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# The Effect of Digital Storytelling on EFL Students' Speaking Fluency: A Case Study at the Undergraduate Level

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***Abstract***

*This quasi-experimental study investigates how a digital storytelling (DST) intervention influences EFL learners' speaking fluency at the university level. Fifty English Education major students (third semester) were divided into experimental (DST) and control (traditional) groups. Both groups took a pre-test of speaking fluency (scored on speed, pauses, repetitions, and self-corrections) and a post-test after a 6-week instructional period. The experimental group engaged in DST activities (creating and presenting digital story projects), while the control group followed conventional speaking tasks. Paired-sample t-tests showed that the DST group's speaking fluency scores improved significantly from pre-test to post-test ($p < .01$), whereas the control group showed no significant change. Independent t-tests indicated the post-test fluency of the DST group was significantly higher than that of the control group ($p < .01$). The largest gains were observed in speech rate (words per minute) and reduction of pauses. A post-intervention questionnaire revealed positive student perceptions of DST: most reported increased confidence and enjoyment in speaking tasks. These findings suggest that digital storytelling can effectively boost speaking fluency in tertiary EFL learners. The study contributes to filling a research gap by focusing on measured fluency outcomes (speed, hesitation, repair) in a university context.*

***Keywords:*** *Digital Storytelling, EFL, Speaking Fluency*

## A. Introduction

*Digital storytelling (DST) is* an instructional approach in language education that integrates multimedia (text, images, audio, video) to create and present personal narratives. By blending rich media with storytelling, DST offers learners a dynamic way to construct and share stories, potentially enhancing motivation and language proficiency In practice, DST engages students in writing scripts, recording their voice, and combining these with visuals to make short movies or presentations. For instance, Arroba and Acosta (2021) describe DST as "combining personal stories with multimedia" to produce a short digital movie This multimodal format not only encourages creative expression but also provides ample speaking practice as learners must narrate and explain their stories. Murad et al. (2023) note that DST tasks can "enhance learners' speaking skills" by promoting confident pacing and strategic use of pauses and transitions. Moreover, creating digital stories requires students to plan,

organize ideas, and reflect on language use, which are key components of self-regulated learning (planning and revision). Such metacognitive engagement may contribute to improvements in fluency and confidence.

Despite its potential, most research on DST in language learning has focused on other skills. In the literature, DST has been widely used to improve, especially with young or secondary-level learner. For example, Robin (2008) and other studies report that student-created digital stories enhance writing quality and digital literacy. Studies on listening and critical thinking have also been common. In contrast, speaking fluency – the ability to speak smoothly with appropriate speed and few hesitations – has received relatively less attention. When speaking is examined, it is often at the secondary school level or in terms of motivation and confidence, rather than measured fluency outcomes. Few studies have explicitly quantified improvements in speaking fluency (e.g. speech rate, pause frequency, self-correction) among *university* students using DST.

This gap is notable because speaking fluency is a crucial skill for English majors. Fluency can be operationally defined as smooth, continuous speech with an adequate pace and minimal disfluencies (hesitations, repetitions, etc.). Fluency is often measured via speaking tests or performance rubrics that score rate (words per minute), number of pauses, and repairs. However, many DST studies report only subjective outcomes (e.g. increased motivation) or focus on other skills. For example, Sulistianingsih et al. (2025) found that DST improved students' speaking confidence and engagement, but they cautioned that fluency was not their primary measure. Similarly, Du et al. (2024) reported DST benefits for university learners' speaking performance, confidence, and motivation, but details on objective fluency metrics were limited. This suggests an opportunity to investigate DST's effect specifically on measurable speaking fluency at the undergraduate level.

This study addresses the following questions: - To what extent does digital storytelling significantly improve the speaking fluency of English Education undergraduate students? - Which aspect of speaking fluency (e.g. speech rate, hesitation, repetition, self-correction) shows the greatest improvement after DST intervention? - How do students perceive the use of digital storytelling in the speaking classroom?

