

Students' Perspectives on the Integration of Augmented Reality Interactive Systems in Supporting Text Construction Skills: A Case Study

Yuliana Susilowati ^{1*}, Siti Nur'Aini ¹, Arso Setyaji ¹

¹ Universitas Persatuan Guru Republik Indonesia Semarang, Indonesia

 yulianasusilowati27@gmail.com*

ABSTRACT

Writing is widely recognized as one of the most challenging language skills for English as a Foreign Language (EFL) learners, particularly in generating ideas, organizing information, and constructing coherent texts, thereby necessitating innovative instructional strategies that can support meaningful learning and student engagement. This study aimed to explore the implementation of the Augmented Reality Interactive System (ARIS) in supporting students' text construction skills in English language learning at the junior secondary school level. The study employed a qualitative approach with a single-case study design conducted at SMP Negeri 28 Semarang. The participants consisted of seventh-grade students and one English teacher. Data were collected through classroom observations, semi-structured interviews, documentation, and field notes, and were analyzed using an interactive data analysis model. The findings revealed that the implementation of ARIS contributed positively to students' engagement during learning activities, supported idea generation and text organization, and fostered collaborative and contextual learning. AR also functioned as a visual scaffold that helped students connect vocabulary, experiences, and observations into more meaningful written English texts. The findings further indicate that the integration of AR in English language learning has the potential to support student-centered learning practices aligned with the principles of Kurikulum Merdeka. Therefore, AR can be considered an alternative instructional innovation to support the development of students' writing skills in the EFL context.

Keywords: Augmented Reality; collaborative learning; EFL writing; English language learning; text construction

ARTICLE INFO

Article history:

Received
August 20, 2025
Revised
September 21,
2025
Accepted
November 28,
2025

Journal Homepage <https://attractivejournal.com/index.php/aj/>
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Published by CV. Creative Tugu Pena

INTRODUCTION

The rapid advancement of digital technologies has transformed educational landscapes worldwide, presenting opportunities and challenges for language learning. Among these innovations, Augmented Reality (AR) has emerged as a formidable educational technology capable of blending digital content seamlessly with real-world environments. AR integrates computer-generated elements such as graphics, audio, and video into users' physical surroundings in real time, creating immersive and interactive learning experiences that can enhance students' cognitive engagement and motivation (Wedyan et al., 2022).

Educational research in recent years has increasingly recognized AR's potential to enrich language instruction by offering context-rich and multimodal learning environments. AR has been applied to facilitate vocabulary acquisition, reading comprehension, and general language engagement, showing promising outcomes in students' linguistic and affective learning processes. For example, studies have demonstrated that AR can significantly enhance motivation and interaction in English language classrooms and support authentic, context-

based practice that transcends traditional textbook limitations (Carrión-Robles et al., 2021; Sagita et al., 2023). However, despite these advances, the application of AR in supporting learners' writing skills, particularly text construction in English as a Foreign Language (EFL) contexts, remains underexplored.

Writing is a complex communicative skill that requires learners not only to master grammar and vocabulary but also to organize ideas coherently and construct meaningful texts. Research suggests that EFL learners often struggle with text construction due to limited exposure to authentic language use and a predominance of teacher-centered instruction that emphasizes accuracy over communicative meaning-making. Studies in similar contexts indicate that interactive and situated learning environments may mitigate these challenges by providing learners with rich linguistic input and real-world contexts that promote deeper cognitive engagement. Yet, most empirical investigations on AR in language learning have focused on micro-skills such as vocabulary or reading, with limited evidence on AR's impact on extended discourse production like writing. This gap signifies a crucial need for research that aligns AR integration with writing pedagogy.

Generative Learning Theory provides an important theoretical lens for understanding how technology-enhanced learning environments can support students' writing development. Originally proposed by Wittrock (1974), the theory posits that learning is not a passive process of receiving information but an active process in which learners generate meaning by connecting new information with their prior knowledge and experiences. Meaningful learning occurs when students engage in cognitive activities such as organizing ideas, elaborating information, making inferences, and constructing relationships among concepts. In language learning contexts, these generative processes are particularly relevant to writing because learners must actively transform ideas into coherent linguistic expressions rather than merely reproduce information.

From this perspective, text construction involves a series of generative cognitive activities through which students observe, interpret, organize, and communicate meaning in written form. The interactive and multimodal features of Augmented Reality may facilitate these processes by providing visual, contextual, and experiential stimuli that encourage learners to generate ideas and organize information more effectively. Consequently, AR has the potential to function not only as a technological tool but also as a pedagogical medium that supports the cognitive mechanisms underlying text construction. The integration of Generative Learning Theory therefore offers a valuable conceptual foundation for examining how AR can assist EFL learners in developing their writing and text construction skills.

