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Cultivating Students' Critical Thinking and Collaboration: Literacy Practice in Digital Storytelling Project

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Abstract: This research explores how a teacher's literacy practices, through a digital storytelling project, foster critical thinking and collaboration among students. It also examines students' experiences during literacy activities and the project itself. Conducted as a qualitative case study, this research involved thirty-six senior high school students. Data were gathered through classroom observations, interviews, and documentation of students' project artifacts. The findings suggest that using reading journals during self-directed reading at home promotes critical thinking and assists students in generating ideas for their digital storytelling projects. Besides, digital storytelling projects also play a key role in enhancing students' critical thinking and collaboration skills. Students effectively articulated issues and proposed solutions within their stories. Some topics related to the environments chosen cover air pollution, water pollution, building/housing, and illegal logging. Participation in the collaborative project encouraged students to take responsibility for their contributions and to respect differing opinions within their teams. Exploring students' views as their reflection on experiencing literacy practices in digital storytelling projects also reveals the positive impacts on their English ability. This approach provides educators with a practical and innovative strategy to foster students' skills, i.e. critical thinking and collaboration in the 21st century in an educational context.

Keywords: literacy, digital project, digital storytelling, critical thinking, collaboration

INTRODUCTION

Literacy becomes the fundamental and sustainable learning process for students' critical thinking (Fisher & Frey, 2012). It deals with the ability to comprehend, interpret, and apply information in different situations or contexts. Metcalfe et al., (2013) argue that literacy offers numerous advantages, such as enhancing language skills, cognitive development, and critical thinking abilities. Based on these perspectives, the researcher concludes that literacy plays a crucial role in the growth of young learners, including their acquisition and learning

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of languages (whether first, second, or additional), their ability to recognize and comprehend knowledge, develop critical thinking, and shape their character—encompassing cultural, religious, ethical values, beliefs, and wisdom that reflect national values.

Therefore, integrating literacy practices in English Language Teaching (ELT) could be an alternative to foster students' English skills and critical thinking. Regarding this, strategies are important for successful literacy practice (Mardiana, 2021). Since practicing literacy should involve collaboration and content knowledge construction, project-based learning is employed. Project-based learning is popularized by students John Dewey is Kilpatrick and is rooted in constructivism theory (Beckett, 2002). Cocco (2006) argues that project-based learning originates from constructivism theory focuses on engaging students with investigative or research-oriented activities that involve students in collaboration. Project-based learning (PjBL) is an inquiry-based learning method that actively involves students in constructing knowledge and solving problems through meaningful projects and making products (Krauss & Boss, 2013). Principles (Krauss & Boss, 2013; Larmer et al., 2015) and characteristics (Krajcik & Shin, 2014) of project-based learning include: a) paying attention to students' interests, b) tasks involving knowledge and skills from several scientific disciplines, c) problems have responsibility value, d) triggering questions, e) collaboration, f) use of technology, and g) creation of real products.

Digital project-based learning integrates technology or digital media in projects given to students. Concerning this, Digital Storytelling (DST) is employed since it is suitable for project-based learning in which students construct their own meaning (Robin, 2016). DST is a multimodal text created with a combination of elements; visual, text, audio, and video (Vinogradova et al., 2011). DST supports students' involvement and develops their critical thinking and digital literacy (Yang & Wu, 2012). In addition, Lee (2013) states that DST improves student-cantered learning which engages students to create stories and experience a collaboration process. Thus, DST and literacy practices promote students' critical thinking and collaboration. These skills are crucial to prepare students for the complexity of real and work life, and global competition for their future life (Partnership for 21st Century, 2011). Both skills help individuals and teams make better decisions, solve problems effectively, and drive innovation. These two skills complement each other, as critical thinking allows one to analyze and evaluate information deeply. At the same time, collaboration enables the application of that knowledge in contexts that require teamwork and communication.

Regarding this, critical thinking skills in Digital Project-Based Learning (DPjBL) involve the capacity to thoroughly examine a central question (an open-ended, guiding question in DPjBL) and initiate an investigation. This includes gathering and assessing information, utilizing evidence and criteria, justifying decisions, and considering various alternatives and their potential impacts (Buck Institute for Education, 2019b). Additionally, key indicators of these skills include the ability to clearly define the problem, propose and implement solutions, and assess the results (Budiarti et al., 2021). In collaboration skills, students conduct individual collaboration including taking responsibility, assisting team members, and showing respect for others; and group collaboration involves reaching and adhering to agreements, organizing tasks, and working cohesively as a unified team (Buck Institute for Education, 2019a).

