



Enhancing Preschool English Vocabulary Through Multimedia Tools: Insights from a Mixed-Methods Study

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Abstract

Purpose – The primary objective of this research was to evaluate the effectiveness of multimedia tools in augmenting English vocabulary enrichment in preschool environments. This study was driven by the need to explore innovative approaches in early childhood language education and assess these tools' impact in enhancing learning experiences.

Design/methods/approach – Adopting a mixed-methods approach, the study, conducted in two North Aceh preschools, evaluated multimedia integration in teaching and its impact on student outcomes, motivation, and engagement. It combined observations, document analysis, interviews, and tests, employing qualitative (educator interviews) and quantitative (vocabulary pre-and post-tests) data collection methods.

Findings – The findings significantly improved students' vocabulary acquisition and active participation. Using multimedia tools in teaching and incredibly interactive PowerPoint presentations led to enhanced engagement and effectiveness in learning. Students showed marked improvements in self-confidence and language skills. The study also observed that multimedia integration fostered collaborative learning and increased technological proficiency among students.

Research implications/limitations – These findings imply a potential paradigm shift in early childhood language education, suggesting incorporating multimedia tools for more engaging and compelling learning experiences. The study's limitations include its focus on specific preschool environments and the potential challenge of replicating the approach in resource-limited settings. Further research is needed to assess the approach's applicability in diverse educational contexts and its long-term impacts.

Originality/value – This study offers novel insights into the application of multimedia tools in early childhood language education. It highlights how innovative teaching methods can significantly improve vocabulary skills and educational outcomes. These findings suggest impactful changes in teaching practices and pave the way for future research and potential shifts in educational policies.

Keywords Preschool education, Multimedia tools, Vocabulary enrichment

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1. Introduction

The acquisition and enrichment of English vocabulary in a preschool environment is a crucial aspect of early childhood education, with far-reaching implications for academic success, cognitive development, and future opportunities in a globalized world (Suwanto & Rahman, 2022). The role of multimedia tools in this process has garnered considerable attention, as these tools promise to revolutionize traditional learning paradigms. Despite this potential, the effectiveness of multimedia in enhancing English vocabulary among preschool children remains a topic of significant debate and ongoing research. This area of study is not only pertinent to the field of language education but also vital for understanding the broader implications of technology in early childhood development. Addressing this issue is crucial for educators, policymakers, and researchers striving to optimize educational strategies and outcomes in the digital age (Bus et al., 2015; Schuth et al., 2017; Silverman & Hines, 2009).

Previous studies have laid a diverse foundation for understanding vocabulary development in early childhood. Pham and Tipton (2018) highlighted the influence of external factors, such as enrichment activities, on Vietnamese bilingual children's vocabulary development, contrasting with the internal factors affecting their English vocabulary. Ghamrawi (2014) found that applying Multiple Intelligences Theory in English as a Second Language (ESL) teaching for preschoolers resulted in varied retention and acquisition rates. Moreover, Daniels (1997) demonstrated that incorporating sign language in prekindergarten curricula significantly boosted African American children's receptive English vocabulary. These studies collectively suggest the multifaceted nature of vocabulary acquisition and the potential impact of innovative teaching methods (Cunningham, 2010; Tavanapour et al., 2022; Teng, 2023; Yawiloeng, 2020; Zhang & Zou, 2022).

Recent research continues to explore diverse approaches to language learning. Law et al. (2023) introduced the Early Language Identification Measure (ELIM), which combines parental reports and practitioner observations to identify children at risk of low language ability. Kim et al., (2023) demonstrated the efficacy of an online literacy curriculum in enhancing vocabulary, comprehension, and fluency among young Korean dual-language learners. Furthermore, Mohamed Salleh et al., (2023) reported on the success of the Developmentally Moderated Focus-on-Form approach in enhancing English vocabulary and grammatical skills among Malaysian preschoolers. These studies underscore the evolving landscape of language education methods and tools (Anguiano, 2020; Takacs & Bus, 2018).

Emerging technologies and innovative approaches have been at the forefront of recent investigations. Augmented Reality (AR) and multimedia applications in early childhood education have shown promising results. For instance, Yumarlin & Jemmy (2019) and Mamani-Calapuja et al (2023) highlighted significant vocabulary improvements through multimedia and AR applications. Additionally, Wei & Wang (2022) noted enhanced learning efficiency and engagement through digital games in language learning. These findings indicate the potential transformative impact of technology on early childhood language education .