Within the Indonesian education system, the adoption of innovative pedagogical practices is further influenced by national policy and curriculum frameworks. In 2024, the Indonesian Ministry of Education, Culture, Research, and Technology promulgated Permendikbudristek No. 12 Tahun 2024 concerning curriculum standards for early childhood through secondary education, which provides the regulatory foundation for the implementation of the Kurikulum Merdeka across basic and secondary schooling. This regulation emphasizes flexibility, student-centered learning, and contextualized instruction, encouraging educators to utilize diverse learning strategies that accommodate individual learner needs. Additionally, Peraturan Pemerintah No. 57 Tahun 2021 on the National Standards of Education underscores the imperative to integrate relevant technologies into pedagogical practice to support standards of competence and learning outcomes.

Despite the curricular mandate for innovation and personalized learning, operationalizing technology-enhanced instruction in EFL classrooms has proven challenging due to limited teacher preparation, resource constraints, and insufficient empirical guidance. Although some studies have begun to explore AR's role in language education such as comparative research analyzing AR versus traditional flashcards and investigations examining AR's effect on classroom writing engagement these investigations predominantly remain localized or focus on general writing tasks without deeply examining the processes of idea development, text organization, and meaning negotiation in authentic classroom settings.

This study, therefore, seeks to address these gaps by exploring how Augmented Reality can be effectively integrated as an innovative instructional strategy to support EFL students' text construction skills within a junior secondary school context in Indonesia. Through a

qualitative case study design, this research aims to provide nuanced insights into the pedagogical affordances of AR, how it assists students' cognitive and linguistic processes during writing, and how teachers perceive the integration of AR in their instructional practices. By bridging technological affordances with pedagogical strategies aligned with national curriculum aspirations, the study contributes to both theoretical understanding and practical application of AR in EFL writing education.

METHOD

This study employed a qualitative case study design to investigate the implementation of Augmented Reality (AR) in English language learning and its role in supporting students' text construction skills. A qualitative approach was considered appropriate because the study aimed to explore classroom practices, participants' experiences, and the meaning-making processes emerging from AR-based learning activities within their natural setting. This study employed a qualitative single-case study design to investigate the implementation of Augmented Reality (AR) in English language learning and its role in supporting students' text construction skills. A qualitative approach was considered appropriate because the study sought to explore classroom practices, students' experiences, and the learning processes emerging from AR-based activities within their natural classroom setting. According to Yin (2018), case study design enables researchers to examine a contemporary phenomenon in depth and within its real-life context, particularly when the boundaries between the phenomenon and context are not clearly evident. Therefore, this design was considered suitable for capturing how AR was integrated into classroom instruction and how students engaged with the activities during the process of text construction.

The research was conducted at SMP Negeri 28 Semarang, Indonesia. The school was selected purposively because it provided a relevant context for AR-supported language learning. Its classroom and surrounding environment contained various visible textual resources, including signs, labels, posters, and other printed materials that could be meaningfully incorporated into AR-based English learning activities. This contextual setting supported the integration of digital and environmental learning resources in students' text construction practices.

The participants of this study consisted of approximately 30 eighth-grade students and one English teacher. The students were selected because they had prior exposure to basic English instruction and were familiar with the use of digital technology in classroom learning. Meanwhile, the English teacher was involved as a collaborative participant in designing and implementing AR-assisted instructional activities. Participants were selected using purposive sampling, which allows researchers to identify individuals who can provide rich and relevant information related to the research focus (Patton, 2002).

Data were collected through classroom observations, semi-structured interviews, documentation, and field notes. Classroom observations were conducted during English learning sessions involving AR activities. The observations focused on instructional procedures, classroom interaction, students' participation, engagement during AR implementation, and the ways students constructed texts during the learning process. These observations enabled the researcher to document naturally occurring classroom practices and students' responses during instruction.

Semi-structured interviews were conducted with the English teacher and selected students after the classroom implementation. The interviews aimed to explore participants' perceptions, experiences, responses, and challenges regarding the use of AR in English learning. This interview format allowed flexibility for participants to elaborate on their experiences while maintaining alignment with the central issues addressed in the study (Creswell & Poth, 2018).

To enrich the data, documentation was collected in the form of lesson plans, students' written texts, screenshots of AR activities, classroom photographs, and other learning artifacts produced during the implementation. These materials functioned as supporting evidence to strengthen data interpretation and provide a more comprehensive understanding of the learning process. In addition, field notes were written during each observation to capture contextual details, significant classroom events, and reflective insights that were considered relevant to the analysis.

The data were analyzed using the interactive model of qualitative data analysis proposed by Miles, Huberman, and Saldaña (2014), consisting of data condensation, data display, and conclusion drawing and verification. In the first stage, all data obtained from observations, interviews, documentation, and field notes were organized, reviewed, and condensed by selecting information relevant to the focus of the study. The data were then coded and categorized into meaningful units related to AR implementation and students' text construction processes. In the second stage, the organized data were displayed in descriptive narratives and thematic categories to facilitate interpretation and identify emerging patterns across the data sources. In the final stage, conclusions were drawn through interpreting recurring themes and verifying them continuously by revisiting the collected data to ensure consistency and credibility.

