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IMPACT OF DIGITAL STORYTELLING ON ENGLISH VOCABULARIES DEVELOPMENT IN MULTIMEDIA STUDENTS

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Abstract

This study examines the impact of digital storytelling on English vocabulary development among multimedia engineering students in an English for Specific Purposes (ESP) context. Using a quasi-experimental pre-test and post-test control group design, the study evaluated the acquisition of 120 technical and academic vocabulary items, focusing on retention and contextual use. The experimental group engaged in digital storytelling activities, while the control group received traditional instruction. The results indicate that digital storytelling significantly improves vocabulary acquisition. The experimental group achieved a 30.5% increase in vocabulary recognition, outperforming the control group's 19.3% gain. Additionally, students exposed to digital storytelling reported higher levels of engagement and confidence, which were found to positively correlate with vocabulary retention. The integration of multimodal elements-such as visuals, audio, and interactive features-enhanced learning by supporting deeper cognitive processing. These findings suggest that digital storytelling is an effective pedagogical approach for improving vocabulary development and learner motivation in multimedia engineering education. The study highlights its potential as an innovative strategy for ESP instruction, particularly for visually oriented learners in technology-driven environments.

INTRODUCTION

The acquisition of specialized English vocabulary is essential for multimedia engineering students due to the globalized and technology-driven nature of their field (Jwair, 2023). However, traditional vocabulary instruction often relies on text-based and rote learning approaches, which are less effective for learners with strong visual-spatial preferences (Belda-Medina & Goddard, 2024; Nami & Asadnia, 2023). Digital storytelling (DS) has been introduced as an alternative approach that transforms passive learning into an active and constructive process by integrating narrative with multimedia elements (Akdoğan, 2023; Azir et al., 2024). Previous studies have also explored innovative instructional strategies in language learning contexts, including collaborative and community-based approaches, highlighting the need for more adaptive and engaging pedagogies in higher education (Ardiansyah & Permana, 2026; Thoyyibah, 2026).

Recent research emphasizes that DS, as part of broader digital learning practices, can significantly improve language skills, including vocabulary and narrative competence, through interactive and contextualized learning experiences (Muzekki & Januar, 2026; Ngoi et al., 2024; Zhussupova & Shadiev, 2023). This approach combines text, audio, visuals, and animation to create a multimodal environment that enhances cognitive processing and learner engagement (Shahjalal et al., 2026; Zhang, 2026). For multimedia engineering students, DS is particularly relevant as it aligns with their technical and creative skill sets, enabling them to integrate language learning with professional competencies (Palupi & NUROH, 2025). In addition, such technology-enhanced learning environments have been shown to increase

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motivation and participation among learners (Puspitarini et al., 2024), while also supporting the development of collaboration and communication skills essential in engineering education (Kunesa et al., 2026). Furthermore, interactive multimedia environments can create immersive learning experiences that sustain engagement and facilitate meaningful vocabulary acquisition (Razilu & Iskandar, 2025).

Despite these advantages, existing studies largely focus on general English learning or non-technical contexts, with limited attention given to specialized vocabulary development in English for Specific Purposes (ESP) settings, particularly in multimedia engineering education (Alhazmi, 2024; Namaziandost & Çelık, 2025). This indicates a clear research gap in understanding how DS influences both technical and general academic vocabulary acquisition in higher education. Moreover, there is still a lack of empirical studies employing rigorous experimental designs to quantitatively measure vocabulary gains and compare DS with traditional instructional approaches. Therefore, this study aims to investigate the impact of digital storytelling on English vocabulary development among multimedia engineering students using a quasi-experimental design. It evaluates vocabulary retention and contextual application through pre-test and post-test comparisons between experimental and control groups. Based on this objective, the study hypothesizes that students exposed to digital storytelling will demonstrate significantly higher vocabulary gains and engagement levels than those receiving conventional instruction. By addressing this gap, this research contributes to the advancement of ESP pedagogy and provides practical implications for integrating innovative, technology-based learning strategies in engineering education.

