly, Digital Arabic Worksheets function as flexible vocabulary practice media that can be developed in response to specific Arabic learning contexts in primary education.

The findings also indicate that Digital Arabic Worksheets can be effectively implemented in Arabic language instruction through gradual instructional patterns, both individually and collaboratively. Students' interactions with the worksheets revealed increased affective and cognitive engagement, particularly when activities were visually rich and varied. Teachers played a central role as facilitators, using worksheet outcomes

as formative assessment tools to reinforce vocabulary learning. Although technical constraints such as limited device access and varying levels of digital literacy were encountered, hybrid strategies combining digital and printed worksheets enabled learning to proceed in an optimal and contextually responsive manner.

From a theoretical perspective, this study confirms the relevance of Dual Coding Theory in Arabic vocabulary learning. Presenting vocabulary alongside visual illustrations supported learners in forming stronger mental associations between word form and meaning, thereby facilitating more meaningful vocabulary retention. The main contribution of this study lies in positioning digital worksheets as pedagogical artifacts intentionally designed based on cognitive learning theory, rather than as mere technological products. Consequently, this research offers both conceptual contributions to vocabulary learning scholarship and practical implications for the development of digital media based Arabic language instruction at the primary education level.

Declaration Of Ai and Ai Assisted Technologies In The Writing Process

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) as a supporting tool for language editing, wording refinement, and improving the clarity and organization of selected parts of the manuscript. The tool was not used as a substitute for the authors' academic judgment, data analysis, or interpretation of the research findings. All AI-assisted outputs were critically reviewed, checked against the research materials, and revised by the authors. The authors remain fully responsible for the originality, accuracy, interpretation, and final content of this manuscript.

Author Contribution Statement

Kiki Cahya Muslimah was responsible for developing the research idea, establishing the research focus and analytical framework, conducting the literature review, analyzing and interpreting the data, and preparing the initial manuscript. Anwar Sanusi contributed to the development and critical examination of the research framework and manuscript. Mochamad Syaifudin contributed to the review of the analysis and discussion and provided critical comments on the manuscript. Mohammad Affan contributed to the critical review and refinement of the manuscript. All authors participated in the revision process and approved the final version of the manuscript for publication.

Funding Statement

This study received no specific financial support or research grant from government agencies, private institutions, commercial organizations, or other external funding bodies. The research was conducted independently by the authors.

Data Availability Statement

The materials and information underlying the findings of this study consist of classroom observations, teacher interview data, documentation of Digital Arabic Worksheets, and related instructional materials described in the manuscript. These materials are not deposited in a public repository. Relevant supporting materials may be

made available by the authors upon reasonable request, subject to applicable ethical, privacy, and copyright considerations.

Declaration of Interests

The authors declare that they have no financial, personal, institutional, or professional interests that could have influenced the design, conduct, analysis, interpretation, or reporting of this study.

Acknowledgment

The authors express their appreciation to the school community, particularly the Arabic language teacher and students who participated in the learning activities examined in this study. Their involvement provided valuable insight into the classroom use of Digital Arabic Worksheets for Arabic vocabulary practice.

The authors also acknowledge their broader academic interest in the development of Arabic language learning media that supports the development of maharah lughawiyah (language skills), including listening (maharah al-istima'), speaking (maharah al-kalam), reading (maharah al-qira'ah), and writing (maharah al-kitabah). This continuing interest forms part of the authors' wider scholarly engagement with technology-supported Arabic language education and provides a broader context for the present study.

References

- Andrä, C., Mathias, B., Schwager, A., & Macedonia, M. (2020). Learning Foreign Language Vocabulary with Gestures and Pictures Enhances Vocabulary Memory for Several Months Post-Learning in Eight-Year-Old School Children. *Educational Psychology Review*, 32(September), 815–850.
- Campbell, S., Greenwood, M., Prior, S., Walkem, K., Young, S., & Bywaters, D. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652–661. <https://doi.org/10.1177/1744987120927206>
- Carsley, D., & Heath, N. L. (2019). Evaluating the effectiveness of a mindfulness coloring activity for test anxiety in children. *The Journal of Educational Research*, 112(2), 143–151. <https://doi.org/10.1080/00220671.2018.1448749>
- Doyle, L., McCabe, C., Keogh, B., Brady, A., & McCann, M. (2020). An overview of the qualitative descriptive design within nursing research. *Journal of Research in Nursing*, 25(5), 443–455. <https://doi.org/10.1177/1744987119880234>
- Giménez-Calvo, M., García-Ochoa, Y. C., & Martínez-Bello, V. E. (2023). Enhancing young children's movement experiences through a colouring activity pages: individualised ad hoc colouring materials can make a difference. *International Journal of Early Years Education*, 31(2), 502–518. <https://doi.org/10.1080/09669760.2020.1778448>
- Hasan, K., Fakhri, A., Mahbub, P., & Seraj, I. (2022). Heliyon The effect of technology-assisted language programme on vocabulary learning among EFL students at the tertiary level. *Heliyon*, 8(8), e10313. <https://doi.org/10.1016/j.heliyon.2022.e10313>
- Hughes, A., Brown, J. D., Andrews, S., Senior, R., & Burns, A. (2011). *Materials Development in Language Teaching The Experience of Language Teaching Language Teachers*.
- Ibrahim, A. L., & Rizki, B. (2026). THE EFFECTIVENESS OF CANVA-BASED DIGITAL VISUAL LEARNING MEDIA IN IMPROVING ARABIC VOCABULARY COMPREHENSION AMONG TENTH-GRADE STUDENTS تادر فلما مهف ةيقرتل افناك

