



Enhancing Digital Teaching: Active Learning and Generative Artificial Intelligence

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1. Digital Stories: How Teachers Can Harness Digital Storytelling for Learning

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Abstract

This article presents the Integrated Digital Storytelling framework, a pedagogical model designed to embed digital storytelling into educational practice in structured, inclusive, and adaptable ways. Grounded in constructivist and narrative learning theories, digital storytelling enables students to express ideas creatively, engage deeply with curricular content, and develop key 21st-century competencies such as critical thinking, collaboration, and digital literacy. The framework unfolds across five interconnected phases: Narrative Inquiry, Digital Composition, Co-Creation, Interaction and Immersion, and Reflection and Assessment. These phases are scaffolded by practical strategies and supported by tools such as Storyboard That, Storyboarder, and Storyboard AI, which facilitate narrative design and multimedia production. By incorporating scriptwriting, peer feedback, and visual storyboarding, the framework fosters not only technical proficiency but also cognitive and emotional engagement. The article also addresses challenges and ethical considerations, including digital access, representation, and student wellbeing. This research contributes to the expanding field of digital pedagogy by offering a replicable model that empowers teachers to use storytelling as a vehicle for personalised, creative, and transformative learning.

Keywords

AI Tools, digital storytelling, digital stories, educational technology,

1. Introduction

In today's rapidly evolving educational landscape, engaging students meaningfully while equipping them with future-ready skills is a central challenge for teachers worldwide. Digital storytelling (DST) has emerged as a powerful pedagogical approach that addresses this challenge by blending traditional narrative structures with digital media tools such as text, images, video, and audio to create immersive, expressive learning experiences (Ogbeiwi et al., 2024; Robin, 2016; Gangan, 2014; Kogila et al., 2020). Rooted in constructivist and narrative learning theories, DST promotes active learning, personal relevance, and emotional engagement, all of which are essential for deeper understanding and long-term knowledge retention (Robin, 2008). Far from being a simple multimedia project, DST positions learners as active agents in their own educational journeys, enabling them to explore topics through personal voice, critical inquiry, and creative expression. Numerous studies have demonstrated the pedagogical value of DST in fostering 21st-century skills such as creativity, communication, collaboration, critical thinking, and digital literacy skills identified as essential for thriving in complex, technology-rich societies (Mannion & Lontas, 2018; Isaacs et al., 2024).

Beyond skill development, DST also enhances learner motivation, promotes social-emotional competencies, and supports differentiated instruction by accommodating diverse learning styles and needs (Cao, 2024). However, despite its clear benefits, the effective and sustainable implementation of DST in everyday classroom practice remains limited. This is due, in part, to challenges related to technological literacy, unequal access to digital resources, and the lack of structured pedagogical models that teachers can readily adopt and adapt to their own educational contexts (West, 2012). At the same time, the emergence of generative artificial intelligence (AIGen) offers new opportunities to enrich DST in ways that are more interactive, inclusive, and adaptive. AI tools can support students in tasks such as scriptwriting, multimedia editing, and personalised feedback, thereby enhancing the storytelling process and expanding access to DST for learners with varied abilities and backgrounds (Cao, 2024; Zhai et al., 2021). While not the focus of this study, the thoughtful integration of selected AI tools can complement DST and support inclusive, student-centred learning environments.

To address the ongoing challenges of implementing digital storytelling (DST), this article presents a practical and replicable pedagogical model designed to support educators in embedding DST meaningfully into their practice. The framework comprises five interconnected phases: Narrative Inquiry, Digital Composition, Co-Creation, Interaction and Immersion, and Reflection and Assessment. Each phase incorporates strategies, tools, and activities that scaffold the storytelling process while fostering student engagement, creativity, autonomy, and reflective thinking. Importantly, the framework emphasises the *optional* use of accessible generative AI tools to support differentiated learning and enhance

pedagogical flexibility—without overshadowing the central role of narrative and human creativity. The core aim of this article is to demonstrate how teachers can harness DST as a powerful pedagogical strategy that enables meaningful, inclusive, and transformative learning. The framework is explored in authentic classroom contexts through activities such as training simulations, interactive presentations, quizzes, and virtual learning environments. This article offers a theory-informed, practice-oriented framework that enables teachers to adopt DST in a structured, purposeful, and adaptable manner. In doing so, it responds to the growing demand for innovative, student-centred, and technology-enhanced pedagogies in 21st-century education, opening new pathways for storytelling as a tool for connection, reflection, and deeper understanding.

