From learners to creators: Empowering English education through AI-generated digital storytelling

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ABSTRACT

The integration of artificial intelligence (AI) has transformed education by offering new possibilities for personalised, creative, and technology-enhanced learning. In English language education, AI opens opportunities to reimagine learning approaches and materials, enabling more diverse, interactive, and student-centred experiences. While AI integration often focuses on supporting learning tasks, less attention has been paid to empowering students as creators of learning materials. This paper reports a qualitative study exploring university students' experiences of creating English storybooks enhanced with AI-generated illustrations for primary learners. Forty-five pre-service teachers created original narratives, embedded moral values, adapted language for young readers, and designed visuals using AI tools, supported by teacher feedback. The completed storybooks were then presented in real classroom settings. Data from structured reflection reports were analysed using thematic analysis. The findings reveal hybrid creativity through human–AI collaboration and pedagogical agency, as participants critically evaluated and adapted AI outputs to meet pedagogical goals and learner needs. These findings challenge views of AI as merely an efficiency tool, demonstrating that, within a carefully designed pedagogical project, AI can support a shift in pre-service teachers' roles from learners to creators through human-led decision-making. The study highlights the importance of student-led content creation supported by AI and guided by ethical and pedagogical responsibility, with human judgment remaining central in English language education.

Keywords: AI literacy; digital storytelling; English language learning; creative pedagogy; reading

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INTRODUCTION

Advances in generative artificial intelligence (AI) have expanded the landscape of English language education, shaping how learners develop listening, speaking, reading, and writing skills through increasingly flexible approaches supported by digital and AI-based tools (Chukhno, 2024; Kristiawan et al., 2024; Rukiati et al., 2023; Shin et al., 2025; Tran, 2024; Yeh, 2025). Beyond supporting language practice, AI has enabled the creation of multimodal learning resources that integrate text, visuals, and interactivity, allowing novice teachers to produce rich instructional materials such as digital storybooks using accessible tools like ChatGPT and Canva, often at minimal cost (Beguš, 2024; Chen, 2024; Weeldenburg & Depardieu, 2023). In many Southeast Asian contexts, this technological democratisation aligns with curricular emphases on character education. This alignment has resulted in a shift in teachers' roles from delivering language input to designing learning materials that integrate language development, moral values, and digital literacy (Herak, 2025). Consequently, teachers are now expected not only to teach English but also to embed ethical and social values within technology-supported learning experiences. As AI becomes more prevalent in educational settings, understanding how pre-service teachers adapt to these expanded pedagogical responsibilities is increasingly important, particularly in contexts with limited learning resources. In this context, pre-service English teachers are increasingly expected to use AI to design learning materials that are linguistically appropriate, suitable for young learners, and support teaching values. This shift points to the need for teacher education programs to move beyond technical training and promote creative and pedagogical agency, enabling future teachers to transform AI-generated outputs into contextually meaningful learning materials.

Existing research offers promising but incomplete insights into the integration of AI in teacher education. Studies on pre-service teachers' use of generative AI tools, such as ChatGPT, highlight the potential of these technologies to personalise learning while also raising concerns about academic integrity and information accuracy (Crompton & Burke, 2024; Karataş & Yüce, 2024). Research on AI-driven digital storytelling further suggests that hands-on collaboration with AI tools can improve pre-service teachers' confidence and attitudes toward technology integration, even when prior familiarity with such tools is limited (Belda-Medina & Goddard, 2024). At the same time, caution has been raised that uncritical reliance on AI may undermine critical thinking and collaboration if appropriate pedagogical scaffolding is absent (Zhang et al., 2025). Despite these insights, little is known about how pre-service teachers in the Global South navigate the intersecting demands of AI integration and moral education within collaborative learning contexts. While theoretical discussions emphasise the importance of AI literacy, prompt engineering, and critical thinking for future educators (Walter, 2024), empirical evidence examining how these competencies develop through concrete design-based tasks remains scarce. This study addresses this gap by examining how Indonesian pre-service English teachers collaboratively design AI-enhanced digital storybooks for primary learners, offering empirical insights into hybrid human–AI creative processes and the ways teachers balance language instruction with character education in AI-supported environments. By foregrounding students' reflections, revisions, and

challenges, the study illustrates how AI-mediated storytelling can support digital literacy and professional identity development.

Several key concepts frame this study. Pedagogical storytelling refers to the purposeful use of storytelling as a teaching strategy, in which narratives are designed not only to engage learners but also to support language development, scaffold comprehension, and embed moral or character values (Benabbes & Taleb, 2024; Nguyen & Phillips, 2022). Digital storytelling involves the use of digital tools to integrate narratives, visuals, and audio in conveying meaning (Novita et al., 2024; Tarigan et al., 2024), while character education is understood as the integration of moral and ethical values into teaching materials (Cholifah & Faelasup, 2024; Mashoedi et al., 2024). Together, these concepts frame the exploration of how pre-service teachers integrate AI into language pedagogy and storybook development. Despite growing interest in AI for language learning, empirical research remains limited in examining how pre-service teachers use AI to transform learners into creators of inclusive and culturally responsive English learning materials, particularly for young learners in diverse and Asian contexts, where sensitivity to learners' age, cultural norms, and moral values is essential. To address this gap, this study draws on sociocultural perspectives that view learning as mediated by tools and pedagogy, alongside the TPACK framework, to examine how AI-supported digital storytelling is enacted in teacher education.