To enhance the trustworthiness of the findings, several validation strategies were employed. First, methodological triangulation was applied by comparing data obtained from classroom observations, interviews, documentation, and students' written work. Triangulation allows the researcher to cross-check findings from multiple sources and strengthen interpretive validity (Denzin, 1978). Second, member checking was conducted by confirming interview transcripts and interpretations with participants to ensure that their perspectives were accurately represented (Creswell & Poth, 2018). Third, peer debriefing was carried out through discussion with academic peers and supervisors to review the analysis process, challenge interpretations, and minimize potential researcher bias. These strategies were employed to ensure the credibility, consistency, and trustworthiness of the research findings (Lincoln & Guba, 1985).

RESULT AND DISCUSSION

The findings of this study indicate that the implementation of the Augmented Reality Interactive System (ARIS) in English language learning provided meaningful support for students' text construction skills. Based on classroom observations, interview responses from students and the teacher, as well as supporting learning documentation, three major findings emerged: (1) AR increased students' engagement during learning activities, (2) AR supported idea generation and text organization during writing, and (3) AR fostered contextual and collaborative learning in the English classroom.

3.1 Augmented Reality Increased Students' Engagement in English Learning

The first finding of this study demonstrates that the implementation of the Augmented Reality Interactive System (ARIS) contributed positively to students' engagement during English learning activities. Data gathered from classroom observations revealed that students showed strong interest and active participation when AR was introduced into the lesson. Their responses were noticeably different from those typically observed during conventional writing activities. From the beginning of the lesson, students appeared curious about the technology being used and were eager to explore the AR features provided through the learning activity. Their engagement was reflected through verbal responses, physical interaction with the media, peer discussion, and sustained attention throughout the writing process.

During classroom observation, students were seen actively scanning AR markers, observing the visual objects that appeared on the screen, pointing to images while mentioning vocabulary aloud, and discussing meaning with classmates before beginning to write. Several students moved closer to the displayed AR content to gain a clearer view and repeated English vocabulary while relating it to the images they observed. The classroom atmosphere became more interactive, with students demonstrating greater enthusiasm and participation compared with regular classroom writing sessions. Rather than waiting for teacher explanation, many students initiated discussion independently and explored the learning material with curiosity.

This increased engagement became particularly visible during learning activities involving daily routine text and procedure text. When students were presented with AR-based visual representations of everyday activities, they immediately connected those images with familiar experiences from their own lives. This connection appeared to make the lesson feel more relevant and enjoyable for them. Students remained focused for longer periods, responded quickly to instructions, and participated more confidently in classroom interaction.

The observation findings were reinforced by student interview data. Most students expressed that learning English through AR felt more enjoyable, less intimidating, and more interesting than ordinary writing lessons. One student explained:

"I felt more interested when the teacher used Augmented Reality because we could see the pictures directly and connect them with English words. Usually writing is difficult for me, but with AR it felt more enjoyable." (S1)

Another student shared a similar experience:

"The lesson felt different from usual. I was more excited to learn because I could directly see the activities and understand them before writing. It helped me focus more in class." (S3)

Several students also highlighted how the visual and interactive elements of AR helped maintain their concentration during the lesson. One participant noted:

"When I saw the pictures appear on the screen, I wanted to keep looking and finding out what vocabulary matched the image. It made me pay attention longer because it was not boring." (S5)

Another student stated:

"Usually when writing English I sometimes feel confused and lose focus, but with AR I became curious about the images and wanted to continue the activity until the end." (S6)

Students also described AR as creating a learning experience that felt more active and collaborative. Some reported that they were more willing to ask questions, answer teacher prompts, and exchange ideas with classmates because the visuals gave them something concrete to talk about. One student explained:

"I became more confident to speak because we could see the object first. If I forgot the vocabulary, my friends and I could guess it together before writing." (S4)

These student perspectives indicate that AR not only attracted learners' attention at the beginning of the lesson but also helped sustain engagement throughout the learning process.

The teacher interview further confirmed this finding. The teacher observed a visible change in students' classroom behavior during AR-assisted instruction compared with previous writing lessons. According to the teacher, students who were usually passive became more responsive and involved when AR was integrated into the learning activity. The teacher stated:

"When Augmented Reality was used, students showed much stronger participation than in ordinary writing activities. They became more curious and immediately wanted to explore the material. Even students who are usually quiet were willing to ask questions, answer prompts, and share ideas with their friends. I could see that they were more focused from the beginning until the end of the lesson." (T1)

The teacher also noted that AR encouraged students to interact more naturally with the lesson content:

"The visual appearance helped students stay connected to the material. Because they could directly observe the object or activity through AR, they became more enthusiastic to discuss vocabulary and meaning before writing. Their attention lasted longer, and classroom participation became more active overall." (T1)

From the teacher's perspective, AR functioned not merely as a digital teaching tool but as an instructional medium capable of creating a more engaging classroom environment. The integration of visual and contextual input appeared to reduce students' hesitation and increase their willingness to participate actively in English learning.

