

A Conceptual Framework for Designing Interactive Digital Audio Books for Arabic Vocabulary Learning in Primary Education

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Abstract

The integration of digital technologies in education has created new opportunities for enhancing language learning; however, the availability of pedagogically grounded digital resources for Arabic vocabulary instruction at the primary level remains limited. This paper addresses this gap by proposing a conceptual framework to guide the design of an interactive digital audio book aimed at improving Arabic vocabulary acquisition among primary school learners. The framework integrates needs analysis, Multimedia Learning Theory, and Contextual Learning Theory to inform the development of a structured and engaging learning model. Drawing on existing literature, the study identifies key challenges in vocabulary learning, including limited exposure to auditory input, lack of interactive materials, and reliance on traditional instructional approaches. The proposed framework incorporates multimedia elements - such as audio, visuals, and interactivity - while positioning learner engagement and motivation as mediating factors in the learning process. It is expected that the integration of these elements will facilitate meaningful vocabulary acquisition and promote self-directed learning. This paper contributes to the literature by offering a theoretically informed model that aligns pedagogical principles with digital innovation in Arabic language education. Future research is recommended to empirically validate the effectiveness of the proposed framework in real classroom contexts.

Keywords: Arabic Vocabulary Learning, Interactive Digital Audio Book, Multimedia Learning, Contextual Learning, Primary Education, Learner Engagement, Instructional Design

Introduction

In recent years, the integration of digital technologies in education has transformed teaching and learning practices across various disciplines. Interactive multimedia resources have increasingly been recognized for their ability to enhance learner engagement, motivation, and instructional effectiveness, particularly in language education. The use of digital learning tools that combine text, audio, visuals, and interactivity has shown considerable potential in supporting vocabulary acquisition and improving learners' comprehension skills.

Despite these developments, the availability of pedagogically grounded digital resources for Arabic language instruction at the primary school level remains limited. This issue is particularly evident in the teaching of Arabic vocabulary, which serves as a fundamental

component in developing learners' listening, reading, speaking, and writing competencies (Johar & Murli, 2022). In many educational contexts, Arabic vocabulary instruction continues to rely heavily on conventional approaches such as memorization, translation, and paper-based exercises, while interactive and audio-supported learning materials remain underutilized (Jasni et al., 2020).

The limitations of traditional instructional practices have created several challenges for learners, especially at the upper primary level. Students often experience difficulties in understanding vocabulary meanings, retaining new words, and applying vocabulary accurately in context. Furthermore, limited exposure to auditory input and the lack of meaningful digital storytelling reduce opportunities for learners to engage actively with the language (Amiruddin & Kamba, 2024). These challenges are increasingly significant in contemporary classrooms, where learners are more responsive to multimodal and technology-enhanced learning environments.

At the same time, previous studies have demonstrated the effectiveness of multimedia learning approaches and contextual learning strategies in supporting language acquisition. Interactive digital resources that integrate audio narration, visuals, and learner interaction have been found to increase motivation, improve comprehension, and facilitate self-directed learning. However, existing studies primarily focus on isolated digital tools or general multimedia applications, with limited attention given to the development of a comprehensive and theory-driven framework specifically for Arabic vocabulary learning among primary school learners.

Accordingly, this paper proposes a conceptual framework for designing an interactive digital audio book aimed at enhancing Arabic vocabulary acquisition in primary education. The framework integrates needs analysis, Multimedia Learning Theory, and Contextual Learning Theory to guide the development of an engaging and pedagogically grounded instructional model. The proposed framework emphasizes the integration of guided text, audio narration, visual illustrations, and interactive activities while positioning learner engagement and motivation as mediating factors in the learning process.

The novelty of this study lies in its integrative and theory-driven approach that combines multimedia learning principles, contextual learning, and learner-centered interactivity within a single conceptual framework for Arabic vocabulary instruction. Unlike previous studies that mainly examine the effectiveness of individual digital applications, this study provides a structured framework that explains how interactive multimedia elements can systematically support vocabulary acquisition and learner engagement.

This study contributes to the field of social sciences, particularly educational technology and language education, by offering a theoretically grounded model that aligns pedagogical principles with digital innovation in Arabic language learning. The framework also provides practical guidance for educators, curriculum designers, and developers in designing interactive learning resources that are responsive to the needs of contemporary primary school learners.