The article is structured as follows: the next section presents the background and theoretical underpinnings of digital storytelling in education, followed by a detailed explanation of the Integrated Digital Storytelling framework. Subsequent sections address the challenges and ethical considerations involved in its implementation, and the article concludes with reflections and future directions for integrating DST into educational practice.

2. Background

Digital storytelling is deeply embedded in human culture, serving as a vehicle for sharing knowledge, fostering self-awareness, and building community (Davis & Restrepo, 2003). As Gersie and King (1989) noted, stories weave together fiction and reality, transforming personal experiences into narratives that resonate with others. In educational settings, digital storytelling integrates narrative techniques with digital tools, enhancing creativity and engagement by allowing students to express themselves and share knowledge effectively (Gangan, 2014). It utilises a clear narrative structure alongside multimedia elements, text, images, audio, and video, catering to diverse learning styles and making learning more interactive and accessible (Gangan, 2014; Kogila et al., 2020). This multimodal approach is particularly relevant in contemporary classrooms where students engage with a variety of media formats. Storytelling in higher education, specifically, offers a multitude of pedagogical benefits. It contributes to the development of critical thinking, strengthens teamwork skills, and increases student motivation (Vinnikova, 2022; Zaitseva et al., 2024). Moreover, storytelling helps lecturers explain complex content in engaging and comprehensible ways, fostering core academic competencies including listening, speaking, reading, and writing (Cruz, 2019; Vinnikova, 2022). In traditionally abstract disciplines such as mathematics, storytelling can also help students reconcile the relevance of the subject to society and their personal lives, equipping them with valuable collaborative skills (Hernandez-Martinez & Keane, 2024).

Digital storytelling aligns closely with constructivist and narrative learning theories, which emphasise active participation, personal relevance, and deep learning processes

(Ogbeiwi et al., 2024). Storytelling enables students to develop higher-order thinking skills by researching, organising, and expressing ideas, as well as connecting learning to personal meaning (Robin, 2008; Muller et al., 2006; Sadik, 2008). Through the creation of digital stories, students gain a sense of self, community, and agency (Jiang, 2024). Moreover, digital storytelling supports the development of 21st-century skills such as critical thinking, creativity, collaboration, and digital literacy, preparing students to navigate complex and unpredictable challenges (Mannion & Lontas, 2024; Isaacs et al., 2024). In this regard, digital storytelling can serve as a powerful tool for teachers seeking to create student-centred, project-based learning environments. It facilitates deep learning by actively engaging students in the construction of meaning through narrative, while simultaneously cultivating digital and media literacies that are essential in today's knowledge society (Condy et al., 2012). It also promotes language learning by supporting reading comprehension and creative expression (Bakar, 2019), making it especially valuable in multilingual and multicultural classrooms. When used strategically, it supports the integration of technology in pedagogically meaningful ways and enables learners to engage with content at both emotional and cognitive levels (Dalim et al., 2019).

Robin (2006) classifies digital storytelling into personal narratives, historical documentaries, and instructional stories, each fostering meaningful engagement by connecting learning content with students' lives and experiences (Lambert & Hessler, 2013; Yang et al., 2020). For instance, students might create a personal narrative to reflect on a life event, a historical documentary to explore a significant moment in history, or an instructional story to explain a concept to peers, each format enhancing motivation and learning (Sadik, 2008). Research shows that creating digital stories allows students to express ideas creatively, encourages critical analysis, and supports collaborative skills through group projects (Beck & Neil, 2021; Miao & Lingling, 2024). Importantly, digital storytelling has also demonstrated psychotherapeutic potential, particularly in mental health contexts, where it can reduce symptoms of depression and support recovery processes (Ogbeiwi et al., 2024). Studies highlight that sharing personal stories can promote self-awareness, resilience, and a sense of community (Jiang, 2024), which can be mirrored in educational contexts as students gain confidence and a sense of ownership over their learning (Robin, 2008; Sadik, 2008). Despite its many advantages, digital storytelling is not without challenges. Varying levels of digital literacy among students and educators can hinder its effective implementation (Cao, 2024), while disparities in access to technology and resources across schools limit widespread adoption (West, 2012). Furthermore, integrating digital storytelling meaningfully into the curriculum requires thoughtful pedagogical design and ongoing teacher training in both technical and narrative aspects (Mannion & Lontas, 2024; Isaacs et al., 2024).