These findings suggest that AR played an important role in enhancing students' emotional, cognitive, and behavioral engagement in the classroom. Emotionally, students expressed enjoyment, curiosity, and enthusiasm toward the lesson. Cognitively, they remained focused on observing and interpreting the AR content while connecting it with English vocabulary and meaning. Behaviorally, they actively participated through questioning, discussing, responding, and completing writing tasks with greater involvement.

This finding is consistent with previous research emphasizing the pedagogical value of AR in language learning environments. Carrión-Robles et al. (2021) argue that AR promotes interactive participation by combining visual, contextual, and digital learning experiences in ways that increase learner involvement. Likewise, Sagita et al. (2023) found that AR contributes to a more dynamic and motivating classroom atmosphere, encouraging students to engage more actively with learning tasks. The present study supports these findings by demonstrating

that AR can meaningfully increase learner engagement in English writing instruction, particularly during activities related to text construction.

Within the context of this study, AR functioned as an engaging instructional medium that helped transform writing activities into more interactive and meaningful learning experiences. By connecting digital visualization with familiar real-life contexts, AR encouraged students to become more attentive, motivated, and actively involved throughout the learning process.

3.2 Augmented Reality Supported Students' Idea Generation and Text Construction

The second finding of this study indicates that the use of the Augmented Reality Interactive System (ARIS) played an important role in supporting students' idea generation and text construction during English writing activities. Based on classroom observation, student interviews, and teacher interview data, AR functioned as a visual and contextual scaffold that helped students generate ideas, recall relevant vocabulary, organize information, and transform their observations into written English text.

Classroom observations showed that students frequently used AR content as a starting point before writing. Rather than immediately beginning with sentence production, students first observed the visual objects displayed through AR, identified what they saw, mentioned related vocabulary, and then gradually translated those ideas into written form. This process was especially visible when students were asked to compose texts related to daily routine and procedure text. The AR visuals appeared to provide concrete references that supported students in moving from observation to verbal expression and finally to written production.

During the daily routine lesson, students observed visual representations of common everyday activities such as waking up, brushing teeth, taking a bath, having breakfast, going to school, and studying at home. These images became meaningful prompts that helped students connect English vocabulary with actions familiar to their daily lives. As students observed the AR content, many began verbally naming the actions they saw before writing them in sentence form. Some students were also observed writing keywords first before expanding them into complete sentences and short paragraphs.

For example, several students developed handwritten paragraphs describing their daily routines based on the AR-supported learning activities. Their writing shows how they were able to transform ideas from visual prompts into connected written sentences. Students described activities such as waking up in the morning, taking a shower, having breakfast, going to school, studying in class, helping their parents at home, and doing homework in the evening. Although some grammatical inaccuracies were still found, most students were able to organize their ideas in a logical chronological order from morning to night and express them in complete sentences. These written responses indicate that AR not only provided visual stimulation for generating ideas but also supported students in recalling vocabulary, sequencing events coherently, and developing their written expression with greater confidence.

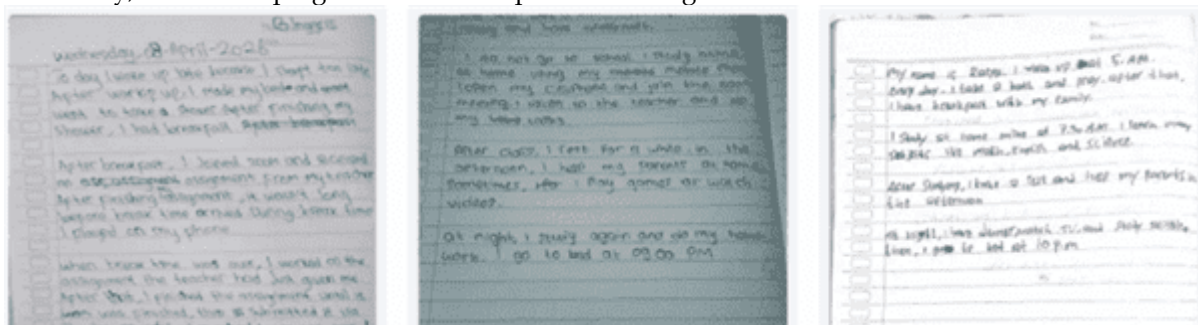


Figure 1. Samples of Students' Handwritten Paragraphs on Daily Routine Produced after AR-Based Learning Activities

Overall, the students' daily routine writing demonstrates that AR-based learning supported their ability to generate ideas and develop them into connected written text. The students were able to organize events chronologically, recall relevant vocabulary, and express their daily activities in simple English sentences. These findings indicate that AR contributed positively to students' confidence and writing development, particularly in constructing meaningful paragraphs based on familiar everyday experiences.

