

“Life Must Move Forward”: Indonesian Students’ Efforts to Understand Traumatic History through Knowledge-Aware Multimodal Dialogue Systems

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Abstract

This study explores the experiences of students using a multimodal dialogue system to engage with sensitive historical content, specifically focusing on the challenges they face and how these challenges are addressed. Data were collected from 35 participants across six public and private schools in Semarang utilising qualitative methods, including interviews and focus group discussions. The findings reveal that students encounter various challenges, such as emotional discomfort and difficulty in articulating their thoughts on traumatic historical events. However, the multimodal dialogue system facilitates a supportive environment that encourages open discussion and reflection, allowing students to navigate these challenges effectively. The study highlights the importance of creating safe spaces for dialogue, where students can explore their identities and values in relation to traumatic history. Additionally, the research underscores the potential of technology to enhance student engagement and foster deeper understanding of sensitive topics. The implications for educators and curriculum developers are significant, suggesting that integrating multimodal dialogue systems can enrich history education and promote critical thinking. Limitations of the study include a small sample size and a focus on a



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specific geographic area, indicating the need for further research to generalise findings across diverse educational contexts.

Keywords: multimodal dialogue system; traumatic history; student engagement; identity reflection

Introduction

Traumatic history often leaves a profound mark on a society's collective memory, shaping the identity and behaviour of future generations. Indonesia has a long history marked by traumatic events, one of which is the mass killings that occurred after the 1965 incident. These killings targeted pro-communist individuals, with the death toll reaching approximately 500,000 across almost the entire country (Eickhoff, Van Klinken, and Robinson 2017; Machell 2017; McGregor 2016). This event left deep wounds for many families and communities and remains a dark chapter that is often difficult to discuss openly. However, understanding this history is crucial for building a more inclusive collective awareness and national identity.

Communities often face challenges in discussing traumatic history due to fear, stigma, and unresolved trauma, causing these events to be forgotten or hidden. This hinders the collective understanding and reconciliation processes that are essential for fostering identity and social peace. A deep understanding of these traumatic events is vital to prevent repeating the same mistakes in the future (Alexander 2004, 2016; Cooper and Nichol 2015). Nevertheless, many students struggle to comprehend the complex and emotional historical context. Research shows that inadequate learning experiences can prevent students from connecting historical lessons to their social realities (Barton and Levstik 2004). Therefore, it is essential to develop more effective teaching methods that help students understand and reflect on traumatic history in a deeper and more meaningful way.

In today's digital era, educational technology presents new opportunities to enhance history learning through knowledge-aware multimodal dialogue systems. A multimodal dialogue system is an interactive process that combines various communication modalities such as text, voice, images, and video to create a richer and more contextual learning experience. These systems not only deliver information but also understand the user's knowledge context, enabling them to provide relevant and adaptive responses that support a more personalised and in-depth learning process. Such dialogue systems can integrate multiple media forms—text, images, and videos—to foster a more interactive and engaging learning environment (Matthew, Kazaure, and Okafor 2021; Öztürk, Kinik, and Öztürk 2023; Sujoko et al. 2024). Previous studies have demonstrated that technology use in education can boost student engagement and deepen their understanding of the subject matter (Hattie 2008). By leveraging multimodal dialogue systems, students can participate in richer, more reflective discussions about traumatic history, helping them develop a holistic and empathetic understanding of past events (Dede 2009).

This study adopts the social constructivism theory, which emphasises that learning is an active process where individuals construct knowledge through social interaction and experience. Rooted in Vygotsky's ideas, this theory highlights the importance of interaction with others and the social context for cognitive development (Vygotsky and Cole 2018). In the context of understanding traumatic history, a constructivist approach enables students to engage in meaningful dialogue, sharing perspectives, discussing emotions, and building a collective understanding of complex historical events. Research indicates that dialogic learning enhances students' grasp of historical context and fosters empathy and critical awareness of relevant social issues (Wells 2000). Therefore, applying knowledge-aware multimodal dialogue systems in history education can strengthen this social constructivist process, allowing students to understand and reflect on traumatic history more deeply.