Therefore, this study explores university students' experiences designing digital storytelling books for children, focusing on the project creation process, teacher feedback, and students' reflections on their challenges and skill development. To achieve this aim, the study was guided by three interrelated research questions that focus on participants' experiences, pedagogical decision-making, and professional learning in AI-supported digital storytelling. RQ1. How do pre-service English teachers experience the process of designing AI-assisted digital storytelling materials for primary learners? RQ2. How does teacher feedback shape pre-service teachers' pedagogical decisions and revisions in AI-enhanced digital storytelling projects? RQ3. What challenges and professional learning outcomes do pre-service teachers report through engaging in AI-supported digital storytelling?

This paper aims to contribute to pedagogical adaptation in integrating AI into English language education. It provides insights into how students use AI not only as a learning aid or source of information but also as a tool for creating educational materials under teachers' guidance.

METHODS

Research design

This study adopted a qualitative research design, drawing on students' project reports and individual reflections to explore their experiences in creating digital storytelling books for 4th-, 5th-, and 6th-grade learners in primary schools. The terms students and pre-service teachers are used interchangeably in this study, referring to undergraduate teacher candidates in an English education program. A qualitative approach was chosen to capture participants' in-depth perspectives on using AI and Canva to design English learning materials that support teaching values to young learners through pedagogical storytelling. The project was conducted as part of an Innovation in English Language Teaching course and involved 45 third-year undergraduate students (aged 19–22) in an English Education program. The participants were organised into 13 groups across two classes. Each group collaboratively designed a digital storytelling book intended for children. The project consisted of several stages, including story development, illustration design, feedback collection, revision, presentation, and reflection as shown in Figure 1.

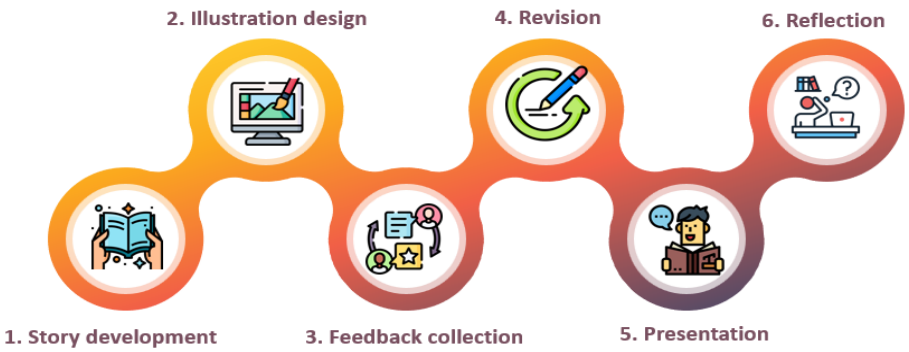


Figure 1. Stages in the digital storytelling project

Data collection

Although the digital storytelling storybooks were produced collaboratively, data for this study were collected through individual written reflection sheets completed upon project completion. Each student submitted a written digital reflection of approximately 1,000 words, guided by open-ended prompts. The reflections focused on pre-service teachers' experiences in designing AI-assisted digital storytelling materials (RQ1), the role of teacher feedback in shaping pedagogical decisions and revisions (RQ2), and the challenges and professional learning outcomes associated with AI-supported digital storytelling (RQ3). The guiding questions were structured around the key project components summarised in Table 1. While the table presents the overall project framework, students received more detailed written guidelines during the course.

Table 1. Framework of the Project

Components	Details
	1. Process
Introduction	- Purpose of the project (goal of creating the digital storytelling book) - Overview of the story (theme, relevance, importance for children)
Justification of Choices	- Storyline: reasons for choosing the story/theme and its appeal to children - Multimedia Elements: images, sounds, videos used and their contribution - Language and Style: suitability of vocabulary and language level for children
Process and Steps	- Planning and Preparation (brainstorming, storyboarding) - Step-by-step creation: 1. Story writing / script creation 2. Multimedia selection and creation 3. Editing and formatting 4. Finalizing the digital book - Involvement: roles of each group member
Presentation and Documentation	- Location and Audience: where and to whom the story was presented - Presentation Process: approach, storytelling method, and engagement strategy - Audience Reaction: responses, questions, and comments - Documentation: visuals, notes, drafts, and final product link
	2. Feedback
Feedback Process	- Feedback Received: who gave feedback and what suggestions were made - Response to Feedback: actions/changes made in response to feedback - Impact of Feedback: influence of feedback on the final product
	3. Reflection
Reflection on Learning	- Challenges Faced: technical, creative, collaborative, or time issues - Skills and Knowledge Gained: storytelling, digital tools, presentation skills - Personal Insights: learning about storytelling, teaching, or self-development