A similar pattern emerged during the procedure text lesson. Students used AR to observe step-by-step actions represented visually on the screen. The sequence of actions helped them understand order and process more clearly before translating those steps into procedural writing. Students appeared better able to identify what should be written first, next, and last, which supported the organization of ideas into coherent text.

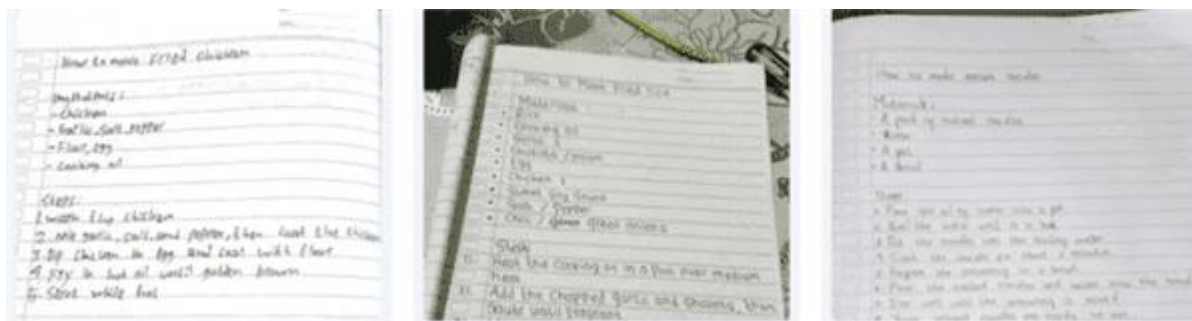


Figure 2. Samples of Students' Handwritten Procedure Texts Produced after AR-Based Learning Activities

The students' written products further demonstrate how AR supported the development of procedural writing. Most students were able to organize their texts into clear sections, such as materials or ingredients followed by ordered steps. Their writing included action verbs and sequencing expressions that reflected their understanding of process and order. Although minor grammatical and vocabulary errors were still visible, the overall structure of the texts shows that students were able to transform visual information from AR into organized written procedures. This indicates that AR not only improved comprehension of procedural sequence but also supported students in constructing coherent written texts with greater confidence.



Figure 3. Students' Engagement and Collaboration during AR-Assisted Writing Activity

Students' writing activities supported by Augmented Reality (AR), in which learners demonstrate active engagement and collaborative interaction throughout the learning process. During the activity, students were not only focused on completing individual writing tasks but also actively involved in peer discussion, idea exchange, and mutual assistance in developing their written work. The integration of AR technology appears to enhance students' engagement, as indicated by their heightened enthusiasm, attentiveness, and sustained focus during the writing session. Furthermore, the interaction among students became more dynamic, characterized by cooperative behaviors such as interpreting instructions together, organizing ideas collaboratively, and providing peer feedback to improve writing outcomes. These findings suggest that AR-assisted writing instruction supports not only cognitive development in writing skills but also promotes social interaction and collaborative learning among students.

These observation findings were strongly supported by student interview responses. Several students explained that the visual prompts from AR made it easier for them to think of what to write because the images gave them ideas before they started writing.

One student stated:

"The pictures helped me think about what I wanted to write. When I saw the daily activities in AR, I could remember the vocabulary and write the sentences more easily." (S2)

Another student explained:

"For procedure text, the AR made it easier because I could see the steps clearly. I knew what should come first and what should come next before writing." (S4)

Other students emphasized that AR reduced the difficulty they usually experience when starting a writing task. One participant shared:

"Usually I need a long time to think about ideas before writing. With AR, I could get ideas faster because I only needed to look at the picture and describe what I saw." (S6)

Another student similarly reported:

"Sometimes I know the vocabulary but I don't know how to begin writing. When I saw the AR image, it helped me imagine the sentence first, then I could write it little by little." (S5)

One student also highlighted how AR supported sentence development:

"It was easier because the picture gave me clues. I could think of words first, then make sentences from those words." (S3)

These responses suggest that AR supported students not only in generating ideas, but also in bridging the gap between vocabulary knowledge and written production. The visual input helped students retrieve words they already knew, while also providing contextual cues that guided them toward sentence construction.

The teacher interview further reinforced this interpretation. According to the teacher, students showed noticeable improvement in developing ideas once AR was integrated into the writing lesson. The teacher explained that many students who previously struggled to begin writing became more confident because they had a concrete visual reference to observe before composing text.