While some previous studies have explored the impact of digital storytelling on student 4Cs (Communication, Collaboration, Critical Thinking, and Creativity) (e.g. Saimon et al., 2023; Mardiana et al., 2022), critical thinking and digital literacy (Yang & Wu, 2012), and the influence of literacy practice on students' critical thinking (Kurniawati et al., 2020), there remains a lack of comprehensive studies that specifically examine its role in enhancing both critical thinking and collaborative skills among students in the context of literacy education. Hence, this study explores how the teacher's literacy practice through a digital storytelling project fosters students' critical thinking and collaboration. Besides, this research also explains the students' experience in doing the literacy activities and the project.

Despite a growing body of research on digital storytelling (DST), much of the existing literature concentrates on its role in enhancing language acquisition, narrative development, or student engagement. While these studies offer valuable insights, they often overlook DST's potential to foster critical thinking and collaborative learning—particularly within structured, project-based literacy contexts. This gap is especially evident in Indonesian senior high school classrooms, where the integration of DST into curriculum-based literacy instruction remains underexplored. Compared to studies conducted in other educational systems (e.g., Yang & Wu, 2012; Lee, 2013), research situated in the Indonesian educational landscape has yet to fully examine how DST supports 21st-century skills such as analysis, reasoning, and teamwork. Therefore, this study seeks to fill that gap by investigating how DST, when embedded in project-based literacy tasks, can promote both critical thinking and collaboration among Indonesian high school students. This focus not only contributes to the pedagogical discourse around DST but also addresses a pressing need for innovative literacy practices aligned with current curriculum reforms in Indonesia.

METHOD

Using a qualitative approach, this study employed a case study since this research explores detailed insights into how literacy practice through digital storytelling projects enhances students' critical thinking and collaboration, and how the students' experiences in a specific and real-life context, i.e., in the classroom for teaching and learning process (Yin, 2018; Cresswell, J.W. & Cresswell, 2012). Hence, this type of research design will get rich and deep data from the phenomena based on the context of literacy practice through digital storytelling projects and students' points of view to discover the advantages and challenges.

This research was conducted at one of the state senior high schools in Mojokerto. The participants were thirty-six students at XII MIPA-8. The school and classes were chosen based on some considerations: 1) the teacher was familiar with and implements Project-based learning, 2) students were familiar with technology, and 3) the teacher and students agreed to fill out the consent form. The stages of implementing literacy practice through digital storytelling projects are presented in Table 1.

Table 1. Literacy Practices through Digital Storytelling Project Stages

Stages	Description
1 st stage:	The teacher introduced the project and the literacy activities.
Introduction	In literacy activities, students must
	1. read stories (doing self-reading at home, choosing books by themselves-based on their interest)
	2. tell what they have read in a journal (digital journal using
	Bookcreator)
	3. give comment other students' journal
	The teacher and students determined the topic. The topic chosen
	was "Environmental Issues"
2 nd stage:	The teacher gave an example of storytelling creation using Canva.
Composing Digital	Students created digital storytelling collaboratively using
storytelling	narrative genres. Students also illustrated the stories using Canva.
3 rd stage: presenting	Students presented their stories
the digital	The teacher gave feedback
storytelling	
4 th stage: reflecting	Students reflected the process of digital storytelling creation
the process of digital	
storytelling	

The researchers took one month or six meetings to conduct a classroom observation to obtain the data. After that, the researchers employed a group interview. Documentation, i.e., students' digital storytelling artifacts was also used to investigate their critical thinking. Each group consists of six participants. The time allocation was sixty minutes for each group. Further, the researchers analyzed the data using thematic analysis as this research identified the pattern or finding the theme through the collected data (Braun & Clarke, 2006; Lochmiller, 2021). The data analyzed thematically were categorized based on the repeated themes and reflected the purpose of the research.

RESULTS

Literacy Activities

Before and during the project process, students are instructed to read any stories (from novels/short stories/biographies/other kinds of storybooks) that they like or are interested in. They must report their reading in the journal digitally using *Bookcreator*. This literacy activity and the journal report must be carried out daily because reading the whole novel in a day may be impossible. Their reading report is described Table 2.