Digital storytelling offers a rich, creative, and interactive approach to learning. It encourages students to engage deeply with content, fosters critical and creative thinking, and builds essential communication and collaboration skills. When effectively integrated, it

supports diverse pedagogical goals and enhances student learning across disciplines. However, its successful adoption depends on addressing technological barriers, ensuring equitable access to resources, and supporting educators in acquiring the skills necessary to guide students through the storytelling process (Ogbeiwi et al., 2024). As such, digital storytelling represents both a powerful opportunity and a pedagogical challenge, but one that holds significant promise for those educators seeking to harness its potential for transformative learning in the 21st century.

3. Integrated digital storytelling

This chapter introduces the Integrated Digital Storytelling framework, a structured pedagogical model designed to enhance educational practice in meaningful, scalable, and inclusive ways. Digital storytelling (DST), by combining narrative techniques with digital tools such as images, text, audio, and video, offers learners a platform to share experiences, knowledge, and ideas both creatively and critically (Gangan, 2014; Kogila et al., 2020). The process supports diverse learning styles and is grounded in constructivist and narrative learning theories, which emphasise active participation, personal connection, and deep learning through authentic experiences (Ogbeiwi et al., 2024). Moreover, DST fosters essential 21st-century competencies, including critical thinking, creativity, collaboration, and digital literacy, preparing students for complex, real-world challenges (Mannion & Lontas, 2024; Isaacs et al., 2024).

The proposed framework, titled Integrated Digital Storytelling (IDST), unfolds across five interconnected pedagogical phases:

1. **Narrative Inquiry:** Students explore topics, brainstorm ideas, and generate guiding questions. This phase fosters critical thinking, inquiry-based learning, and authentic expression, aligning content with students' experiences and promoting personal relevance (Robin, 2008). Techniques such as story circles collaborative group discussions where students share drafts and ideas support the co-construction of narratives (Lambert, 2013). Writing prompts (e.g., personal milestones, moments of change) help spark reflection and self-discovery.
2. **Digital Composition:** Students draft scripts, storyboard their ideas, and select or create multimedia elements (e.g., images, audio, video, animations). Scriptwriting is foundational; a compelling narrative serves as the backbone of an impactful digital story (Robin, 2006). Notes, overemphasis on technology at the expense of narrative coherence can lead to superficial outcomes. Therefore, educators should prioritise story development, treating the script as an independent artefact before integrating digital tools.

3. **Co-Creation:** In this optional phase, students engage with generative AI tools such as language models or AI storyboard generators (e.g., Storyboard AI) to expand, refine, or adapt their narratives. AI can simulate dialogue, suggest improvements, or generate visual content, providing differentiated support for learners with diverse needs (Cao, 2024). This step also introduces students to critical AI literacy and ethical considerations.
4. **Interaction and Immersion:** Students transform their stories into interactive learning experiences using platforms like websites, apps, or digital portfolios. Incorporating elements such as branching narratives, embedded quizzes, or virtual tours enhances engagement and decision-making. AI tools can personalise story pathways based on user inputs, offering adaptive learning experiences (Zhai et al., 2021).
5. **Reflection and Assessment:** In this final phase, students and teachers engage in reflective analysis of the digital stories. Learners evaluate narrative coherence, media integration, and emotional impact, using rubrics, self-assessments, and peer feedback. Reflection prompts whether teacher-guided or AI-generated encourage metacognitive growth and help learners articulate what they have learned (Isaacs et al., 2024).