Statement of the Problem

The use of digital audio books in Malaysia remains limited and has yet to reach mainstream adoption (Omar & Mustafa, 2024), particularly in the context of language education at the primary school level. Most available digital books are concentrated in the English language and are typically used as supplementary reading resources rather than as purposefully designed instructional materials. In the case of Arabic language education, digital audio materials - especially interactive ones - are exceedingly scarce, despite the proven effectiveness of technology in supporting language acquisition when implemented systematically (Kiflee et al., 2021).

Within the context of upper primary Arabic language instruction under the KSSR curriculum, students continue to face difficulties in mastering vocabulary due to the limited availability of instructional tools, insufficient exposure to auditory input, and a lack of supplementary reading resources. Previous studies have shown that primary school learners, including those in upper primary level, encounter significant challenges in acquiring and accurately using Arabic vocabulary. For instance, Hashim et al. (2021) found that learners frequently make errors in spelling, understanding meanings, and using vocabulary in sentences, indicating a shallow level of vocabulary mastery despite exposure to prescribed word lists.

Moreover, existing instructional materials tend to focus primarily on printed texts that lack interactive features, even though children are more motivated to learn through interactive approaches involving visual and auditory presentations, as well as game-based activities (Isahak & Samah, 2024). These factors contribute to students' difficulties in reading, text comprehension, and sustained learning motivation. Additionally, Baharudin and Azrin (2020) reported that Year Six students rely heavily on teachers or peers to understand word meanings, reflecting limited ability to independently acquire vocabulary and highlighting the need for more interactive and explanatory learning resources.

Based on these considerations, a significant gap remains in the availability of pedagogically grounded and interactive digital resources for Arabic vocabulary instruction at the primary level. Accordingly, this paper proposes a conceptual framework that integrates needs analysis, multimedia learning principles, and contextual learning to guide the design of an interactive digital audio book. This framework contributes to the literature by offering a theoretically informed model that supports vocabulary acquisition, enhances learner engagement, and promotes self-directed learning.

Purpose of Research and Research Questions

This paper aims to propose a conceptual framework to guide the design of an interactive digital audio book for enhancing Arabic vocabulary acquisition among primary school learners. Specifically, it seeks to integrate needs analysis, multimedia learning principles, and interactive design elements in developing an effective and engaging model for vocabulary instruction. As such, research questions that will be addressed are:

- i. What are the key needs and challenges in Arabic vocabulary acquisition among primary school learners?
- ii. How can Multimedia Learning Theory and Contextual Learning Theory be integrated to inform the design of an interactive digital audio book?

- iii. How can an effective conceptual framework be developed by incorporating needs analysis, multimedia principles, and interactive design elements to enhance vocabulary acquisition and learner motivation?

Literature Review

Arabic Vocabulary Instruction

Pedagogical Content Knowledge (PCK) has been consistently identified as a critical determinant of effective vocabulary instruction in Arabic. Teachers with strong PCK can integrate content knowledge with appropriate pedagogical strategies and contextual understanding, thereby presenting vocabulary in a structured and meaningful manner that enhances learners' acquisition of language skills (Aman & Baharudin, 2019). At the primary level, particularly among upper primary learners, vocabulary mastery forms the foundation for the development of listening, speaking, reading, and writing competencies (Hashim et al., 2021).

However, the effectiveness of vocabulary instruction is not solely dependent on teachers' expertise. It is also influenced by the availability of instructional materials that align with learners' cognitive levels and learning preferences. Prior research highlights that non-interactive materials, particularly those lacking auditory and visual support, limit learners' ability to comprehend and retain new vocabulary, especially in primary education contexts (Jasni et al., 2020). This suggests that the successful implementation of PCK requires complementary teaching resources that support diverse learning modalities.

In this regard, interactive digital materials - particularly digital audio books - offer promising potential. By combining textual input with audio and interactive elements, such resources can provide repeated and meaningful exposure to vocabulary, thereby facilitating deeper learning and retention. These materials also enable teachers to operationalize PCK more effectively while supporting independent learning among pupils. This underscores the need for instructional models that integrate pedagogical knowledge with interactive digital resources, forming a foundation for the proposed framework.