Data analysis

The data were analysed using reflexive thematic analysis following the framework proposed by Braun & Clarke (2019, 2020). First, all reflection sheets were read to achieve familiarisation with the data. Initial codes were then generated inductively to capture meaningful features related to students' experiences of using AI and Canva in designing digital storytelling materials. Although reflection prompts were guided by a project framework, the analysis was inductive, with themes generated from participants' accounts rather than pre-defined categories. Coding was conducted iteratively, with codes refined over time and

grouped into coherent, distinct themes. Finally, the themes were defined and named to capture the core patterns across participants' accounts while also acknowledging individual variations in experiences.

Trustworthiness and rigor

Several strategies were employed to ensure the trustworthiness of the study. Credibility was supported through repeated reading of the reflection data and constant comparison across participants' accounts. Reflexivity was maintained by acknowledging the researchers' dual roles as a course instructor and researcher, and by grounding interpretations closely in students' reflective narratives rather than in project outcomes. Coding decisions were documented to support dependability. Prior to data collection, students were informed verbally and in writing about the study's purpose and the voluntary nature of participation. Written informed consent was obtained, participation had no impact on course grades, and all data were anonymised to guarantee confidentiality.

Instructional context and project procedure

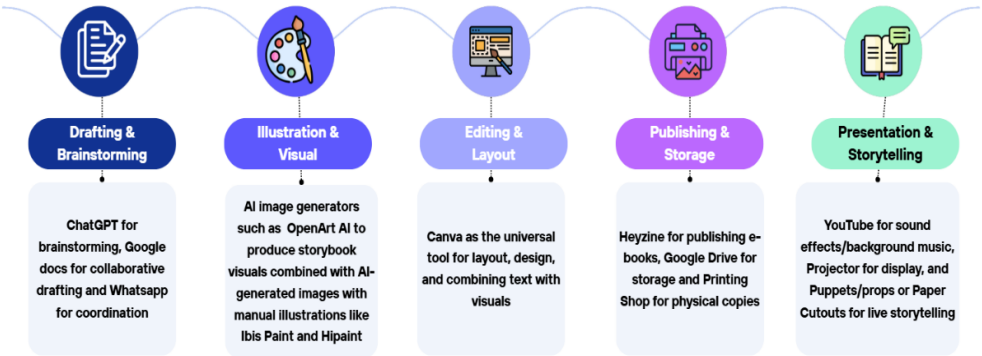
This subsection provides contextual background for the analysis of students' experiences reported in the Results section. A total of 13 storybooks were produced in both printed and digital formats, which formed the basis for examining how students designed and developed their storylines, multimedia elements, and language adaptation (see Figure 2).

Figure 2. Student-created storytelling books

Students created storybooks using AI and Canva following a structured workflow. First, students brainstormed ideas and drafted storylines for primary students. In many cases, initial drafts were written in Bahasa Indonesia and later translated into English. Next, students generated illustrations using AI-based image tools and refined the visual layout, text placement, and overall design using Canva. During this stage, multimedia elements such as images, background audio, animations, and QR-linked content were integrated. Some groups additionally used digital tools (e.g., IbisPaint, CapCut, and ME-QR) to improve illustrations, animations, and interactive features. Feedback was integrated into the project process. After completing a draft, students shared printed samples with primary school teachers from partner schools. The teachers' feedback was collected through brief interviews, recorded, and later discussed in groups to guide revision. After finalising the storybooks based on the teacher's feedback, outputs

were produced in printed, digital, and video formats. Students then prepared for school implementation by planning storytelling activities and accompanying interactions incorporating various multimedia and interactive elements such as QR codes, props, puppets, sound effects, and quizzes to involve students in storytelling experiences. In the end, students presented the completed storybooks in primary school classrooms and the printed copies were donated to school libraries. The completed digital storybooks were also published online and made publicly accessible via a Padlet platform. The overall workflow of storybook creation and implementation is illustrated in Figure 3.

Figure 3. Workflow of storybook creation and tools used by students



RESULTS

RQ1: Pre-service teachers' experiences in designing AI-assisted digital storybooks

The findings show that, through the design process, pre-service teachers collaborated with AI to develop English learning materials that were appropriate for children and incorporated moral and character education.