Despite these advancements, gaps, and controversies remain in the field. (2018) challenged traditional notions of classroom participation in language learning, while Wong critiqued the educational content of media for dual-language learners. Moreover, studies like that of (2023) and Liu et al. (2023) reveal nuanced differences in vocabulary development among bilingual and monolingual children and between typical and language-delayed children, respectively. These gaps and controversies highlight the need for further research to refine our understanding of effective vocabulary teaching methods in preschool environments.

Our study aims to fill these gaps by evaluating the effectiveness of multimedia tools in enhancing English vocabulary enrichment in preschool settings, employing a mixed-methods approach. This research seeks to address limitations in existing studies, such as the need for comprehensive evaluations of multimedia tools in diverse preschool environments and the exploration of their impact on different demographic groups. By focusing on multimedia tools, this study contributes to the ongoing discourse on the role of technology in early childhood language education and aims to provide empirical evidence for best practices in this rapidly evolving field (Alatalo & Westlund, 2021; Gehlot et al., 2020; Ilham et al., 2023).

The primary focus of this study is to evaluate the effectiveness of multimedia tools in enhancing English vocabulary enrichment in preschool settings. We aim to contribute to the field by providing a nuanced understanding of how multimedia tools can be optimally utilized in early childhood education. The study's mixed-methods approach will offer comprehensive insights into multimedia's practical implications and effectiveness in diverse educational settings. The findings are anticipated to influence curriculum design, teaching strategies, and policy formulation, thereby significantly contributing to the field of early childhood language education.

2. Methods

This study adopted a mixed-methods (triangulation) research design, focusing on using enhanced multimedia teaching in preschool environments, emphasizing vocabulary enrichment (Creswell & Creswell, 2017). They were conducted in two distinct preschool settings, one public and one private, in North Aceh; the research involved observations, document analysis, interviews, and tests. These procedures aimed to investigate the strategies teachers and peer instructors employed to incorporate multimedia in teaching and the impact of such methods on students' learning outcomes, motivation, and engagement. The study utilized qualitative and quantitative data collection methods, including detailed interviews for subjective insights and pre-and post-tests for objectively measuring students' vocabulary skills.

The quantitative aspect involved vocabulary tests administered before and after integrating multimedia components into classroom instruction. These tests, designed to evaluate students' vocabulary proficiency, included a Word-Definition Matching Test, a Multiple-Choice Sentence Test, and a Short Sentence Writing Test. The methodology, drawing on the work of (Somjai and Soontornwipast, 2020), ensured the reliability and validity of the assessment tools, thus providing a credible measure of the efficiency of multimedia-enhanced training. The qualitative data collection, comprising interviews with educators and peer instructors, complemented these findings by providing a comprehensive view of the educators' experiences with multimedia-enhanced teaching. This approach facilitated a holistic assessment of the integrated learning approach's impact on students' vocabulary development and overall academic and innovative outcomes. To provide further clarity, the components of these assessments are delineated as follows:

2.1. Matching Word to Definition Test

This section of the assessment aimed to assess the participant's ability to accurately pair words with their corresponding definitions, evaluating their knowledge of word meanings and associations.

2.2. Multiple-Choice Sentence Test

The second part of the assessment presented participants with multiple-choice questions requiring them to select the most appropriate word to complete sentences, assessing their capacity to contextualize and utilize vocabulary.

2.3. Short Sentence Writing Test

In the final segment, participants were tasked with constructing short sentences employing newly acquired vocabulary words. This assessment portion measured their proficiency in integrating vocabulary into written expression. These pre- and post-tests enabled a comprehensive evaluation of the participants' vocabulary development throughout the integrated instructional program, shedding light on the effectiveness of the pedagogical strategies in enhancing their vocabulary abilities.

3. Result

3.1. Vocabulary Improvement and Active Participation (Self-Confidence Building)

This course shines a light on comprehensive vocabulary expansion approaches in the complicated tapestry of language teaching. At its core, it is a guiding light, revealing a way to word mastery that goes beyond the limitations of repetition. Instead, learners are given a set of precisely tuned

tools that allow them to decipher the meanings of new words effortlessly and quickly. The art of closely examining context clues that surround unfamiliar terminology is central to this technique. Students have an intrinsic ability to extract subtle meanings by immersing themselves in the context of sentences, giving life to words that might otherwise stay ambiguous.