Previous research indicates that understanding traumatic history can be significantly enhanced through dialogic and multimodal approaches. For example, Kress (2009) highlights the importance of multimodality in communication, which enables students to access and represent knowledge through diverse media forms. Similarly, Damşa et al. (2024) demonstrate that structured dialogue helps students develop a deeper comprehension of complex historical events. López (2017) found that integrating technology in history education increases student engagement and fosters richer discussions. Moreover, Dede (2009) shows that interactive and collaborative learning environments improve students' grasp of historical contexts. According to Todorović et al. (2023), when teachers adopt a critical thinking paradigm, it can stimulate the strengthening of students' epistemic abilities, including a profound understanding of trauma. Research by Hakkarainen et al. (2004) emphasises that group collaboration enhances students' understanding of social issues related to traumatic history. Finally, Mercer (2002) illustrates that productive classroom dialogue can improve students' critical thinking skills, which are essential for comprehending and reflecting on painful historical experiences.

This study aims to explore how knowledge-aware multimodal dialogue systems can support students in gaining a deeper and more meaningful understanding of traumatic history. By integrating various communication modes such as text, images, and videos, the research seeks to create an interactive and collaborative learning environment where students can discuss and reflect on difficult historical experiences. The primary contribution of this research is the development of a pedagogical model that leverages technology to enhance history learning, while also providing new insights into how structured dialogue can improve students' understanding of complex historical contexts. Additionally, this study is expected to offer practical recommendations for educators and curriculum developers to design more effective and inclusive learning experiences when addressing sensitive historical topics.

Research Questions

1. How do students describe their experiences using multimodal dialogue systems to understand traumatic history?
2. What challenges do students face when interacting with sensitive historical material through knowledge dialogue, and how do they overcome these challenges?
3. In what ways can multimodal dialogue systems facilitate discussions and reflections among students regarding the impact of traumatic history on their identities and values?

Theoretical Framework

Indonesia has a complex traumatic history, including events such as the mass killings following the G30S/PKI (September 30 Movement/Indonesian Communist Party) incident in 1965. In official history this was a failed communist coup, which resulted in the loss of hundreds of thousands of lives and left a profound collective trauma within society. Research shows that the memory of these events continues to influence social and political dynamics in Indonesia, where many individuals and groups struggle to cope with the legacy of violence and injustice (Anderson 2020; Chandra 2019; Dragojlovic 2018). Moreover, the omission of this history from the educational curriculum often leads to a lack of understanding among younger generations about the context and impact of these events, making it essential to develop more inclusive and sensitive approaches to teaching history (Kurniawan, Warto, and Sutimin 2019; Leong 2021). By utilising multimodal dialogue systems, this research aims to provide students with a space to explore and discuss this traumatic history in a deeper and more reflective way (Cairns and Garrard 2024; Utami 2021).

The theoretical framework used in this study focuses on a social constructivist approach, which emphasises that knowledge is constructed through social interaction and individual experiences. This theory is rooted in Vygotsky's thinking, which posits that learning occurs within social and cultural contexts, where individuals collaborate to build a shared understanding. In the context of history education, this approach allows students to engage in deep dialogue about traumatic events, enabling them to construct meaning from complex historical experiences (Vygotsky and Cole 2018).

Existing theories can be used to analyse traumatic history and how the cognitive aspects related to trauma are constructed and deconstructed in the history learning process. Understanding traumatic history involves not only mastering facts but also recognising how emotional experiences and collective narratives influence how individuals and groups perceive the past. In the context of history education, these cognitive aspects are shaped through the interaction of factual knowledge, personal experience, and socio-cultural context. This process of construction and deconstruction allows students to

reflect on and critique dominant historical narratives, opening space for a more inclusive and empathetic understanding of past trauma. This approach aligns with social constructivism theory, which emphasises the importance of dialogue and social interaction in knowledge formation, as well as Bakhtin's dialogic theory, which highlights the plurality of voices in historical narratives. Thus, the multimodal dialogue system used in this study serves as a medium that supports these cognitive processes, helping students integrate various sources of information and perspectives in understanding traumatic history.