To support the effective implementation of this framework, a wide range of digital tools is available to assist both the creative and technical aspects of the process. For instance, Storyboard That offers an intuitive platform for creating visual storyboards that help students sequence and organise their ideas clearly. Similarly, Storyboarder provides a free and flexible environment for sketching and arranging scenes, enhancing visual storytelling and planning. Storyboard AI, a generative AI tool, automatically converts textual descriptions into illustrated storyboard scenes, offering valuable support for learners with varying levels of artistic skill.

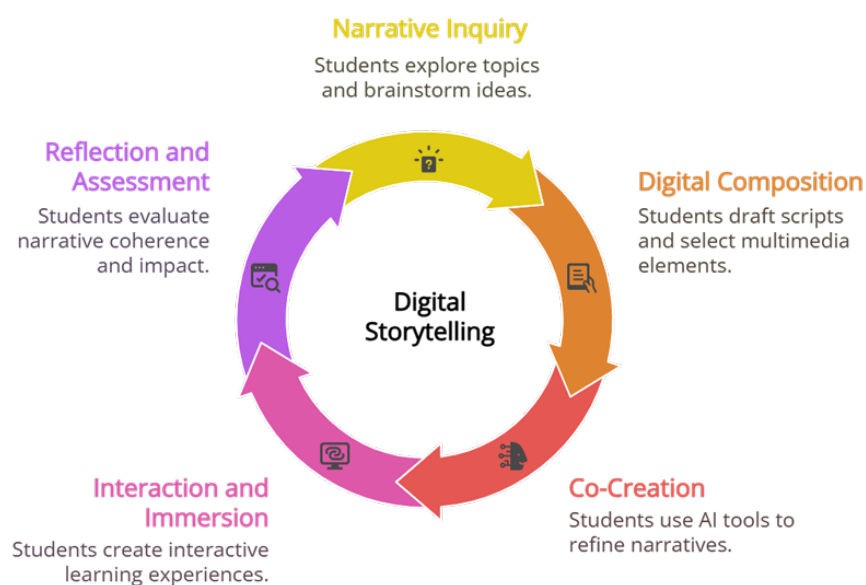


Figure 1: Steps to Digital Storytelling

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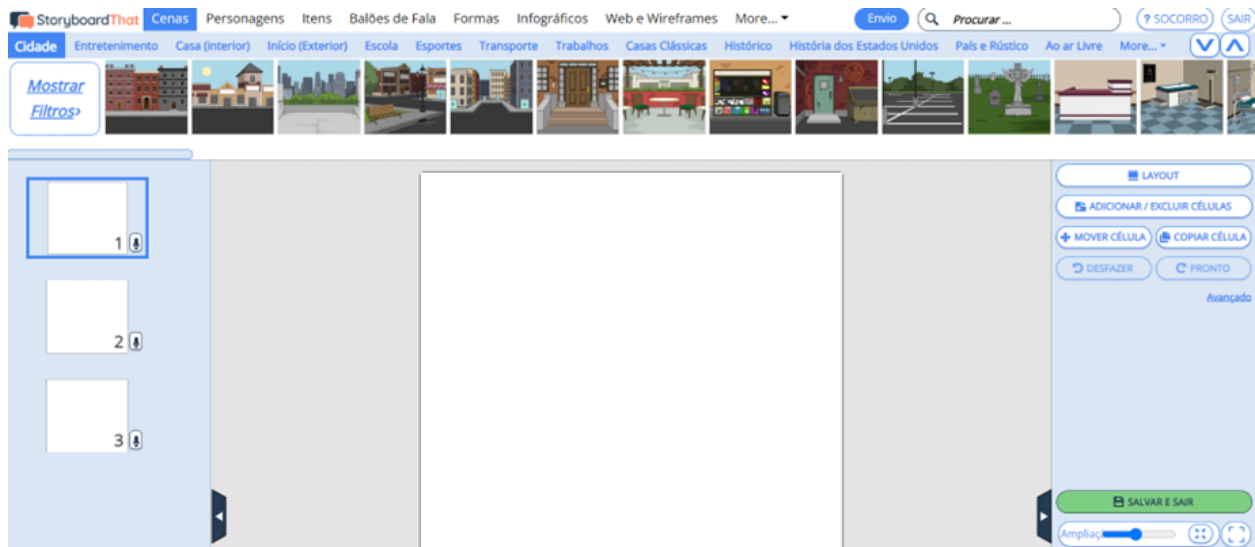


Figure 2: Storyboard That App for creating storyboards

In the production phase, tools such as Animoto and iMovie enable learners to blend visuals, narration, and music into cohesive and compelling stories. For audio editing, Audacity provides accessible, professional-grade functionality, allowing students to record, clean, and mix soundtracks. Furthermore, access to royalty-free music libraries (e.g., Free Music Archive, Jamendo, ccMixter) ensures ethical compliance with copyright regulations while enriching the emotional tone of student work.