"The students are braver to practice and present what they have gained during the teaching-learning process, with the help of multimedia instruction."

"I can increase their confidence in utilizing English vocabulary to talk or write in front of the class, mostly because of the multimedia that we use."

Excerpt from peer instructors' interview.

Furthermore, by investigating prefixes and suffixes, this course digs into the intricate anatomy of words, offering students the crucial ability of word dissection. This dissect-and-decipher technique gives students the tools to break down complicated terminology into small chunks, uncovering the essence of meaning buried therein. Students develop a comprehensive and long-lasting comprehension of terminology as they gradually reveal the core workings of language. This newfound information serves as a solid basis for their language ability, allowing them to confidently and precisely navigate the complex tapestry of English.

Further, through the observations and document analysis (syllabus and lesson plan), the material in the classroom focused on bridging the gap between visual and auditory learning through interactive PowerPoint presentations as its central teaching tool. These engaging presentations include eye-catching graphics, real pronunciation clips, and informative examples of sentence use. This strategy incorporates many senses, improving memory retention and making acquiring new vocabulary more exciting and more accessible to recall. Students see a marked improvement in their self-confidence as a direct result of the routine of giving presentations in front of their classmates on multiple occasions. Students realize the power of their voices in the English language when they have the unwavering support of their teachers, who provide essential comments, recommendations, and advice.

3.2. Cultivating Collaboration in Classroom Multimedia Integration

The focus on cultivating teamwork and smoothly integrating multimedia is at the heart of this revolutionary language course, resulting in an impactful and futuristic learning experience. Students are not passive consumers of knowledge in this setting; they are active participants in a dynamic learning landscape. Students are encouraged to teach and learn from one another through collaborative tasks. Beyond the usual teacher-student paradigm, this symbiotic interaction generates a sense of camaraderie and shared growth. Students broaden their learning and become catalysts for one another's advancement as they exchange ideas, provide constructive comments, and participate in peer-led conversations.

"Because we use a collaborative multimedia approach, we can give the classroom more life, and students engage more with their peers."

Excerpt from peer instructors' interview.

The infusion of technology into the teaching-learning process is a hallmark of this course. Students are provided with key digital skills in this tech-savvy setting, allowing them to navigate the digital realm confidently. Students seamlessly integrate technology throughout their educational path, from the creation of multimedia presentations to the completion of educating classmates utilizing modern technology. Instead of passive information consumers, they become active creators and communicators, expertly utilizing technology to enhance their learning experience. As a result, technology emerges as an essential companion in their educational journey, bridging the gap between old and modern learning approaches. Technological cooperation ensures learners can access the tools and resources they need to engage with multimedia content effectively, whether through online discussion boards, video conferencing, or collaborative document editing.

3.3. Innovative Strategies Means Positive Outcomes

This section digs deeper into the subject of progressive classroom instruction, in which creativity and forward-thinking instructional approaches play a significant role in shaping the trajectory of educational advancement in these preschools. Further, an investigation into how innovative strategies can transform traditional educational frameworks. This seeks to elucidate how these innovative strategies are poised to usher in a new epoch of educational eminence, instigating consequential and long-lasting transformations within the educational sphere by examining empirical evidence gleaned from observations and lesson plans.

This course's distinctive approach is central to its innovation, altering the language teaching landscape. It daringly combines implicit and explicit vocabulary learning, effortlessly knitting them into a tapestry of multimedia involvement, project-based learning, and experiential learning. This complete integration redefines traditional educational boundaries and traces an unexplored path toward vocabulary growth. It is a paradigm shift in education that's reviving language learning.

What distinguishes this innovative approach is its risky alternate route. It fearlessly establishes a new path, taking pre-schoolers into unexplored territory in language acquisition. The entire core of learning is converted into a dynamic, interactive, and immersive experience within this instructional frontier beyond the boundaries of traditional teaching methodologies. Passive memorization has given way to a vivid and engaged learning journey that sparks young learners' imaginations.

