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Enhancing Narrative Writing Skills among BTech ESL Learners through Digital Storytelling: A Quasi-Experimental Study

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ABSTRACT

Technology integration in English language instruction has become essential in the digital age for the development of effective communication skills, particularly in writing. The effect of Digital Storytelling (DST) on improving the narrative writing abilities of BTech students learning English as a second language (ESL) is examined in this study. Based on metacognitive theory, which stresses learners' awareness and control of cognitive processes, the study investigates how DST promotes linguistic proficiency, creativity, and structured thinking. Two BTech student groups—the control and experimental groups—were evaluated during an eight-week intervention using a quasi-experimental design. The control group received traditional writing instruction, while the experimental group used multimodal tools like voiceovers, visuals, and narration scripts to complete DST tasks. Pre- and post-tests were given to evaluate students' progress in narrative writing using rubrics that emphasized vocabulary, grammar, coherence, organization, and creativity. The experimental group's narrative writing performance significantly improved, according to the findings, highlighting the contribution of DST to improving language proficiency, deeper engagement, and reflective thinking. By giving students a feeling of

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purpose and ownership, the incorporation of digital storytelling not only enhanced the writing process but also inspired students. This study confirms that DST can be a transformative pedagogical tool in ESL contexts, especially for improving tertiary-level learners' narrative competencies. In order to improve student outcomes and encourage greater engagement with writing assignments, future implications recommend integrating DST into regular curricula.

Keywords: Digital Storytelling; ESL Learners; Narrative Writing; Writing Proficiency

1. Introduction

Writing is considered the most difficult of the four fundamental learning abilities[1]. It is intertwined with speaking, listening, and reading, and contributes indirectly to the development of each of the other three skills[2]. Writing represents an active or productive competency that requires students to articulate ideas effectively. However, EFL learners often struggle to produce high-quality writing due to the complexity of the language. Writing entails the expression of thoughts or viewpoints through written language and holds significant value in English language teaching and learning[3]. It is a core academic skill across various disciplines, including language arts, social studies, science, and mathematics[4, 5]. Moreover, it is a demanding aptitude that learners must master to communicate successfully[6, 7]. Students must be capable of organizing and articulating thoughts, constructing coherent sentences, and refining drafts through revision. Rashid et al.[7] emphasized writing as a cognitive process involving ideation, initial composition, and revision, requiring particular proficiencies not inherently present in all learners. Therefore, teaching writing is essential to give students ample practice and enable them to produce engaging compositions.

Digital storytelling (DST) is a pedagogical strategy used to enhance students' writing abilities. According to Yamac and Ulusoy[8], DST improves writing quality by enhancing idea development, organization, vocabulary, and sentence fluency. It fosters creativity, syntactic accuracy, and structured writing[9]. Since its inception by Lambert in 1993, DST has evolved into a global movement, where personal stories are crafted through structured steps using mobile and multimedia tools[10]. His framework reflects significant life changes, engaging learners through relatable narratives. Consequently, educational institutions worldwide have adopted DST to boost digital literacy[11] and second language writing proficiency[12]. DST is also used across diverse disciplines like history and journalism[13], supporting narrative development among L2 learners[14]. According to Gakhar and Thompson[15], DST allows learners to creatively structure and articulate authentic ideas. It also fosters critical thinking, media literacy, and coherent writing structures.

2. Literature Review

Digital storytelling has proven to be an impactful technological tool in EFL classrooms[16]. It enhances literacy by integrating multimedia applications[17]. Multiple studies consistently highlight the benefits of DST in L2 contexts[18–22]. While some studies focus on literacy skills and technology use[20, 21], others explore learner attitudes toward DST tools[22–24]. Abdel-Hack and Helwa[25] found DST improved learners' narrative writing, encouraging complex sentence structures and idea elaboration. Robin and McNeil[26] emphasized DST's role in student motivation and engagement. Stephens[27] and Rahimi and Yadollahi[21] agreed that DST fosters meaningful writing participation by removing expressive constraints. DST is defined as a modern version of traditional storytelling[28], integrating user-generated content to enhance technology-based pedagogy[17]. Castañeda[24] describes DST as a process combining visuals, audio, and video for impactful narratives. Yamac and Ulusoy[8] conducted an action research study on third-grade rural students, showing DST improved their writing organization, vocabulary, fluency, and revising skills. Students followed a structured writing process—planning, drafting, editing, multimedia integration, and sharing. Results indicated improved technological, informational, and visual literacy. Duman and Göcen[9] studied 76 pre-service teachers using DST (experimental group) vs. PowerPoint (control group). The DST group showed enhanced creative writing across eight domains including originality, sentence construction, grammar, and style. DST improved cognitive flexibility and precise language use. Its ability to stimulate imagination and visual thinking made

it an engaging learning method[17]. Audio-visual elements, including animations and subtitles, supported narrative comprehension and textual production[8].

