



## Enhancing Vocabulary Retention Through Digital Storytelling on EFL Middle School Learners: A Quasi-Experimental Study in Indonesia

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**Abstract.** *This research investigates the effectiveness of digital storytelling as a supplementary tool for lexical fact retrieval and sustainable retention of EFL vocabulary among middle school learners. The research was conducted in particular Islamic School in Gresik, Indonesia. The selected participants were 38 eight-grade EFL learners, divided into experimental and control groups. Vocabulary knowledge was assessed through pre-test, immediate post-test, and delayed post-test conducted after two weeks. The independent sample t-test showed a significantly greater mean improvement in the digital storytelling (DST) group compared to the control group ( $MD = 8.04, p < .001$ ). The vocabulary retention proved by the result of paired sample t-test which show consistency on the students' delayed test result ( $p > .005$ ). This study contributes to the growing literature on digital storytelling and its impact on lexical support. The method proved that DST is effective to enhance students' vocabulary retention through related multimedia. Digital Storytelling enhance students' focus and motivation to participate in class.*

**Keywords:** *Digital Storytelling; DST; EFL Learners; Vocabulary Acquisition; Vocabulary Retention.*

### 1. INTRODUCTION

In the era of Education 4.0, the digital transformation has changed the provision of teaching and learning, particularly in English as a Foreign Language (EFL) classroom. Through the availability of mobile devices and digital platforms, learners nowadays have more multimedia tools available providing them with learning that is flexible, autonomous and engaging (Haleem et al. 2022). Vocabulary is one of the basic elements of English proficiency. Learners with insufficient vocabulary knowledge may not be able to understand relevant texts, not able to express their ideas or engage in a meaningful conversation (Vol 2022).

Around the world, countries like South Korea, Finland, and Singapore have successfully incorporated digital technologies into their education systems for second and foreign language learning. Among these approaches, DST has emerged as a promising multimedia tool that integrates various input forms, such as text, images, sound, and narration, to craft compelling and contextually sound narratives. Research findings widely reveal that DST can help learners acquire vocabulary deeply and enhance their retention and application of words in honest communication (Razmi, Pourali, and Nozad 2014). The power of DST is attributed to its underlying framework, which aligns with Mayer's Cognitive Theory of Multimedia Learning. This theory suggests that learning is more effective when both verbal and visual channels are active, minimizing cognitive overload and increasing retention.

In contrast, the EFL situation in Indonesia is still heavily reliant on traditional teacher-centered practices, particularly in middle school learners. Although the national curriculum—

Kurikulum Merdeka—prioritizes student autonomy, contextual learning, and project-based learning, implementing such pedagogical practices is scarce. Vocabulary learning often relies on memorization, drilling, and book exercises, which demotivate learners and result in low retention (Vol 2022). Furthermore, support for incorporating digital resources in low-resourced schools is uneven, and many teachers are inadequately trained in integrating technology into language learning.

Digital storytelling is a creative approach enabling individuals to tell personal stories through multimedia elements such as images, videos, and narration, resulting in concise narratives approximately two to three minutes long (Vaia, 2023). Besides increasing students' vocabulary, the integration of digital storytelling offers students a meaningful learning experience by utilizing accessible technology, including computers and mobile devices, fostering both engagement and comprehension (Asnas, 2023). With the use of this technology, it allows students to practice at their capacity. In addition, providing immediate feedback to learners helps them to acquire more vocabulary. The study by (Choo, Abdullah, and Nawi 2020) suggested that digital storytelling can be used as an alternative learning method in the classroom. Furthermore, learners' level of understanding in content creation is better and serves their multiple intelligences.

(Jwair 2023) revealed that in particular for DST, students receive short story-based videos including core vocabulary in context. In addition to involving the emotions of students' stories also offer repeated exposure to words, which ensures deep-level processing and the establishment of long-term memory. DST provides students with stories to words, allowing them to see, hear, and make sense of new words in the context of a cohesive narrative—an important aspect of language learning.

