
| RESEARCH ARTICLE

The Effect of Digital Storytelling on English Vocabulary Learning in Inclusive and Diverse Education

Jose Belda-Medina¹ ✉ and Max Benjamin Goddard²

¹Senior Lecturer, Dept. of English Studies, Digital Language Learning (LD2), University of Alicante, Alicante, Spain

²Teaching Assistant, Dept. of English Studies, Digital Language Learning (DL2), University of Alicante, Alicante, Spain

Corresponding Author: Jose Belda-Medina, **E-mail:** jr.belda@ua.es

| ABSTRACT

Despite a rich body of research on digital storytelling within language education, studies focusing on its effects from an inclusive perspective remain scarce. This paper addresses the gap by exploring the impact of digital storytelling on vocabulary learning through an inclusive and diverse lens. It aims to fill this gap by pursuing three primary objectives: (1) examining pre-service teachers' prior knowledge of digital storytelling usage, (2) evaluating teacher candidates' digital skills in creating collaborative digital stories from an inclusive viewpoint, and (3) measuring the effect of using these inclusive digital stories on vocabulary learning among children aged 8-10. Employing a mixed-methods research design based on convenience sampling, the study involved 62 second-year college students from a teacher education program and 112 primary education children aged 8-10. The teacher candidates were first introduced to the benefits and limitations of digital storytelling in EFL contexts, followed by the creation of 12 digital stories reflecting an inclusive perspective, which were later implemented with the children. Quantitative and qualitative data were gathered through pre-post-tests, questionnaires, and class discussion, and analyzed using SPSS for quantitative analysis and QDA Miner for qualitative analysis. The findings revealed that teacher candidates exhibited proficient digital and critical thinking skills necessary for creating effective digital stories. The results showed a positive impact on vocabulary learning related to inclusive and diverse education among children, contributing to the understanding of digital storytelling's role in enhancing vocabulary acquisition and supporting the integration of inclusive digital narratives in language education.

| KEYWORDS

Digital storytelling, inclusive and diverse education, English as a Foreign Language (EFL), vocabulary learning, teacher training.

| ARTICLE INFORMATION

ACCEPTED: 02 February 2024

PUBLISHED: 26 February 2024

DOI: 10.32996/ijels.2024.6.1.11

1. Introduction

The use of digital storytelling in language education has significantly contributed to enhancing vocabulary acquisition and improving language skills (Schmoelz, 2018; Rodríguez et al., 2021). Digital storytelling, which integrates images, texts, sounds, and movies to tell and share stories in a digital format, has been recognized for its potential to motivate learners and increase interactivity (Hava, 2021). The engagement and interaction that digital storytelling promotes in students lead to increased intrinsic motivation for learning vocabulary (Sembiring & Simajuntak, 2023). Moreover, interactive digital stories have proven to be effective in supporting students' acquisition of academic and content vocabulary by embedding the vocabulary within a visual narrative, making the learning experience both engaging and educational (Kristiawan et al., 2022).

Digital storytelling in language education encompasses various practices, such as multimedia story creation, integration of language learning across different literacies, and enhancement of academic performance through critical thinking and multimedia skills application (Yang & Wu, 2021). Several works have demonstrated the positive impact of digital storytelling on English vocabulary learning among primary education children (Abdul-Ameer, 2014; Kegenhof et al., 2014). These studies highlight the

versatility of digital storytelling in teaching vocabulary within diverse contexts in primary education, offering interactive, engaging, and technologically integrated learning experiences (Sarica & Usluel, 2016).

However, despite these advancements, there remains a scarcity of studies focusing on the application of digital storytelling to teach vocabulary within the area of inclusive and diverse education (Belda-Medina, 2022). While digital storytelling has been acknowledged as a valuable tool for enhancing English vocabulary acquisition among primary school pupils, including those with learning disabilities (Saridaki & Meimaris, 2018), its potential in inclusive education settings has not been fully explored. This paper aims to bridge this gap by analyzing the effect of digital storytelling on vocabulary learning related to inclusive and diverse education. It examines pre-service teachers' prior knowledge and digital skills in creating inclusive digital stories, and the impact of these stories on vocabulary learning among children aged 8-10. Employing a mixed-methods approach with participants from a teacher education program and primary education, the study reveals significant findings on the benefits of digital storytelling for vocabulary learning from an inclusive and diverse perspective, contributing to a broader understanding of its pedagogical value. The study aims to achieve three main objectives: firstly, to investigate the existing familiarity of pre-service teachers with digital storytelling practices; secondly, to evaluate the digital proficiency of teacher candidates in co-creating inclusive digital narratives; and thirdly, to gauge the impact of these inclusive digital narratives on vocabulary acquisition among children aged 8-10.