Hybrid creativity through human-AI collaboration

The data revealed a blended creative process in which AI tools were used to generate illustrations, and Canva operated as the main platform for refinement and design. Students drew on various AI applications (Bing AI, Dreamina, OpenArt, Copilot, SeaArt) to create images, while Canva was used for layout and final presentation. Beyond static visuals, many projects incorporated multimedia elements such as animations, background music, QR-linked videos, props, projectors and sound effects. Students often experimented with multiple tools, adapting or discarding outputs as needed. One student noted, "We used AI to generate illustrations and Canva for the layout" (S19). Another student emphasized how AI supported image creation while Canva provided structure and coherence, "We explored OpenArt and Dreamina for illustrations, then arranged everything in Canva" (S21). The findings suggest that students treated AI as a "creative partner" rather than a replacement. When the AI results were unsatisfactory, they revised, combined, or switched tools, reflecting active engagement with technology and deliberate decision-making in the use of AI tools. Some even sketched characters by hand before converting them into digital

using AI. Overall, the students demonstrated an ability to blend imagination, technological resources, and human judgment to expand their creative possibilities.

Digital storytelling as a vehicle for moral and character education

Across the projects, the students consistently framed their stories as vehicles for moral learning. They regarded the task not only as a language-learning activity but also as an opportunity to embed values, contemporary issues and lessons for young readers, including honesty, kindness, and teamwork. The narratives often drew inspiration from folktales, fairytales, or everyday contexts, which were then creatively adapted to address contemporary issues such as gaming addiction or the balance between technology and nature. One student explained, "We created a story about friendship and honesty, so children learn to value their friends and tell the truth" (S37). Similarly, students connected their storytelling to everyday moral lessons, "This story is relevant because it teaches children the importance of not being stingy and learning to share with others" (S35). These findings indicate that students saw themselves as moral educators and storytellers (see Table 2).

Table 2. Themes and titles of students' digital storybooks

Theme	Titles
Honesty & Integrity	Lila and the Honest Tree – Honesty sustains trust, while dishonesty undermines relationships. The Key to Another World – Honesty fosters trust and leads to positive outcomes. The Liar Bunny – Mistakes can be forgiven through honesty.
Friendship & Teamwork	An Adventure that Brings Friendship – Respect and teamwork strengthen bonds. Elephant and Mousedeer – Cooperation helps overcome challenges. The Crocodile and the Little Fish – Friendship can flourish despite differences. Stuck in the Game World – Real friendships outweigh virtual distractions.
Responsibility & Self-Discipline	Amelia and the Magic Kettle – Prioritising values over personal desires helps avoid greed. Vadel and All His Responsibilities – Balancing gaming, school, and family responsibilities. The Lost Twins – Caring for family and limiting excessive gadget use.
Wisdom & Leadership	The Wise Queen – True wisdom arises from kindness, responsibility, and following one's conscience. Castle in the Forbidden Forest – Courage and purity of heart guide wise choices.
Bravery	Little Friend Behind the Toy – Bravery and responsibility in facing challenges.

Simplified language as pedagogical scaffolding

Students consistently modified their language choices to suit the needs of young readers, demonstrating an awareness of their audience's linguistic competence. Strategies included using short sentences, repetition, familiar vocabulary, daily

expressions, and, in some cases, translation from Bahasa to English. These choices reflect pedagogical sensitivity, ensuring comprehension, engagement, and alignment with primary school learners' proficiency levels. As illustrated by one student, "The language is simple, with short sentences and familiar vocabulary suitable for children" (S1). Others emphasised similar strategies: "The vocabulary is simple with repeated words so children can follow easily" (S11) and "The language used was simple sentences and daily expressions suitable for grade 4" (S10). The findings show that students went beyond storytelling, adapting their narratives like curriculum designers to suit children's developmental levels. This scaffolding reflects their attention to learners' needs through the use of simplified language. While the findings for RQ1 focus on pre-service teachers' internal learning processes and design experiences, the following section shifts to RQ2, examining how teacher feedback shaped their pedagogical decisions and revisions.

RQ2: Pedagogical decision-making and revision through teacher feedback

Students' responses indicate that teachers provided feedback on language, narrative structure, and visual design, which students addressed through iterative revisions that improved linguistic simplicity, pedagogical clarity, and overall storybook quality. In addition to corrective feedback, positive comments motivated students to further improve their storybooks.

Focus of teacher feedback: Language, narrative, and design

Students reported that teacher feedback focused on language use to make the storybooks accessible to primary school learners. Teachers emphasised age-appropriate grammar and vocabulary, directly commenting on linguistic complexity and accuracy. One teacher noted, "The language is too difficult for the students and the story is too long but the story has a good lesson" (S20). Another student recalled receiving detailed guidance on learner levels: "She also corrected grammatical errors in my story. She explains that my story suits Grade 3–4 learners in private schools, Grade 5–6 learners in public schools, and Grade 1 learners in international or bilingual schools" (S5). These comments indicate that teachers prioritised linguistic suitability alongside accuracy, guiding students to align their language choices with learners' limited exposure to English.