This study shows that students describe their experiences using a multimodal dialogue system as an effective and profound way to understand traumatic history, where they can access various sources of information interactively and reflectively. Despite facing emotional challenges and discomfort in discussing sensitive historical material, students are able to overcome these obstacles through the support of an inclusive learning environment and the use of technology that facilitates emotional expression and open discussion. The multimodal dialogue system facilitates richer discussions and reflections on the impact of traumatic history on students' identities and values, helping them connect personal experiences with historical contexts more empathetically and critically. Furthermore, Bakhtin's dialogic theory (2010) emphasises the importance of dialogue in the formation of identity and understanding. In the context of this study, the dialogue between students and the multimodal system serves as a space to explore various perspectives on traumatic history. By creating this dialogic space, students can express their views, listen to others' perspectives, and build a more holistic understanding of painful historical events.

Additionally, experiential learning theory is integrated into this framework. This theory highlights the significance of direct experience in the learning process, where students are not merely recipients of information but actively engage in exploration and reflection. In the context of traumatic history, learning experiences that involve simulation, discussion, and reflection can help students better understand the emotional and social impacts of these events, as well as develop empathy for those affected (Kolb 2014; Motala, Senekal, and Vally 2023).

This theoretical framework also considers the aspect of multimodality in learning. Multimodality refers to the use of various modes of communication, such as text, images, audio, and video, to convey information. In this research context, the multimodal dialogue system is designed to provide a richer and more engaging learning experience for students. By utilising different modes, students can access information from various sources and perspectives, which in turn can deepen their understanding of traumatic history (Kress 2009).

The aim of this theoretical framework is to create an inclusive and reflective learning environment where students feel safe to share their experiences and viewpoints. By integrating social constructivist, dialogic, experiential learning, and multimodal

approaches, this research seeks to make a significant contribution to students' understanding of traumatic history in Indonesia (Gee 2014). Through this approach, it is hoped that students will not only grasp historical facts but also feel the emotional and social impacts of these events, enabling them to move forwards with a better understanding of the past.

Method

Research Design

This research design employs a qualitative approach using a case study method (Yin 2018), which allows the researchers to deeply explore students' experiences and perspectives in understanding traumatic historical events through a multimodal dialogue system. In this study, the multimodal dialogue system serves as the main intervention used to help students comprehend traumatic history. The system integrates various modalities such as text, images, video, and audio to create a richer and more interactive learning experience. Through the use of this system, the research explores how technology can support students' cognitive and emotional processes in learning complex historical material.

By opting for a case study design, this research can gather rich, contextual data from students' interactions with the system, as well as how they construct their understanding of complex historical events. The strength of this design lies in its ability to capture the nuances and dynamics of social interactions that occur during the learning process, while also providing profound insights into how students derive meaning from traumatic historical experiences. Furthermore, this qualitative approach enables the researcher to adapt to the context and needs of the participants, ensuring that the findings are more relevant and applicable to the development of more effective learning systems.

This study was conducted through several systematic stages, beginning with the identification and selection of participants, namely students from several schools in Semarang. The next stage involved the development and implementation of the multimodal dialogue system as an intervention medium in the process of learning traumatic history. Subsequently, data was collected through interviews, group discussions, and analysis of students' reflective memos to evaluate their experiences and understanding. The final stage included qualitative data analysis to identify patterns of students' understanding and reflection on the historical material studied.

Data and Sources of Data

The data used in this study is drawn from two primary sources: students and the memos they wrote during the lessons. The students involved in this research are a group of learners from diverse backgrounds participating in a programme focused on Indonesia's traumatic history. Throughout the learning process, students were asked to write memos that captured their thoughts, emotions, and reflections on the material being taught. These memos serve as personal records, offering insights into how students process

information and construct their understanding of complex historical events. By combining data from student interactions and the memos they wrote, this study can deeply analyse how their learning experiences are influenced by the multimodal dialogue system, as well as how they internalise and reflect on the traumatic history they are studying.