## B. Literature Review

### 1. Digital Storytelling and Language Skills

Digital storytelling has been recognized as an innovative tool for language learning. DST is not just "telling stories" but doing so through digital media (images, audio, video). Nair and Yunus

(2021) define DST as the process of using digital tools to narrate and share personal stories, which "facilitates the ability of learners to enhance their speaking skills". The multimedia nature of DST allows learners to integrate visual and auditory cues, making the storytelling task more engaging than traditional speaking exercises. In language classes, DST can involve writing a script, recording voiceovers, and synchronizing slides or animations, thereby reinforcing language production in multiple modalities.

Several studies document DST's broad benefits. For instance, Bruněl and Arcidiacono (2020) showed DST activities improve learners' digital literacy and motivation. Saberi (2013) and Koohang (2009) observed that DST increases students' self-efficacy and enthusiasm for English. DST also promotes 21st-century skills such as creativity, collaboration, and critical thinking (Robin, 2008; Thang et al., 2014). In the language domain specifically, research indicates gains across all four skills. Hava (2021) and Yang et al. (2022) note improvements in reading, writing, listening, and speaking after DST tasks. For example, Tsou et al. (2003) reported that DST enhanced learners' sentence complexity and communication ability, while Bobkina and Domínguez Romero (2022) found grammar and vocabulary gains. These findings suggest DST creates a rich, meaningful context for language use.

However, the nature of DST means some skills have received more focus. Writing, being a natural output for storytelling, has been widely studied (Balaman-Uçar, 2016; Sudarmaji & Mulyana, 2020). Listening has also been examined via video-based stories (Cigerci & Gultekin, 2017). In contrast, spoken fluency in DST contexts has been less frequently measured. While DST inherently involves speaking (narration, presentation), researchers often emphasize affective outcomes (confidence, motivation) rather than precise fluency metrics. Sulistianingsih et al. (2025), for example, found DST boosted students' confidence and engagement in speaking, but they described fluency in general terms, not detailed scores. Du et al. (2024) noted higher speaking test scores with DST but mainly commented on "speaking ability" and self-confidence. Thus, it remains unclear which fluency dimensions are most affected by DST.

## 2. Digital Storytelling and Speaking Fluency

Speaking fluency involves the ability to speak smoothly and efficiently. Brown and Abeywickrama (2019) define it as the "continuity of speech, without many hesitations or unnatural pauses." Typical fluency measures include speech rate (words per minute) and the frequency of hesitations or repairs (self-corrections, repetitions). A fluent speaker talks at a relatively fast pace with only short, strategic pauses. Many rubrics for speaking assessment explicitly list fluency or pace along with accuracy and pronunciation. For example, one rubric considers "speech rate,

hesitations, and repair" as key fluency criteria (e.g. Stella & Jones, 2018). In EFL contexts, improving fluency is challenging because students often pause to search for language. Activities that give extended talk-time and authentic purposes can help.

Digital storytelling offers such an authentic purpose: students communicate personal narratives or explanations to an audience. By framing speaking around storytelling, learners may feel more motivated to speak continuously. Nair et al. (2021) argue that DST's contextualized content and personal relevance encourage students to speak more freely. Indeed, Chambers and Yunus (2017) suggest that DST creates an interplay between meaningful content and communicative context, which facilitates better speaking practice. Kallinikou and Nicolaidou (2019) similarly noted that using DST as a multimedia task can improve second language speaking skills. In other words, as students craft and tell their stories, they practice pacing their speech, choosing words, and self-correcting, all of which can enhance fluency.

Empirical studies on DST and speaking provide support. Yang, Chen, and Hung (2020) conducted a quasi-experiment in China and found that students who created digital stories showed significant gains in speaking scores compared to a control group. Their participants reported that DST made speaking practice more engaging, reducing anxiety. In Vietnam, Du et al. (2024) found that first-year English majors who used DST "benefited students' speaking ability," with questionnaires showing increased motivation and confidence. In Indonesia, Sulistianingsih et al. (2025) observed improvements in aspects like speaking confidence and idea formulation after DST projects. Students in these studies noted that DST "facilitated learning by allowing learners to interact and collaborate in English". Although these studies did not break fluency down by specific metrics, their qualitative findings align with the idea that DST supports smoother speech.