Teachers also provided feedback on narrative length, structure, and moral clarity to help children follow the storyline and understand the message. Several students reported that their stories were perceived as either too short or too long. For example, one teacher commented, "First the story is too short, second the printed book is too small" (S3). Teachers also affirmed stories that met narrative conventions and conveyed clear moral lessons. As one student recalled, "She said that my story had fulfilled the requirements of narrative text, was suitable for kids, and had a reasonable story and a good moral lesson" (S5). These responses indicate that teachers encouraged a balance between simplicity, coherence, and moral depth to support effective and engaging storybooks for young learners.

Another key area of feedback concerned visual and textual design, which teachers associated with readability and learner engagement. Teachers frequently commented on text placement, font size, and the amount of text per page. One student reported, "The feedback we got is… a small amount of revision which are the position of text and amount in a page" (S7). Others were advised to make the

text more visually engaging, as reflected in the comment, "The texts in the book must be eye-catching" (S22). Teachers also responded positively to effective integration of visuals, with one student noting, "She said my story is good enough, the cover is so good and the vocabulary easy to understand" (S35). In some cases, illustrations were seen as compensating for linguistic difficulty, as S45 recalled: "The language was still quite difficult… but they understood the moral of the story because they engaged through the pictures." Overall, teachers treated design as pedagogically functional rather than simple decorations, helping children comprehend the story when language was difficult.

Student responses to feedback and iterative revision

Students described the revision process as both a means of improving their products and a valuable learning experience. Through engaging with teacher feedback, they reported feeling challenged yet motivated to produce better storybooks. In response to language-related feedback, students made several types of adjustments. First, they corrected grammatical errors, as one participant explained: "Yes, I made a change based on her feedback because there was a grammatical error in my story. I fixed the grammatical error. From 'hide' to 'hid'…" (S5). Second, students simplified vocabulary to make the content easier to understand, with one student reflecting, "We will try to improve it by using vocabulary that is easier to understand" (S23). Others similarly noted revising difficult words: "Because the teacher said that the language was too difficult… we revised the story and chose the easier words" (S44). Third, students adjusted sentence structures and clarity to match children's understanding. As one participant explained, "We opted for more everyday language" (S40). These revisions indicate that students addressed more than surface-level errors. They learned to adapt grammar, vocabulary, and sentence structure to suit young readers. This process was associated with increased attention to learners' needs and the use of materials in classroom contexts.

Students also revised their stories in response to feedback on narrative length, pacing, and design. Teachers' comments prompted students to expand overly brief stories or shorten those that were too long. One participant recalled, "Because of the time limitation we can only change the storyline become longer" (S3), while others shortened and simplified their texts to improve readability (S34). In addition, students revised the layout and structure of their storybooks, particularly the placement and amount of text per page. As one group explained, "The feedback we got is… the position of text and amount in a page" (S7). Feedback also encouraged improvements in visual design and the integration of text and illustrations. One participant reflected, "With the feedback given, it is an evaluation for us in writing or arranging writing for children…" (S7). Through these revisions, students came to understand design as a pedagogical tool. They learned that producing effective storybooks requires not only accurate language but also attention to narrative pacing, layout, and visual design. This process deepened their understanding of how stories operate as holistic learning materials, where form and content must align to support young learners' comprehension and engagement.

In addition to guiding revision, teacher feedback also played a motivational role since students received positive reinforcement and encouragement from

teachers, which further motivated them to create better storybooks. One student recalled a suggestion to publish their work: "This is good for literacy for students who like learning English… send it to the publisher and publish it" (S16). Another noted positive comments on delivery and content clarity: "Our storytelling was quite clear and loud… the book was quite interesting" (S1). Such feedback increased students' confidence and encouraged them to view their projects as meaningful contributions. Thus, teacher feedback served not only as correction but also as empowerment.

RQ3: Challenges and professional learning in AI-supported storytelling

Students' reflections show that although pre-service teachers faced substantial challenges in managing time, collaboration, and the complexity of AI-supported digital storytelling projects, these challenges supported professional learning and strengthened digital, pedagogical, and storytelling skills, as well as professional confidence and identity.

Managing time, collaboration, and project complexity

Across the reflections, students reported various challenges in creating their digital storytelling books, such as technical problems with devices and software, creative blocks in developing stories or illustrations, and difficulties in keeping children engaged during presentations at schools. However, the most common challenges were time and project management, collaboration, and communication.