2.1. The Digital Storytelling (DST) Strategy's Key Features

Digital storytelling (DST) is a cutting-edge teaching method that blends contemporary multimedia resources like audio, video, images, music, and narration with the age-old craft of storytelling. Students' linguistic and digital literacy are improved as a result of being able to create and present their stories in a variety of ways. In the context of teaching ESL, DST encourages students to plan, write, edit, and present stories that have personal significance, going beyond traditional composition exercises. In addition to offering a more genuine communicative context for language use, this process fosters critical thinking, creativity, and emotional involvement. As opposed to traditional writing, DST promotes process-oriented learning, encourages group projects through peer interaction, and helps auditory and visual learners who might find it difficult to focus on just text-based tasks.

2.2. DST Framework Employed in the Study

The DST process in this study followed four structured phases:

- Students outlined their narratives and generated story ideas as part of the pre-writing and script development process.
- Storyboarding and Multimedia Integration: Students chose narration, music, and pictures to go with their texts.
- Peer review and drafting: Students got input on their use of language and multimedia components.
- Publishing and Reflection: After sharing final stories with peers, they had a thoughtful conversation about what they had learned.

By placing learning in an interesting and significant context, this method is consistent with constructivist pedagogy and has demonstrated the ability to enhance students' narrative fluency, vocabulary usage, and general writing quality.

2.3. Traditional Writing Education Approach (Control Group)

The control group received instruction in writing using a traditional model that focused on developing mechanical writing skills through essay writing, grammar drills, and teacher-led instruction. The primary characteristics of this traditional approach were:

- Weekly grammar classes that emphasize capitalization, punctuation, and sentence structure rules are known as "direct grammar instruction."
- Model Essays: Students examined narrative samples and recognized the introduction, body, and conclusion as structural elements.
- Guided Writing Practice: Students were given writing prompts that included few visual or aural components and asked to compose essays or narratives.
- Teacher-Centered Feedback: Peer review and revision were not given much weight; instead, the teacher evaluated and corrected the students' writing.
- Paper-Based Submissions: Students turned in handwritten or typed assignments devoid of innovative presentation formats and digital enhancements.

3. Method of Research

This study investigates how DST influences the narrative writing skills of BTech students, who often face challenges in this area. The research employs a quasi-experimental design with pre- and post-test assessments[29]. Participants will be BTech students enrolled in an English language course, randomly assigned to control and experimental groups. The experimental group will receive DST-based instruction, while the control group undergoes conventional narrative writing training. DST intervention includes collaborative brainstorming, digital storyboarding[30], and multimedia story creation following Lai and Osthoff's paradigm[31]. Pre-tests and post-tests will measure narrative writing improvement. Data will be analyzed using SPSS (Statistical Package for the Social Sciences) software. The study is grounded in Flavell's metacognitive theory[32], which emphasizes self-monitoring and cognitive regulation. The hypothesis posits that DST enhances metacognitive skills essential for narrative writing through planning, visual structuring,

and teamwork. Results aim to guide educators in leveraging DST for effective writing instruction and contribute to the growing body of ELT research.

3.1. Research objectives

- To look at how well Digital Storytelling (DST) interventions work in helping English as a Second Language (ESL) students write narratives better, as determined by pre-and post-test results.
- To investigate how DST affects ESL students' planning, self-monitoring, and appraisal of metacognitive skills as demonstrated by their narrative writing processes and final outputs.

3.2. Research Questions

1. To what extent does digital storytelling enhance the grammatical accuracy and narrative writing skills of ESL learners?
2. In what ways does exposure to digital storytelling influence ESL students' attitudes toward writing and their engagement in the writing process?

3.3. Research Sample

87 first-year B. Tech students who were first-semester ESL learners participated in this research. All participants were under eighteen and came from different Indian states, with a wide range of cultural backgrounds. Tamil, Telugu, Malayalam, Hindi, and Urdu were among their mother tongues. The participants' willingness to study ESL served as the selection criterion. Everyone expressed the need to work on their ability to write effective narratives, yet with different degrees of skill in place- everything from basic mistakes in capitalization and syntax to spelling and punctuation. Participants were pre-randomized to a Digital Storytelling (DST) experimental group intervention or to control, receiving conventional story writing training in a quasi-experimental design. For the respondents, two novel methodology features of the study were using a pre & post-test evaluation and DST as well. A study was designed to evaluate the efficacy of DST in assisting ESL to improve their narrative writing skills. The study mainly focused on the impact of DST on writing norms related to grammar, spelling, capitalization, and punctuation by examining the pre-and post-test results.