Table 2. Some Points in Reporting Reading Activities

Day 1	Day 2 and so on (The same title)
1. The title of the stories	1. The interesting point
2. The characters	2. The boring point

- 3. The plot of the stories
- 4. The moral values of the stories
- stories
- 3. What should the writer tell?

5. The possible following idea of the If the next day uses different stories, they can use the table on the left or students may modify.

In this activity, most of the students report their journals every day. Some students do it once in two days or three days. Toward this journaling, students are encouraged to think critically because they must evaluate the stories such as points number 1 to 3 in the table on the right above. Students must express their points of view about the interesting and the boring points in the stories, and they are encouraged to imagine and write possible interesting stories based on their ideas if the students mention the boring points of the stories. Figure 1 is one of the examples of a student's journaling work.

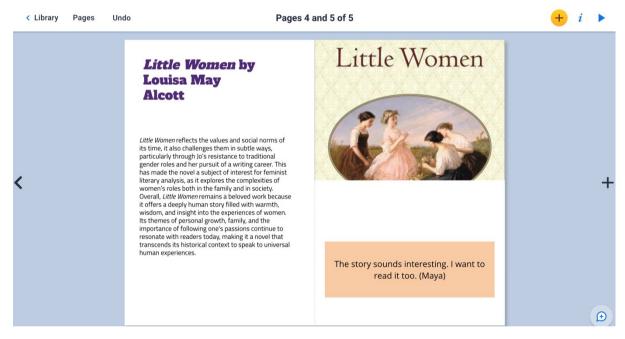


Figure 1. Student's Reading Journal in Bookcreator

In Figure 1, one student could evaluate what she/he read by correlating the stories with real life and elucidating the characters in the novel. The statements on the Orange Box are the other student's comments. This is interesting what one student tells in his/her journal and encourages the other student to read the story. This means that literacy activities can be designed as collaborative or peer feedback because it can trigger students' curiosity and willingness to read. Questions provided in Table 2 and journal writing are teacher interventions to conduct structured literacy activities.

Driving Questions or Problems

In this research, the teacher facilitated students to discuss environmental issues in Indonesia. The teacher provided prompt questions to activate students' critical thinking skills. The teacher utilized multimodal digital content related to environmental issues; such as plastic garbage in the sea, forest fires, and illegal logging. See the following pictures in Figure 2.



Figure 2. Teacher's Prompt Question

The teacher provided contextualization through the multimodal media to encourage students' participation and argumentation. Furthermore, the teacher also used infographic information related to the environment to trigger students' curiosity. See Figure 3.



Figure 3. Teacher's Media of Environmental Infographic Information

Through the process of meaningful discussion related to environmental issues, students were curious about the environmental problems in Indonesia by asking about the cause-effect and evaluation, giving the solution, and environmental awareness. The examples of the student's questions and discussion results are described in Table 3.

Table 3. Students' Questions and Responses

Types	Questions/Responses
Cause-effect Are environmental issues only related to pollution?	
Evaluation	whereas the government has the big effort to overcome, why rubbish/garbage is still becoming the biggest issues?
Solution	If I live in the area that has a rubbish or garbage problem, I will establish youth movement to do some programs to overcome the rubbish problem.

The students' questions, such as "Are environmental issues only related to pollution?" demonstrate their initial questioning of existing assumptions. Another question like "Whereas the government has made significant efforts to address it, why is garbage still a major issue?" reflects a critical evaluation of the government's actions in handling environmental problems. Moreover, the solution-oriented response, "If I live in an area with a garbage problem, I will establish a youth movement to implement programs to solve the garbage problem," indicates that students are not just analysing issues but also thinking about concrete solutions.

In this context, students are practicing critical thinking through problem-based discussions that require them to question causes, evaluate situations, and propose solutions—all essential components of critical thinking skills. This approach not only enhances their awareness of environmental issues but also encourages them to become more reflective and solution-oriented thinkers. This reflects that student have environmental issue schemata and awareness. The students' questioning triggers the other students to discover the answer. The teacher facilitated the discussion and provided feedback and also other point of view. The student also attempted to give a solution based on the picture given by the teacher. The students' voices also emphasize these findings. See the following

"...the environmental issues allow me to be more aware of the problems related to the environment and I began to think more and more or be critically about the solution through the stories. It's a wonderful experience"

(Excerpt, Student 1)

"Environmental topic is appealing because it happens in our daily life. So, this story can be a medium to advise in a fun way."