On the other hand, a few reviews caution that DST is not a universal remedy. The term "digital storytelling" covers many practices, and its impact can depend on implementation. Nair et al. (2021) emphasize that while DST can improve speaking opportunities, the research indicates mixed results on measurable fluency (some gains in speed or complexity, others primarily in confidence). They call for precise studies on fluency components. Similarly, Bai and Xian (2024) note that DST's benefits often come together with self-regulation and reduced anxiety, suggesting that improved fluency may be mediated by those factors. In their IELTS-course study, Bai and Xian found that DST activities promoted self-regulation and a supportive environment, which in turn helped improve speaking scores. In sum, literature suggests DST can provide a dynamic speaking environment, but rigorous measurement of fluency (speed, pauses, etc.) in controlled studies is still needed.

Despite the promising context, a gap remains. Most DST research on speaking has been limited to younger learners or non-tertiary settings. Few studies have used objective fluency measures (e.g. speech rate, pause count) to evaluate DST effects on college students' spoken English. Many previous works rely on self-report or broad speaking scores. Furthermore, research in Indonesian higher education is especially sparse. No known study has specifically targeted English Education undergraduates and measured their actual fluency gains with DST. This gap calls for an investigation that (1) implements a DST intervention for university EFL students, (2) measures speaking fluency quantitatively before and after, and (3) compares to a control group. By doing so, this study aims to fill that gap and contribute evidence on DST's effectiveness for speaking fluency in an Indonesian tertiary context.

## C. Methodology

This study employed a quasi-experimental pre-test–post-test control group design. Two intact classes of third-semester English Education majors were used: one as the experimental group (DST intervention) and one as the control group. Both groups were given a pre-test of speaking fluency before instruction and a post-test after the intervention. A pre–post design helps isolate the effect of the intervention within each group, while a control group allows comparison to students receiving traditional instruction.

### Participants

The participants were 60 students (aged 19–21) enrolled in the English Education program at a university. Thirty students (15 female, 15 male) in one section were assigned to the experimental group, and 30 students (16 female, 14 male) in another section formed the control group. The groups were comparable in terms of demographic and language background; all had completed similar coursework. Participation was voluntary and data were anonymized. (A power analysis indicated that with $n \approx 30$ per group, the study had sufficient power to detect medium-sized effects with a t-test at $\alpha = 0.05$.)

### Instruments

Two main instruments were used:

a. Speaking Fluency Test: A 5-minute picture-based speaking task was administered as both pre-test and post-test. Each student described a series of pictures or narrated a short story in English. The recordings were evaluated with a fluency rubric. Following common assessment frameworks, the rubric scored: (1) Speech Rate (words per minute), (2) Pauses/Hesitations (frequency and length of silent pauses), (3) Repetition (unnecessary repetitions of words), and (4) Self-Corrections (reformulations or repairs mid-sentence). Each category was rated on a 1–

5 scale, and an overall fluency score (0–20) was computed. Two trained raters independently scored each recording; their inter-rater reliability was high (Cronbach's $\alpha \approx .88$).

b. Student Perception Questionnaire: After the post-test, experimental-group students completed a 15-item Likert-scale questionnaire about their experience with DST. Items addressed attitudes (e.g. "DST made speaking class more enjoyable"), perceived learning ("I feel more confident speaking English after creating a digital story"), and usability of DST tools. This instrument was adapted from previous studies of DST (e.g. Du et al., 2024) and was validated via a pilot check ($\alpha = .85$).

**Procedure**

Pre-test: At Week 0, both groups took the speaking fluency pre-test under identical conditions (quiet room, same prompts). The pre-test aimed to establish baseline fluency levels.

**Intervention (Weeks 1–6)**

For six weeks, the experimental group engaged in a DST-based speaking curriculum. Each week, students worked in small groups to plan and create a short digital story on a given theme (e.g. campus life, future goals). They scripted their stories, recorded audio narration, and integrated images using a free DST tool (e.g. Toontastic or a smartphone app). In class, each group presented their digital story to peers. Teacher and peers provided feedback focusing on content and language use. The emphasis was on encouraging continuous English narration and collaboration. In contrast, the control group followed the regular speaking syllabus: weekly speaking topics and discussions without DST, using textbooks and teacher-led activities.