2. Literature Review

Digital storytelling has emerged as a dynamic tool in primary education, offering a multifaceted approach to teaching language skills, including vocabulary (Maya & Al Halim, 2021). By integrating multimedia research, production, and presentation with traditional literacy and oral skills, digital storytelling provides a compelling and engaging learning experience, particularly beneficial for young learners and those with learning disabilities (Leong et al., 2019). As Har et al. pointed out (2019), this innovative approach not only makes school-learned skills relevant to the broader world but also creatively addresses challenges in vocabulary mastery by leveraging technology to connect form, meaning, and use, thus facilitating speech acquisition and vocabulary retention.

The pedagogical potential of digital storytelling extends beyond vocabulary learning to include grammar, listening, and speaking skills. Activities designed around digital storytelling, such as creating narratives to illustrate different tenses or using digital tools to highlight parts of speech, enrich students' understanding of grammatical concepts (Liu et al., 2014). Moreover, the capacity of digital storytelling to blend visual, verbal, and audio elements creates an ideal medium for deep, reflective learning, thereby improving listening comprehension and engaging students in oral communication. This interactive learning environment not only enhances students' language skills but also their digital literacy, meeting the cognitive and emotional needs of young learners and making language learning more engaging and effective (Wu & Chen, 2020).

However, integrating digital storytelling into early childhood education is not without challenges. Skepticism from parents and educators about the impact of technology on young children, coupled with disparities in technology access and digital skills among students and teachers—particularly in developing countries—presents hurdles to its adoption (Beck & Neil, 2021). Despite these obstacles, digital storytelling remains a powerful tool for enriching primary education with creative, inclusive, and effective teaching methods.

Empirical studies underscore the benefits of digital storytelling in elementary education, demonstrating its effectiveness in enhancing students' language skills, engagement, and understanding of complex concepts (Smead et al., 2014). For instance, research on young ESL learners highlighted digital storytelling's positive impacts on vocabulary learning, attributing improvements to the method's interactivity and engaging format (Tajeri et al., 2017). Similarly, a study on the use of the digital storytelling application for improving explanatory text writing skills showed significant enhancements, further affirming digital storytelling's role in facilitating a deeper conceptual understanding among children compared to traditional methods (Tannkulu, 2022). These findings collectively affirm the value of digital storytelling in elementary education. By offering a multifaceted approach that leverages technology to make learning more interactive, enjoyable, and effective, digital storytelling enriches education across various language learning domains, proving to be an invaluable resource for educators and students alike (Yang & Wu, 2021).

Incorporating digital storytelling into teacher training programs represents a strategic approach to enhancing the pedagogical skills of educators, particularly in the area of primary education. These programs are meticulously designed to familiarize teachers with a suite of digital tools and applications, including but not limited to Pixton, Weebly, Storybird, and StoryboardThat. Such tools equip teachers with the capabilities to craft compelling audio-visual narratives, enriching their teaching repertoire with the skills necessary for creating engaging digital projects that resonate with the diverse learning needs of students (Şahin et al., 2022).

The essence of these training programs lies in their hands-on approach, encouraging teachers to engage in the creation of their digital stories. This immersive experience serves not only to foster their technical proficiency but also to deepen their understanding of digital storytelling's educational potential (Okumus, 2020). By navigating the challenges of video editing, sound integration, and

narrative construction, teachers emerge more confident and prepared to weave digital storytelling into their educational practices. Further emphasizing the value of digital storytelling in education, research provides a foundation of recommendations and guidelines aimed at maximizing its impact within teaching and learning activities (Güvey Aktay, 2020). These insights guide educators on effectively leveraging digital storytelling to foster a dynamic learning environment, one that nurtures creativity, critical thinking, and digital literacy among students.