Scriptwriting plays a critical role in the DST process. A well-crafted script communicates meaning, emotional depth, and structure, even without multimedia. Educators should encourage iterative drafting, peer review, and collaborative refinement to elevate the narrative quality (Lambert, 2013). Likewise, storyboarding supports the visual organisation of stories. Tools like Canva's Storyboard Creator or PowerPoint templates help students arrange scenes, narration, and transitions clearly before entering the production stage.

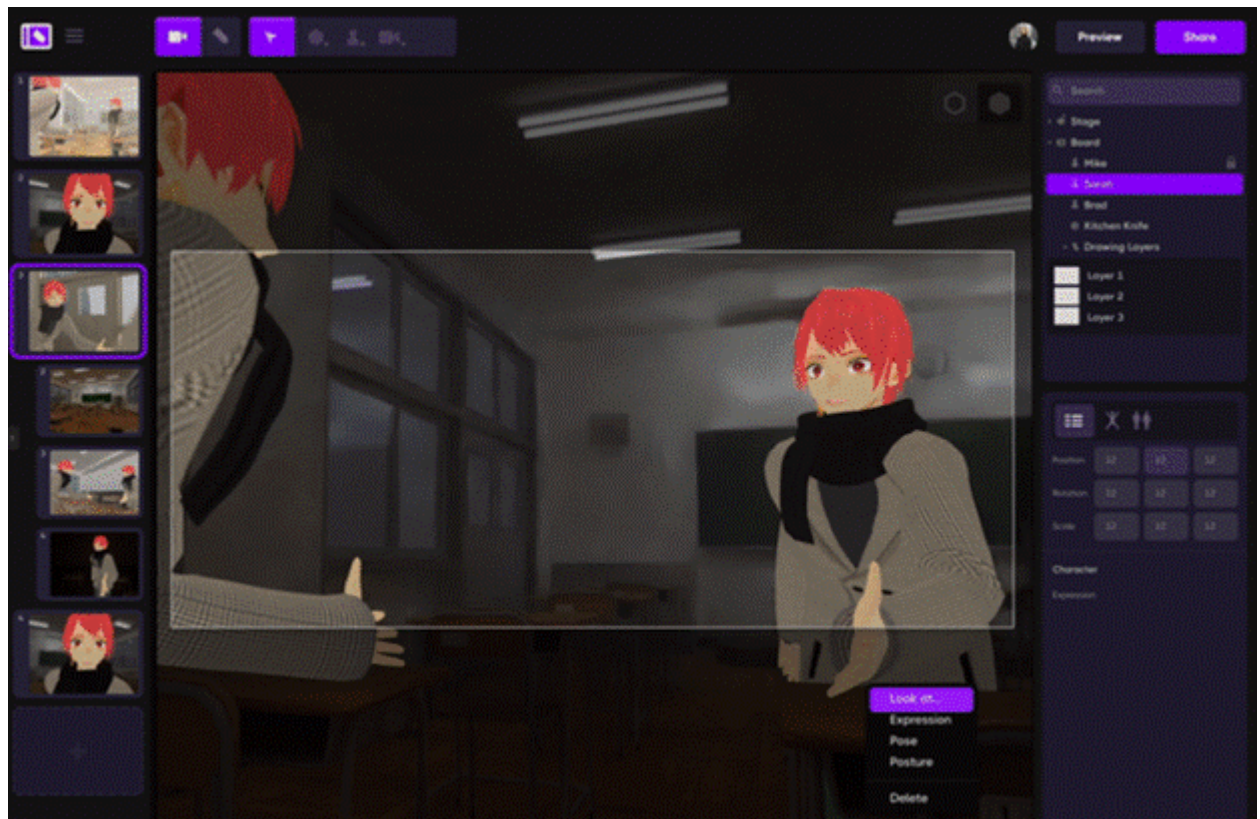


Figure 3: Storyboarder for story creating

Storyboarder (<https://storyboarder.com/>) allows both amateur and professional users to visualise their ideas through sketching and scene sequencing. Storyboard AI (<https://krock.io/storyboard-ai/>) enhances this by generating visual storyboards from text input, streamlining the creation process in educational, media, and content design settings.