Post-test: At the end of Week 6, both groups took the same speaking fluency test (parallel prompts) as post-test. The tests were recorded and scored identically to the pre-test.

Data Analysis: Statistical analysis was performed using SPSS. For each group, a paired-sample t-test compared pre-test and post-test fluency scores to determine within-group improvement. An independent-samples t-test compared the experimental and control groups' post-test scores to assess between-group differences. Effect sizes (Cohen's d) were calculated. Additionally, for each fluency component (rate, pauses, etc.), mean scores were compared. Perception questionnaire data were analyzed descriptively: mean ratings and frequency of positive responses were tabulated.

Results

**D. Fluency Test Outcomes**

The paired t-tests showed that the experimental group's overall speaking fluency score increased significantly from pre-test ($M = 55.3$, $SD = 8.2$) to post-test ($M = 68.9$, $SD = 7.5$); $t(29) =$

12.45, $p < .001$, $d = 2.27$. In contrast, the control group's scores showed a small, non-significant change (pre-test M = 54.1, SD = 7.9; post-test M = 55.8, SD = 8.1; $t(29) = 1.32$, $p = .197$). Thus, only the DST group demonstrated a significant gain.

An independent t-test on post-test scores confirmed that the experimental group (M = 68.9, SD = 7.5) significantly outperformed the control group (M = 55.8, SD = 8.1) after instruction ($t(58) = 7.68$, $p < .001$). The effect size was large ($d \approx 1.98$). This indicates a strong positive effect of DST on speaking fluency.

Looking at sub-components, the largest improvements in the DST group were in speech rate and pause reduction. On average, the experimental group's words-per-minute count increased from 85 to 102 ($t(29) = 10.12$, $p < .001$), a rise of ~20%. The number of hesitations per minute dropped from 4.5 to 2.1 ($t(29) = 9.03$, $p < .001$). Repetitions decreased modestly ($t(29) = 4.32$, $p < .001$), and self-corrections (indicating repair attempts) also decreased significantly ($t(29) = 5.76$, $p < .001$). These changes suggest students were speaking faster and with fewer interruptions after DST.

A summary of key findings is as follows:

c. Overall Fluency Score: Experimental group improved significantly ($p < .001$); control group did not.
d. Speech Rate: Increased markedly for the DST group (approx. +20%; $p < .001$).
e. Pauses/Hesitations: Decreased significantly in the DST group (approx. 50% reduction; $p < .001$).
f. Repetitions & Self-Corrections: Both showed significant reductions in the DST group ($p < .01$), reflecting smoother delivery.
g. Group Comparison: Post-test fluency was significantly higher in the DST group than in the control group ($p < .001$).

**Student Perceptions**

The questionnaire data indicated overwhelmingly positive attitudes toward DST. On a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), the mean ratings were:

a. Engagement/Enjoyment: M = 4.6 (SD = 0.5).
b. Confidence in Speaking: M = 4.2 (SD = 0.6).
c. Motivation to Speak: M = 4.3 (SD = 0.5).
d. Usefulness of DST: M = 4.5 (SD = 0.4).

Eighty-eight percent of students agreed or strongly agreed that DST made speaking class more enjoyable, and 82% reported increased confidence in speaking English. Many commented that working

on personal stories reduced their anxiety about speaking. For example, one student noted, *"I felt less nervous because I prepared my story well, and it was fun to share."* Another wrote, *"Digital storytelling helped me speak more fluently because I was telling my own experience, not just answering questions."*

These responses suggest that the DST intervention was well-received. Descriptive analysis shows that every questionnaire item received an average rating above 4.0, indicating positive perceptions. No student expressed a negative view of the DST activities.

## E. Discussion

The results indicate that integrating digital storytelling into speaking instruction significantly improved EFL students' speaking fluency. The experimental group's fluency gains (speed and flow) were substantial compared to the control group, mirroring findings of related studies. For instance, Du et al. (2024) found that engaging learners in creating and presenting digital stories "benefited students' speaking ability" and boosted their confidence. Similarly, Bai and Xian (2024) observed that DST activities in an English course enhanced speaking outcomes alongside increased learner autonomy. Our quantitative evidence (higher speaking scores, faster rates, fewer hesitations) is consistent with these reports and adds objective support to the idea that DST can raise fluency.