Digital Books and Multimedia in Education

The integration of digital books and multimedia elements in education has gained increasing attention due to their potential to create interactive and engaging learning environments. Digital books that incorporate text, audio, visuals, and video have been shown to promote learner engagement and support self-directed learning, although their impact on reading comprehension remains subject to ongoing debate (Mashfufah et al., 2019). Similarly, the use of interactive applications, educational games, and audio-visual storytelling has been found to enhance learners' motivation and overall learning experience (Kurniawan, 2021).

Within the Malaysian context, needs analysis studies indicate a strong readiness among learners to engage with multimedia-based learning. Students demonstrate positive attitudes toward the use of digital tools and report increased motivation when multimedia elements are integrated into instruction (Zainuddin & Shahrir, 2013). They also show clear preferences for video-based and visual materials, followed by audio and text, highlighting the importance of multimodal design in instructional resources.

From the perspective of educators, multimedia materials are viewed as effective tools for diversifying teaching practices, reducing classroom monotony, and addressing the needs of digital-native learners. Nevertheless, challenges remain, including the limited availability of suitable materials, difficulties in vocabulary retention among learners, and issues related to understanding word forms and functions. These challenges underscore the need for well-designed, interactive multimedia resources that not only engage learners but also align with pedagogical objectives.

In primary education, particularly at the upper primary level, interactive digital audio books represent a viable instructional alternative. Such materials provide repeated auditory input, visual scaffolding for comprehension, and interactive features that actively involve learners in the learning process. Consequently, they are well-positioned to support vocabulary acquisition in a manner that is both engaging and pedagogically sound. These findings support the inclusion of multimedia and interactive elements as essential components within the proposed conceptual framework.

Technology Integration in Arabic Language Education

The growing emphasis on technology integration in language education reflects its potential to enhance instructional effectiveness and improve learning outcomes. In the context of Arabic language teaching, multimedia-based tools have been shown to contribute significantly to learners' proficiency, particularly in foreign language settings (Mohd Yusman, 2024). At the same time, reliance on traditional instructional approaches - such as textbooks and board-based teaching - has been identified as insufficient for developing comprehensive language skills (Johar & Murli, 2022).

Digital applications, such as *Salam Arabic*, illustrate the potential of technology-enhanced learning by integrating text, audio, and visual elements to support vocabulary development, sentence construction, and overall language proficiency. However, limitations in the use of advanced multimedia features, such as video and animation, suggest opportunities for further innovation in instructional design.

In the Malaysian educational context, Arabic continues to be taught largely through conventional methods, despite its status as an elective foreign language. This reliance on traditional resources has contributed to persistent challenges in language mastery. In particular, the underdevelopment of listening skills has been linked to teacher-centered practices and memorization-based approaches, prompting calls for the development of digital, story-based materials that can provide richer auditory input and more meaningful learning experiences (Al-Hasiri & Al-Dalalah, 2023). This further justifies the need for a structured, theory-driven framework to guide the integration of digital tools in Arabic vocabulary instruction.

Overall, the literature highlights three key gaps: (1) the limited availability of interactive and multimedia-based materials for Arabic vocabulary instruction at the primary level, (2) the misalignment between pedagogical knowledge and available teaching resources, and (3) the underutilization of technology to support meaningful language input, particularly in listening and vocabulary acquisition. These gaps justify the need to develop an interactive digital audio book that integrates text, audio, and interactivity to enhance vocabulary learning among

upper primary learners in a manner that aligns with contemporary pedagogical and technological advancements. Unlike previous studies that focus primarily on the effectiveness of isolated digital tools, this study advances the field by proposing a theory-driven and integrative conceptual framework that explains the mechanisms through which multimedia and contextual learning influence vocabulary acquisition. By positioning engagement and motivation as mediating factors, the framework provides a more nuanced understanding of learning processes, thereby offering both theoretical and practical contributions to Arabic language education.

Theoretical Framework

Multimedia Learning Theory (Mayer)

The Multimedia Learning Theory (MMLT), developed by Richard E. Mayer (1997), is grounded in cognitive learning theory and explains how individuals learn more effectively through the integration of multiple forms of media. The theory is based on three core assumptions. First, learners process information through dual channels—auditory and visual—commonly referred to as the multimedia principle, which posits that learning is enhanced when words and images are presented together rather than words alone. Second, each channel has a limited capacity, meaning that learners can only process a finite amount of information at a given time. Third, learning is an active process in which learners select, organize, and integrate information with prior knowledge.