Time and project management emerged as the most frequently reported challenges across participants' reflections. Students highlighted four main reasons why time became a source of stress. First, the project deadlines were tight in relation to the workload required. Students felt that producing a full storybook, including writing, illustration, editing, and rehearsing, within the given timeframe, forced them to cut corners. As one explained, "The time was so limited, so we had to rush our editing and couldn't make it as neat as we wanted" (S12). This reflects how compressed timelines reduced opportunities for revision and refinement. Second, group schedules often clashed, delaying progress. Coordinating meetings was difficult, and when students could not meet regularly, tasks piled up. One student shared, "It was hard to gather everyone because our schedules clashed, and in the end, only two or three people carried most of the work" (S27). Here, the stress came not only from lack of time but from the added inefficiency of poor coordination. Third, uneven task distribution increased the burden on certain members. Some students felt they were left to complete the bulk of the work when others failed to contribute. As one described, "We were running out of time, and the story was still not finished, so I stayed up late to complete the illustrations" (S33). This shows how time pressures combined with unequal effort to create feelings of frustration and fatigue. Fourth, the multi-layered nature of the project itself compounded stress. Students were expected to simultaneously manage different stages of the work, from writing and editing to illustration and design. One student reflected, "I had to learn Canva while also finishing the story, which made it stressful with the deadline" (S21). This illustrates how juggling new technical skills alongside ongoing creative tasks intensified the sense of time pressure. The reports show that students' stress about time was caused not just by short deadlines but by a combination of factors such as clashing

schedules, uneven workload, and the many stages of the project.

Collaboration and communication difficulties were another major challenge students faced during the project. Their reflections revealed four main reasons why group work often broke down. One major reason was unequal participation that created tension. Some members contributed far less than others, leaving their peers frustrated. One student remarked, "Some members didn't participate actively, so in the end, I had to do more than my part to finish the story" (S18). This highlights how group imbalance undermined trust and placed extra pressure on more responsible members. Another contributing factor was miscommunication, which led to mistakes and delays. Students reported that unclear instructions or misunderstood ideas forced them to redo tasks. As one explained, "We often misunderstood each other's ideas, and it caused delays because we had to redo some parts" (S30). Such miscommunication not only wasted time but also reduced efficiency and morale. Also, students noted disagreements over roles disrupted workflow. Some groups argued about responsibilities rather than focusing on the project. One participant recalled, "Our group argued about who should present, and it wasted time instead of focusing on the project" (S40). These disputes reveal how fragile group dynamics can be when roles are not clearly negotiated. Finally, a recurring issue was lack of responsiveness, which slowed progress. Students sometimes struggled with members who ignored messages or failed to update their peers. One described, "It was difficult to continue because some members did not respond in the group chat, so the work was delayed" (S22). In this case, poor communication habits hindered coordination and momentum. For many students, these issues were as stressful as technical or creative demands, demonstrating that successful digital storytelling projects depend as much on effective teamwork as on individual effort. These challenges increased students' awareness that planning, coordination, and shared responsibility are essential professional skills.

Development of digital, pedagogical, and storytelling skills

One of the most significant benefits students reported from the digital storytelling project was the development of new digital and design skills. Their reflections highlighted several ways in which the project improved their technological competence and creative ability. One major gain was learning to use new digital tools. Many students had little prior experience with platforms such as Canva, AI-based image generators, or online flipbook applications. One participant noted, "I had never used Canva before, so I learned step by step how to make layouts and combine text with pictures" (S14). This shows how the project pushed students to acquire practical design literacy by working with authentic tools. Another benefit was developing visual design awareness. Students became more conscious of how colors, layouts, and images influence readability and engagement. As one reflected, "I realized that choosing the right background and font is important so children can focus and not be distracted" (S9). In this context, the project helped participants link technical skills with pedagogical considerations for young learners. Additionally, students gained confidence in integrating multimodal elements. Combining text, visuals, and animation required new forms of creativity. One student explained, "I learned how to add animations and transitions so the story would be more alive" (S25). This illustrates how the project expanded their ability to produce interactive, engaging learning materials.

Finally, participants strengthened their adaptability in solving design challenges. Several described facing problems when images did not match their storylines or when software was difficult to use, yet they learned to find solutions. For instance, one remarked, "Sometimes the picture from AI didn't fit, so I tried again until it matched the story" (S37). This persistence reflects growth in both problem-solving and digital resilience. These reflections indicate that the digital storytelling project involved both creative work and the development of practical technology skills. Students left with increased skills in digital design, multimodal composition, and adaptive problem-solving competencies that are increasingly essential for future teachers in technology-rich classrooms.

At the end of the project, students visited a primary school to present the storybooks they had created in a classroom setting. Students emphasized the value of storytelling and presentation skills gained through the project. These included improvements in narrative delivery, voice modulation, and classroom management strategies to engage young learners. One key gain was greater confidence in oral delivery. Students reflected on how the project pushed them to practice public speaking, improve articulation, and vary intonation. As one explained, "I learned to speak more clearly and with expression so the children would enjoy listening" (S6). This shows how digital storytelling encouraged the development of performance-oriented communication skills. Another important outcome was mastering the use of gestures and body language. Participants noted that stories came alive when paired with expressive movement. For instance, one shared, "I used hand movements and facial expressions to make the story more interesting for the students" (S28). These reflections highlight the way multimodal presentation raised awareness of non-verbal strategies in teaching.