- يمقرلا ميمصتلا بلع قمناقلا يرصبلا ملعتلا قليسو مادختسا قىلاعف قىلاعلا قسر دلماب رشاعلا فصلا بلا
Ibrah: Journal of Arabic Language Education, 09(01), 375–385.
<https://doi.org/https://doi.org/10.24256/jale.v9i1.10988>
- Kim, H., Sefcik, J. S., & Bradway, C. (2018). HHS Public Access. Res Nurs Health, 40(1), 23–42. <https://doi.org/10.1002/nur.21768.Characteristics>
- Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic Inquiry. SAGE Publications.
- Mahmudah, M., Tinggi, S., Islam, A., & Indonesia, A. P. (2025). Al-Muhawarah : Jurnal Pendidikan Bahasa Arab Enhancing Arabic Vocabulary with Hilyah Book. 01(01), 1–11.
- Matthew B. Miles, A Michael Huberman, J. S. (2014). Qualitative Data Analysis A Methods Sourcebook Edition 3. SAGE Publications.
- Mayer, R. E., & Moreno, R. (2003). Nine Ways to Reduce Cognitive Load in Multimedia Learning. Educational Psychologist, 38(1), 43–52. https://doi.org/10.1207/S15326985EP3801_6
- Muslimah, C., Sanusi, A., & Firdaus, D. (2025). Deep Learning Based Digital Quizzes as A Pathway to Joyful and Meaningful Morphology Learning. 8(2), 226–239. <https://doi.org/10.26555/insyirah.v8i2.14446>
- Muslimah, K. C., Huda, M., Taufiqurrochman, R., & Affan, M. (2024). Linguistic Landscape in Arabic Writing Skills Learning : Project-Based Learning Approach. 7, 231–248.
- Nation, I. S. P. (2013). Learning Vocabulary in Another Language. In Cambridge Applied Linguistics (2nd ed.). Cambridge University Press. <https://doi.org/DOI:10.1017/CBO9781139858656>
- Paivio, A. (1990). Mental Representations: A dual coding approach. Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780195066661.001.0001>
- Sharan B. Merriam, E. J. T. (2016). Qualitative Research A Guide to Design and Implementation.
- Sultan, U. I. N., Hasanuddin, M., Sanusi, A., Soleh, W., Sobri, M., & Zainul, A. M. (2025). Uktub : Journal of Arabic Studies Mastering Students ' Learning Characteristics : A Case Study on the Pedagogical Competence of Arabic Teachers in Secondary School. 5(1), 102–118.
- Thohir, M., Muslimah, K. C., Arab, P. B., Islam, U., Sunan, N., Wonosari, J., Wonocolo, K., Timur, J., Arab, P. B., Islam, U., Sunan, N., Wonosari, J., Wonocolo, K., Timur, J., Arab, P. B., Islam, U., Maulana, N., Ibrahim, M., Batu, K., ... Berbicara, K. (2021). TADARUS : Jurnal Pendidikan Islam. 10(1), 1–12.
- Webb, S. (2023). How effective is second language incidental vocabulary learning ? A meta-analysis. 161–180. <https://doi.org/10.1017/S0261444822000507>
- WEBB, S., YANAGISAWA, A., & UCHIHARA, T. (2020). How Effective Are Intentional Vocabulary-Learning Activities? A Meta-Analysis. The Modern Language Journal, 104(4), 715–738. <https://doi.org/https://doi.org/10.1111/modl.12671>
- Yunanta, I. R. (2022). Transforming Arabic Vocabulary Learning for Beginners through Interactive Digital Media. 06(02), 240–252.
- Zaki, M. (2025). Enhancing Arabic Vocabulary Mastery through Kahoot : Evidence from Elementary Madrasah Students. Al-Ta'rib: Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab, 13(2), 423–442. <https://doi.org/https://doi.org/10.23971/altarib.v13i2.10544>