Children are no longer passive spectators in this fresh learning setting but engaged explorers of language's complexities. They engage on an exciting journey through the enticing medium of multimedia presentations, participating in real-world experiences and working together on projects that bring words to life. The effects of this pedagogical adventure are palpable and transformative rather than ephemeral. As these young students begin on this adventurous journey, they diligently record their progress, recording their increasing language skills through explorative and collaborative learning. These records consistently show significant improvements in their language proficiency, demonstrating that this approach is more than just a deviation from the educational norm; it is a powerful catalyst for significant growth and an inspiring testament to the limitless potential of innovation in early childhood education.

The empirical evidence from observations and lesson plans suggests that this teaching method significantly improves language proficiency among young learners. This is particularly noteworthy considering the challenge of inadequate vocabulary knowledge, a prevalent issue in contemporary preschool education, especially among English language learners. The research indicates that this innovative approach to language learning is more than just a departure from traditional methods; it is a powerful tool for fostering significant growth and unlocking the potential of young learners.

In conclusion, your outlined study underscores the importance of innovative teaching methods in early childhood education. It demonstrates that by adopting a more creative, interactive, and engaging approach to teaching, educators can effectively address challenges like inadequate vocabulary knowledge and inspire a new era of educational excellence.

3.4. Pre-test and Post-test results

The results of the paired-sample t-test indicate a significant difference in the mean scores of vocabulary ability between the pre-test ($M = 44.21$, $SD = 6.23$) and the post-test ($M = 61.35$, $SD = 7.05$); $t(22) = 40.67$, $p < .001$. Furthermore, the effect size, as measured by Cohen's d ($d = 2.64$), demonstrates a substantial impact of the intervention on ability (in vocabulary) from the pre-test to the post-test.

The paired-sample t-test results revealed a significant shift in language ability due to the intervention. The statistical analysis revealed a substantial difference in the mean scores between the pre-test and post-test evaluations, indicating that the participants' vocabulary proficiency improved significantly. These statistical results prove the intervention's usefulness in improving participants' language ability. It emphasizes the importance of the intervention and the possibility for innovative teaching practices to result in significant and beneficial changes to learning results.

Table 1. Pre-test and Post-test results

	Pre		Post				
	\bar{x}	SD	\bar{x}	SD	t	p	d
Vocabulary ability	44.21	6.23	61.35	7.05	40.67	.001	2.64

These results suggest that the intervention was highly Influential in enhancing vocabulary skills. Given the context of inadequate vocabulary knowledge among young learners, especially those learning English as a second language in preschool settings, this research underscores the potential impact of targeted educational interventions. The significant shift in language ability post-intervention indicates the success of this method and highlights the broader possibilities for innovative teaching practices in early education.

By effectively addressing vocabulary deficiencies early, such interventions could improve language competence and academic performance in young learners, particularly in diverse educational environments where English is not the first language. This research contributes valuable insights into the effectiveness of specific educational strategies and their potential for broader application in preschool and early learning contexts.

4. Discussion

The research embarked on a journey to explore the effectiveness of multimedia tools in enhancing English vocabulary enrichment within a preschool environment, utilizing a mixed-method study approach. This inquiry aligns with the academic interest in early language acquisition, particularly in a globally dominant language like English. The critical role of language development in early childhood education forms a foundational pillar in the academic literature, with numerous studies underscoring the significance of effective language learning strategies during the formative years (Wedyan et al., 2022; L. Wei, 2022). Previous research has delved into various facets of early language learning, including bilingualism's impact, the role of different teaching methodologies, and the integration of technology in early childhood education (Ghamrawi, 2014; Payesteh & Pham, 2022). The current study contributes to this expanding domain by explicitly examining the role of multimedia tools in enhancing language acquisition in preschool settings. It seeks to bridge the gap in existing research, providing insights into how innovative teaching tools can revolutionize early language learning, a crucial aspect of cognitive development in young children.

The study's results reveal a nuanced and multifaceted approach to vocabulary expansion and active participation in a preschool setting driven by multimedia tools. These tools, encompassing a range of interactive and engaging content, have demonstrated their effectiveness in enhancing the learning experience and fostering a heightened sense of confidence and engagement among students. The study's most intriguing and significant findings lie in the tangible improvements in students' vocabulary skills, as evidenced by the substantial differences between pre-test and post-test results. This improvement is not only statistically significant but also indicative of multimedia tools' profound impact on language acquisition (Alghamdy, 2019; Gilakjani, 2012). These findings are significant in early childhood education, where the foundational skills for lifelong learning are established. The study's results underscore the potential of multimedia tools to revolutionize traditional teaching methods, offering a more dynamic and engaging approach to language learning in young learners (Dhivya et al., 2023; Tang et al., 2023).

