

Multimodal Communication in Informal Learning: Learners' Perceptions of Interactive Multimedia for Supporting Language Understanding

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ABSTRACT

This study explores learners' perceptions of multimodal communication in informal learning environments, with particular emphasis on the perceived role of interactive multimedia in supporting language understanding among primary school learners. A mixed-methods approach was employed involving 301 upper primary students aged 10 to 12 years from Negeri Sembilan, Malaysia. Data were collected using a questionnaire comprising closed-ended and open-ended items. Quantitative data were analyzed descriptively using frequencies and percentages, while qualitative responses were examined to provide additional insights into learners' perceptions. The findings indicate that many respondents perceived traditional museum communication approaches as less suitable for contemporary learners because they offer limited opportunities for interaction and engagement. In contrast, learners expressed positive perceptions towards interactive information boards that integrate text, visuals, audio, video, and user interaction, suggesting that these multimodal resources are viewed as more engaging and supportive of language understanding. While this study does not directly measure language learning outcomes, the findings highlight learners' preference for interactive and multimodal communication within informal educational settings. The study contributes to the growing body of literature on multimodal communication by providing empirical evidence of learners' perceptions in museum-based learning environments and offers practical implications for designing more engaging informal learning experiences.

Keywords: Multimodal communication, informal learning, interactive multimedia, language understanding, learner perceptions

INTRODUCTION

The rapid advancement of digital technologies has transformed the ways individuals communicate, interact, and acquire knowledge. In contemporary education, learning increasingly extends beyond formal classroom settings into informal learning environments such as digital platforms, mobile applications, interactive media, and educational spaces including museums (Gee, 2017). Within this context, primary school learners are growing up in a highly digitalized environment where technology forms an integral part of their daily experiences. As a result, they are frequently exposed to multimodal forms of communication that combine text, images, audio, video, and interactive elements (Kress, 2010).

This continuous exposure to digital media has influenced how young learners access, process, and engage with information. Unlike previous generations who relied primarily on printed materials, contemporary learners are accustomed to receiving information through multiple channels simultaneously. They often encounter educational content through videos, animations, interactive applications, and digital games, which encourage active participation and immediate feedback. Consequently, learners may expect educational experiences that are visually engaging, interactive, and responsive to their needs.

In language learning, multimodal communication is particularly valuable because it presents information through complementary modes that support meaning-making. Rather than relying solely on written text, multimodal resources provide additional contextual support through images, audio, and interactive features. For example, visual representations can help learners understand unfamiliar vocabulary, while audio elements can support pronunciation and listening comprehension. Interactive features further encourage learners to explore content actively and engage with information at their own pace. By presenting information in multiple forms, multimodal communication may facilitate deeper understanding and help learners construct meaning more effectively.

As informal learning environments continue to gain importance in education, they provide valuable opportunities to support language learning beyond the classroom. However, their effectiveness depends on the extent to which they reflect the learning preferences and experiences of contemporary learners. Despite the growing availability of digital technologies, many museums continue to rely on conventional methods of information delivery that are primarily text-based and offer limited opportunities for interaction. Such approaches may not fully align with the expectations of learners who are accustomed to dynamic, visually rich, and digitally supported learning environments.

Therefore, this study aims to: (1) explore primary school learners' perceptions of multimodal communication in informal learning environments, particularly in museum-based educational settings; and (2) to examine learners' perceptions of interactive multimedia, particularly interactive information boards, as multimodal resources for supporting language understanding and learner engagement.

Research Gap and Theoretical Framework

Although multimodal communication has been widely examined within educational research, existing studies have predominantly focused on formal instructional settings, including classroom teaching, online learning environments, and technology-assisted language instruction. While these studies have demonstrated the educational value of multimodal resources, their findings may not be directly transferable to informal learning environments, where learning occurs through voluntary exploration, self-directed engagement, and contextual interaction rather than structured instruction.