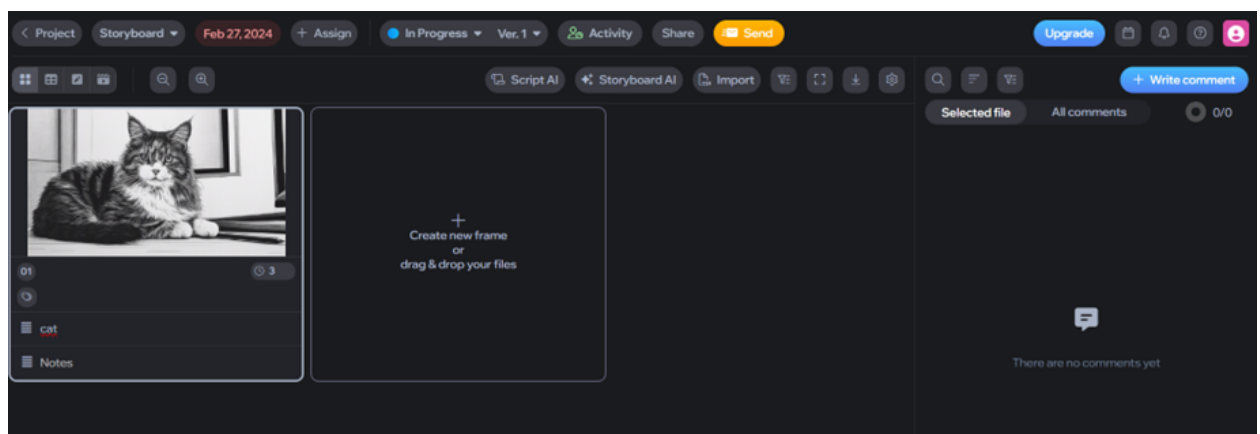


Figure 4: Storyboard AI for creating storyboards

Digital storytelling, supported where appropriate by AI tools, represents a pedagogically sound and student-centred approach to teaching and learning. By navigating the five interconnected phases, students develop not only technical proficiency but also cognitive,

social, and emotional competencies essential for lifelong learning. For educators, the IDST framework offers a structured and adaptable model applicable across disciplines; for researchers, it provides a foundation for investigating how digital storytelling and emerging technologies contribute to inclusive and transformative education.

4. Challenges and ethical considerations

While digital storytelling offers rich opportunities for creativity, engagement, and learner agency, its implementation is not without challenges many of which carry significant pedagogical and ethical implications. Educators and researchers alike must navigate these complexities to ensure that DST is deployed in ways that are both inclusive and responsible.

One critical concern is copyright and fair use. As students incorporate multimedia elements such as images, music, and video into their digital narratives, it is essential that they understand the principles of ethical sourcing and intellectual property. Teachers must explicitly teach these concepts and guide learners towards platforms that offer royalty-free or Creative Commons-licensed materials (Commonsense Media, 2023). This not only safeguards against legal infringements but also cultivates digital citizenship and respect for authorship. Another pressing issue is representation and bias. Digital stories are powerful vehicles for identity expression, but they can also unintentionally reinforce stereotypes or exclude marginalised perspectives. Educators must create inclusive environments that encourage critical reflection on voice, audience, and cultural sensitivity. Facilitating discussions about whose stories are being told and how they are told is vital to promoting equity and social justice within digital narratives.

The digital divide also remains a significant barrier. Not all students have equitable access to devices, software, or reliable internet connectivity, which can limit participation and deepen existing educational inequalities (Jiang, 2024). Schools and policymakers must address these disparities to ensure that DST is accessible to all learners, regardless of their socioeconomic background. In addition, educators must be mindful of student wellbeing, particularly when narratives involve personal or emotionally charged content. Topics such as loss, trauma, or mental health can emerge naturally in storytelling but may evoke distress if not handled with care. Teachers should establish clear ethical guidelines, provide opt-out alternatives, and ensure appropriate support mechanisms are in place.