Additionally, students developed classroom management strategies to sustain attention, such as simplifying language, using rewards, and adjusting pacing. One student remarked, "I had to use simple words and repeat them so the children could follow, and I gave small prizes to keep them focused" (S34). Such adaptations show how participants learned to bridge storytelling techniques with pedagogical practices for young audiences. Finally, students connected storytelling with emotional engagement. They discovered that enthusiasm and expression were essential to holding children's interest. One noted, "When I told the story with energy, the children responded better and wanted to join in" (S19). This illustrates the role of affective strategies in creating a supportive learning atmosphere. These reflections demonstrate that the project improved not only students' narrative delivery but also their awareness of classroom dynamics. Storytelling became a space to practice performance, refine language use, and apply engagement strategies tailored to young learners. As a result, digital storytelling acted as both a creative activity and a rehearsal for future classroom teaching.

Emerging professional identity: From learners to creators

Students reflected on how the project contributed to their personal and professional growth as future teachers. The experience boosted their confidence, resilience, and sense of responsibility in ways that extended beyond the immediate task of creating a storybook. One significant gain was increased teaching confidence. Several students described feeling more capable after

successfully presenting their stories to children. As one explained, "After telling the story, I felt more confident that I can stand in front of a class and teach" (S11). This shows how performance in authentic classroom contexts helped students believe in their own teaching ability. Another important outcome was developing patience and persistence. Participants recognized that managing the project required not only technical effort but also endurance. One student reflected, "It trained my patience because sometimes things didn't go well, but I had to finish it anyway" (S20). Such reflections highlight how overcoming setbacksbuilt resilience, a critical attribute for teaching. Additionally, students gained a sense of pride and motivation.

The act of completing and presenting a storybook gave them a sense of achievement. As one noted, "I felt proud when the children enjoyed our story, and it motivated me to keep improving" (S41). Here, personal satisfaction became a driver of continued professional growth. Finally, participants began to see themselves as teachers with a mission. Some reflected on the value of embedding moral messages into their stories and how storytelling could be used as a teaching tool. One remarked, "This project made me realize that teaching is not only about knowledge but also about giving values through stories" (S8). This illustrates how the experience shaped their professional identity and pedagogical vision. These accounts indicate that the project involved more than technical competence and was associated with confidence, resilience, motivation, and value-oriented views of teaching. Digital storytelling thus became a transformative experience, helping students step into their roles as reflective, motivated, and purposeful future educators.

DISCUSSION

This study set out to explore how third-year pre-service teachers in Indonesia engaged in designing AI-assisted digital storybooks for elementary learners. The investigation focused on their creative processes, responses to feedback from elementary school teachers, and reflections on challenges and professional growth. The findings reveal that the project functioned as more than a technical exercise in learning how to use AI; instead, it became a transformative pedagogical experience that went beyond simply designing learning materials. Through the project, students developed pedagogical decision-making skills that helped them think and act like teachers, take responsibility, and see themselves as creators of educational content. They also learned to use AI critically and responsibly, as well as to develop practical classroom-related skills that can be applied in their future teaching careers.

From sociocultural perspectives, learning is conceptualised as mediated by tools, social interaction, and pedagogical guidance rather than driven by technology alone (Vygotsky, 1978). In this study, AI tools were not inherently transformative, their educational value depended on how they were incorporated into meaningful pedagogical activities shaped by human judgment, feedback, and reflective practice. From this perspective, AI served as a mediating artefact through which students actively evaluated, adapted, and revised AI-generated outputs in line with pedagogical goals and learner needs, supporting a shift from learners to creators. Sociolinguistic theory further explains how students adapted English to

suit children's linguistic competence, reflecting a growing awareness of inclusive and culturally responsive material design, as well as sensitivity to learners' age, cultural context, and moral norms through storytelling as a form of socialization. Complementing this interpretation, the TPACK framework clarifies how these linguistic and pedagogical intentions were realised through the integrated use of technological, pedagogical, and content knowledge (Mishra & Koehler, 2006), showing that transformation occurred not through AI use per se but through the pedagogically informed design of age-appropriate English learning materials incorporating educational values.

The findings of this study align with recent research showing that generative AI can improve creativity and material design in English language education when used as a pedagogical support rather than a replacement for human effort (Belda-Medina & Goddard, 2024; Chen, 2024; Dewi, 2025; Yeh, 2025). Similar to prior studies, students in this study used AI to support multimodal storytelling and reported increased confidence and engagement in material development. However, this study differs from much of the existing literature by demonstrating a clear shift in pre-service teachers' roles from users of AI-generated content to designers who critically evaluated, adapted, and pedagogically reshaped AI outputs. While earlier research has largely emphasized AI for efficiency, personalization, or skill practice (Crompton & Burke, 2024; Kristiawan et al., 2024; Liu et al., 2025), the present findings reveal AI as a mediating tool within a values-oriented, design-based pedagogical project. This difference may be explained by the structured integration of teacher feedback, authentic classroom implementation, and an explicit focus on moral and character education, which required sustained human judgment. A surprising finding was the extent to which participants positioned themselves as moral educators, using storytelling to balance language learning with moral values and ethical socialization, an aspect often underexplored in AI-in-ELT studies. These findings suggest that AI becomes pedagogically meaningful only when integrated in intentional learning design that foreground human agency, professional identity development, and socially responsible teaching practices.