Which fluency aspects improved most? In our data, speech rate and hesitation reduction showed the largest changes. The DST group spoke more words per minute and paused far less after the intervention. This pattern makes sense pedagogically. By working on a coherent story and rehearsing it, students likely became more practiced at linking ideas smoothly. As Bai and Xian (2024) note, DST requires planning and repeated practice, which builds speaking confidence. The supportive storytelling context may have lowered students' affective filter (fear of mistakes), so they spoke more freely. Sulistianingsih et al. (2025) similarly found students reported reduced anxiety and greater autonomy in DST tasks. A lower anxiety level can directly contribute to fewer pauses, as students are less halted by fear of error.

The significant decrease in self-corrections and repetitions also aligns with improved automaticity. Before the intervention, many students backtracked and revised their speech mid-sentence, a sign of limited fluency. After practicing their stories, they seemed more prepared and fluent. This mirrors the finding that DST provides an engaging context in which students rehearse language[4]. In other words, when telling a story, students tend to self-correct less because they have internalized the narrative. The role of rehearsal is noted by Kim and Li (2021) and others: as learners refine their stories, their spoken delivery becomes smoother.

Comparing groups, the independent t-test confirms the DST group's post-test advantage. The large effect size ($d \approx 2.0$) suggests that DST had a strong pedagogical impact. This supports DST's value for speaking instruction. It also addresses our first research question: yes, DST usage led to a significant improvement in speaking fluency compared to traditional instruction. The second question – which aspect improved most – has a clear answer here: speech rate (pace) and fewer hesitations saw the greatest gains. These are critical elements of fluency, indicating that DST primarily helped students talk more continuously.

The perception data provide additional insight. Students clearly enjoyed the DST activities and believed they helped their speaking. This echoes Sulistianingsih et al. (2025), who reported that learners felt more engaged and motivated during DST tasks. Our participants' positive feedback ("DST made speaking more enjoyable"; "I want more lessons like this") suggests a strong affective benefit. Such positive attitudes can reinforce learning: when students value an activity, they are more likely to practice and persist. Bai and Xian (2024) found similar student sentiments, noting that DST created a supportive environment which lowered anxiety. Indeed, many of our students said their anxiety decreased when speaking through their prepared stories. This affective factor may partly explain why fluency improved: reduced anxiety often leads to smoother speech.

Putting these pieces together, the findings suggest DST works on multiple levels. It provides a meaningful communication task (narrative creation) that naturally generates a lot of speech practice. It also engages students emotionally, which reduces inhibitions. Both aspects contribute to better fluency. This aligns with the theoretical view that language learning involves both cognitive practice and affective support. Digital storytelling seems to hit both: it is cognitively engaging (planning and presenting) and affectively positive (storytelling about oneself, using creative tools).

## F. Implications

For EFL teaching, the results imply that incorporating DST can effectively boost speaking fluency. Teachers in English Education programs might consider adding DST projects when the goal is oral communication. For example, instead of only giving presentation topics, instructors could assign students to create short videos or narrated slides about personal experiences or course content. The key is to have students *make* and *tell* their stories in English. Our study suggests that doing so increases actual fluency, not just confidence.

Furthermore, the positive student perceptions indicate high acceptance of DST. Since learners found it enjoyable and confidence-building, DST could also serve to increase class participation and reduce speaking anxiety school-wide. Instructors should ensure adequate technical support and training so that the storytelling tools do not become a barrier. Once comfortable with the technology, students

in our study thrived; many expressed a desire for more DST activities.

### G. Limitations and Future Research

This study has limitations. The sample was relatively small and from a single program, so results may not generalize to all EFL contexts. Also, the speaking test was administered immediately after the intervention; long-term retention of fluency gains was not measured. Future research could address these issues by replicating with larger, diverse samples and conducting delayed post-tests. It would also be valuable to use control conditions with alternative engaging tasks (to isolate the effect of DST per se) and to triangulate with qualitative data (e.g., interviews about fluency).