This gap is particularly evident in informal learning environments, particularly museums, where learners engage with educational content through exploration rather than structured classroom instruction. Although museums have increasingly adopted digital technologies to enhance visitor engagement, relatively little research has examined how primary school learners perceive multimodal communication as a resource for supporting language understanding in these settings. However, comparatively little research has explored how primary school learners perceive multimodal communication in supporting language understanding within museum-based informal learning environments. Consequently, there remains limited empirical evidence regarding learners' perceptions of interactive multimedia in these contexts.

Consistent with Creswell and Creswell (2018), this study adopts an exploratory mixed methods approach to develop an initial understanding of learners' perceptions rather than to establish causal relationships or produce findings that are statistically generalizable to all learner populations. The purpose of this study is to explore how upper primary school learners perceive multimodal communication within informal learning environments and to provide preliminary empirical evidence that may inform future experimental studies involving learners from different educational levels and geographical regions. Therefore, the geographical focus on Negeri Sembilan and the selection of upper primary school learners define the context of the study rather than diminish its contribution as exploratory research.

Furthermore, although previous studies have reported positive educational outcomes associated with interactive multimedia, relatively little attention has been given to learners' own perceptions of these technologies within informal educational settings. Understanding these perceptions is important because they influence learners' willingness to engage with educational content and shape the quality of their learning experiences. Therefore, this study addresses an important gap by examining how primary school learners

perceive multimodal communication and interactive multimedia as resources that support language understanding and learner engagement in museum learning environment.

Multimodal Communication Theory

Multimodal Communication Theory, proposed by Kress (2010), argues that meaning is constructed through multiple modes of communication rather than through language alone. These modes include linguistic elements such as text, visual elements such as images and graphics, auditory elements such as sound and narration, spatial design, and interactive or gestural features. In digital environments, understanding increasingly relies on the integration of these modes within multimedia and interactive platforms.

In this study, multimodal communication is represented through tools such as interactive information boards that combine text, visuals, audio, video, and user interaction. The integration of these modes enables learners to access information through different communicative channels, potentially supporting comprehension and retention. For primary school students, who often respond well to visual and interactive stimuli, multimodal resources may provide more engaging and meaningful learning experiences. Consequently, Multimodal Communication Theory supports the view that presenting information through multiple communicative resources may provide learners with richer opportunities for meaning making and may be perceived as supportive of language understanding.

Multimodal Communication in Youth Informal Learning

Today, the way young people understand and pick up languages has shifted massively toward informal, media rich spaces. Dressman and Lee (2024) look closely at this trend, describing these unstructured online platforms as digital wild spaces. When youth spend time on social media or gaming networks, they naturally encounter language through a mix of text, audio, and visuals. This organic, everyday immersion creates a highly motivating environment where language understanding happens naturally.

But for this mix of sights and sounds to turn into deep understanding, the design of the media matters a lot. This is where Plass and Kaplan (2022) connect with the conversation. They argue that interactivity is the secret ingredient that keeps the brain from getting overwhelmed. While Dressman and Lee point out how rich these informal spaces are, Plass and Kaplan explain the mental process behind it. Interactive multimedia stops young people from just staring blankly at a screen. Instead, it forces them to actively process what they see and hear, helping them map out how the language works.

This transition from just watching to actively participating becomes even clearer when young people start making their own content. Bridging this gap, Hafner and Ho (2023) show that when youth create their own multimedia, like short videos, they reach the highest level of language processing. To make a video in those digital wild spaces mentioned by Dressman and Lee, they cannot just be passive users. They must combine audio, captions, and images themselves, which forces them to really think about the language they are using to communicate.

When you look at these three studies together, they form a perfect circle. Dressman and Lee open the door by showing us the informal spaces where youth hang out. Plass and Kaplan explain how interactive media in those spaces helps the brain learn. Finally, Hafner and Ho show us what happens when youth use that media to create something of their own. Together, these studies suggest that interactive multimedia in everyday life is not just a distraction, it is a powerful environment that reshapes how the younger generation understands language.

