



Multimodal Approach to Language Learning: Integration of Technology to Improve Understanding and Effective Communication in the Digital Era

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Article Info	Abstract
<p>Received: 2026-03-09 Revised: 2026-04-23 Accepted: 2026-04-27</p> <p>Keywords: <i>communication;</i> <i>comprehension;</i> <i>language learning;</i> <i>multimodality;</i> <i>technology.</i></p> <p>DOI: 10.24256/ideasv14i1.9901</p> <p>Corresponding Author: Mustakim Sagita mustakim_sagita@unigha.ac.id Pendidikan Bahasa Inggris, Universitas Jabal Ghafur, Aceh, Indonesia</p>	<p><i>This study aims to analyze the effectiveness of a multimodal approach in improving students' language learning comprehension and communication skills. The multimodal approach integrates various modalities, such as text, images, sound, video, and digital technology, compared to the monomodal method which only uses one modality. This study used a quasi-experimental design with two groups, namely the control group and the experimental group, with a total of 60 students. The instruments used included pre-test and post-test, student perception questionnaires, classroom observations, and semi-structured interviews. The results showed that the experimental group taught with a multimodal approach experienced a significant increase in language comprehension, averaging 25%, while the control group increased by only 10%. In addition, students who used the multimodal approach reported higher levels of motivation and engagement in the learning process. Observations showed that technology plays an important role in creating an interactive and dynamic learning environment. However, there are challenges related to equitable access to technology among students. In conclusion, the multimodal approach proved more effective at improving students' language comprehension and communication skills than the monomodal method. This study recommends developing technological infrastructure, providing teacher training, and integrating multimodality into the curriculum to maximize the benefits of this method.</i></p>

1. Introduction

Language learning has undergone significant changes with the advancement of technology that has triggered a multimodal learning approach. This approach does not only focus on one type of modality, such as written text, but integrates various forms of communication, such as visual, auditory, kinesthetic, and technological, to create a more interactive and immersive learning environment. Multimodality, as an approach that combines modalities, allows students to process information more effectively by delivering content in multiple forms. As the digital era evolves, this approach is increasingly relevant and has great potential for application in language learning.

Multimodal approaches offer many benefits for language learning, especially in improving students' comprehension. When different modalities such as text, images, sound, and movement are combined, students have the opportunity to understand concepts from different perspectives, which can increase their engagement and comprehension of the material. A study by Muraina et al., (2019) found that the use of multimodal approaches, including videos, games, and online classes, significantly improved students' performance in learning programming languages, which indirectly shows the great potential of this method in language learning in general.

The use of multiple media or modes within a single artefact is known as multimodality. Multimodality affects different theoretical contexts, and this collection of modes or elements helps readers better understand ideas and concepts. The multimodal learning model is chosen to enhance students' creativity and to help them solve learning problems independently by combining multiple modes (media) or technologies into a meaningful whole. The purpose of the multimodal model is to educate students to become knowledgeable readers and producers of texts. According to Kennedy (2015), there are at least five types of activities that can be used in multimodal learning design. (1) Educational games, these educational games can make students use many modes at once.

One way to convey learning messages is to use words, colours, movements, images, speech, music, and actions that require writing. Educational games give students the opportunity to learn both in and out of class. 2. Think-pair-share is a collaborative learning strategy that aims to improve students' understanding of the material, cooperation, and sharing of ideas. This activity consists of three steps: first, giving students the opportunity to think about the material individually; second, pairing up to discuss their ideas or findings; and third, debriefing. (3) Case-based learning is a type of learning in which real situations are used as teaching materials.

Methods such as interviews, reading, listening, taking notes, and observation will all help students gain new knowledge. Teachers use this activity to encourage class discussions about the cases discussed and ensure that students can relate them to the material and teaching materials. The advantage of this

method is that it gives students the belief that what they are learning is useful and meaningful in the real world. As a result, students' learning activities can increase as their attitudes and desire to learn increase. (4) Personal journal entries, which are activities where students have the opportunity to enter learning materials in their own words. Teachers can suggest that students view these personal journals in various media, such as podcasts, stories, written notes, illustrations, and videos. (5) Multimodal research projects allow students to conduct simple research on learning materials. They can use various modes and sources, both digital and traditional.