(Excerpt, Student 7)

After discussing environmental issues, the teachers prepared the students to create digital storytelling. Students were equipped with the genre of the story, i.e. narrative and technological usage, i.e., Canva. The teacher explained the narrative text by giving examples related to the environment followed by a discussion. Moreover, the teacher showed the students how to illustrate the stories with some multimodal elements (Lee, 2014) in Canva.

Constructing Stories Collaboratively

Before constructing stories, teachers divided the thirty students into six groups. Each group consists of six students. Topics were related to environmental issues in Indonesia. Four

themes chosen were 1) water pollution, 2) air pollution, 3) Building/housing construction, and 4) land selling. After that, the teacher guided the students with some prompts to develop the theme chosen into the stories:

- 1. Who, where, and when did your story happen?
- 2. What happened?
- 3. How was the conflict?
- 4. What was the resolution or solution?
 - What could I do to solve problems in this place? What could I change?
 - Was your solution possible? Was your solution challenging? Why?
- 5. How was the end of your story? Deliver the moral value from your story!

In the process of constructing the stories, the researchers observed the collaboration skills of the students. Students actively engaged in the process of writing the stories. They had an individual responsibility to help their group and respect their friends. They also contributed to delivering their opinion and working in a team. The students' voices also confirm these observation results in the interview session

"I like doing the project in a group because we can share our ideas, so we can finish our project quickly."

(Excerpt, Student 8)

"I prefer collaborative work because we can discuss with our friends and they give feedback to correct our stories. This is very helpful to improve our stories."

(Excerpt, Student 18)

"Doing the project in a group can teach us how to cooperate and deal with our responsibility to finish our project. We support each other and discuss the things that I may not understand with the materials."

(Excerpt, Student 26)

"It's very interesting for me to work collaboratively. Since digital storytelling projects involve some skills such as digital, writing, and designing skills, it allows us to give our contribution based on what we can do and we share our work with our team."

(Excerpt, Student 33)

The excerpts from the students reflect their positive experiences and perceptions of collaborative work, particularly in the context of a digital storytelling project. Each student highlights different aspects of collaboration that contribute to their learning and project outcomes. Student 8 emphasizes the efficiency gained through group work, noting that sharing ideas within a team enables them to complete the project more quickly. This response indicates that collaboration can streamline the creative process and enhance productivity. Student 18 values the feedback mechanism inherent in collaborative work. They appreciate the opportunity to discuss their work with peers, which helps in refining and improving their stories. This underscores the role of collaboration in providing constructive criticism that enhances the quality of individual contributions. Student 26 focuses on the development of cooperation and responsibility. They mention that working in a group teaches them how to collaborate effectively and fulfil their duties, which includes supporting one another and clarifying any misunderstandings about the material. This suggests that collaborative

projects do not only improve academic skills but also foster important interpersonal and organizational skills. Student 33 finds collaborative work interesting because it allows each team member to contribute according to their strengths, whether in digital skills, writing, or design. This shows that collaborative projects can accommodate diverse skill sets, and enable students to contribute in ways that align with their abilities, while also learning from others.

The data above shows that digital project-based learning encourages students' collaborative skills. Students perceived collaborative work positively and they enjoyed the process of collaborative work to achieve their project. Furthermore, the researchers also investigated the students' critical thinking from their writing artifacts. In this project, students were encouraged to be able to give solutions that contributed to making the situation better. For instance, Group 1 narrated the issues as follows:

In short, several years later. Currently, I have entered high school. My village was currently in increasingly worrying condition. Floods have become daily food for us. Even now, the cliff area has started to landslide which made residents even more anxious. My village, which used to have clean and refreshing air, was now no different from industrial areas in the city. If we had rejected the plans of those bandits, we would not have suffered this badly. When nature has willed it, who can be responsible?

One day, after school, there was a commotion in front of the village hall. From a distance, I can see a police car parked there. I ran towards the crowd. Not far from the crowd, I accidentally met Si Mbah. I then asked for clarity on this situation. "Actually, what's going on Mbah? Why is there such a fuss?" I asked in surprise. "Finally, they were arrested, the owner of the factory. They were arrested because they were suspected of dumping toxic waste without processing it first," explained Si Mbah. A moment of silence. "That means, after all this hustle and bustle is over, we have to work together to rebuild this village, restore its tranquillity and the peace of our nature," I invited the people there.