These principles suggest that instructional effectiveness can be enhanced when content is presented through a balanced combination of text, visuals, and audio, while carefully managing cognitive load to match learners' capacities (Yana, 2020). In the context of this study, the proposed framework draws on these principles to guide the design of interactive digital learning materials by integrating written text, audio narration, visual illustrations, and interactive activities. Such multimodal design is expected to facilitate structured and meaningful vocabulary learning, improve comprehension, and promote self-directed learning among upper primary learners.

Contextual Learning Theory

Contextual Learning Theory emphasizes that vocabulary is more effectively acquired when presented within meaningful and authentic contexts, such as stories or dialogues, rather than in isolation (Davtyan, 2014). Contextualized learning enables learners to infer meaning, understand usage, and apply vocabulary in real-life situations, thereby enhancing both comprehension and retention. It also promotes more engaging and autonomous learning experiences.

However, within formal classroom settings, contextual learning requires appropriate instructional guidance to ensure alignment with curriculum objectives and learning outcomes. Without such structure, learning activities may deviate from intended goals.

This theory aligns closely with the present study with a narrative-based digital resource. In this approach, vocabulary is embedded within a coherent and age-appropriate storyline, allowing learners to connect new words with familiar contexts and everyday situations. This reduces reliance on rote memorization and supports deeper, more meaningful vocabulary acquisition.

Conceptual Framework

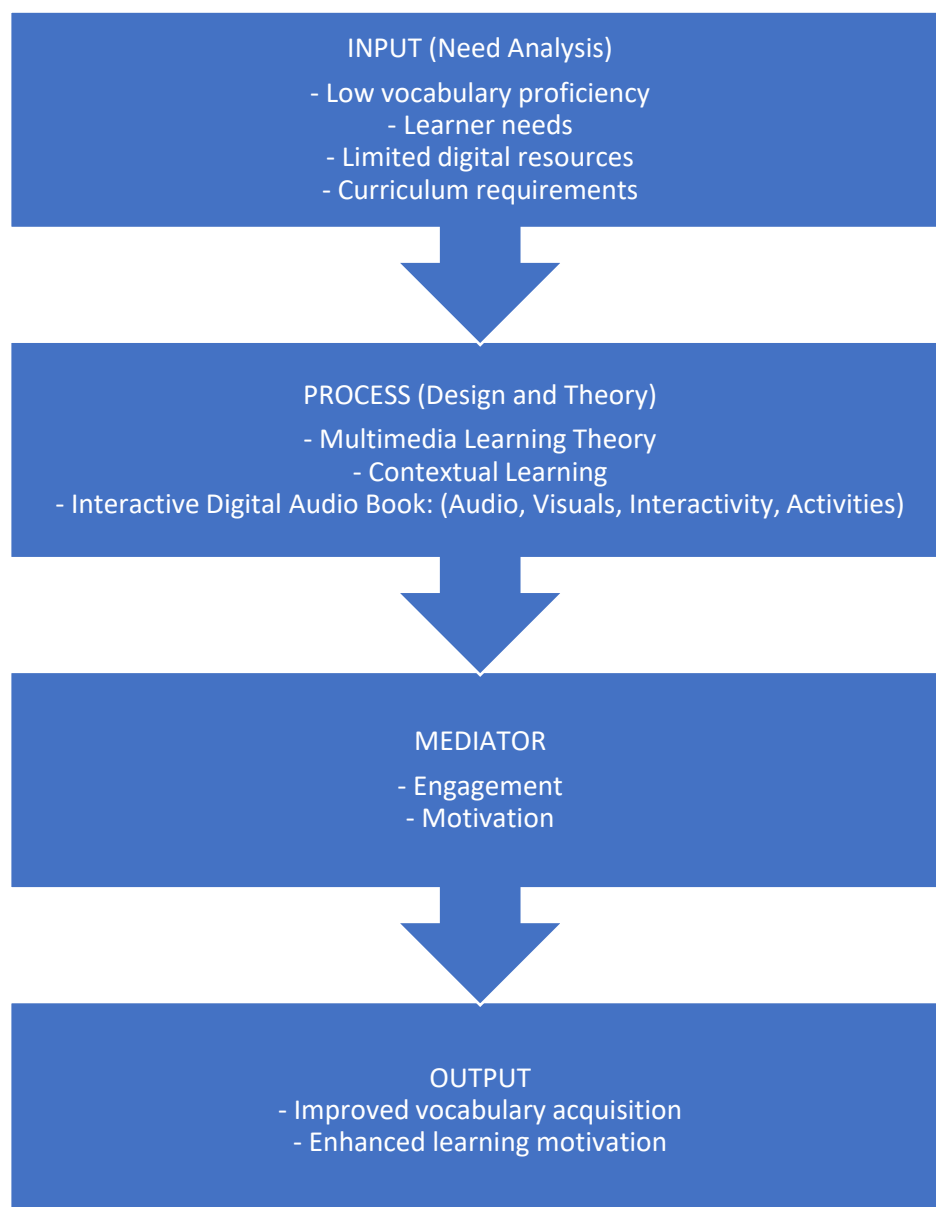
This study proposes a conceptual framework for designing an interactive digital audio book to enhance Arabic vocabulary acquisition among primary school learners. The framework is structured into three main components, namely input (needs analysis), process (design and theoretical foundation), and output (learning outcomes).