While digital storytelling can indeed foster self-understanding, build resilience, and support emotional literacy, it also raises questions about the boundaries of disclosure in educational contexts. Encouraging personal storytelling must be balanced with sensitivity to learners' psychological safety. Research has shown that poorly scaffolded storytelling activities especially those that delve into trauma can cause harm if not facilitated with ethical foresight (Lely et al., 2019). Ultimately, effective integration of digital storytelling requires more than technical proficiency. It demands a thoughtful, ethically grounded approach that

anticipates potential risks, foregrounds student agency, and prioritises inclusive and supportive learning environments. For educators and researchers, addressing these challenges is not a limitation, but rather an opportunity to elevate DST as a transformative, compassionate, and responsible educational practice.

5. Conclusion and future directions

The integration of DST into educational contexts represents a powerful and multifaceted pedagogical innovation. By combining narrative techniques with digital tools including text, images, audio, and video DST enables students to express themselves creatively, develop critical and reflective thinking, and engage more deeply with curricular content (Gangan, 2014; Kogila et al., 2020). Rooted in constructivist and narrative learning theories, this approach supports multimodal learning, promotes learner agency, and fosters the development of essential 21st-century skills such as collaboration, creativity, and digital literacy (Ogbeiwi et al., 2024; Isaacs et al., 2024). The pedagogical benefits of DST have been widely acknowledged in both general and higher education settings. It has proven effective in increasing student motivation (Vinnikova, 2022), enhancing academic performance (Cruz, 2019), and supporting the development of core competencies such as reading, writing, speaking, and listening (Bakar, 2019; Vinnikova, 2022). Importantly, DST allows students to bring personal and cultural narratives into the learning space, thereby encouraging empathy, identity formation, and social understanding (Jiang, 2024).

The proposed Integrated Digital Storytelling framework responds to the growing need for structured and adaptable pedagogical models that make DST accessible and sustainable in contemporary classrooms. Through its five interconnected phases Narrative Inquiry, Digital Composition, Co-Creation, Interaction and Immersion, and Reflection and Assessment the framework scaffolds the storytelling process while promoting creativity, autonomy, and critical engagement. Moreover, the optional integration of generative AI tools presents new opportunities for differentiated instruction, personalisation, and inclusive practice (Cao, 2024; Zhai et al., 2021). Nevertheless, important challenges persist. These include disparities in digital access (Jiang, 2024), varying levels of technological literacy (Cao, 2024), ethical concerns around representation and bias, and the sensitive nature of personal storytelling. Teachers must be equipped not only with technical competencies, but also with pedagogical strategies that ensure the emotional safety, ethical integrity, and inclusivity of storytelling practices. Addressing these challenges is crucial for the responsible and effective integration of DST into curricula.

Looking ahead, future research should investigate how DST can be systematically embedded across subjects and educational levels, and how its long-term impact on student learning, identity development, and emotional wellbeing can be measured. Further studies are also needed to explore the affordances and limitations of AI-assisted storytelling tools

particularly in relation to student creativity, authorship, and ethical use. Comparative studies across cultural and institutional contexts would contribute valuable insights into how DST can be adapted to diverse educational systems. Ultimately, digital storytelling offers more than just a tool for enhancing learning; it serves as a medium for transformation, enabling students to connect with themselves, with others, and with knowledge in deeply meaningful ways. As educators and researchers, we must continue to ask: what kinds of stories do our students need to tell, and how can we empower them to tell them well?

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This book brings together a collection of innovative practices developed as part of the European project Empower Digi Teach, which aims to strengthen teachers' digital competences through the design of active learning resources and the pedagogical integration of generative artificial intelligence. The chapters explore diverse topics such as 3D modelling, gamification, digital storytelling, accessibility, inclusion, and creativity assessment—offering practical examples of how to transform teaching in the digital age.

A must-read for teachers seeking to integrate technology and innovation with purpose and impact.