3.4. Participants and Context Clarification

This study took into account undergraduate ESL students, between 18 and 21 years of age, who were pursuing a Bachelor of Technology (B.Tech) degree in an Indian technical institute. The participants had received formal English instruction at the secondary level and were found to possess intermediate-level proficiency in the English language, as reflected in previous academic records and placement tests given by the institution. By so clearly defining the population of young adult learners, this research acknowledges that cognitive maturity, academic requirements, and familiarity with technology are all markedly different from those of elementary school or secondary school students. College students tend to be more independent and able to perform higher-order thinking processes like self-reflection, multimodal synthesis, and peer review—all at the heart of the DST process. Additionally, the applicability of DST to this population is especially urgent as these students are soon to be exposed to professional or academic settings increasingly that place a premium on digital communication skills alongside and sometimes in addition to literacy per se. The incorporation of DST in their writing curriculum thus has a double purpose: advancing their narrative and grammatical skills while, at the same time, advancing their technological skill and presentational ability. Although younger students might react differently to DST based on variations in cognitive development, motivation, and experience with digital media, the present study is specifically focused on late adolescents and young university students. Subsequent research can examine how age-related variables affect the reception and impact of DST in various educational contexts.

3.5. Research Procedure

Researchers like Hà and Bellot, Hamouda, Ahmad et al., and Robin have studied how well ESL students write narratives and have found that they frequently struggle with vocabulary, grammar, and punctuation. Their research shows that these enduring problems can be resolved by integrating digital storytelling (DST) methods with conventional

teaching strategies. Compared to traditional text-based approaches, digital storytelling—which is the blending of multimedia tools (music, video, images, and text) to create academic or personal narratives—offers a more dynamic and captivating medium for language learning. In contrast to traditional methods, which frequently place an emphasis on isolated writing exercises and rote grammar instruction, DST promotes student agency, creativity, and contextual language use, leading to a deeper understanding of writing structure and conventions. The study also emphasizes how DST helped students' narrative writing skills improve gradually but noticeably. Teachers are encouraged to use more dynamic and varied teaching resources as digital content and educational technology tools proliferate. DST enhances language and presentational skills by enabling students to not only write their own stories but also present them in a variety of multimedia formats. By doing this, digital storytelling can improve students' conceptual understanding of a variety of academic subjects and promote interdisciplinary learning. Deeper cognitive engagement and insightful class discussions are frequently sparked by incorporating abstract or difficult material into stories.

Figure 1 illustrates the detailed research procedure adopted in the study, involving both experimental and control groups. While the experimental group used digital storytelling tools, the control group followed a conventional writing instruction method. However, the nature of the traditional method used in the control group—possibly involving textbook-based writing exercises, grammar drills, or peer feedback—is not elaborated in the original study and would benefit from further clarification to contextualize the comparative results.

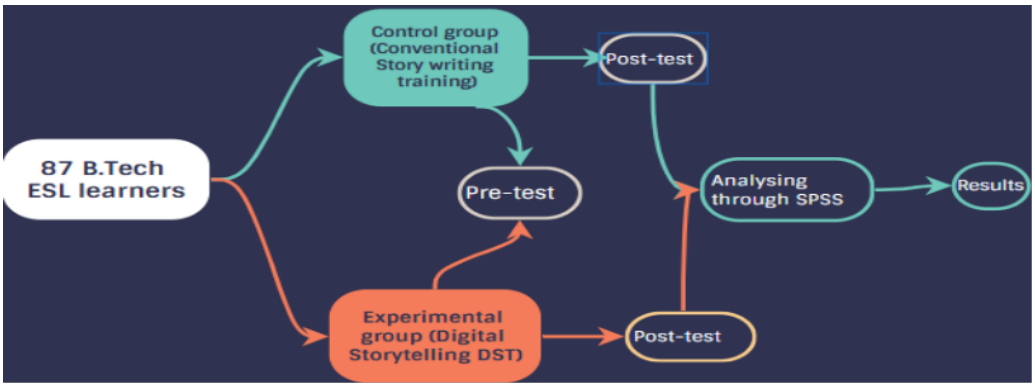

Figure 1. Detail Research Procedure.

4. Results and Discussion

Capitalization, syntax, spelling, and punctuation are the three main linguistic components that were the focus of the study, which aimed to assess how digital storytelling affected ESL learners' grammatical accuracy in narrative writing. A structured pre-test was used to evaluate these elements and was given to both the experimental and control groups. There was a clear and measurable comparison of grammatical proficiency because each component had a maximum possible score of 48.

The pre-test results, which were displayed in tabular and graphical formats (refer to **Figure 2**), showed that participants excelled in two areas: spelling and punctuation and capitalization, with average scores up to 48. This implies that pupils had a solid foundational grasp of fundamental surface-level grammatical rules, including appropriate noun usage, sentence construction, and standard punctuation. Prior instruction that placed a strong emphasis on mechanical correctness or exposure to written English in standardized formats may have contributed to the high scores in these domains. The average score for syntax, on the other hand, was significantly lower at 40 out of 48, suggesting that the participants' command of sentence structure was somewhat lacking. Problems with subject-verb agreement, sentence fragments, run-on sentences, and improper word order are common examples of syntax errors; these problems frequently call for more sophisticated language processing and a deeper comprehension of grammatical construction. The need for pedagogical interventions that go beyond mechanical correctness and focus on more intricate syntactic structures—which are

crucial for coherence and sophistication in narrative writing is highlighted by this gap.