Constructivist Learning Theory

Constructivist Learning Theory, associated with Piaget (1972) and Vygotsky (1978), posits that learners actively construct knowledge through experience, interaction, and social engagement. Learning is not a passive process of receiving information, but an active process in which individuals build meaning based on prior knowledge and contextual experiences. Piaget's cognitive constructivism emphasizes the role of exploration

and discovery in developing understanding, particularly among children. Meanwhile, Vygotsky's social constructivism highlights the importance of social interaction and scaffolding, where learners develop knowledge through guided support and collaborative learning within their Zone of Proximal Development (ZPD).

In this study, interactive multimedia tools in informal learning environments, such as museums, function as scaffolding mechanisms that guide learners in constructing meaning. For example, interactive boards and multimedia exhibits could provide opportunities for students to explore content independently while receiving visual, auditory, and textual support that enhances understanding. This aligns with constructivist principles where learners actively engage with content rather than passively receiving information.

Integration of Both Theories

The integration of Multimodal Communication Theory and Constructivist Learning Theory provides a coherent framework for understanding how learners engage with educational content in informal learning environments. Rather than operating as separate explanatory models, the two theories address complementary dimensions of the learning process. Multimodal Communication Theory explains how meaning is represented and communicated through multiple semiotic resources, whereas Constructivist Learning Theory explains how learners actively interpret, negotiate, and construct meaning from those resources.

The relationship between these theories is particularly relevant within interactive learning environments. Multimodal resources such as text, visuals, audio, video, and interactive features do not inherently produce learning outcomes. Rather, their educational value depends on how learners engage with and interpret the information they provide. From a constructivist perspective, learners actively construct understanding by connecting new information to prior knowledge, exploring content independently, and reflecting on their experiences. Consequently, multimodal communication provides the representational resources necessary for learning, while constructivism explains the cognitive processes through which those resources acquire meaning.

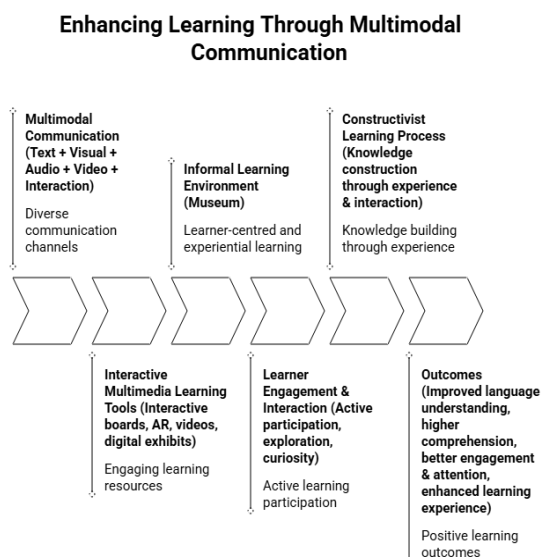


Figure 1 Enhancing Learning Through Multimodal Communication

This theoretical integration is especially significant for language learning. Language understanding involves more than decoding linguistic forms; it requires learners to interpret meaning within specific contexts. Multimodal resources can support this process by presenting information through complementary modes that reinforce one another. Visuals, audio, text, and interactive elements may provide contextual cues that help learners make sense of the content, while active engagement with these resources encourages them to develop a deeper understanding of language concepts. Therefore, the combined framework offers a useful theoretical

lens on how multimodal communication may support language understanding and learner engagement within informal educational settings.

DISCUSSION

Perception that Museum Exhibitions are Less Suitable for Younger Learners

Pameran di muzium kebanyakannya tidak sesuai dengan generasi muda.