The input component is grounded in a needs analysis that identifies several key issues, including students' low mastery of Arabic vocabulary, limited use of interactive digital learning tools, and the requirements outlined in the primary school Arabic language curriculum. In addition, the analysis considers learners' characteristics and their specific linguistic needs, which serve as the basis for designing appropriate instructional materials.

The process component integrates relevant learning theories and instructional design elements. Specifically, the framework draws on multimedia learning theory and contextual learning principles to guide the development of the interactive audio book. The design emphasizes key features such as audio narration, visual support, repetition, and interactive activities, which are essential in facilitating meaningful vocabulary learning. These elements aim to create an engaging and learner-centered environment that supports active participation.

Furthermore, learner engagement and motivation are positioned as mediating factors within the framework. The interactive nature of the digital audio book is expected to increase students' interest and involvement in the learning process, which in turn enhances their ability to acquire and retain new vocabulary.

Finally, the output of this framework is reflected in improved Arabic vocabulary acquisition and increased learning motivation among students. Overall, this conceptual framework highlights the importance of aligning needs analysis, pedagogical theories, and interactive design features in developing effective digital learning tools for language education.



This framework aligns with the research questions by addressing learner needs through the input component, informing design through theoretical integration in the process component, and outlining expected learning outcomes through the output component.

Practical and Theoretical Implications

This conceptual paper offers several important implications for educational practice, instructional design, and future research. From a pedagogical perspective, the proposed framework highlights the importance of integrating interactive and audio-based learning approaches in teaching Arabic vocabulary at the primary school level. Teachers are encouraged to move beyond traditional rote memorization methods and adopt more engaging strategies that incorporate audio narration, visuals, and interactive activities. Such approaches can enhance students' motivation and support more meaningful vocabulary acquisition.

In terms of instructional design, this study provides a guideline for developers and educators in designing effective digital learning materials. The framework emphasizes the role of needs

analysis as a foundational step in understanding learners' characteristics, proficiency levels, and learning preferences. By aligning these needs with appropriate multimedia elements and interactivity, designers can create digital audio books that are both pedagogically sound and learner centered.

Furthermore, the framework contributes to the theoretical understanding of technology-enhanced language learning by demonstrating how multimedia learning principles and contextual learning can be integrated into a coherent design model. It reinforces the idea that the effectiveness of digital tools depends not only on the technology itself but also on how well it is grounded in established learning theories.

Finally, this study opens avenues for future empirical research. Researchers may use the proposed framework as a basis for developing and testing interactive digital audio books in real classroom settings. Future studies could examine the effectiveness of such tools in improving vocabulary acquisition, learner motivation, and overall language proficiency among different groups of learners.

Conclusion

In conclusion, this paper proposes a conceptual framework for guiding the design of an interactive digital audio book aimed at enhancing Arabic vocabulary acquisition among primary school learners. The framework integrates needs analysis, relevant learning theories, and interactive design elements to provide a comprehensive and theoretically grounded approach to instructional design.

The findings of this conceptual analysis suggest that the integration of multimedia and contextual learning principles has the potential to support meaningful vocabulary learning while enhancing learner engagement and motivation. The framework also highlights the importance of aligning instructional design with learners' needs and cognitive characteristics. However, as this study is conceptual in nature, the proposed framework requires empirical validation. Future research is recommended to implement and evaluate the effectiveness of the framework in real educational settings.

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