Research Participants

The participants in this study consist of 35 students from six public and private schools in Semarang, Central Java Province, Indonesia, representing diverse backgrounds. The selection of participants was based on the need to obtain a variety of perspectives from different social and educational backgrounds. This approach allows the study to capture a more representative and rich learning experience in understanding traumatic history. Additionally, the number of participants was considered sufficient for an in-depth qualitative study, enabling detailed analysis of students' interactions with the multimodal dialogue system.

Table 1: Research participants

No.	Participant category	Sub-category	Number of participants
1	Gender	Female	18
		Male	17
2	Age	17	17
		18	18
3	“Ethnicity”	Javanese	21
		Sundanese	4
		Chinese	8
		Banjarese	2
4	Religion	Islam	16
		Christian	9
		Buddha	5
		Hindu	5
5	Social Class	Upper	10
		Middle	15
		Lower	10

All participants are connected to the traumatic history of the past, particularly the events of 1965, through the involvement of their parents, grandparents, or close relatives such as uncles and aunts. The participants in this study consist of 35 students with a diverse and balanced composition. In terms of gender, there are 18 females and 17 males, ensuring that perspectives from both genders are well represented. The participants' ages range from 17 to 18 years old, which is an appropriate age range for this study as they are at the stage of learning history in senior high school. The majority are Javanese (21), followed by Chinese (8), Sundanese (4), and Banjar (2), reflecting the cultural diversity of the research area. Regarding religion, participants include Muslims (16), Christians (9), Buddhists (5), and Hindus (5), demonstrating inclusivity in terms of

belief backgrounds. Lastly, in terms of social class, participants are divided into upper class (10), middle class (15), and lower class (10), allowing the study to capture a variety of social experiences in understanding traumatic history. Additionally, their connection to traumatic history varies, with some students showing strong interest and deep understanding, while others have limited knowledge, creating an intriguing dynamic in the discussions and reflections generated during the research.

Data Collection

The data collection process in this study was carried out through a series of systematic steps to ensure the validity and reliability of the information obtained. First, the researchers initiated contact with six public and private schools in Semarang to obtain permission and support for conducting the research. After securing approval, the researchers conducted an orientation session with the students to explain the purpose of the study and the importance of their participation. Subsequently, the researchers collected data through in-depth interviews and focus group discussions (FGDs) with the students, allowing them to share their experiences and perspectives on traumatic history relevant to their context.

In addition to interviews, the researchers also gathered supplementary data through memos written by the students during the lessons. These memos served as reflective notes capturing the students' thoughts and feelings regarding the material taught, particularly as it related to traumatic history. This process not only provided rich qualitative data but also allowed students to express themselves freely and creatively. By combining interviews and memo analysis, the researchers were able to gain a deeper understanding of how students internalise and respond to traumatic history within their educational context.

Trustworthiness of the Data

To ensure the trustworthiness of the data in this study, the researchers applied the triangulation method, which involves using multiple data sources and collection techniques to validate the findings. Triangulation was carried out by combining the results of in-depth interviews, focus group discussions, and the analysis of memos written by the students. This approach allowed the researchers to compare and confirm information obtained from various perspectives, thereby reducing bias and enhancing the accuracy of the data. Additionally, triangulation also involved collaboration with teachers and school administrators to gain additional context regarding students' experiences related to traumatic history. This method not only strengthened the reliability of the data but also provided a more comprehensive understanding of how students comprehend and respond to sensitive historical issues within their educational environment.

Data Analysis

The data analysis in this study was conducted by applying a systematic coding process to identify themes and patterns emerging from the collected data. This process began with the transcription of interviews and focus group discussions, during which the researchers read and understood the context of each student's statement. Next, the researchers performed open coding, where each relevant statement was labelled with keywords reflecting its underlying meaning or theme. For example, a student's statement such as "I felt scared when hearing stories about the past" was coded as "fear of history", indicating an emotional response to traumatic historical experiences.

Following the open coding stage, the researchers proceeded to axial coding, where the identified codes were grouped into broader categories. In the previous example, the code "fear of history" could be grouped into a larger category such as "emotional reactions to history". This process helped the researchers see connections between various themes and understand how students linked their personal experiences to broader historical contexts. Additionally, the researchers used qualitative analysis software to facilitate the organisation and visualisation of data, making it easier to identify significant patterns.