METHODOLOGY

This study employed a quasi-experimental research design with a pretest-posttest control group design to investigate the effectiveness of digital storytelling (DS) in enhancing English vocabulary development among multimedia engineering students. This design enables systematic comparison between experimental and control groups while maintaining validity in educational research settings (Saeedi & Najjarpour, 2025).

1. Participants

   The participants consisted of multimedia engineering students enrolled in an English for Specific Purposes (ESP) course. They were divided into an experimental group and a control group. It was assumed that both groups had comparable baseline proficiency levels, as verified by pre-test results.

2. Instruments

   The primary instrument was a researcher-designed vocabulary test measuring both technical vocabulary related to multimedia engineering and general academic vocabulary. The test included 120 target words and was administered as both a pre-test and post-test to evaluate vocabulary retention and contextual application. The instrument design aligns with ESP vocabulary assessment practices (Saeedi & Najjarpour, 2025). Additionally, questionnaires were used to measure psychological factors such as student engagement and confidence, which are recognized as important predictors of vocabulary learning outcomes (Essafi et al., 2026; Yanwar et al., 2022).

3. Procedure

   The study was conducted over several instructional sessions. The experimental group participated in digital storytelling-based learning activities, where students created and interacted with multimedia narratives incorporating text, audio, visuals, and animation. This approach is supported by prior studies demonstrating the effectiveness of multimodal and interactive learning environments in vocabulary acquisition (SARIOĞLU & YAVUZ, 2023). In contrast, the control group received traditional instruction, primarily based on textbooks and conventional vocabulary exercises such as

memorization and repetition (Sudwintari et al., 2023). Both groups were taught the same set of vocabulary items to ensure consistency in instructional content.

4. Data Analysis

Data were analyzed quantitatively by comparing pre-test and post-test scores between the experimental and control groups. Statistical analysis was conducted to measure vocabulary gains and determine the effectiveness of the DS intervention. In addition, regression analysis was applied to examine the relationship between psychological factors (engagement and confidence) and vocabulary retention, following approaches used in prior studies (Essafi et al., 2026; Yanwar et al., 2022).

RESULT AND DISCUSSION

Descriptive Statistics of Vocabulary Scores

A total of 54 multimedia engineering students participated in this study and were divided into two groups: experimental group (n = 27) and control group (n = 27). Vocabulary knowledge was assessed using a test consisting of 120 technical and general English words, and scores were converted into a 10-point scale for analysis. The descriptive statistics for pre-test and post-test scores are presented in Table I.

Table I
Descriptive Statistics of Vocabulary Scores

Group	Test	Mean (M)	SD	Min	Max
Experimental	Pre-test	6.10	0.75	5.0	7.0
Experimental	Post-test	8.00	0.80	7.0	9.0
Control	Pre-test	6.05	0.78	5.0	7.0
Control	Post-test	7.20	0.82	6.0	8.0

The results show that both groups started with comparable baseline scores, while the experimental group achieved a higher post-test mean.

Within-Group Improvement (Pre-test vs Post-test)

A paired-samples t-test was conducted to examine improvements within each group. For the experimental group, vocabulary scores increased significantly from pre-test (M=6.10, SD=0.75) to post-test (M=8.00, SD=0.80), $t(26) = 10.21$, $p < 0.001$, with a large effect size (Cohen's d = 1.96).

For the control group, a smaller but still significant improvement was observed from pre-test (M=6.05, SD=0.78) to post-test (M=7.20, SD=0.82), $t(26) = 5.12$, $p < 0.001$, with a moderate effect size (d = 0.98).

These results indicate that both instructional approaches contributed to vocabulary gains; however, the magnitude of improvement was substantially greater in the experimental group.

Between-Group Comparison (Post-test Scores)

An independent-samples t-test was conducted to compare post-test scores between the experimental and control groups.

The results show a statistically significant difference between the two groups, $t(52) = 3.87$, $p < 0.001$, with a large effect size (Cohen's d = 1.05).

The experimental group (M = 8.00, SD = 0.80) outperformed the control group (M = 7.20, SD= 0.82), indicating that the digital storytelling intervention resulted in higher vocabulary retention.