Although existing international literature has explored the role of DST in vocabulary acquisition within international contexts (Anggara 2023), limited research has been conducted among junior high school EFL students in Indonesia, particularly regarding its long-term impact on vocabulary acquisition. Most studies focus on vocabulary gains without assessing whether the acquired vocabulary is retained over time. Moreover, investigations into vocabulary retention under experimental conditions using delayed post-tests are sparse. Nonetheless, lexical retention is a crucial indicator of meaningful learning. This research examines the causal impact of DST on vocabulary acquisition and retention among eighth-grade Indonesian junior high school students. Consequently, the research design incorporates a quasi-experimental approach, utilizing both post-tests and delayed post-tests to evaluate the immediate causal effect of DST but also the retention of vocabulary. The study will address

the question what is the causal effect of digital storytelling on vocabulary retention in junior high school EFL students? This study will contribute to theoretical research on the role of digital media in curriculum design, especially in developing countries. Additionally, it will strengthen the evidence supporting the value of DST for teachers working with Gen Alpha students and the Kurikulum Merdeka. Ultimately, the study aims to establish a more engaging and effective model for teaching vocabulary that aligns with students' digital experiences and promotes long-term vocabulary learning through psychologically-based processes.

## **2. LITERATURE REVIEW**

Digital storytelling, or DST, is defined as a teaching technique that allows students to create their own stories using digital tools, such as smartphones, PCs, etc. The application of digital storytelling media has been around since the 90th century. In its application, participants tell a story with a short video, usually three minutes long, where the final result is a collection of photos and videos (Nilsson, M. E., 2008). Robin, B. (2017) defined digital storytelling as an art that combining relevant multimedia, such as photos, videos, and sound, digital graphics, text, and so on. Digital storytelling is different from traditional storytelling. A study by (Choo et al. 2020) showed that there are four differences in digital storytelling compared to the traditional, there are: technological implementation, storyteller function, process and product orientation and audience participation.

There are some studies that have found the effects of DST where vocabulary will be enhanced through providing students with contextualized input and multimodal supports (Maya, Halim, and Lamongan 2021). For example, students who received DST could remember vocabulary more than others because of variety of input from auditory, visual and text forms (Jwair 2023). Furthermore, the digital storytelling process prompts learners to think about language use, interact with others and become metacognitively aware.

Watching digital storytelling provides significant benefits in vocabulary learning as it allows students to understand and remember new words through an engaging visual and audio context. By watching stories that combine text, images and sound, students can associate the meaning of words with real or emotional situations that occur in the story, enhancing their contextual understanding of the vocabulary. In addition, digital storytelling allows students to learn in a more contextualized and engaging context. The combination of text, images, audio and video allows digital storytelling to provide a more immersive learning experience, where students can see, hear and feel the use of new words in real-life situations. This enriches students' contextual understanding of vocabulary, making it easier for them to remember and

apply the words in their daily lives. As Robin (2017) explains, the use of digital media in storytelling increases student engagement, which contributes to a deeper understanding of vocabulary.

Nevertheless, incorporating DST into classroom practice is not free of problems. Lack of technological accessibility, inadequate multimedia training for teachers and limited amount of time during class hours are major obstacles in the successful implementation (Maya et al. 2021). In addition, although DST enables learner autonomy and creativity, learners with low digital literacy and language proficiency might find it difficult to develop narrative effectively (Vol 2022). These constraints illustrate the need for scaffolding and differentiated instruction when implementing DST especially in EFL learning situations where learner readiness may differ greatly. Consequently, further empirical studies in the classroom are necessary to clarify tactics for maximizing the use of DST across a variety of instructional contexts.

### **3. RESEARCH METHOD**

This research design was chosen due to the nature of the study, which aimed to investigate the impact of DST on EFL learners' vocabulary acquisition and retention. The quasi-experimental non-equivalent group design was selected as it allows for comparing the effects of the intervention (DST) on the experimental group with a control group that did not receive the intervention. This design, combined with a quantitative approach, provides a robust method for evaluating the effectiveness of DST. The design involved two post-test eighth-grade classes at an Islamic junior high school in Gresik, East Java. The study sample consisted of 38 students, with 20 in the experimental group and 18 in the control group. Random assignment was impossible due to institutional restrictions; therefore, purposive sampling was utilized based on previous interviews with the English teacher to categorize students as having low vocabulary motivation and mastery in both classes, a concern that must be addressed.