Moreover, the inclusion of digital storytelling in teacher training extends to the area of vocabulary education, particularly for students with varied learning needs. By embedding vocabulary within memorable narratives and utilizing interactive storytelling techniques, teachers can significantly enhance vocabulary acquisition and retention (Karakuş et al., 2020). Tools such as Storybird, Pixton, and StoryboardThat offer accessible platforms for creating visually rich stories, thus facilitating an inclusive and engaging learning atmosphere conducive to the diverse needs of primary education students. Best practices for integrating digital storytelling into vocabulary training emphasize the importance of engaging, motivating strategies, and interactive storytelling (Zakaria et al., 2016). These practices not only support the acquisition of academic and content vocabulary but also ensure that learning experiences are personalized, relevant, and multimodally rich. As teachers tailor content to align with students' interests and experiences, they foster a more engaging and effective learning environment, thereby enhancing the educational experience for all learners, including English language learners and students with disabilities (Moradi & Chen, 2019).

Despite the growing interest in digital storytelling as an educational tool, there is a noticeable scarcity of studies specifically examining its use for enhancing English vocabulary learning from an inclusive perspective (Belda-Medina, 2022). This gap in research highlights a critical area for investigation, particularly given the potential of digital storytelling to offer engaging, multimodal learning experiences that cater to a wide range of learner needs and backgrounds. This paper addresses this gap by investigating the impact of digital storytelling on vocabulary learning from an inclusive perspective within English as a Foreign Language (EFL) settings. The primary objectives of the study are threefold: firstly, to explore pre-service teachers' prior knowledge of digital storytelling usage; secondly, to assess teacher candidates' digital skills in collaboratively creating digital stories with an inclusive viewpoint; and thirdly, to measure the effect of using these inclusive digital stories on vocabulary learning among children aged 8-10.

3. Methodology

3.1. Sample and context

The methodology employed a mixed-methods approach with convenience sampling, engaging 62 second-year college students from the University of Alicante in Spain, who were enrolled in a course titled "Integrating Skills in English." These students were tasked with creating digital stories in teams, aimed at promoting inclusivity and diversity for children, incorporating specific EFL activities. Implementation occurred in real classroom settings across various primary schools, involving 112 children aged 8-10. Ethical adherence was ensured by following the University of Alicante's guidelines, with all participants providing informed consent, ensuring data anonymity and confidentiality. School administrators and in-service teachers provided their approval for the digital stories to be employed in real-language classrooms with children. This consent was contingent upon the assurance that all collected data would be anonymized, and treated with confidentiality, and the implementation of these digital storytelling projects would be carefully monitored.

3.2. Instruments and Procedure

The research unfolded in several stages to evaluate the efficacy of integrating digital storytelling to teach inclusive vocabulary in English to primary education children aged 8-10. Initially, participants completed a questionnaire assessing their knowledge and experience with digital storytelling, along with a series of Moodle tasks focused on digital storytelling in language education. These tasks aimed to gauge participants' familiarity with digital storytelling techniques and their readiness to incorporate them into educational practices. Following the initial assessment, participants were randomly assigned to teams of 6-7 members each for project collaboration. They then underwent two training sessions dedicated to collectively creating digital stories from an inclusive and diverse perspective. These sessions covered various aspects such as script writing, tool selection, story design, and editing techniques, aiming to equip participants with the necessary skills to develop digital stories for educational purposes.

Subsequently, participants implemented their digital stories in real-classroom settings by presenting them to primary school children aged 8-10. Before implementation, participants coordinated with primary school administrators to arrange for the presentation of their stories. Utilizing their digital stories as teaching tools, participants conducted sessions in real classrooms focusing on inclusive English vocabulary. Additionally, they employed English as a Foreign Language (EFL) activities and vocabulary tests to measure the learning outcomes of the children after exposure to the digital storytelling treatment. After the implementation phase, teacher candidates shared their digital stories and the outcomes of their interventions with their peers. Engaging in reflective discussions, participants explored the potential benefits and limitations of using digital storytelling to teach

inclusive vocabulary in English. Finally, participants completed a post-survey about their level of satisfaction with the projects and teaching experience.

Quantitative data from pre- and post-surveys were analyzed using SPSS software. Concurrently, qualitative data, such as reflections and discussions, underwent thematic analysis utilizing QDA Miner software to uncover recurring themes and insights regarding the efficacy of digital storytelling in teaching inclusive vocabulary. This dual approach provided a comprehensive understanding of both the statistical shifts in attitudes and the qualitative perspectives on the integration of digital storytelling in promoting inclusivity and diversity within language education.