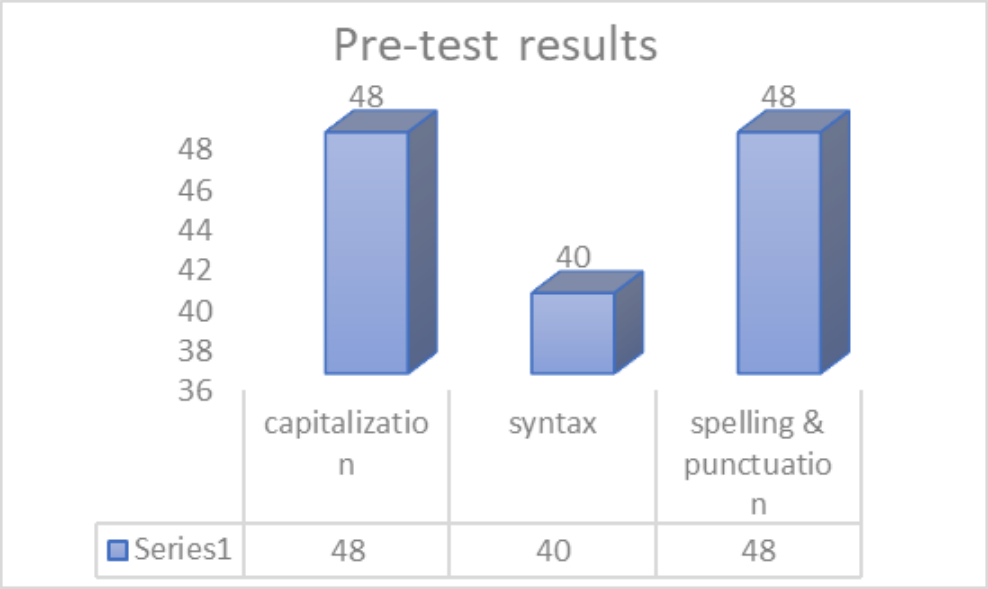

Figure 2. Pre-test results.

Table 1, the one-sample t-test findings, which compare a sample's mean to a given test value, are shown in the table. The test value in this instance is 0. The following columns are present in the table: t: The computed t-statistic, which expresses the variation between the test value and the sample mean as a function of the standard error. The sample size less one is indicated by the degrees of freedom, or df. Sig. (2-tail): The null hypothesis, which states that there is no difference between the sample mean and the test value, is represented by the p-value, which is the likelihood of getting a t-statistic that is as severe or more extreme than the observed one. Mean Difference: The variation between the test value and the sample mean. Lower and Upper: The mean difference's lower and upper bounds on the confidence interval. The results show that the means of the three categories (spelling and punctuation, syntax, and capitalization) deviate considerably from the test value of 0. All of the categories' p-values are 0.000, which is below the standard alpha threshold of 0.05 and indicates substantial statistical evidence that refutes the null hypothesis. For capitalization, syntax, and spelling and punctuation, the mean differences are 55172, 45977, and 55172, respectively. According to these figures, the sample means are much greater than the test value of zero. The conclusion that the sample means are substantially different from 0 is further supported by the fact that none of the three categories' confidence intervals include the test result of 0. The findings indicate that there is a considerable difference between the sample averages for capitalization, syntax, and spelling and punctuation and the test value of 0. This suggests that the sample's members had a high degree of competency in these grammatical domains.

Table 1. T test results.

	Test Value = 0					
	t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**95% Confidence Interval of the Difference**	
					Lower	**Upper**
capitalization	10.288	86	0.000	0.55172	0.4451	0.6583
syntax	8.555	86	0.000	0.45977	0.3529	0.5666
spelling & punctuation	10.288	86	0.000	0.55172	0.4451	0.6583

Descriptive statistics for three variables—capitalization, syntax, and spelling and punctuation—are shown in the table. Based on a sample of 87 people, the data was collected. The **Table 2** standard deviation result gives the following details for every variable: N: For all three variables combined, the sample size is 87. Mean: The variable's average score. The average scores for syntax, spelling, and punctuation are 45.98, 55.17, and 55.17 for capitalization, respectively. The standard deviation is a statistical metric used to quantify the variation in scores from the mean. The capitalization, syntax, and spelling and punctuation standard deviations are 500.20, 501.27, and 500.20, respectively. Standard Error Mean: The sample mean's estimated variability is given by the mean's standard error. The standard errors are 0.5363, 0.5374, and 0.5363 for capitalization, syntax, and spelling and punctuation. For each of the three variables, the table gives an overview of the variability (standard deviation) and central tendency (mean). This data may be utilized to compare participant performance across the various grammatical categories and to comprehend the distribution of results.

Table 2. Std.Deviation results.