The treatment group was taught vocabulary using digital storytelling videos for three 70-minute classes. These DSTs were short, animated videos (5–10 minutes long) sourced from freely available YouTube channels. They were screened for their adaptability to the themes of the Grade VIII narrative text and the vocabulary items listed in the national curriculum. The content validity of the videotapes was established through a review by two English education professionals using a curriculum-based audit checklist. The students in the control group were taught using traditional printed narrative texts without multimedia supplementation.

The vocabulary knowledge was assessed through a 25-item multiple-choice test developed by the researchers. These include receptive (word recognition) and productive

(usage in context) measures of vocabulary knowledge, derived from words contained within the narrative texts. The vocabulary test was administered three times: prior to the treatment (pre-test), immediately following the treatment (post-test), and one week later (delayed post-test) as a test of long-term retention. The delayed test interval is based on Amani's recommendation (2023) to leave out 1–2 weeks when testing the retention stability.

The Gregory Index was used for content validation with two TEFL experts, and there was a high agreement coefficient regarding this for the finalization of the questionnaire. The scale's internal consistency reliability was assessed using Cronbach's Alpha, and the value was 0.816, indicating high reliability. The Shapiro-Wilk and Levene tests were performed to verify whether the data had a normal distribution and if the variances were homogeneous. Both assumptions of parametric tests were satisfied.

Data were examined using a paired sample t-test for the within-group analysis and an independent t-test for the between-group analysis. Significance was set at  $p < 0.05$ . The effect size of the results was estimated using Cohen's  $d$  to illustrate the practical significance of the findings. This method also allowed for a direct comparison of the efficacy of DST and traditional instruction in promoting vocabulary learning and retention over time.

#### 4. RESULT AND FINDINGS

The objective of this study was to investigate whether digital storytelling (DST) impacted students' vocabulary retention. Three sets of tests (pre-test, post-test, and delayed test two weeks later) were administered to both groups. Independent sample t-test and paired sample t-test were employed to analyse the data.

The pre-test results indicated no significant difference in vocabulary knowledge between the experimental group ( $M = 57.6$ ,  $SD = 10.16$ ) and the control group ( $M = 55.3$ ,  $SD = 4.80$ ;  $p$ -value = .394), suggesting similar levels for the two groups. This served as an appropriate control for comparing the relative effect of treatment.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Pretest	Equal variances assumed	4.038	.052	.862	36	.394	2.26667	2.62876	-3.06470	7.59804
	Equal variances not assumed			.892	27.682	.380	2.26667	2.53999	-2.93897	7.47230

**Figure 1.** Independent Samples Test.

Following the intervention, the experimental group achieved significantly higher vocabulary scores ( $M = 73.6$ ,  $SD = 2.43$ ) than the control group ( $M = 65.5$ ,  $SD = 1.77$ ); the independent sample t-test produced  $p = .013$ . The paired sample t-test revealed that the within-group differences were significant in the experimental group ( $t = -27.57$ ,  $p < .001$ ), with a mean difference in score of 16.0 points. The effect size (Cohen's  $d$ ) was 2.63 (very large), indicating that the intervention had a strong effect. By contrast, the control group demonstrated only a slight improvement (mean gain = 10.2; Cohen's  $d = 1.45$ ), which, although statistically significant ( $p < .001$ ), was much less than that of the experimental group.

		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Posttest	Equal variances assumed	1.371	.249	2.619	36	.013	8.04444	3.07136	1.81543	14.27346
	Equal variances not assumed			2.670	33.872	.012	8.04444	3.01334	1.91976	14.16913

Figure 2. Independent Samples Test.

Retention was evaluated with the delayed post-test conducted one week after treatment. The mean score of the experimental group was relatively consistent ( $M = 75.0$ ), and the difference in post and delayed scores was non-significant according to the paired t-test ( $p = .420$ ). This result suggests that the DST aided both vocabulary learning and retention in the short term. Furthermore, compared to the controls, the control group's mean score significantly decreased ( $p < .001$ ) to 44.0 on the delayed test, demonstrating how vocabulary learned through traditional instruction is fleeting.

		Paired Differences		95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Mean	Std. Error			
Pair 1	PretestCont - PosttestCont	-10.22222	7.41664	1.74812	-	-6.53401	-5.84817	.000

Figure 3. Paired Samples Test.