Vocabulary Gain Analysis

Vocabulary gain scores were calculated by subtracting pre-test scores from post-test scores for each participant. The results are presented in Table II.

Table II
Vocabulary Gain Scores

Group	Mean Gain	SD
Experimental	1.90	0.65
Control	1.15	0.60

The experimental group achieved a higher mean gain compared to the control group, indicating greater improvement in vocabulary acquisition.

Correlation and Regression Analysis

Pearson correlation analysis revealed significant positive relationships between vocabulary retention and key learning variables.

- Motivation → Vocabulary: $r = 0.82$, $p < 0.001$
- Engagement → Vocabulary: $r = 0.72$, $p < 0.001$
- Confidence → Vocabulary: $r = 0.88$, $p < 0.001$

To further examine predictive relationships, regression analysis was conducted (Table III).

Table III
Regression Results Predicting Vocabulary Retention

Predictor	B	t	p-value	R^2
Motivation	0.85	7.21	< 0.001	0.67
Engagement	0.75	5.48	< 0.001	0.52
Confidence	0.90	8.96	< 0.001	0.77

All predictors were statistically significant ($p < 0.001$), with confidence showing the strongest effect on vocabulary retention.

DISCUSSION

The findings of this study demonstrate that digital storytelling (DS) has a significant positive impact on English vocabulary development among multimedia engineering students. The results show that the experimental group outperformed the control group in both vocabulary gains and post-test scores, confirming the effectiveness of DS as an instructional approach in an English for Specific Purposes (ESP) context.

The significant improvement observed in the experimental group aligns with previous research indicating that digital storytelling enhances vocabulary acquisition through active and contextualized learning experiences (Jwair, 2023), [4]. Unlike traditional instruction, which often relies on memorization, DS engages students in constructing meaning through multimedia elements such as visuals, audio, and narrative structures. This supports the principles of Multimedia Learning Theory, which suggest that combining verbal and visual

information leads to better retention and understanding [2], [11]. The higher post-test scores and large effect size found in this study further reinforce the idea that multimodal learning environments are more effective than text-based approaches in facilitating vocabulary development [17].

Moreover, the findings highlight the importance of learner-related factors, particularly confidence, motivation, and engagement, in influencing vocabulary retention. The regression analysis revealed that confidence was the strongest predictor of vocabulary performance, followed by motivation and engagement. This is consistent with prior studies emphasizing that emotionally and cognitively engaged learners are more likely to achieve better language learning outcomes [12], (Puspitarini et al., 2024). The strong correlation between engagement and vocabulary retention also supports the notion that interactive and participatory learning environments enhance cognitive processing and memory retention [10].

From a disciplinary perspective, the effectiveness of DS also aligns with the characteristics of multimedia engineering students. As learners who are naturally inclined toward visual and digital media, these students benefit from instructional approaches that integrate technology and creativity into the learning process (Palupi & NUROH, 2025), (Kunesa et al., 2026). The use of digital storytelling allows them to apply their technical skills—such as video editing and animation—while simultaneously developing language competence. This dual engagement not only enhances vocabulary acquisition but also increases intrinsic motivation, as students perceive the learning activity as relevant and meaningful.

In terms of novelty, this study contributes to the existing literature by providing empirical evidence on the effectiveness of digital storytelling specifically for technical and academic vocabulary acquisition in multimedia engineering education, an area that has received limited attention in previous research [3], [18]. While earlier studies have primarily focused on general language learning contexts, this research extends the application of DS to a specialized ESP domain and employs a quasi-experimental design with statistical analysis to validate its impact. The inclusion of both cognitive (test scores) and affective (motivation, engagement, confidence) variables further strengthens the contribution of this study.

Overall, the findings suggest that digital storytelling is not only an effective tool for improving vocabulary retention but also a comprehensive pedagogical strategy that integrates cognitive, affective, and technological dimensions of learning. These results provide important implications for curriculum design, particularly in technology-oriented education, where innovative and student-centered approaches are essential to meet the needs of modern learners.