	N	Mean	Std. Deviation	Std. Error Mean
capitalization	87	0.5517	0.50020	0.05363
syntax	87	0.4598	0.50127	0.05374
spelling & punctuation	87	0.5517	0.50020	0.05363

Figure 3 shows a group of people's test results post-test, which is an emphasis on the degree to which they performed well in three grammatical categories: capitalization, syntax, and spelling and punctuation. A bar graph as well as a tabular format will be used to show the data. Graphical representations of the scores for each category are indicated in the bar graph. On the x-axis, there are listed categories, and the scores are as indicated on the y-axis. Each category is represented by a blue bar, and the height of each represents the score. The scores are broken down numerically in a tabular style. There is a row with the scores and a column for each category. The scores are 58, 48, and 55 for capitalization, syntax, spelling, and punctuation, respectively. The post-test findings point to an overall improvement in the participants' use of grammar norms. The syntactic score has risen slightly, thereby indicating a better proficiency in this area, but the scores for capitalization, spelling, and punctuation have maintained their high levels. In fact, many study scenarios, such as language acquisition studies, writing evaluations, and mistake analysis, will find this data useful. There is informative information about grammatical understanding by the participants, and it can hence guide the development of a focused intervention or teaching approach.

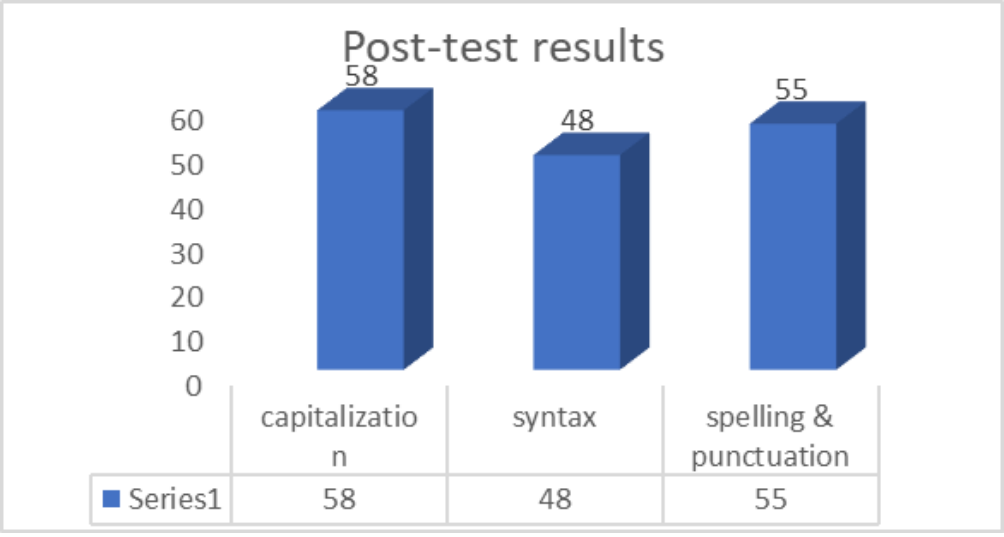

Figure 3. Post-test results.

Table 3 shows the descriptive statistics of three variables: capitalization, syntax, and spelling and punctuation. Based on the sample size of 87 people, the data were collected. The table presents the following details about every variable: N: For the three variables as a whole, the sample size is 87. Mean: The mean of the score of the variable. The average scores are 66.67, 55.17, and 63.22 for Capitalization, syntax, and spelling and punctuation, respectively. The standard deviation is a statistical measure that measures the spread of scores from the mean. The capitalization, syntax, and spelling and punctuation standard deviations are 474.14, 500.20, and 485.01, respectively. Standard Error Mean: This is the estimated variability of the sample mean, which is the standard error of the mean. The spelling, punctuation, syntax, and capitalization error norms are 0.5083, 0.5363, and 0.5200 respectively. For each of the three variables, the following table presents an overview of variability (standard deviation) and central tendency (mean). This information may be used to compare participant performance across the different grammatical categories, and to understand the distribution of results.

Table 3. Std.Deviation results.

	N	Mean	Std. Deviation	Std. Error Mean
capitalization	87	0.6667	0.47414	0.05083
syntax	87	0.5517	0.50020	0.05363
spelling & punctuation	87	0.6322	0.48501	0.05200

The one-sample t-test, which compares a sample's mean to a given test value, is shown in the attached **Table 4**. The test value in this instance is 0. The following columns are present in the table: t: The computed t-statistic, which expresses the variation between the test value and the sample mean as a function of the standard error. The sample size less one is indicated by the degrees of freedom, or df. Sig. (2-tail): The null hypothesis, which states that there is no difference between the sample mean and the test value, is represented by the p-value, which is the likelihood of getting a t-statistic that is as severe or more extreme than the observed one. Mean Difference: The variation between the test value and the sample mean. Lower and Upper: The mean difference's lower and upper bounds on the confidence interval. The results show that the means of the three categories (spelling and punctuation, syntax, and capitalization) deviate considerably from the test value of 0. All of the categories' p-values are 0.000, which is below the standard alpha threshold of 0.05 and indicates substantial statistical evidence that refutes the null hypothesis. In terms of spelling and punctuation, capitalization, and syntax, the mean differences are 66667, 55172, and 63218, respectively. According to these figures, the sample means are much greater than the test value of zero. The conclusion that the sample means are substantially different from 0 is further supported by the fact that none of the three categories' confidence intervals include the test result of 0. The findings indicate that there is a considerable difference between the sample averages for capitalization, syntax, and spelling and punctuation and the test value of 0. This suggests that the sample's members had a high degree of competency in these grammatical domains.