The teacher stated:

"The AR content helped students develop ideas before writing. They could observe the object or activity first, then connect it to vocabulary, and finally write sentences or short paragraphs. This made the writing process easier for them because they had something clear to describe." (T1)

The teacher also noted that AR supported students who often struggled with idea development:

"Usually students ask what they should write because they cannot imagine the topic. But when using AR, the ideas came more naturally because they could directly see the activity or object. The visual context helped them begin writing with more confidence." (T1)

Additionally, the teacher observed that AR supported students in organizing written ideas more systematically:

"The sequence shown in the AR activity helped students understand structure. They could identify the beginning, middle, and ending more easily, especially when writing procedure text. Their sentences became more organized because they already understood the order before writing." (T1)

These findings indicate that AR played a significant role throughout multiple stages of the writing process. AR supported students during pre-writing, when generating and gathering ideas; during drafting, when selecting vocabulary and forming sentences; and during organization, when arranging ideas into meaningful sequence and text structure. From a pedagogical perspective, AR can therefore be understood as a multimodal scaffolding tool that combines visual representation, contextual meaning, and language production. The integration of digital imagery and contextualized vocabulary appears to reduce cognitive burden during writing by providing students with concrete stimuli to think from. Rather than generating ideas from abstract prompts alone, students were able to observe, interpret, and then compose based on visual experiences.

These findings align with Song (2022), who argues that multimodal learning environments support composition development by connecting visual and linguistic meaning-making during writing. Similarly, Zhang (2023) emphasizes that AR-based learning environments can facilitate L2 writing development by offering immediate contextual support that assists learners in generating content and organizing ideas more effectively. AR did not merely function as a technological enhancement to the classroom, but as a pedagogical support system for writing development. By providing visual prompts, contextual meaning, and sequential representation of actions, AR helped students transform observation into language

and language into written text. This demonstrates the potential of AR to support EFL learners' text construction skills in more meaningful, structured, and accessible ways.

3.3 Augmented Reality Fostered Contextual and Collaborative Learning

The third finding of this study reveals that the implementation of the Augmented Reality Interactive System (ARIS) fostered contextual and collaborative learning during English instruction. Data from classroom observation, student interviews, and teacher interviews indicate that AR created opportunities for students to learn not only through individual interaction with the content, but also through peer discussion, collaborative meaning-making, and connection with their everyday experiences. The use of AR transformed the writing classroom into a more interactive social learning environment in which students actively constructed meaning together before producing written text.

During classroom observation, students were frequently seen discussing vocabulary, sharing interpretations of the visual content, helping peers operate the AR features, and collaboratively organizing ideas before writing. These interactions emerged naturally throughout the learning activities without requiring constant teacher prompting. Students often gathered in small groups around the AR markers or mobile device display, observed the same visual content together, and exchanged ideas about what they saw before translating those ideas into English sentences. In several moments of the lesson, students were observed pointing to visual objects on the screen while verbally identifying actions or objects in English. Some students asked classmates for vocabulary support, while others responded by suggesting words or correcting pronunciation. Peer discussion also continued into the writing phase, where students compared sentence ideas, asked whether word choices were appropriate, and checked the sequence of their written responses together. These interactions created an active collaborative learning atmosphere in which knowledge was built collectively through discussion and shared observation.

Students often supported one another during the writing process. Learners who understood vocabulary more quickly frequently assisted classmates who needed additional help. In some groups, students discussed the meaning of unfamiliar words before beginning to write, while in others they collaboratively arranged sentence order based on the AR visuals. This peer interaction appeared to reduce hesitation and increased students' confidence to participate in the activity.

These findings were further strengthened through student interview responses. One student explained:

"We discussed together while looking at the AR content. If someone didn't understand the meaning, we helped each other before writing." (S5)

Another student shared:

"Sometimes I forgot the English word, but my friend remembered it first. Then we talked about it together before writing the sentence." (S2)

A similar response was expressed by another participant:

"It was easier when we worked together because we could look at the AR picture and talk about what it meant. If someone had an idea, we could use it together." (S6)

One student also emphasized that AR made classroom interaction feel more natural:

"Usually when writing we work quietly, but with AR we talked more because we needed to discuss what we saw and how to write it in English." (S4)

These responses suggest that AR encouraged meaningful peer interaction by providing a shared visual reference that students could observe and interpret collectively. The digital visual content became a common point of discussion, enabling students to negotiate meaning together before producing written language.

The teacher interview also confirmed this finding. According to the teacher, classroom interaction became noticeably more collaborative during AR-assisted instruction. The teacher observed that students who were usually passive became more communicative and more willing to participate in peer discussion.

The teacher stated:

"Students became more active in discussing ideas. They exchanged vocabulary, corrected each other's sentences, and became more collaborative during the writing process. They were not only interacting with the media, but also interacting more with each other." (T1)

The teacher further explained:

"What I noticed was that AR encouraged students to help one another naturally. Students who understood the task more quickly often guided their friends. This made the learning atmosphere feel more cooperative and students became more confident to express ideas." (T1)

The teacher also highlighted that the collaborative interaction emerged because students shared the same visual experience:

"Because they were looking at the same object or activity through AR, students had something concrete to talk about together. This made discussion easier and more spontaneous before they started writing." (T1)

Beyond collaborative learning, AR also strengthened contextual learning because the learning materials were closely connected to students' real-life environment and everyday experiences. The topics used during instruction particularly daily routine and procedure text were highly familiar to students and reflected activities they encounter in their daily lives. The visual representation of waking up, preparing for school, eating breakfast, or following step-by-step actions in a procedure allowed students to connect classroom learning with lived experience. This contextual connection appeared to make writing tasks feel more meaningful and easier to understand. Rather than writing about unfamiliar or abstract topics, students wrote about situations they recognized from their own routines. Because AR presented those experiences visually, students were able to connect language learning with observation and personal experience simultaneously. As a result, students appeared more confident in generating ideas and more capable of expressing meaning through written language.