Finally, the researchers conducted selective coding to identify the main themes emerging from the data analysis. In this study, some of the identified themes included "the influence of traumatic history on identity", "students' perceptions of history education", and "students' coping strategies". For instance, a student who stated "I feel stronger after learning about history, even though it was painful" demonstrated how learning experiences can contribute to the development of a positive identity despite trauma. Thus, the systematic coding process not only helped organise the data but also provided deep insights into how students interact with and respond to the traumatic history they are learning.

Results

RQ1: How do students describe their experiences using multimodal dialogue systems to understand traumatic history?

Students described their experiences with the multimodal dialogue system as highly interactive and supportive of their understanding of traumatic history. One student, Rina (16), stated, "By using images, videos, and text, I could feel what happened in the past. It made history feel more real." This statement highlights how the use of various communication modes helped students connect information with emotions and context, creating a more profound learning experience. Additionally, students reported that the multimodal dialogue system allowed them to explore multiple perspectives on historical events, which are often overlooked in traditional learning.

Another student, Andi (17), added, "When we watched videos about historical events, I could see how people experienced that trauma. It made me more empathetic." This

experience demonstrates that visual media can enhance students' understanding of the emotional impact of traumatic history. By using the multimodal dialogue system, students not only learned historical facts but also felt the emotional impact experienced by individuals and communities involved. This is crucial in the context of history education, where a deep understanding of the social and emotional consequences of historical events can help students develop empathy and social awareness.

During the data collection process, students were also asked to write memos about their experiences after each learning session using the multimodal dialogue system. These memos provided additional insights into how students reflected on their experiences. In one memo, Siti (15) wrote, "I felt more connected to history when we discussed the feelings of the people who experienced those events. I didn't just learn about dates and places, but also about how those events affected their lives." This shows that students were not only focused on the cognitive aspects of learning history but also on the deeper emotional and social dimensions.

The data collection process also included focus group discussions, where students could share their experiences more openly. In these discussions, many students expressed that the multimodal dialogue system made them feel more comfortable discussing sensitive topics. For example, Budi (16) stated, "I usually don't like talking about painful history, but this way, I felt safer sharing my thoughts." This indicates that the multimodal approach not only enhanced students' understanding but also created a more inclusive and supportive learning environment.

Students also noted that the use of technology in the multimodal dialogue system made learning more engaging. In one interview, Lila (17) said, "I liked using the app that allowed us to interact with historical material. It made me feel like I was part of the story." This experience shows that integrating technology into history education can increase student engagement and make them more active participants in the learning process. As a result, students are not just passive recipients of information but active contributors to building their own understanding of history.

Overall, the data collected indicates that students had positive experiences using the multimodal dialogue system to understand traumatic history. They felt more connected to the material, more empathetic towards the individuals involved in historical events, and more active in the learning process. The use of various communication modes, including images, videos, and discussions, allowed students to explore multiple perspectives and feel the emotional impact of history. Thus, this study highlights the importance of a multimodal approach in history education, particularly in contexts involving traumatic experiences.

A preliminary conclusion in this section can be drawn that the multimodal dialogue system not only enhances students' cognitive understanding of history but also helps them develop important social and emotional skills. By creating a supportive and

interactive learning environment, students can more easily navigate sensitive and complex topics and build empathy for others' experiences. This study provides valuable insights for educators and curriculum developers on how to integrate multimodal approaches into history teaching to create more meaningful and profound learning experiences.

RQ2: What challenges do students face when interacting with sensitive historical material through knowledge dialogue, and how do they overcome these challenges?

Students reported various challenges when interacting with sensitive historical material, particularly topics related to trauma and violence. One of the main challenges they faced was difficulty managing the emotions that arose when discussing painful subjects. For example, Rina (16) shared, "When we discussed historical events involving a lot of suffering, I felt very sad and didn't know how to express those feelings." This highlights that students often feel caught between their desire to understand history and the difficulty of confronting the emotions it evokes. These challenges can hinder their learning process, as strong emotions can distract from the cognitive understanding needed to analyse historical events.