The **Figure 4** represents a group of test takers' pretest and post-test scores with the stress on the degree of each group's performance in three grammatical categories: capitalization, syntax, and spelling and punctuation. A bar graph and a table represent the scores. All categories are displayed graphically for every time point in the bar graph. The categories are indicated along the x-axis and the y-axis displays scores, and there are colored bars that represent the pre-test as well as the post-tests. The tabular breakdown of scores is as indicated by category names, along with the pre-test scores and scores on the post-tests. Evidence suggests that the overall direction of change in the use of grammar rules by the respondents is positive. The general scores for spelling, punctuation, and capitalization were still fairly good, but the syntactic score improved dramatically from pre-test to post-test. This indicates that the intervention or training in syntax was helpful. A number of research laboratory conditions, including language acquisition research, writing assessments, and error analysis, may benefit from these results. It provides enlightening data regarding the grammatical understanding of the participants and can be applied in creating focused interventions or teaching methods. For instance, the improvement in syntax suggests that the participants' deficits in this

area were effectively tackled by the intervention or lesson. The specific strategies or approaches used in the intervention that assisted with this improvement could be analyzed further. In addition, the fact that the participants consistently score very high in spelling, capitalization, and punctuation would suggest that they must have had a sound grounding in these areas that might have assisted them in further perfecting their overall grammatical accuracy.

Table 4. T test results.

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
capitalization	13.115	86	0.000	0.66667	0.5656	0.7677
syntax	10.288	86	0.000	0.55172	0.4451	0.6583
spelling & punctuation	12.158	86	0.000	0.63218	0.5288	0.7356

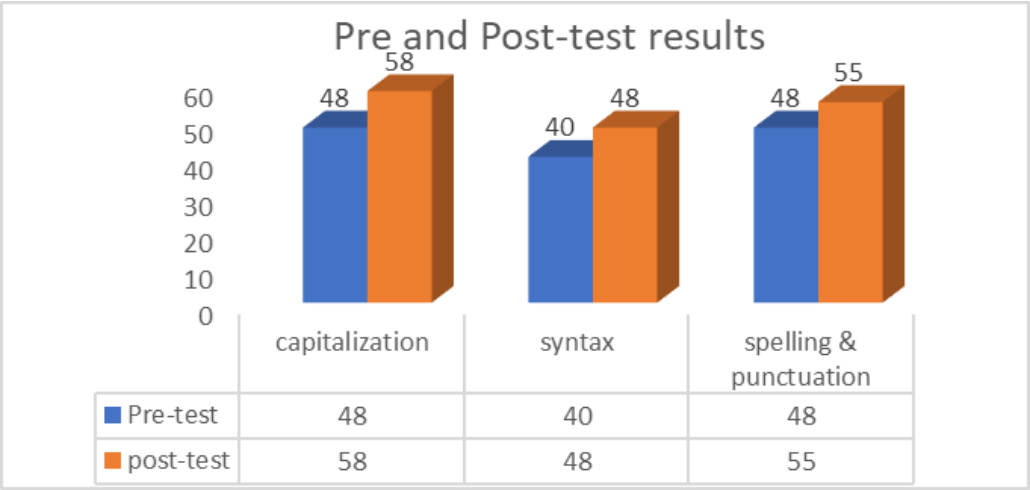

Figure 4. Pre and Post-test results.

The findings of a correlation study between the pretest and post-test variables are shown in the supplied image. The degree and direction of the linear link between the two variables are determined by the analysis using the Pearson correlation coefficient. The following is displayed in the correlation matrix: There is a 0.114 correlation between the pretest and post-test. This suggests a weak positive association, which means there is a small chance that people who scored higher on the pretest would also score higher on the post-test. The correlation's significance level (Sig.) is 0.295. This result indicates that the correlation is not statistically significant at the 5% level, as it is bigger than the generally accepted alpha threshold of 0.05. This suggests that there's a likelihood that the observed association exists. For both variables, the sample size (N) is 87. Interpreting the correlation's significance and strength requires this information.

Overall, the findings point to a somewhat favorable correlation between pretest and post-test outcomes. There isn't much proof of a causal association between the two variables, though, as this relationship is not statistically significant. It's probable that additional elements, such as individual variances or chance, are impacting the results. To investigate the possible causes of the observed correlation between pretest and post-test scores, further investigation would be required. Furthermore, a bigger sample size may be taken into account to boost the analysis's statistical power and enhance the reliability of the results.