These findings reflect the principles of situated learning, which emphasize that learning becomes more meaningful when knowledge is constructed within authentic contexts and social interaction. The integration of AR into English instruction enabled students to construct meaning through observation, interaction, discussion, and written expression within their immediate learning environment. Learning became not only a cognitive activity but also a social and contextual process shaped by collaboration and experience. This finding is also relevant to the student-centered and contextual learning orientation emphasized in Kurikulum Merdeka, in which learners are encouraged to actively construct knowledge through meaningful experiences, interaction, and reflection. Within this study, AR supported this orientation by creating a classroom environment where students learned English through authentic context, peer collaboration, and active participation in meaning-making before writing.

DISCUSSION

The findings of this study demonstrate that the implementation of Augmented Reality Integrated Storytelling (ARIS) contributed positively to students' text construction skills in English learning. The use of AR provided meaningful support during the writing process by helping students generate ideas, recall vocabulary, organize information, and transform those ideas into written sentences and short paragraphs. Based on classroom observations, student interviews, and teacher reflections, AR was not merely used as digital classroom media, but functioned as a pedagogical tool that scaffolded students' writing development through visual, contextual, and interactive learning experiences.

The first major finding shows that AR increased students' engagement and motivation during English learning activities. Students became more active in participating, responding to instructions, and completing writing tasks when learning materials were delivered through AR. The visual and interactive elements attracted students' attention and reduced their hesitation during writing. This finding supports previous research indicating that AR environments can increase learner motivation and participation by creating immersive and meaningful learning experiences. Liu et al. (2023) found that AR-based language learning significantly improved students' motivation and involvement in EFL classrooms because learners interacted directly with contextualized digital content. Likewise, Khan et al. (2023) reported that AR integration positively influenced learners' attitudes and engagement in English learning, particularly because visual support helped sustain students' attention and curiosity throughout the lesson.

The second finding reveals that AR strongly supported students' idea generation and text construction. AR materials including images, vocabulary labels, and contextual visual prompts helped students connect what they observed with English vocabulary and sentence structure before writing. Students were able to develop ideas more easily because AR gave them concrete representations of objects, actions, and sequences. This reduced the difficulty commonly experienced during pre-writing, particularly when students struggled to begin writing or lacked vocabulary. These findings are consistent with Hwang et al. (2023), who explain that technology-supported writing environments can facilitate EFL writing by providing contextualized input and personalized support that stimulate students' language production. Similarly, Lin et al. (2022) found that augmented-reality writing applications improve students' writing performance by supporting idea development, memory retention, and self-regulated writing behavior in EFL contexts.

The third finding indicates that AR fostered contextual and collaborative learning in the classroom. During AR-based learning activities, students frequently interacted with peers to discuss vocabulary meaning, exchange ideas, help each other operate AR features, and review sentences before writing. This collaborative interaction emerged naturally as part of the learning process. At the same time, AR strengthened contextual learning because the materials were closely connected to students' everyday experiences, such as daily routines and step-by-step procedure activities. These familiar contexts helped students understand the meaning of the tasks more clearly and made writing more relevant to their real lives. This finding aligns with situated learning theory, which emphasizes that knowledge is more effectively constructed when learners engage with authentic contexts and social interaction. It also reflects findings from Çelik and Yangın (2022), who reported that AR-based instruction creates collaborative learning environments while increasing students' achievement and positive attitudes toward learning.

Taken together, the findings extend previous literature on AR in language learning. Much existing research has focused on AR for vocabulary acquisition, speaking, or reading comprehension. However, this study highlights that AR also has strong pedagogical potential in supporting text construction in EFL writing, especially at the early stages of generating ideas and developing written expression. The integration of ARIS shows that AR can bridge visual learning, contextual understanding, vocabulary development, and written language production in one connected learning experience. Through observation, interaction, discussion, and writing, students were able to construct meaning more actively and confidently.

These findings also offer important pedagogical implications for English language teaching, particularly in Indonesian secondary school contexts. AR can serve as an alternative instructional medium for designing writing activities that are interactive, contextual, and student-centered. Teachers may use AR to provide richer visual prompts, stimulate students' imagination before writing, and create collaborative classroom interaction that supports writing development. This approach is relevant to the principles of Kurikulum Merdeka, which emphasizes meaningful learning experiences, student participation, creativity, and contextual knowledge construction. Therefore, integrating AR into EFL writing instruction can be considered a promising strategy to support students' writing development while simultaneously improving engagement, collaboration, and confidence in English learning.