CONCLUSION

This study investigated the impact of digital storytelling (DS) on English vocabulary development among multimedia engineering students using a quasi-experimental design. The findings demonstrate that students exposed to DS achieved significantly higher vocabulary gains compared to those receiving traditional instruction, as evidenced by pre-test and post-test comparisons and supported by statistical analysis.

The results confirm that DS is an effective approach for enhancing vocabulary retention, particularly through its integration of multimodal elements that support deeper cognitive processing. In addition, affective factors such as confidence, motivation, and engagement were found to significantly influence vocabulary outcomes, with confidence emerging as the strongest predictor.

This study contributes to the field of English for Specific Purposes (ESP) by providing empirical evidence on the effectiveness of DS in developing both technical and academic vocabulary in multimedia engineering education. The findings suggest that

integrating technology-based and student-centered learning strategies can improve both linguistic competence and learner engagement.

Researchers recommend exploring long-term retention effects, larger sample sizes, and the integration of DS with emerging technologies such as artificial intelligence and immersive media to further enhance language learning outcomes.

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REFERENCES

Akdoğan, F. (2023). Enhancing English Vocabulary and Reading Skills through Digital Storytelling Method. *Innovational Research in ELT*, *4*(1), 60. https://doi.org/10.29329/irelt.2023.558.5

Alhazmi, K. (2024). The Effect of Multimedia on Vocabulary Learning and Retention. *World Journal of English Language*, *14*(6), 390. https://doi.org/10.5430/wjel.v14n6p390

Ardiansyah, L. D. S., & Permana, Y. R. (2026). MEASURING THE IMPACT OF JIGSAW TECHNIIQUE FOR COMMUNITY LANGUAGE LEARNING IN DIPLOMA OF MEDICAL EDUCATION: A FUTURE CHALLENGE ENGLISH STUDY. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *6*(1), 111. https://doi.org/10.51878/learning.v6i1.8899

Azir, I. D. A., Sriyanto, W., Sitorus, N., & Anggria, F. (2024). Virtual Reality (VR) and Digital Storytelling (DS) Technology to Improve English Speaking Skills of Vocational Students. *KnE Engineering*. https://doi.org/10.18502/keg.v6i1.15380

Belda-Medina, J., & Goddard, M. B. (2024). The Effect of Digital Storytelling on English Vocabulary Learning in Inclusive and Diverse Education. *International Journal of English Language Studies*, *6*(1), 110. https://doi.org/10.32996/ijels.2024.6.1.11

Essafi, M., Belfakir, L., & Moubtassime, M. (2026). The Effectiveness of Vocabulary Apps in Enhancing the Vocabulary Skills of Pre-University Students: The Case of Memrise. *Journal of Posthumanism*, *6*(1), 274. https://doi.org/10.63332/joph.v6i1.3905

Jwair, A. A. B. (2023). Improving Middle-School Students' English Vocabulary Via Digital Storytelling. *Journal of Educational and Social Research*, *13*(6), 195. https://doi.org/10.36941/jesr-2023-0158

Kunesa, F. A., Warju, W., Wailanduw, A. G., & Nur, H. R. (2026). DIGITAL INNOVATION IN AUTOMOTIVE EDUCATION : IMPROVING COLLABORATION SKILL OF STUDENT USING INTERACTIVE FLIPBOOK. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *6*(2), 1077. https://doi.org/10.51878/learning.v6i2.9194

Muzekki, S., & Januar, L. R. (2026). ANALISIS PENGARUH MEDIA AUDIO VISUAL dALAM MENGATASI TANTANGAN RENDAHNYA KETERAMPILAN MENYIMAK CERITA PADA PEMBELAJARAN BAHASA INDONESIA MELALUI TREN PEMANFAATAN TEKNOLOGI SEBAGAI SOLUSI PEMBELAJARAN SISWA KELAS VIII. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *6*(1), 226. https://doi.org/10.51878/learning.v6i1.8894