The findings align with previous research that emphasizes the usefulness of DST in language learning (Amani, 2023; Nami & Asadnia, 2024). The stable retention in the experimental group may be explained by Mayer's Multimedia Learning Theory (2022), which asserts that dual-channel processing (visual and auditory) reduces cognitive load and enhances

memory encoding. In DST, the target vocabulary is taught through deep, meaningful, and emotional stories supported by multimodal elements that enable learners to visualize, contextualize, and emotionally connect with new words, which are known to promote deep learning (Anggara, 2023; Alqahtani & Rao, 2022).

The efficacy of DST in this study may also be attributed to its appeal to Generation Alpha students, who learn best when the experience is interactive, visual, and technology-based. Using animated narrative-based videos enabled children to connect vocabulary with characters, actions, and situations, strengthening the semantics and pragmatics of the words they learned. This aligns with the study elucidating that vocabulary in a story is more likely to be remembered than words in isolation (Br Sembiring & Simanjuntak, 2023).

Furthermore, DST offers diverse learning opportunities through visual, auditory, and kinesthetic methods, supporting differentiated learning and inclusive education, particularly in Indonesian junior high schools where student diversity is high. Using curriculum-based narrative content also enhances contextual relevance and aligns with the objectives of learning outcomes-based Kurikulum Merdeka.

This study also fills a significant void in the literature (Edwards, 2006), as previous studies have largely ignored the long-term effects (e.g., vocabulary retention after a time delay) of frequency-based vocabulary instruction. With a delayed post-test, the present experiment provides empirical support for the view that DST serves memory consolidation rather than just the formation process. Furthermore, the study setting (a junior high school in Indonesia) contributes to its novelty, as most DST research has been conducted in primary and tertiary education.

However, despite the encouraging outcomes, this study has several limitations. The sample is relatively small and only from one school, which may also impact the generalizability of the results. Additionally, the DST materials were teacher-selected rather than student-determined, possibly affecting motivation differently. Further, it would be interesting to investigate the impact of student-developed DST projects and to draw from larger, more diverse groups of participants to explore the potential scalability of the results.

To conclude, the results prove that digital storytelling, as a pedagogical activity, is a valuable resource for facilitating vocabulary development and retention in EFL classrooms, especially for Gen Alpha learners. By combining narrative context with multimedia input, DST can offer practical, engaging, and lasting vocabulary instruction, thus becoming an indispensable part of EFL teaching in the digital era.

## 5. CONCLUSION AND SUGGESTION

The present study demonstrates that digital storytelling (DST) is a viable teaching approach for facilitating vocabulary acquisition and retention in Indonesian junior EFL learners and an effective instructional technique. In the reading domain, the treatment group taught with DST showed significantly greater vocabulary gains than the control group, which was exposed to traditional printed texts. Furthermore, the stability of the delayed post-test scores for the DST group suggests that the vocabulary acquired through this multimodal, narrative-based approach is more sustainable in the long run.

These results hold particular significance when considering the Generation Alpha learner—those who are accustomed to technology-enhanced, visually engaging, interactive materials. Digital storytelling meets these preferences by presenting target terms within compelling narratives that include visual, auditory, and spoken elements, fostering both emotional and cognitive engagement. Besides promoting immediate learning, DST also enhances memory consolidation, a process further supported by cognitive multimedia learning theory.

What is new in this study is that it is conducted with junior high school learners, who have been studied less in relation to frequency effects in DSTs in general. It focuses on the long-term retention of vocabulary tested with a delay. The study addresses a pedagogical gap in the Indonesian EFL context, where vocabulary teaching frequently adopts a decontextualized and uninspiring approach. It also contributes to the growing literature on the integration of digital media in the field of language teaching. This development appears to align with the objectives of Kurikulum Merdeka.

Because of its relatively low-fidelity nature, flexibility in application across various proficiency levels, and alignment with 21st-century learning practices, DST holds promise as a scalable, inclusive approach to vocabulary instruction in various educational contexts. Future studies that investigate student-designed DST projects, involve more participants, and utilize longitudinal designs are recommended to confirm and extend these results.

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