Comparing the study's findings with previous research reveals both correlations and contrasts. The improvements in vocabulary and confidence align with findings from similar studies, such as the work of S. Kim et al. (2023), which highlighted the positive impact of an online literacy curriculum on vocabulary acquisition in young learners. However, our study extends these findings by integrating multimedia tools in a more interactive, collaborative, and contextually rich classroom setting. This contrasts with findings from Ghamrawi (2014), who observed weaker retention in ESL teaching for preschoolers using Multiple Intelligences Theory. Our study, in contrast, demonstrates strong retention and application of vocabulary, suggesting a significant added value in using multimedia tools for language acquisition. This comparison not

only underscores the uniqueness of our study's approach but also highlights the evolving nature of language teaching methodologies, especially in the context of early childhood education.

The notable findings of this study can be primarily attributed to the immersive and interactive nature of the multimedia tools utilized. These tools create a dynamic learning environment where language acquisition is not merely about memorization but about engaging with the language in a meaningful, contextual, and stimulating manner. The multimedia tools' varied formats—combining visual, auditory, and interactive elements—cater to different learning styles, making the learning process more inclusive and effective (Daniels, 1997; Payesteh & Pham, 2022; Pham & Tipton, 2018); additionally, they played a crucial role in the observed vocabulary enhancement. While these results are promising, it is essential to interpret them with a degree of caution. The specific educational context, demographic variances, and the study's design may limit the generalizability of the findings. This caveat is crucial in ensuring a balanced and realistic application of the study's insights in broader educational settings.

The study's findings significantly contribute to the discourse on early childhood language education, particularly highlighting the transformative potential of multimedia tools. These tools have demonstrated their capacity by facilitating an engaging, interactive, and practical learning process. The marked improvement in pre-test and post-test scores is a testament to this. Moreover, these findings underscore the importance of integrating innovative and diverse methods in language teaching, especially during the critical early years of education. The significance of these findings lies in their potential to inspire a paradigm shift in teaching methodologies, moving towards more learner-centric, technology-integrated models that can adapt to the evolving educational landscape and the diverse needs of young learners.

The implications of these findings are both profound and far-reaching. They suggest a potential paradigm shift in early childhood language education, advocating for integrating multimedia tools for a more engaging, effective, and inclusive learning experience. This approach can redefine traditional teaching methodologies, paving the way for a more interactive, learner-centric model in education. Furthermore, these findings provide valuable insights for curriculum developers, educators, and policymakers. They underscore the benefits of multimedia tools in language teaching, potentially influencing future educational practices and policies. The study's results could catalyze further research and innovation in this field, contributing to a more holistic and practical approach to language learning in the critical early years of a child's educational journey.

5. Conclusion

The research on enhancing English vocabulary enrichment in preschool environments through multimedia tools has yielded profound implications for early childhood language education, suggesting a paradigm shift from traditional methodologies. The study aimed to evaluate the effectiveness of these tools in a preschool setting using a mixed-methods approach, and the findings were remarkable. There was a significant improvement in vocabulary acquisition and active participation, fostering learners' self-confidence. Integrating multimedia, particularly interactive PowerPoint presentations, enriched the learning experience and proved more effective than conventional teaching methods. This approach promoted collaborative learning and technological proficiency, enhancing language skills comprehensively. However, the study's limitations include its specific preschool setting and potential infeasibility in resource-limited environments. Further research is recommended to explore the applicability of this approach in various educational settings and to assess its long-term effects. The study is a testament to the potential of innovative teaching practices in revolutionizing learning outcomes, as evidenced by the statistically significant improvement in vocabulary skills from pre-test to post-test, underscoring the importance of innovative methods in effecting significant and beneficial changes in educational practices.

Declarations

Author contribution statement

Muhammad Ilham presented idea and data taker. Fadhlur Rahman developed the theory of preschool english vocabulary. Dwby Dinda Sari developed the theory of Multimedia Tools. Annisaturrahmi analyzes the method. All authors discussed the results and contributed to the final manuscript.

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Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.


Declaration of interests statement


The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.


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