4. Results and Discussion

During the training sessions, teacher candidates engaged in the production of 12 digital stories aimed at teaching English language skills from an inclusive and diverse perspective. These narratives were organized into two broad categories: Special Needs and Cultural and Ethnic Diversity. Within the Special Needs category, a total of 8 digital stories were crafted, each addressing specific aspects of physical, sensory, and developmental challenges. Among these, three stories centered on physical mobility impairments, encompassing conditions such as multiple sclerosis and spina bifida, while another three focused on sensory impairments, including hearing loss and deafblindness. Additionally, two narratives were dedicated to neurological and developmental disorders, particularly Autism Spectrum Disorder. On the other hand, the Cultural and Ethnic Diversity category comprised four stories highlighting religious and ethnic diversity, with narratives centered around Jewish and Muslim communities. The remaining four stories delved into themes of migration and cultural differences, exploring the multifaceted experiences of individuals navigating diverse cultural landscapes. Table 1 includes a summary of these digital stories.

Table 1. Digital stories

Category	Story Title	Summary	Digital Tool
Special Needs	"Ariel and the Wheels of Hope"	Follows the journey of a mermaid with multiple sclerosis, promoting empathy and understanding.	Storyjumper
	"Hearing the World"	Explores the challenges of a child with hearing loss, fostering awareness.	Storybird
	"Tim and the unbreakable Spirit"	Chronicles the life of a child living with spina bifida, emphasizing strength and courage.	Storyboard That
	"Mousy's Magical Journey"	Provides insight into the life of a mouse with autism, promoting acceptance and inclusivity.	Pixton
	"Dreamland"	Portrays the dreams and aspirations of a child overcoming physical challenges with determination.	Pixton
	"We can see you"	Engages children in the vibrant world of a visually impaired protagonist.	Little Bird Tales
Cultural & Ethnic Diversity	"A Tale of Two Cultures"	Celebrates the similarities and differences between Jewish and Muslim traditions.	Little Bird Tales
	"A new home for all"	Explores the experiences of migrant families, highlighting cultural diversity.	Storyjumper
	"My roots and wings"	Examines the journey of identity for children of diverse ethnic backgrounds.	Storybird
	"Rania's new school"	Illustrates the bonds formed amidst cultural differences, fostering understanding.	Storyboard That
	"Zara and the Magic Carpet"	Explores cultural exchange through the adventures of children from different parts of the world.	Storyjumper
	"The amazing adventures of Samir and Maya"	Navigates the complexities of cultural adaptation through the lens of immigrant children.	Storyboard That

The diverse array of animation styles showcased in the digital stories reflects a thoughtful approach to catering to the varied needs and preferences of learners at different stages. For instance, in "Ariel and the Wheels of Hope," the incorporation of animals within the animation serves to captivate younger audiences, tapping into their fascination with the animal kingdom while subtly imparting valuable life lessons. Contrastingly, "Hearing the World" employs the timeless appeal of 2D animation to create an immersive auditory landscape, engaging learners with its imaginative depiction of sound and fostering creativity and critical thinking skills. On the other hand, "Tim and the Unbreakable Spirit" embraces the cutting-edge technology of dynamic 3D animation, appealing to older students and offering a visually stunning experience that enhances their understanding of complex themes such as resilience and perseverance. Finally, "Zara and the Magic Carpet" transports viewers to a world of enchantment and wonder,

drawing inspiration from classic fairy tales to evoke a sense of nostalgia. Through the integration of these digital styles, each story not only transports children into realms of fantasy but also serves as a powerful educational tool, instilling important values and fostering holistic development in learners.

Figure 1. Samples of digital stories. ‘Ariel and the New Wheels of Hope’ (Left) and ‘Mousy’s magical journey’ (Right)



Once upon a time there was a little mouse named Mousy, who lived alone in a house located in a beautiful village

Regarding the pre-survey results, the data shown in Table 1 indicates that a relatively low percentage of teacher candidates had prior experience, formal training, and awareness regarding digital storytelling in education, with percentages ranging from 12.8% to 22.3%, which is consistent with previous findings (Kocaman-Karoglu, 2016). However, there is a slightly higher belief (21.4%) in the potential of digital storytelling to enhance student engagement and learning outcomes. These results suggest a potential gap in knowledge and training among teacher candidates regarding the integration of digital storytelling into teaching practices. Addressing this gap through targeted professional development and training opportunities could help empower educators to leverage digital storytelling effectively to enrich the educational experience and improve student outcomes, as suggested by Heo (2009).