Table 1. Summary of Findings on the Implementation of ARIS in Supporting Students' Text Construction

No.	Main Findings	Evidence from Observation and Interview	Interpretation
1.	AR increased students' engagement during English learning	Classroom observations showed that students were more focused, enthusiastic, and actively participated during AR-based learning activities. Students paid attention to AR visual objects, responded to teacher instructions, and showed curiosity while interacting with the learning materials.	AR created an interactive and visually engaging learning environment that increased students' motivation, classroom participation, and

		Interview data also revealed that students felt more interested and motivated when learning English through AR compared with regular classroom activities.	willingness to complete writing tasks.
2	AR supported students' idea generation before writing	Students used AR images, labels, and contextual information as visual prompts to generate ideas before beginning to write. During daily routine and procedure text activities, students were able to identify actions, recall vocabulary, and connect ideas more easily. Students reported that AR helped them think about what they wanted to write because they could observe the content directly before composing sentences.	AR functioned as visual scaffolding that stimulated students' imagination and helped them generate ideas for writing more effectively.
3	AR supported vocabulary recall and sentence construction	Students were observed referring to AR vocabulary labels while writing. They used the words displayed through AR to build simple sentences and short paragraphs. Interview responses showed that students felt more confident writing because they could remember vocabulary more easily when supported by visual representation.	AR helped bridge vocabulary knowledge and written production, allowing students to construct sentences with greater confidence and accuracy.
4	AR improved students' text construction skills	Analysis of students' written work showed that students were able to organize ideas into short paragraphs, especially in daily routine and procedure text writing. Students demonstrated clearer sequencing, better idea organization, and stronger connections between vocabulary and sentence development after using AR-supported learning materials.	AR contributed to students' development of text construction skills by supporting the stages of pre-writing, drafting, and organizing ideas into written form.
5	AR fostered collaborative learning and peer interaction	During classroom observation, students frequently discussed vocabulary, exchanged ideas, helped peers use AR features, and reviewed each other's sentences before writing. Students often worked together naturally during the learning process. Teacher interview data also confirmed increased collaboration among students.	AR encouraged social interaction and collaborative meaning-making, creating a more cooperative learning environment during English writing activities.
6	AR strengthened contextual learning	Learning topics presented through AR such as daily routines and procedure texts were closely connected to students' real-life experiences. Students could relate the visual content to familiar activities in their daily lives, making it easier to understand and write about the topics.	AR supported contextual learning by connecting classroom instruction with authentic and familiar experiences, making writing tasks more meaningful and relevant for students.

The summary presented in Table 1 highlights the major contributions of ARIS in supporting students' text construction. These findings are further discussed in relation to previous studies and relevant theoretical perspectives in the following section.

CONCLUSION

This study explored the implementation of the Augmented Reality Interactive System (ARIS) in supporting students' text construction skills in English language learning within an Indonesian junior secondary school context. The findings indicate that the integration of Augmented Reality contributed positively to students' engagement, idea generation, vocabulary recall, text organization, and collaborative learning during writing activities. Through visual and contextual learning experiences, AR assisted students in transforming observations and experiences into meaningful written English text. The implementation of AR also created a more interactive classroom atmosphere in which students participated actively, discussed ideas collaboratively, and connected learning materials with their everyday experiences.

The study further suggests that AR functioned not only as a technological medium, but also as a pedagogical support system that facilitated students' writing development across multiple stages of the writing process, particularly during pre-writing, drafting, and idea organization. The contextual and multimodal characteristics of AR helped reduce students' difficulty in initiating writing and supported them in constructing more coherent and meaningful texts. In this regard, the findings contribute to the growing body of research on technology-enhanced language learning by extending the role of AR beyond vocabulary and reading instruction toward the development of EFL writing and text construction skills. From a pedagogical perspective, the findings highlight the potential of AR to support student-centered and contextual learning practices aligned with the principles of Kurikulum Merdeka. The integration of AR into English instruction may provide teachers with alternative strategies for creating engaging, collaborative, and meaningful writing activities that encourage active learner participation and authentic language use. Therefore, AR can be considered a promising instructional innovation for supporting English writing instruction in secondary education contexts. Nevertheless, this study was limited to a qualitative single-case study involving one classroom context and a relatively limited number of participants. The implementation was also conducted within a specific instructional setting focusing on daily routine and procedure texts. Consequently, the findings cannot be generalized to all educational contexts. Future research is therefore recommended to investigate the long-term impact of AR on students' writing development through broader participant groups, different educational levels, and diverse text genres. Further studies employing mixed-method or experimental designs may also provide deeper insight into the effectiveness of AR in improving specific dimensions of EFL writing performance.

Overall, this study demonstrates that the meaningful integration of Augmented Reality in English language learning has the potential to enrich writing pedagogy by fostering engagement, contextual understanding, collaboration, and students' confidence in text construction. As digital innovation continues to shape educational practice, AR offers valuable opportunities for developing more interactive and meaningful language learning environments in contemporary classrooms.

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