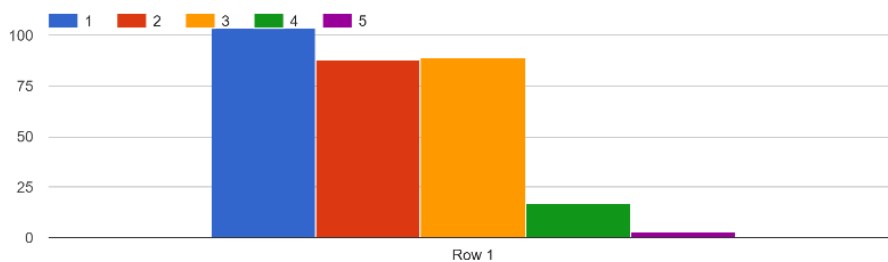


Figure 2 Perception that museum exhibitions are less suitable for the younger generation

The finding that 104 respondents perceived museum exhibitions as less suitable for younger learners suggests that traditional approaches to presenting educational information may not fully align with the expectations and learning preferences of contemporary students. Rather than indicating that conventional museum exhibitions are ineffective, this finding reflects respondents' perceptions that static displays, lengthy written explanations, and limited opportunities for interaction are less engaging than multimedia-based approaches. As museums continue to play an important educational role, the findings highlight the need to reconsider how information is communicated to learners who are increasingly accustomed to digital technologies in their everyday lives.

For contemporary learners, educational experiences are often associated with visual stimulation, interactivity, and immediate access to information. Consequently, exhibitions that rely predominantly on text-based communication may be perceived as offering fewer opportunities for active engagement. This finding suggests a potential mismatch between conventional museum communication practices and the learning preferences of digitally connected learners, particularly within informal learning environments where participation is largely voluntary and self-directed.

This finding is consistent with Multimodal Communication Theory (Kress, 2010), which proposes that meaning is constructed through the integration of multiple communicative modes rather than through written language alone. The respondents' perceptions indicate that multimodal resources incorporating visuals, audio, video, and interactive elements are viewed as more engaging ways of accessing and interpreting information. Similarly, Dressman and Lee (2024) argue that young learners increasingly experience language through rich combinations of digital media, making multimodal communication more closely aligned with their everyday learning experiences.

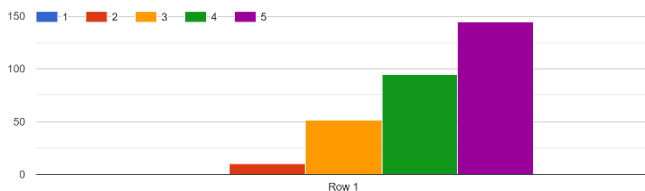
The findings can also be interpreted through the lens of Constructivist Learning Theory. According to Piaget (1972) and Vygotsky (1978), learners construct understanding through active exploration and interaction with their environment. Traditional museums displays often position visitors as passive recipients of information, whereas multimodal resources encourage learners to explore content, make connections between ideas, and engage more actively with educational materials. These opportunities for active participation are particularly relevant in informal learning environments, where learners have greater autonomy over how they engage with information.

From the perspective of language learning, the respondents' perceptions suggest that multimodal communication may provide richer opportunities for engaging with language related content than conventional text-based displays. Visual representations, audio narration, and interactive features may offer contextual

support that learners perceive as helpful when interpreting unfamiliar vocabulary or concepts. However, it is important to emphasize that the present study examined learners' perceptions rather than the actual effectiveness of multimodal communication in improving language understanding. Therefore, the findings should be interpreted as reflecting learners' preferences for multimodal learning experiences rather than as evidence of measurable effectiveness in language achievement.

Interest in Interactive Information Boards

Teknologi interaktif (seperti skrin sentuh, AR/VR,QR kod) di muzium membuatkan lawatan lebih menyeronokkan.



Saya lebih gemar sekiranya ada papan penerangan interaktif untuk membantu pemahaman dengan lebih jelas berkenaan Sejarah.