Table 2. Participants’ previous knowledge and experience with digital storytelling

Item	M	SD
1 Have you previously used digital storytelling tools or platforms in your educational practices?	22.3%	0.92
2 Do you feel confident in your ability to integrate digital storytelling into your teaching practices?	16.3%	0.81
3 Have you received formal training or professional development related to digital storytelling in education?	12.8%	0.86
4 Are you aware of the potential benefits of using digital storytelling in educational settings?	15.7%	0.75
5 Do you believe that digital storytelling can enhance student engagement and learning outcomes?	21.4%	1.12

In the subsequent stage, teacher candidates effectively utilized their digital stories and EFL activities to teach English to 112 students across six Primary Education schools. The EFL activities, meticulously designed to align with the vocabulary used in the stories, aimed at enhancing listening comprehension and speaking skills. The digital stories incorporated inclusive vocabulary across various domains, encompassing Special Needs and Cultural, Ethnic, and Religious Diversity. Terms such as "wheelchair," "braille," "sign language," "autism," "guide dog," and 'crutches' were woven into the narratives, promoting understanding and acceptance. Similarly, elements of cultural diversity were depicted through terms like 'Kimono', 'Diwali', 'Sari', and 'Hanukkah', fostering appreciation for different cultural traditions and practices. The inclusive vocabulary helped to promote empathy and cultural awareness among the children. To assess their comprehension and retention of the vocabulary, the children were tasked with completing a short pretest consisting of five multiple-choice questions related to the vocabulary, followed by watching the digital story. Afterwards, they completed a posttest, allowing educators to gauge the effectiveness of the digital stories in enhancing vocabulary acquisition and fostering inclusivity among the students.

Table 3. Samples of EFL questions (multiple choice). Pre-post-test

Digital story: ‘Dreamland’	Digital story: ‘We can see you’
What helps someone walk if they have difficulty? a. Crutches b. Hat c. Ball d. Pen	What's the system blind people use to read? a. Braille b. Alphabet c. Numbers d. Symbols

Overall, the results displayed in Table 4 indicate a significant improvement in vocabulary learning related to inclusive and diverse education following the utilization of digital stories. Among the tales with the most notable improvements in post-test scores, "My

Roots and Wings" and "The Amazing Adventures of Samir and Maya" stand out, with post-test scores of 76% and 75%, respectively. These stories demonstrated a substantial increase in correct answers compared to their pre-test scores, indicating the effectiveness of the narratives in enhancing vocabulary acquisition. Additionally, "Tim and the Unbreakable Spirit" and "We Can See You" also exhibited considerable improvements, with post-test scores of 71% and 68%, respectively. Conversely, while some stories such as "Dreamland" and "Hearing the World" showed lower pre-test scores, they still demonstrated notable enhancements in post-test scores, highlighting the overall efficacy of digital storytelling in promoting vocabulary learning related to inclusivity and diversity (Skouge & Rao, 2009).

Table 4. Inclusive vocabulary pre-post-test results.

Digital Story	Pre-test scores (correct answers)	Post-test scores (correct answers)
"Ariel and the Wheels of Hope"	15%	68%
"Hearing the World"	12%	56%
"Tim and the unbreakable Spirit"	21%	71%
"Mousy's magical Journey"	19%	63%
"Dreamland"	11%	54%
"We can see you"	21%	68%
"A Tale of Two Cultures"	22%	54%
"A new home for all"	18%	59%
"My roots and wings"	27%	76%
"Rania's new school"	23%	62%
"Zara and the magic carpet"	21%	69%
"The amazing adventures of Samir and Maya"	28%	75%

The teacher candidates expressed satisfaction in the utilization of their own digital stories within the classroom setting, noting the high level of engagement and participation observed among the children during the EFL activities. They highlighted the enthusiasm displayed by the students as they interacted with the narratives and actively engaged in vocabulary exercises and discussions inspired by the stories. Furthermore, the in-service teachers who monitored the activity commended the effectiveness of the digital stories in facilitating learning and fostering inclusivity and respect among the children. In line with previous findings (Yang & Wu, 2021), they emphasized that exposure to diverse narratives and vocabulary through digital storytelling not only cultivates empathy and respect but also serves as a powerful deterrent against discriminatory behavior and bullying in the school environment. Recognizing the potential of inclusive education materials to promote understanding and acceptance of differences among students, they advocated for the integration of such resources into the curriculum as a proactive measure to foster a safe and inclusive learning environment for all. This acknowledgement further reinforces the significance of incorporating inclusive and diverse materials, like the digital stories developed by the teacher candidates, into educational practices to promote positive social interactions and prevent instances of bullying among children (Rubegni et al., 2022).