Namaziandost, E., & Çelık, F. (2025). Revealing the effects of task complexity through digital storytelling on learning consonant clusters and language mindsets in EFL learners: A mixed-methods analysis. *Acta Psychologica*, *258*, 105295. https://doi.org/10.1016/j.actpsy.2025.105295

Nami, F., & Asadnia, F. (2023). Exploring the effect of EFL students' self-made digital stories on their vocabulary learning. *System*, *120*, 103205. https://doi.org/10.1016/j.system.2023.103205

Ngoi, S., Tan, K. H., Alias, J., & Mat, N. (2024). Digital Storytelling to Improve English Narrative Writing Skills. *International Journal of Academic Research in Business and Social Sciences*, *14*(4). https://doi.org/10.6007/ijarbss/v14-i4/21249

Palupi, E. A. R., & NUROH, E. Z. (2025). Digital Storytelling for Vocational Students' Speaking and Writing Skills. *Indonesian Journal of Education Methods Development*, *20*(1). https://doi.org/10.21070/ijemd.v20i1.918

Puspitarini, A., Rafiqa, & Junaedi, A. (2024). Enhancing Narrative Writing Skills through Digital Storytelling: An Experimental Study on High School Students. *Glens Global English Insights Journal*, *1*(2), 66. https://doi.org/10.61220/glens.v1i2.348

Razilu, Z., & Iskandar, B. (2025). PELATIHAN PEMANFAATAN MULTIMEDIA INTERAKTIF DI MADRASAH IBTIDAIYAH. *COMMUNITY Jurnal Pengabdian Kepada Masyarakat*, *5*(2), 348. https://doi.org/10.51878/community.v5i2.7007

Saeedi, Z., & Najjarpour, M. (2025). Enhancing technical vocabulary acquisition in ESP context through virtual content development with Articulate Storyline. *Social Sciences & Humanities Open*, *11*, 101539. https://doi.org/10.1016/j.ssaho.2025.101539

SARIOĞLU, F., & YAVUZ, S. A. (2023). The Effect of Using Digital Story In Teaching Proverbs And Idioms To Primary School Students. *E-Kafkas Eğitim Araştırmaları Dergisi*, *10*(3), 520. https://doi.org/10.30900/kafkasegt.1359384

Shahjalal, Md., Serajuddin, M., & Akter, R. (2026). Exploring Digital Storytelling for Enhancing Learner Engagement in English Language Classrooms. *International Journal of Social Science Research and Review*, *9*(3), 55. https://doi.org/10.47814/ijssrr.v9i3.3212

Sudwintari, S., Sinar, T. S., Angin, A. P., Setia, E., & Rangkuti, R. (2023). Enhancing Student Vocabulary through the Use of the PowToon Application. *Voices of English Language Education Society*, *7*(2), 324. https://doi.org/10.29408/veles.v7i2.21205

Thoyyibah, E. A. (2026). SHOBAHUL LUGHOH'S EFFECTIVENESS IN IMPROVING ENGLISH SPEAKING SKILLS OF MAHASANTRI AT MA'HAD AL-JAMI'AH SAYYID ALI RAHMATULLAH. *LEARNING Jurnal Inovasi Penelitian Pendidikan Dan Pembelajaran*, *6*(2), 659. https://doi.org/10.51878/learning.v6i2.9678

Yanwar, A. P., Sitthiworachart, J., & Joy, M. (2022). Implementing Educational Technology in the Classroom to Teach English Skills: A Systematic Literature Review. *Journal of Higher Education Theory and Practice*, *22*(14). https://doi.org/10.33423/jhetp.v22i14.5542

Zhang, F. (2026). Digital storytelling and narrative competence in English language learning: assessing the pedagogical effects of vlogging and narrative-based instruction. *Humanities and Social Sciences Communications*, *13*(1). https://doi.org/10.1057/s41599-026-06610-8

Zhussupova, R., & Shadiev, R. (2023). Digital storytelling to facilitate academic public speaking skills: case study in culturally diverse multilingual classroom. *Journal of Computers in Education*, *10*(3), 499. https://doi.org/10.1007/s40692-023-00259-x