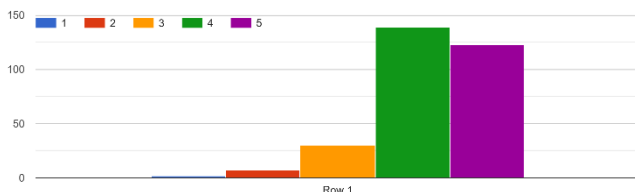


Figure 3 Interest in Interactive Information

Boards

The respondents' strong support for interactive information boards suggests a deeper interest than a simple preference for technology-based learning tools. Rather, it indicates that learners value educational resources that provide greater opportunities for participation, exploration, and control over the learning process. Unlike conventional museum displays, interactive information boards enable learners to determine how they access information, the sequence in which they explore content, and the pace at which learning takes place. Such flexibility is particularly important in informal learning environments, where learner engagement is largely individually driven.

From the perspective of Multimodal Communication Theory, the respondents' positive perceptions may be attributed to the integration of multiple communicative modes within a single learning platform. Text, visuals, audio, video, and interactive functions work together to provide complementary sources of information, allowing learners to access content through different representational forms. This finding is consistent with Suboh and Ibrahim (2019), who reported that interactive multimedia environments encourage children to explore ideas, solve problems, and develop creative thinking through active participation rather than passive information reception.

The findings also support Constructivist Learning Theory, which emphasizes that meaningful learning occurs when learners actively construct knowledge through exploration and interaction. Interactive information boards allow learners to navigate educational content independently while receiving support through multiple communicative resources. Such learning experiences may encourage learners to connect new information with their existing knowledge and develop deeper engagement with educational content.

With regard to language understanding, the respondents generally perceived interactive information boards as supportive resources for interpreting information presented within museum environments. The integration of visuals, audio, and interactive features was viewed as providing additional contextual cues that could facilitate

comprehension and engagement with educational materials. These findings are consistent with previous studies suggesting that multimodal resources create richer learning experiences by presenting information through complementary communicative modes (Murcia, 2014; Chong & Smith, 2017; Godoy, 2021). Nevertheless, the present study did not directly assess language acquisition or learning achievement. Instead, the findings indicate that learners perceive interactive multimedia as potentially supportive of language understanding within informal learning environments.

Overall, the findings suggest that respondents value interactive multimedia not simply because it incorporates digital technology, but because it offers richer opportunities for exploration, participation, and meaning making. Rather than demonstrating the effectiveness of multimodal communication in improving language understanding, this study provides preliminary empirical evidence that primary school learners perceive multimodal communication as a more engaging approach to accessing educational information in informal learning environments. These findings contribute to the growing body of literature on learners' perceptions of multimodal communication and provide a foundation for future experimental research examining its impact on language learning outcomes.

CONCLUSION

This study explored upper primary school learners' perceptions of multimodal communication within informal learning environments, with particular emphasis on the use of interactive multimedia in museum settings. The findings indicate that respondents generally perceived multimodal communication as more engaging than conventional approaches to information presentation. In particular, learners expressed positive perceptions towards interactive information boards that integrate text, visuals, audio, video, and user interaction, suggesting that these multimodal resources are viewed as supportive of learner engagement and language understanding within informal learning environments.

The findings also contribute to the growing body of knowledge on multimodal communication by extending existing research beyond formal educational settings. Guided by Multimodal Communication Theory and Constructivist Learning Theory, the study demonstrates that learners value educational experiences that encourage active participation, exploration, and interaction with multiple communicative modes. Rather than replacing traditional museum exhibitions, interactive multimedia may complement existing approaches by providing more engaging opportunities for learners to explore educational content.

From a practical perspective, the findings suggest that museums and other informal educational institutions may benefit from incorporating interactive multimedia technologies, such as interactive information boards and digital storytelling, to enhance learner engagement. As contemporary learners increasingly interact with multimodal forms of communication in their daily lives, integrating these technologies into museum environments may contribute to more accessible and meaningful learning experiences.