Additionally, students faced challenges in communicating with their peers about sensitive topics. In an interview, Andi (17) stated, "Sometimes, my classmates have very different views on history, and that makes discussions difficult. I feel afraid to speak up because I worry about offending others." The fear of conflict or discomfort in discussions can prevent students from openly sharing their perspectives. This suggests that social interactions in the context of sensitive history education require strong communication skills and a safe environment for sharing opinions.

To address these challenges, students developed various strategies. One common strategy was seeking support from teachers or peers who had a better grasp of the material. Siti (15) explained, "When I feel stuck, I usually ask the teacher or a more experienced classmate. They help me see different perspectives and work through my feelings." Support from teachers and peers proved crucial in helping students navigate their emotions and understand complex historical contexts. With guidance, students found it easier to process their feelings and contribute to discussions.

Students also used personal reflection techniques to cope with emotional challenges. In a memo written after a lesson, Budi (16) noted, "After discussing a difficult topic, I often write in my journal about how I feel. It helps me process my emotions and better understand what I've learned." This reflective practice allowed students to explore their feelings more deeply and find meaning in their learning experiences. By writing, students could express emotions that might be difficult to articulate verbally, helping them feel more prepared for classroom discussions.

Students also reported that the use of an interactive knowledge dialogue system helped them overcome challenges in understanding sensitive historical material. Lila (17) said, “With group discussions and the use of technology, I feel more comfortable sharing my opinions. We can support each other and learn from one another.” This approach created a collaborative learning environment where students felt safer discussing their experiences and perspectives. With peer support, students found it easier to manage fears and anxieties that arose when addressing sensitive topics.

During the data collection process, students also emphasised the importance of recognising differing perspectives in historical discussions. In one interview, Rina added, “I’ve learned that everyone has different experiences, and that has made me appreciate others’ views more. Even though it’s hard, I try to listen and understand.” This awareness helped students develop empathy and better listening skills, which are essential when discussing sensitive historical topics. By understanding that each individual brings unique backgrounds and experiences, students became more open to engaging with their peers.

Overall, the data collected shows that students face various challenges when interacting with sensitive historical material, but they also develop effective strategies to address these challenges. Difficulties in managing emotions, communicating with peers, and understanding differing perspectives were among the main obstacles students encountered. However, with support from teachers and classmates, as well as the use of personal reflection techniques, students found ways to overcome these challenges and actively engage in learning history. This research provides valuable insights for educators on the importance of creating supportive and inclusive learning environments where students feel safe to share their experiences and perspectives on sensitive historical topics.

RQ3: In what ways can multimodal dialogue systems facilitate discussions and reflections among students regarding the impact of traumatic history on their identities and values?

The multimodal dialogue system used in this study integrates various elements, such as text, images, videos, and audio, to create a more interactive and immersive learning experience. Students reported that the use of these multimodal elements greatly aided their understanding of complex historical contexts. For example, Dika (16) stated, “When we watched videos about historical events, I felt more connected to what happened. The images and sounds helped me better understand the emotions people experienced at that time.” By leveraging multiple media formats, students were able to access information from diverse perspectives, enabling them to better grasp the impact of traumatic history on their identities.

One way the multimodal dialogue system facilitated discussion was by creating a safe space for students to share their experiences and viewpoints. In an interview, Siti (15) shared, “I felt more comfortable talking about my feelings when using this system.

There are so many ways to express myself, and it made me feel less pressured.” With various communication formats available, students could choose the method that suited them best, whether through writing, images, or videos. This fostered an inclusive environment where every student felt valued and heard.

The multimodal dialogue system also encouraged students to engage in deep reflection about their identities and values. In a memo written after a lesson, Rina (16) noted, “After discussing history, I realised how the experiences of people in the past have shaped who I am today. I started to understand the values I hold and how they are connected to history.” This reflection shows that students were not only learning historical facts but also connecting those experiences to their personal identities. As a result, the system helped students develop greater self-awareness and understand how history shapes their values.