In the subsequent stage, teacher candidates participated in a collaborative sharing session where they presented their digital stories and reflected on their teaching experiences with the rest of the class. This interactive exchange provided an opportunity for the candidates to showcase their innovative approaches to integrating digital storytelling into English as a Foreign Language (EFL) instruction from an inclusive perspective (Hava, 2021). Following the presentations, the class engaged in discussions exploring the affordances and limitations of utilizing digital storytelling as a pedagogical tool in the EFL classroom. These discussions delved into the various benefits of digital storytelling, such as its ability to captivate student interest, foster language acquisition, and promote cultural understanding and empathy. Simultaneously, the candidates also critically examined the challenges and constraints associated with incorporating digital storytelling, including access to technology, time constraints, and the need for appropriate training and resources (Belda-Medina, 2022). Through this reflective dialogue, teacher candidates gained valuable insights into the effective utilization of digital storytelling to enhance language instruction while promoting inclusivity and diversity within the classroom setting.

The data included in Table 5 reveals several significant results regarding the benefits and challenges associated with integrating digital storytelling into the EFL classroom. Overwhelmingly, teacher candidates highlighted the positive impact of digital stories on student engagement, language development, awareness raising, and inclusivity promotion, with percentages ranging from 76.5% to 87.0%. These comments underscore the effectiveness of digital storytelling in captivating student interest, improving language skills, fostering cultural appreciation, and promoting empathy towards diverse perspectives (Maya & Al Halim, 2021). However, challenges such as limited resources, time constraints in implementation, the need for better training, and technical support were also noted, with percentages ranging from 42.5% to 61.5%. These challenges reflect the practical hurdles faced by

educators in accessing necessary resources, finding time for implementation, and receiving adequate training and technical assistance to effectively integrate digital storytelling into their teaching practices. Despite these challenges, the overwhelmingly positive feedback regarding the benefits highlights the potential of digital storytelling as a valuable tool for enhancing language learning and promoting inclusivity in the EFL classroom (Okumus, 2020).

Table 5. Qualitative analysis (QDA Miner). Participants' perceptions of digital storytelling creation and implementation

Benefits	Main Themes	Freq.	Comments
	Student engagement	81.5%	"The digital stories grabbed the students' attention and kept them focused."
	Language Development	87.0%	"I noticed a significant improvement in students' vocabulary after using the stories."
	Raises awareness	76.5%	"The stories helped students appreciate different cultures and traditions."
	Promotes inclusivity	81.0%	"Students showed more empathy towards characters with disabilities after the stories."
Challenges	Main Themes	Freq.	Comments
	Limited resources	61.5%	"Not all schools have access to electronic devices (screens), which limits the use of digital stories."
	Time constraints in the implementation	52.5%	"Finding time to incorporate digital storytelling into the curriculum can be challenging."
	Need for better training	51.0%	"We could benefit from more training on how to effectively use digital storytelling in the EFL classroom"
	Technical support	42.5%	"We struggled to find free tools to create our stories for certain topics and student needs."

5. Conclusion

Based on the research objectives, the conclusions drawn from the analysis of the data highlight significant findings regarding the efficacy of digital storytelling in promoting vocabulary learning within inclusive and diverse educational settings. Firstly, the study aimed to analyze pre-service teachers' previous knowledge and digital skills in creating inclusive digital stories. The findings reveal a notable gap in pre-service teachers' prior experience, formal training, and awareness regarding digital storytelling in education. However, despite these initial challenges, participants demonstrated a willingness to engage in the creation of inclusive digital stories, showcasing their potential to embrace innovative pedagogical approaches.

Secondly, the study sought to explore the impact of digital stories on vocabulary learning among children aged 8-10 in primary education. The results indicate a significant improvement in vocabulary learning outcomes following exposure to digital stories. Notably, stories such as "My Roots and Wings" and "The Amazing Adventures of Samir and Maya" exhibited substantial increases in post-test scores, indicating the effectiveness of the narratives in enhancing vocabulary acquisition. These findings underscore the potential of digital storytelling as a powerful educational tool for promoting language development and fostering inclusivity among young learners.