The findings have important pedagogical implications for English language teacher education in the AI era. While traditional language teaching has emphasised developing receptive and productive skills through engagement with existing texts and structured practice, this study highlights the potential of repositioning language learners, particularly pre-service teachers, as creators of learning materials with pedagogical guidance rather than passive consumers. Second, the findings highlight the need to integrate AI literacy into teacher education curricula not as a standalone technical course, but as an integral part of pedagogical practice across content areas. AI literacy extends beyond technical skills to include the ability to critically evaluate AI outputs, understand AI's limitations, navigate ethical considerations, and maintain pedagogical agency in human–AI collaboration. As AI literacy does not develop automatically through tool exposure, teacher education programs should provide explicit instruction in prompt design, criteria for evaluating AI-generated content, and ethical decision-making, positioning AI as a supportive pedagogical resource rather than a shortcut for task completion. Finally, teacher education programmes need to provide opportunities for real or simulated classroom enactment to strengthen

professional confidence and identity by enabling pre-service teachers to test and refine their pedagogical decisions in authentic contexts, as demonstrated when students presented their storybooks in primary school classrooms.

Despite its pedagogical benefits, the study highlights challenges and ethical considerations in implementing AI-supported digital storytelling. Time constraints, uneven participation, and coordination difficulties increased cognitive and emotional demands on pre-service teachers, indicating the need for clearer task structuring and scaffolded collaboration. Ethically, the findings emphasise the importance of maintaining human agency and pedagogical responsibility in AI use, particularly regarding authorship, transparency, and reliance on automated outputs. Without explicit guidance, AI risks being used only as a tool for task completion rather than for learning. Clear guidelines for responsible AI use are needed to support pedagogical integrity and continued reflection on authorship and originality in teacher education.

Building on these pedagogical implications, this study makes a contribution to research on AI in language teacher education by shifting attention from AI adoption and efficiency to the pedagogical processes through which AI-supported tasks shape professional learning. Unlike many previous studies that focus on perceptions of AI or its role as a content-generation tool, this study captures a complete pedagogical cycle encompassing AI-assisted design, feedback-driven revision, classroom enactment with real learners, and reflective learning. Its most significant contribution lies in demonstrating that AI becomes pedagogically transformative not by design but through intentional learning design that centres human agency, feedback, and reflection. By evidencing a shift from learners as consumers to creators of pedagogically meaningful content, the study advances current understanding of AI as a collaborative resource that supports creativity, professional identity development, and values-oriented teaching practice in English language education.

Despite these contributions, several limitations should be acknowledged. First, the study was conducted in a specific context which means that the findings should be interpreted with caution, as different educational contexts may produce different results. Second, the data relied mainly on students' self-reported reflections, which may be influenced by social desirability or limited self-awareness. Future studies could include observations, artifact analysis, or longitudinal data to strengthen the evidence base. Third, this study did not assess the impact of the storybooks on elementary learners' language or character development. Future research may investigate how AI-enhanced materials affect learners directly. Finally, the one-semester timeframe limited insights into long-term effects on teaching practice and AI literacy; future longitudinal studies could explore whether these outcomes persist into early teaching careers.

CONCLUSION

This study captures how pre-service English teachers, supported by AI, created digital storybooks for primary learners, highlighting a shift in EFL education from learners as consumers to creators through AI-assisted digital storytelling. The findings demonstrate that AI is not transformative by design; rather, it becomes

transformative when embedded within purposeful pedagogy, including clear learning goals, teacher feedback, reflective practice, meaningful tasks, and human decision-making. The process not only empowers students but also signals a paradigm shift in how educational materials are developed and used. The rise of AI-human hybrid creativity suggests a new model for producing teaching materials and content, especially valuable in resource-limited educational contexts. By designing their own materials, educators can better tailor learning experiences to their students' needs, promoting more engaging and effective instruction. Nonetheless, the study emphasizes that human guidance remains essential to ensure the pedagogical soundness and ethical use of AI-generated materials. Future research should explore how learners' approaches to language acquisition evolve as they increasingly engage with AI in content creation, offering deeper insight into the changing landscape of language education in the AI era.

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CONFLICT OF INTERESTS

The author declares that there is no conflict of interest.

AUTHOR(S) CONTRIBUTION

Novita, P.: Conceptualization, methodology, data collection, analysis, writing, original draft preparation, review, editing and revision. The author solely contributed to all aspects of this work.

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