Additionally, students reported that the multimodal dialogue system enhanced their ability to collaborate and discuss topics more effectively with classmates. In an interview, Andi (17) said, “We could share our opinions and discuss ideas more easily. The system made discussions livelier.” With interactive features, students could participate in more dynamic group discussions, where they supported one another and built shared understanding. This created a collaborative learning atmosphere where students felt more engaged and motivated to contribute.

The system also provided opportunities for students to explore multiple perspectives on traumatic history. In one session, Lila (17) noted, “I learned that there are many ways to look at historical events. These discussions helped me understand that not everyone shares the same perspective.” By facilitating discussions involving diverse viewpoints, the system helped students develop empathy and openness to others’ experiences. This is particularly important in the context of sensitive historical topics, where a deeper understanding of different perspectives can help students appreciate the complexity of identities and values shaped by historical experiences.

Students also expressed that the multimodal dialogue system allowed them to connect personal experiences to broader historical contexts. In a reflective memo, Budi (16) wrote, “I felt connected to the stories we studied. I could see how the experiences of people in the past mirrored what I’m going through now.” By linking personal experiences to history, students gained a better understanding of how their identities are shaped by social and cultural contexts. This demonstrates that the system not only served as a learning tool but also as a means for deeper identity exploration.

The system also provided constructive feedback to students, aiding their reflective process. In an interview, Rina explained, “When I received feedback from my teacher and peers, I could see where I could improve. It helped me better understand myself and the values I hold.” This feedback was crucial in helping students evaluate their thoughts

and feelings, while also encouraging continuous learning and growth. With positive feedback, students felt more motivated to engage in discussions and reflections.

Overall, the data collected shows that the multimodal dialogue system played a significant role in facilitating student discussions and reflections on the impact of traumatic history on their identities and values. By integrating various multimodal elements, the system created an interactive, inclusive, and collaborative learning environment. Students felt more comfortable sharing their experiences and perspectives, while also engaging in deep reflection about their identities and the values shaped by historical experiences. This study provides valuable insights for educators on the importance of using technology in history education, particularly in sensitive contexts, to help students develop a better understanding of themselves and the world around them.

Discussions

In this study, we found that the multimodal dialogue system significantly facilitated student discussions and reflections on the impact of traumatic history on their identities and values. These findings align with previous research indicating that the use of technology in education can enhance student engagement and their understanding of complex material. For instance, studies by Suryani (2016), Dousay (2018), and Williamson (2021) have shown that the use of interactive media in history education can help students connect information to their personal experiences, thereby deepening their understanding of historical contexts. These findings support the argument that a multimodal dialogue system can be an effective tool in addressing the challenges of teaching sensitive historical topics.

Furthermore, research by Cooper and Nichol (2015) and Koh (2021) emphasises the importance of creating safe spaces for students to share their experiences and perspectives. In our study, students reported feeling more comfortable discussing their emotions when using the multimodal dialogue system. This suggests that an inclusive and interactive approach can help students overcome the discomfort often associated with discussing sensitive historical topics. By fostering a supportive environment, students are more likely to openly share their views and experiences, which in turn enriches classroom discussions.

Previous research by Dwyer, Hogan, and Stewart (2014) and Almazroui (2023) also found that collaboration among students in history education can enhance their understanding of identity and values. In our study, students reported that the multimodal dialogue system encouraged them to collaborate and discuss topics more effectively with their classmates. This suggests that social interactions facilitated by technology can strengthen students' understanding of the impact of traumatic history on their identities. By sharing perspectives and experiences, students can develop empathy and openness to others' viewpoints, which is crucial in the context of complex historical narratives.

The results of this study are relevant to Todorović et al.'s (2023) research, which emphasises that epistemic abilities have opened up students' deep understanding of a subject material, and multimodal dialogue has proved to stimulate these abilities in learning, and most importantly students better understand the roots of traumatic history. Additionally, our findings align with those of Dede (2009), who demonstrates that deep reflection on personal experiences can help students understand the values they hold. In this study, students noted that after discussing history, they began to realise how the experiences of people in the past influenced their own identities. This indicates that the multimodal dialogue system not only serves as a learning tool but also as a means for deeper identity exploration. By connecting personal experiences to historical contexts, students can better understand how their identities are shaped by historical events.