Furthermore, the study aimed to investigate the benefits and challenges associated with integrating digital storytelling into the EFL classroom from an inclusive perspective. The qualitative analysis of participants' feedback revealed positive perceptions of digital storytelling, highlighting its ability to engage students, enhance language development, raise awareness, and promote inclusivity. However, practical challenges such as limited resources, time constraints, and the need for better training and technical support were also identified, indicating areas for improvement in implementing digital storytelling initiatives in educational settings.

In conclusion, the study provides valuable insights into the pedagogical value of digital storytelling in promoting vocabulary learning and fostering inclusivity within diverse classrooms. The findings underscore the importance of integrating innovative pedagogical approaches, such as digital storytelling, into teacher training programs to equip educators with the necessary skills and resources to effectively leverage technology in the classroom. Additionally, the study highlights the need for ongoing professional development and support to address practical challenges and ensure the successful implementation of digital storytelling initiatives in educational contexts. The implications of this research extend to curriculum development, teacher training, and policy formulation, with the aim of creating inclusive and engaging learning environments that cater to the diverse needs of students.

6. Study Limitations and Future Research

Despite the promising findings regarding the effectiveness of digital storytelling in promoting vocabulary learning and inclusivity, several limitations should be acknowledged. Firstly, the study focused primarily on pre-service teachers and children aged 8-10 in primary education, limiting the generalizability of the findings to other educational contexts and teacher populations. Additionally, the study predominantly utilized self-report measures and qualitative analysis, which may introduce biases and subjectivity into the data. Furthermore, the duration of the intervention and follow-up period may have been insufficient to fully assess the long-term impact of digital storytelling on vocabulary acquisition and inclusivity. Future research could address these limitations by conducting longitudinal studies with larger and more diverse participant samples, including in-service teachers and students from a wider age range. Additionally, incorporating objective measures of vocabulary learning, such as standardized assessments or observational data, could provide more robust evidence of the effectiveness of digital storytelling interventions. Moreover, exploring the role of digital storytelling in promoting other aspects of language development, such as grammar and writing skills, could further enrich our understanding of its potential benefits in the EFL classroom. Finally, investigating the perspectives of parents, school administrators, and other stakeholders on the integration of digital storytelling into inclusive education practices could offer valuable insights into the broader impact of these initiatives on the learning ecosystem.

Funding: This research received no external funding

Conflicts of Interest: The authors declare no conflict of interest.

ORCID iD <https://orcid.org/0000-0003-0115-0417> and <https://orcid.org/0000-0002-8781-014X>