Nevertheless, several limitations should be acknowledged. The study was conducted among upper primary school learners in Negeri Sembilan, Malaysia, and the findings are based on respondents' self reported perceptions. Consequently, the findings should be interpreted within the context of this exploratory study and should not be generalised to all learner populations or interpreted as evidence of actual improvements in language understanding or learning achievement. Accordingly, the findings should be interpreted as reflecting learners' perceptions within the specific context of this study rather than as evidence of causal relationships between interactive multimedia and language learning outcomes.

Future research should extend this work by employing experimental or longitudinal research designs to examine the actual effects of multimodal communication on language learning outcomes. Studies involving learners from different educational levels, geographical regions, and informal educational contexts would also strengthen the generalisability of the findings and provide a more comprehensive understanding of how multimodal communication supports learning across diverse settings.

Overall, this study provides preliminary empirical evidence that primary school learners perceive multimodal communication as a valuable approach for supporting engagement and facilitating access to educational

information in informal learning environments. These findings provide a useful foundation for future research and offer practical insights for educators, museum practitioners, and instructional designers seeking to create more engaging learning experiences through interactive multimedia.

REFERENCES

1. Baltrušaitis, T., Ahuja, C., & Morency, L. P. (2018). Multimodal Machine Learning: A Survey and Taxonomy. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 41(2), 423-443.
2. Bezemer, J., & Kress, G. (2010). Multimodality, Learning and Communication: A Social Semiotic Frame. *Educational Review*, 62(3), 327-336. <https://doi.org/10.1080/00131911.2010.503541>
3. Chong, C., & Smith, D. (2017). Interactive Learning Units on Museum Websites. *Journal of Museum Education*, 42(2), 169-178. <https://doi.org/10.1080/10598650.2017.1301626>
4. Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and mixed Mmethods pproaches*. SAGE.
5. Dressman, M., & Lee, J. S. (2024). Multimodal and Informal Language Learning in Digital Wild Spaces: A Synthesis of Recent Youth Research. *System*, 121, 103241.
6. Diamantopoulou, S., Christidou, D., Blunden, J., & Kress, G. (2024). Multimodality and Museums: Innovative Research Methods and Interpretive Frameworks. *Museum Management and Curatorship*. <https://doi.org/10.1177/26349795241270436>
7. Godoy, C. H., Jr. (2021). Augmented Reality for Education: A Review. *International Journal of Innovative Science and Research Technology*. 5(6), 39-45.
8. Hafner, C. A., & Ho, W. Y. J. (2023). Youth Digital Practices and Multimodal Literacy: Developing Language Understanding Through Informal Video Production. *Language Learning & Technology*, 27(1), 45-66.
9. Kress, G. (2010). *Multimodality: A Social Semiotic Approach to Contemporary Communication*. Routledge.
10. Menon, N. (2025). Museums As Sites of Belonging, Empowerment, and Multimodal Literacies for Immigrant and Racialized Families. *Journal of Ethnic and Migration Studies*. <https://doi.org/10.1177/14687984251380649>
11. Murcia, K. (2014). Interactive and Multimodal Pedagogy: A Case Study of How Teachers and Students Use Interactive Whiteboard Technology in Primary Science. *Australian Journal of Education*, 58(1), 74-88. <https://doi.org/10.1177/0004944113517834>
12. Plass, J. L., & Kaplan, S. (2022). Interactive Multimedia and Cognitive Load in Language Acquisition: Designing for The Next Generation of Learners. *Educational Psychology Review*, 34(3), 1425-1455.
13. Stein, J. P., & Graham, C. R. (2020). *Essentials for Blended Learning: A Standards-based Guide*. Routledge.
14. Suboh, N., & Ibrahim, R. (2019). Developing Human-Factored Model for Learning Social Behaviour During Game Playing. *Proceeding of the 14th ICLEHI Bangkok*, 25.
15. Vygotsky, L. S. (1978). *Mind in society: The Development of Higher Psychological Processes*. Harvard University Press.