Descriptive statistics for the pretest and post-test, two variables, are shown in the **Table 5**. Based on a sample of 87 people, the data was collected. The table gives the following details for every variable: Mean: The variable's average score. 52.1073 is the mean score on the pretest, while 61.6858 is the mean score on the posttest. N: The sample size for both variables is 87. Std. Deviation: The

score distribution around the mean is measured by the standard deviation. The pretest's standard deviation is 23.12820, whereas the post-test's standard deviation is 26.18200. Std. Error Mean: The sample mean's estimated variability is given by the mean's standard error. The pretest's standard error is 2.47960, while the post-test's standard error is 2.80700. The table also offers bootstrap statistics for the mean difference between the pretest and post-test scores, such as the bias, standard error, and confidence interval. The accuracy and dependability of the predicted mean difference may be evaluated using these data. Together with details regarding the accuracy and dependability of the calculated mean difference, the table summarizes the central tendency (mean) and variability (standard deviation) for each variable. This data may be used to compare participant performance on the pretest and post-test, as well as to comprehend the distribution of results.

The paired samples t-test, which compares the means of two paired samples, is shown in the **Table 6**. Here, a set of participants' pretest and post-test results serves as the two samples. The following columns are present in the table: The term "pretest–posttest" refers to the paired variable in this instance. Mean: The average variation in scores between the pretest and post-test. The post-test results were, on average, 9.58 points lower than the pretest scores, according to the mean difference of −9.57854. Std. Deviation: The variability of the differences around the mean is measured by the paired differences standard deviation. 32.90737 is the standard deviation. Standard Error Mean: The sample mean difference's estimated variability is given by the standard error of the mean difference. 3.52804 is the standard error. Interval of the 95% Self-assurance: The mean difference's lower and upper limits for the 95% confidence interval. The range is [−2.56503, −16.59206]. The difference between the sample mean difference and the predicted mean difference (0) concerning the standard error is measured by the computed t-statistic or t. −2.715 is the t-statistic. df: The t-test's degrees of freedom, which in this instance are 86. Sig. (2-tail): When the null hypothesis (no difference between the pretest and post-test means) is true, the p-value, which indicates the likelihood of getting a t-statistic that is as extreme or more extreme than the observed one, is true. The p-value is smaller than the standard alpha threshold of 0.05, at 0.008 instead of 0.05. The findings imply that the differences between the pretest and post-test scores are statistically significant. The post-test results were lower than the pretest scores, as indicated by the negative mean difference. The conclusion that the difference is statistically significant is further supported by the fact that the confidence interval does not contain 0.

Table 5. Paired sample results.

			Bias	Std. Error	95% Confidence Interval	
					Lower	Upper
Pair 1 pretest Post-test	Mean	52.1073	0.1069	2.4725	47.5096	57.0881
	N	87				
	Std. Deviation	23.12820	−0.16133	1.72190	19.59752	26.23084
	Std. Error Mean	2.47960				
	Mean	61.6858	0.0303	2.7592	55.9387	67.0498
	N	87				
	Std. Deviation	26.18200	−0.18094	1.98222	22.06350	29.84013
	Std. Error Mean	2.80700				

Table 6. Paired sample t-test results.

Paired Differences					t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
−9.57854	32.90737	3.52804	−16.59206	−2.56503	−2.715	86	0.008

The correlation analysis between the pretest and post-test, two paired variables, is shown in the accompanying **Table 7**. The degree and direction of the linear link between the two variables are determined by the analysis using the Pearson correlation coefficient. The following is displayed in the correlation matrix: There is a 0.114 correlation between

the pretest and post-test. This suggests a weak positive association, which means there is a small chance that people who scored higher on the pretest would also score higher on the post-test. The correlation's significance level (Sig.) is 0.295. This result indicates that the correlation is not statistically significant at the 5% level, as it is bigger than the generally accepted alpha threshold of 0.05. This suggests that there's a likelihood that the observed association exists. For both variables, the sample size (N) is 87. Interpreting the correlation's significance and strength requires this information. The findings point to a marginally favourable correlation between pretest and post-test outcomes. There isn't much proof of a causal association between the two variables, though, as this relationship is not statistically significant. It's probable that additional elements, such as individual variances or chance, are impacting the results.

Table 7. Paired sample correlations results.

					Bootstrap for Correlation			
		N	Correlation	Sig.	Bias	Std. Error	95% Confidence Interval	
							Lower	Upper
Pair 1	pretest & post-test	87	0.114	0.295	0.001	0.109	−0.107	0.334

4.1. From an Academic Perspective, These Results Are Significant for Several Reasons

I. Language Acquisition Research: The results advance the field by highlighting the grammatical areas that are more difficult to teach using conventional techniques. Because syntax is more cognitively demanding, it frequently calls for meaningful practice and contextualized learning, both of which DST is well-equipped to offer.

II. Writing Skills Assessment: Teachers can differentiate between superficial correctness (like punctuation) and more profound grammatical fluency (like syntactic cohesion) by using the scores, which provide a diagnostic overview of students' baseline writing competencies. Learner-centered pedagogy and curriculum design both depend on this distinction.