(Excerpt digital storytelling entitled: Give Back Our Village)

From the excerpt of the story, students in Group 1 were able to elucidate the issues based on the title and answered the prompt questions. They also provide the solution at the end of the story that the students as the writers ask the citizens to protect their village by reconstructing the factory building. The summary of all of the groups' digital storytelling aspects of critical thinking are as follows:

Table 4. The L	Summary of	'Students' I	Digital Stoi	rytelling

ď	Theme/	Critical Thinking		
Group	Topic	Problem Definition	Solution	
1.	Land selling, building/		Rebuild or reconstruct the building	
	housing			
2.	Air pollution		Movement to reduce air pollution	
3.	Water pollution	The issues are relevant to the topic,	Giving scientific solution to filter the water pollution	
4.	Land selling,	problems	Related to cultural belief	
	building/	constructed in the stories are based on	Preserving & respect to the local	
	housing	the criteria	culture	
5.	Land selling, building/		Green movement	
	housing			
6.	Illegal logging		Citizens' voices to protest against the illegal lumberjack	

Table 4 shows that literacy practice with digital storytelling projects encourages students' critical thinking. They can write stories based on their own experience in their awareness of the real-life environmental crisis. Bringing real-life issues, i.e. environment into the digital storytelling project triggers students' critical awareness of environmental issues toward their stories' construction.

The table showcases how students applied critical thinking to real-world environmental and social issues. Each group identified a specific problem related to their theme and proposed relevant solutions. The diversity in problem definitions and solutions reflects the students' ability to analyze issues from different perspectives, whether it involves technological solutions, cultural preservation, environmental advocacy, or community mobilization. This data illustrates that the digital storytelling project fosters critical thinking and problem-solving skills among students.

Students' Reflection on Experiencing Literacy Practice through Digital Storytelling Project

In the process of writing digital storytelling, students also experienced the advantages and challenges. They expressed that integrating literacy activities in writing storytelling projects gives them opportunities to improve their English abilities, such as reading, vocabulary, and writing. Besides, they also explain that they become more aware of environmental issues and contribute to environmental protection through stories. Consider the following

"At first, the reading and journaling program was so hard because I don't like reading. But then I could feel the story and I'm addicted to reading. Ehm... you know that the reading or literacy activities help me create stories for the project from my teacher. It gives me an idea. I used to be confused in writing stories but this time I could imagine what I wanted to tell and I contributed to the group discussion for discussing stories with my team. Overall, I love this program"

(Excerpt, Student 30)

"So far, this project with the reading journal makes me confident in writing English. I think my vocabulary improved and I could understand quickly long passages in reading activities when in the classroom. I need to think deeply it means that we are trained to think critically because we have to give our views and in writing storytelling for the project, we have to create an imaginative but reflecting real-life story containing moral values. Wow..it was challenging but we enjoyed it."

(Excerpt, Student 25)

Students' reflections provide valuable insights into the impact of literacy activities and digital storytelling projects on their critical thinking and overall engagement with learning. See the following details:

1. *Initial Struggle and Transformation:* Student 30 initially struggled with the reading and journaling program, citing a dislike for reading. This resistance is common when students are first introduced to new and challenging activities. However, the student's attitude changed over time, transitioning from reluctance to enthusiasm ("I'm addicted to reading"). This indicates that the program successfully engaged the student, potentially by providing materials or activities that resonated with their interests.

- 2. *Impact on Story Creation:* The student credits the reading activities with helping generate ideas for creating stories in the project. This suggests that the program effectively stimulated the student's imagination and creativity, which are crucial for storytelling. The student's newfound ability to "imagine what I wanted to tell" reflects an improvement in narrative skills, likely supported by exposure to diverse texts and the practice of journaling.
- 3. Contribution to group work: The student's enhanced confidence in storytelling led to active participation in group discussions. This highlights the program's role in not only developing individual skills but also in fostering collaborative learning. The student's positive overall impression ("I love this program") suggests a significant transformation in their attitude toward reading and learning.
- 4. Confidence in Writing English: Student 25 emphasizes the program's positive impact on their confidence in writing English, which is a critical skill in language learning. The reading journal appears to have played a key role in vocabulary development and comprehension, enabling the student to engage more deeply with texts during classroom activities.
- 5. *Critical Thinking Development:* The student associates the program with training in critical thinking. The need to think deeply and reflect critically when contributing to storytelling tasks indicates that the program encouraged higher-order thinking skills. The challenge of creating imaginative yet realistic stories with moral values suggests that students were pushed to not only think creatively but also to consider ethical and real-life implications.
- 6. Overall Enjoyment: Despite acknowledging the challenges, the student expresses enjoyment of the project, which implies that the program was both intellectually stimulating and rewarding. This combination of challenge and enjoyment is a key indicator of effective educational practices.