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

References

- [1] Abdul-Ameer, M. A. (2014). Improving vocabulary learning through digital stories with Iraqi young learners of English at the primary level. *Journal of Studies in Social Sciences*, 8(2).
- [2] Beck, M. S., & Neil, J. A. (2021). Digital storytelling: A qualitative study exploring the benefits, challenges, and solutions. *CIN: Computers, Informatics, Nursing*, 39(3), 123-128.
- [3] Belda-Medina, J. (2022). Promoting inclusiveness, creativity and critical thinking through digital storytelling among EFL teacher candidates. *International Journal of Inclusive Education*, 26(2), 109-123.
- [4] Güvey A, E. (2020). Writing a Folktale as an Activity of Written Expression: Digital Folktales with StoryJumper. *Educational Policy Analysis and Strategic Research*, 15(3), 159-185.
- [5] Har, A. L. C., Mohamad, J. Z. A., & Jamal, S. S. (2019). The benefits and drawbacks of using tablet-based digital storytelling in vocabulary learning among Malaysian young English as a Second Language (ESL) learners. *Asia Pacific Journal of Educators and Education*, 34, 17-47.
- [6] Hava, K. (2021). Exploring the role of digital storytelling in student motivation and satisfaction in EFL education. *Computer Assisted Language Learning*, 34(7), 958-978.
- [7] Heo, M. (2009). Digital storytelling: An empirical study of the impact of digital storytelling on pre-service teachers' self-efficacy and dispositions towards educational technology. *Journal of Educational Multimedia and Hypermedia*, 18(4), 405-428.
- [8] Karakuş, M., Türkkkan, B. T., & Namlı, N. A. (2020). Investigation of the Effect of Digital Storytelling on Cultural Awareness and Creative Thinking. *Education & Science/Eğitim ve Bilim*, 45(203), 64-71.
- [9] Kegenhof, A., Cutrim Schmid, E., & Whyte, S. (2014). Digital storytelling in the primary EFL classroom. *Teaching Languages with Technology: Communicative Approaches to Interactive Whiteboard Use*, 86.
- [10] Kocaman-Karoglu, A. (2016). Personal voices in higher education: A digital storytelling experience for pre-service teachers. *Education and Information Technologies*, 21, 1153-1168.
- [11] Kristiawan, D., Ferdiansyah, S., & Picard, M. (2022). Promoting vocabulary building, learning motivation, and cultural identity representation through digital storytelling for young Indonesian learners of English as a foreign language. *Iranian Journal of Language Teaching Research*, 10(1), 19-36.
- [12] Maya, L., & Al Halim, M. L. (2021). The Effectiveness of Digital Storytelling for Young Learners' Vocabulary Mastery. *Karangan: Jurnal Bidang Kependidikan, Pembelajaran, dan Pengembangan*, 3(2), 67-72.
- [13] Leong, A. C. H., Abidin, M. J. Z., & Saibon, J. (2019). Learners' perceptions of the impact of using digital storytelling on vocabulary learning. *Teaching English with Technology*, 19(4), 3-26.
- [14] Liu, C. C., Wu, L. Y., Chen, Z. M., Tsai, C. C., & Lin, H. M. (2014). The effect of story grammars on creative self-efficacy and digital storytelling. *Journal of Computer Assisted Learning*, 30(5), 450-464.
- [15] Moradi, H., & Chen, H. (2019). Digital storytelling in language education. *Behavioral Sciences*, 9(12), 147.
- [16] Okumus, A. (2020). The perceptions and preferences of 8th grade students in digital storytelling in English. *International Online Journal of Education and Teaching*, 7(2), 585-604.
- [17] Rodríguez, C. L., García-Jiménez, M., Massó-Guijarro, B., & Cruz-Gonzalez, C. (2021). Digital storytelling in education: A systematic review of the literature. *Review of European Studies*, 13.
- [18] Rubegni, E., Landoni, M., Malinverni, L., & Jaccheri, L. (2022). Raising awareness of stereotyping through collaborative digital storytelling: Design for change with and for children. *International Journal of Human-Computer Studies*, 157, 102727.
- [19] Şahin, A. N. E., & Hatice, K. A. R. A. (2022). A digital educational tool experience in history course: Creating digital comics via Pixton Edu. *Journal of Educational Technology and Online Learning*, 5(1), 223-242.
- [20] Sarca, H. Ç., & Usluel, Y. K. (2016). The effect of digital storytelling on visual memory and writing skills. *Computers & Education*, 94, 298-309.

- [21] Saridaki, M., & Meimaris, M. (2018, June). Digital Storytelling for the empowerment of people with intellectual disabilities. In *Proceedings of the 8th international conference on software development and technologies for enhancing accessibility and fighting info-exclusion* (pp. 161-164).
- [22] Schmoelz, A. (2018). Enabling co-creativity through digital storytelling in education. *Thinking skills and creativity*, 28, 1-13.
- [23] Sembiring, D. L. B., & Simajuntak, D. C. (2023). Digital Storytelling as an Alternative Teaching Technique to Develop Vocabulary Knowledge of EFL Learners. *Journal of Languages and Language Teaching*, 11(2), 211-224.
- [24] Skouge, J. R., & Rao, K. (2009). Digital storytelling in teacher education: Creating transformations through narrative. *Educational Perspectives*, 42, 54-60.
- [25] Smeda, N., Dakich, E., & Sharda, N. (2014). The effectiveness of digital storytelling in the classrooms: a comprehensive study. *Smart Learning Environments*, 1, 1-21.
- [26] Tajeri, M., Syal, P., & Marzban, S. (2017). Enhancing Vocabulary and Writing Skills through Digital Storytelling in Higher Education. *Journal of Educational Technology*, 14(3), 40-48.
- [27] Tanrikulu, F. (2022). Students' perceptions about the effects of collaborative digital storytelling on writing skills. *Computer Assisted Language Learning*, 35(5-6), 1090-1105.
- [28] Wu, J., & Chen, D. T. V. (2020). A systematic review of educational digital storytelling. *Computers & Education*, 147, 103786.
- [29] Yang, Y. T. C., & Wu, W. C. I. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & education*, 59(2), 339-352.
- [30] Zakaria, S. M., Yunus, M. M., Nazri, N. M., & Shah, P. M. (2016). Students' experience of using Storybird in writing ESL narrative text. *Creative Education*, 7(15), 2107-2120.