Research by Shabalina et al. (2015) and Lee (2019) also emphasises the importance of feedback in the learning process. In our study, students felt that the feedback they received from teachers and peers aided them in their reflective process. This feedback provided encouragement for students to continue learning and growing, while also helping them evaluate their thoughts and emotions. This indicates that integrating feedback into the multimodal dialogue system can enhance the effectiveness of student learning and reflection, aligning with previous findings on the importance of feedback in education.

Furthermore, research by Hattie (2008) demonstrates that constructive feedback can increase student motivation to engage in learning. In the context of our study, students reported that positive feedback from teachers and peers made them feel more motivated to participate in discussions and reflections. Thus, a multimodal dialogue system that incorporates feedback can create a more supportive learning environment, encouraging students to actively engage in history education. These findings underscore the importance of creating interactive and reflective learning experiences to help students understand the impact of traumatic history on their identities and values.

The social constructivist framework, grounded in Vygotsky's theory, provides a compelling lens through which to examine history education, particularly in the context of traumatic events. By emphasising that knowledge is co-constructed through social interaction and situated within cultural contexts, this approach highlights the importance of dialogue and collaboration in learning. In the case of traumatic history, such as the events studied here, this framework supports the idea that students do not passively receive historical facts but actively engage with multiple perspectives to build a shared and nuanced understanding. However, while this approach fosters empathy and critical reflection, it also raises challenges regarding how educators can effectively facilitate sensitive discussions without retraumatising students or oversimplifying complex histories. Moreover, the reliance on social interaction assumes a supportive and inclusive environment, which may not always be present. Thus, integrating technology, like a multimodal dialogue system, could potentially mediate these interactions, but it

also requires careful design to ensure it aligns with the social constructivist principles and addresses emotional complexities.

The results of this study demonstrate that the multimodal dialogue system can be an effective tool in facilitating student discussions and reflections on traumatic history. By combining these findings with previous research, we can conclude that an interactive, inclusive, and reflective approach to history education can help students overcome the challenges they face when engaging with sensitive material. This study provides valuable insights for educators on the importance of using technology in history education to help students develop a deeper understanding of themselves and the impact of history on their identities and values.

Conclusion

This study shows that students describe their experiences using a multimodal dialogue system as an effective and profound way to understand traumatic history, where they can access various sources of information interactively and reflectively. Despite facing emotional challenges and discomfort in discussing sensitive historical material, students are able to overcome these obstacles through the support of an inclusive learning environment and the use of technology that facilitates emotional expression and open discussion. The multimodal dialogue system has proved to facilitate richer discussions and reflections on the impact of traumatic history on students' identities and values, helping them connect personal experiences with historical contexts more empathetically and critically. Besides, the contribution of Vygotsky's social constructivist theory is clearly evident in this study, where learning is understood as a process that occurs through social interaction and collaboration within cultural contexts. This approach enables students to build a deeper shared understanding of traumatic history. Furthermore, Bakhtin's dialogic theory emphasises the importance of dialogue as a space for identity formation and holistic understanding, which is reflected in how students interact with the multimodal system to explore various perspectives and develop critical reflections on complex historical events.

The implications of this study are highly significant for educators and curriculum developers. By integrating multimodal dialogue systems into history education, educators can create more interactive and reflective learning environments, enabling students to explore their identities and values more deeply. Additionally, this study underscores the importance of constructive feedback in the learning process, which can boost students' motivation to engage in discussions and reflections. Therefore, training teachers in the use of technology and teaching strategies that support social interaction is strongly recommended.

While this study provides valuable insights, there are several limitations to consider. First, the limited number of participants and the focus on six schools in Semarang may restrict the generalisability of the findings to broader contexts. Furthermore, this study primarily focused on students' experiences with the multimodal dialogue system,

without considering the perspectives of teachers or parents, which could also influence the learning process. As such, further research with larger and more diverse samples, as well as a more holistic approach, is needed to gain a more comprehensive understanding of the impact of multimodal dialogue systems in history education.

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