Students' statement above proves that they are also encouraged to read. They also feel enjoyment although it was hard at first. Literacy activities help them generate their idea and construct stories. Therefore, they experience vocabulary and writing improvement. Besides, the digital storytelling project allows them to sharpen their thinking or cultivate their critical thinking. In addition, students also perceive positive views on the collaboration process. Although they faced the challenges, they enjoy the process.

DISCUSSION

Journal writing played an important role in helping the teacher understand how students were participating in the literacy activities. It wasn't just about monitoring progress—it became a space where students could reflect, express ideas, and sharpen their thinking. This approach reflects what Aimah and Purwanto (2019) as well as Khairuddiniyah (2017) observed: thoughtful questions and meaningful literacy tasks can actively engage students and strengthen their ability to evaluate and reflect on texts. In addition, when students gave and received feedback from peers, they weren't just checking each other's work—they were learning to build arguments, consider other perspectives, and explain their reasoning.

Tackling real-world environmental issues also helped spark deeper thinking. By using prompt questions and rich, multimodal content, the teacher guided students into meaningful discussions. Instead of just absorbing information, students explored causes, questioned assumptions, and suggested possible solutions. This kind of classroom dialogue shows what critical thinking looks like in action—something that aligns with the ideas of Budiarti et al. (2021) and the Buck Institute for Education (2019a), where students are encouraged to question, connect, and create.

Working in groups also made a noticeable difference. Through digital project-based learning, students weren't just completing tasks—they were learning how to collaborate. They valued the teamwork involved in creating their projects, and this process helped build a more supportive classroom environment. This matches what Saimon et al. (2023) found: collaboration doesn't just make projects better, it helps students grow more confident and cooperative.

Bringing real-life topics—like environmental challenges—into their digital stories gave students a chance to connect schoolwork with things they actually care about. It made the tasks more meaningful and encouraged them to think critically about the world around them. Studies by Putri (2018) and Kotluk & Kocakaya (2017) support this too, showing that when students explore real-world issues through storytelling, their critical awareness grows. Yang and Wu (2012) also highlight how digital storytelling promotes not just reflection, but problem-solving as well.

Beyond thinking and collaborating, students also improved their language skills. As they brainstormed, wrote, and revised their stories, many became more confident in using vocabulary and expressing ideas in writing. This mirrors what Kurniawati, Sugaryamah, and Hasanah (2020) noted—that digital storytelling helps students develop both their language and their ability to reflect and think more deeply.

To sum up, this study shows how combining structured literacy, digital storytelling, and project-based learning can help students grow in multiple ways—especially in critical thinking, teamwork, and language development. When students work on projects that matter to them, and have the chance to discuss, reflect, and build something together, learning becomes more meaningful. These findings suggest this approach has real potential to support 21st-century learning—not just in one classroom, but across other similar contexts as well.

CONCLUSION

This study demonstrates that the integration of project-based digital storytelling with structured literacy activities can effectively enhance students' critical thinking and collaboration. Rather than simply developing narrative or language skills, the DST approach encouraged deeper engagement with content, peer interaction, and reflective analysis—skills essential for 21st-century learning in Indonesian classrooms.

From a pedagogical standpoint, educators are encouraged to complement DST with tools such as reading journals and reflection logs to further promote metacognition and group learning. These practices may serve as valuable additions to literacy instruction, particularly in environments seeking to align with project-based learning models. However, this study was limited to a single classroom in one school context, which may constrain the

generalizability of its findings. Variables such as teacher experience, student background, and access to technology were not controlled, which could influence the outcomes of DST integration.

Future research should explore the long-term impact of DST on students' problemsolving and communication abilities across different regions, school types, and subject areas. Comparative studies involving varied socio-cultural settings and age groups would also contribute to a more comprehensive understanding of DST's pedagogical value and scalability.

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