III. Error Analysis and Instructional Design: Targeted instructional strategies can be informed by the identification of syntax as a weak area. To make sure that students are not only telling captivating stories but also using proper grammar, teachers can incorporate syntactic scaffolding exercises into digital storytelling assignments.

Furthermore, it is crucial to remember that the study did not specifically describe the participants' language proficiency levels before the intervention. Since differences in starting proficiency may have affected performance outcomes, this omission restricts how the results can be interpreted. Future studies should use standardized language proficiency tests and stratified group assignment based on test results to guarantee fair comparison between the experimental and control groups. Furthermore, the control group's conventional methodology is not well defined. A more thorough explanation, including whether it included guided writing without multimedia components, grammar worksheets, or textbook exercises, would help create a more distinct point of comparison. Without this background, it is challenging to pinpoint the precise benefits that digital storytelling offers. Overall, the relative underperformance in syntax reveals a need for instruction, even though the preliminary results show that students are proficient in some grammatical conventions. A promising way to address these syntactic issues in a more interesting and pedagogically sound way is through digital storytelling, which places a strong emphasis on multimodal composition and authentic language use.

4.2. Limitations and Recommendations

Although this research is informative regarding the effect of Digital Storytelling (DST) on ESL learners' narrative writing capabilities, there are some limitations to be considered. First, the intervention was done over a relatively short timeframe, and therefore, the long-term retention and the transferability of enhanced writing ability could not be determined. A longer intervention time could potentially provide stronger and more sustainable results. Secondly, the sample was limited to 87 first-year B.Tech students from

one institution, which would restrict the generalizability of results to other varied educational, linguistic, and cultural environments. Thirdly, while the study made use of both pre- and post-tests, it failed to employ detailed qualitative measures such as learner reflection or portfolio evaluations, which could yield more complex information about students' writing development processes. Furthermore, the study only emphasized grammar-related features (punctuation, syntax, capitalization) and did not look at other aspects in depth, like narrative style, creativity, or the scope of vocabulary. Considering these restrictions, it is suggested in a number of areas that future research be conducted. Longitudinal studies over numerous academic terms would assist in assessing the long-term effect of DST on writing skills. Increasing the participant sample to learners from various disciplines, age groups, and skill levels would boost the external validity of the results. Moreover, adding mixed methods like interviews, classroom observations, or student-created reflective journals can provide a richer picture of how DST impacts learners' attitudes, motivation, and cognitive involvement. Future studies should also investigate the application of DST on other genres of writing, like argumentative or expository writing. Finally, teacher education in DST software and evaluation techniques should be investigated to facilitate proper classroom application. The above steps will help refine DST as an educational tool and increase its reach across various ESL teaching environments.

5. Conclusions

The focus of this study will be the effects of integrating digital storytelling that utilizes personal photographs on ESL learners' narrative writing performances. Using a quasi-experimental design, this study will determine the effectiveness of using digital storytelling approaches for improving ESL students' performance in writing compared to other forms of instruction. The findings will make available great insights into powerful pedagogical strategies for improving the abilities of ESL students in producing narratives at the digital stage. With a quasi-experimental design, it becomes possible to compare the effects of digital storytelling instruction and the traditional kind of writing instruction on ESL students' narrative writing. The study will gather both quantitative data, through pre- and post-assessments of writing skills, and qualitative data, via questionnaires and interviews, to provide a comprehensive understanding of the intervention's impact on students' writing outcomes and perceptions. This research is expected to yield insights that could make valuable contributions to the literature about the pedagogical benefits of digital storytelling techniques, particularly through the use of personal photographs, in second-language writing development. Pre- and post-assessments, questionnaires, and interviews comprise data collection methods that aim at fully understanding the possible advantages and student perceptions about the instruction. This study will have the potential to make some contributions to the emerging body of literature on digital storytelling and its application in ESL writing instructions on the impact it creates in the narrative writing performance and self-efficacy beliefs of ESL students. Comparing the effectiveness of digital storytelling and traditional writing instruction could provide valuable insights for educators seeking innovative ways in which to leverage technology to improve ESL students' competencies in narrative writing. It could inform pedagogical decision-making by providing evidence-based insights into the benefits of integrating technology-mediated approaches like digital storytelling in helping ESL students develop as writers.

Author Contributions

Conceptualization, B.S. and A.B.R.; methodology, B.S.; software, M.M.; validation, B.S., A.B.R. and V.K.K.; formal analysis, B.S.; investigation, B.S.; resources, C.N.; data curation, J.N.; writing—original draft preparation, B.S.; writing—review and editing, A.B.R.; visualization, J.N.; supervision, A.B.R.; project administration, A.B.R.; funding acquisition, V.K.K. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board (Ethics Committee) of Kalasalingam Academy of Re-

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the participants to publish this paper.

Data Availability Statement

Data will be available on request.

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Conflicts of Interest

The authors declare no conflict of interest.

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