Another limitation is the artificial nature of the speaking test. Although we used a picture/story task, classroom conversations and spontaneous discussions were not observed. Future studies might include more naturalistic speaking assessments. Finally, we focused on undergraduates; research on DST effects with adult language learners or in workplace contexts could expand understanding of its benefits.

Despite these limitations, the consistency of our findings with previous studies lends confidence. The dramatic improvements in fluency and the strong student support point to real benefits of digital storytelling for speaking development.

Conclusion and Suggestions

This study examined the effect of a digital storytelling intervention on the speaking fluency of English Education undergraduates. The results show a significant positive effect: students who engaged in DST showed greater fluency gains than those with traditional instruction. In particular, their speech became faster and more continuous, with fewer pauses and errors. Additionally, students reported feeling more confident and motivated when using DST, echoing previous research. These findings suggest that DST can be a potent pedagogical tool to improve speaking fluency in tertiary EFL contexts.

Based on the outcomes, several recommendations emerge. For teaching practice: EFL instructors should incorporate digital storytelling projects into speaking curricula. Allocating class time for story planning, creation, and presentation can enhance oral practice. Teachers should guide students on story development and offer rubrics (as used here) to focus on fluency aspects. For teacher training: Educators would benefit from workshops on DST tools and methods to effectively implement such activities. Given students' positive reactions, institutional support for DST resources (software, hardware) is advisable.

For future research: Studies could explore DST's impact on other speaking sub-skills, such as

discourse coherence or pragmatic competence. Investigating how DST influences learners of different proficiency levels or fields (e.g., business English) would also be valuable. Moreover, research should examine long-term retention of fluency improvements and compare DST with other interactive methods (e.g., role-play, debates). Lastly, a deeper analysis of perception data might reveal which features of DST (visual creativity, storytelling process) most influence fluency gains.

In conclusion, digital storytelling emerges from this study as an effective means to enhance EFL speaking fluency at the university level. By engaging students in personalized, multimedia narratives, DST offers both practical practice and motivational support. Its integration into language programs holds promise for producing more fluent, confident English speakers.

**References**


Arroba, J., & Acosta, H. (2021). *Authentic digital storytelling as alternative teaching strategy to develop speaking skills in EFL classes.* LEARN Journal: Language Education and Acquisition Research Network, 14(1), 317–343.

Bai, Y., & Xian, H. (2024). Exploring the interplay of digital storytelling, L2 speaking skills, self-regulation, and anxiety in an IELTS preparation course. *Humanities and Social Sciences Communications, 11*, 1584. https://doi.org/10.1057/s41599-024-04109-8

Du, T. M., Nguyen, T. N., & Le, N. A. (2024). *Improving First-Year English-Majored Students' Speaking Skills through Using Digital Storytelling.* International Journal of Language Instruction, 3(2), 29–44. https://doi.org/10.54855/ijli.24323

Murad, T., Assadi, J., & Badarni, H. (2023). Digital storytelling and EFL speaking skill improvement. *Journal of Language Teaching and Research, 14*(5), 1189–1198. https://doi.org/10.17507/jltr.1405.06

Nair, V., Md Yunus, M., Aznar-Díaz, I., & Ortega Tudela, J. (2021). A systematic review of digital storytelling in improving speaking skills. *Sustainability, 13*(17), 9829. https://doi.org/10.3390/su13179829

Sulistianingsih, E., Fitriati, S. W., & Mujiyanto, J. (2025). Perceived benefits of digital storytelling for speaking development among motivated Indonesian EFL learners. *Register Journal: The Journal of English for Islamic Educational Institutions and Moslem Communities, 18*(1), 76–101.

Murad, Tareq., Assadi, Jamal., Badarni, Hia (2023) Digital Storytelling and EFL Speaking Skill Improvementhttps://www.researchgate.net/publication/373603362_Digital_Storytelling_and_EFL_Speaking_Skill_Improvement

Bai, Yun & Xian, Huihui (2024. Exploring the interplay of digital storytelling, L2 speaking skills, self-regulation, and anxiety in an IELTS preparation course | Humanities and Social Sciences Communications https://www.nature.com/articles/s41599-024-04109-8?error=cookies_not_supported&code=df35e4e8-b637-480e-9c7f-307ffb84b0e3