After that, students can present their research results in various ways they like, such as interactive discussions, lectures, videos, and posters. The development of multimodal learning media is in line with the needs of teachers to understand multimodal literacy. Multimodal literacy is an important skill that students must master in the millennial era. Students must be able to master skills other than writing, reading, and numeracy, which are the basis of education, but also new skills, such as human, data, and technology literacy (Kasturi, 2021). Multimodal learning stems from the Jigsaw learning strategy, which focuses on multimodal texts and analysis methods to uncover them. Multimodal literacy learning methods utilize constructivist learning principles to provide students with multisemiotic experiences.

This strategy refers to several principles, namely: (a) knowledge is constructed by students themselves, both socially and personally, (b) knowledge is not transferred from teacher to student unless students actively think, and (c) students actively construct consistently, so that they can learn continuously. Multimodal literacy learning strategies rely on the idea that all students, from elementary school age to college, have the opportunity to be creative and take part in various activities that help them learn and discover new things. Firdaus et al. (2024) states that multimodal literacy learning strategies can be implemented in the following ways: (a) forming student groups based on the number of students, (b) determining the material to be discussed in each group, and (c) providing each group with a section according to the topic of the learning study.

Materials, such as song lyrics and dance videos that contain local wisdom, such as the *Saman* dance. Multimodal literacy is part of a learning strategy that gives students the opportunity to be creative and participate in various activities across different educational interactions, helping them explore and discover new information.

Besides that, Julia Setyaningsih (2023) confirmed that students responded positively to the integration of visual and linguistic elements in the creation of Indonesian morphology textbooks. According to respondents, the integration of elements such as images, tables, graphs, photos, text, colour, and infographics in textbook design was considered very positive. As a result, it is clear that developing an Indonesian morphology learning model that integrates this linguistic-visual multimodality is both important and urgent.

Technology also plays an important role in enabling multimodal approaches to be integrated into language learning (Sagita et al., 2021; Sagita et al., 2024; Amumpuni et al., 2023). The use of technology enables the delivery of language-learning materials across platforms such as video platforms, mobile applications, and other online learning tools, enriching the learning experience. This has been demonstrated by studies showing that multimodality, when combined with technology, can provide a richer and more dynamic learning experience. (Choi & Yi, 2016).

Technological advances offer significant opportunities for integrating multimodality into language learning. Technology allows students to engage with learning materials in more in-depth and interactive ways, through digital platforms, applications, and visual and auditory presentation tools. In a study by Zhang et al. (2019), deep learning was used to develop a multimodal learning model integrating vision and language, demonstrating that advanced technology in language learning can enable more innovative and efficient learning (Zhang et al., 2020).

Technology also enables the creation of learning environments that are available anytime and anywhere, increasing flexibility in language learning. In the context of foreign language learning, the use of video, audio, and interactive applications allows students to learn independently with the support of multimodal technology. The use of multimodal technology in learning English as a foreign language (EFL) presentations improves student achievement and facilitates the learning process in a more interactive and holistic way (Lee, 2019).

Multimodal approaches also have great potential in increasing the effectiveness of communication in language learning. By integrating visual, auditory, and technological elements, students can understand language across contexts, from face-to-face interactions to digital communication. (Holler & Levinson, 2019). This allows for a deeper understanding of the language, as students are exposed not only to one form of communication, but to multiple forms of communication simultaneously (Özyürek, 2021).

In language learning, integrating technologies such as video and audio can help students visualize how language is used in everyday contexts (Grapin, 2019). A study conducted by Lazaridou et al. (2016) emphasized the importance of interaction in language learning by using a multimodal approach involving cooperative referential games, which showed that effective communication can be enhanced through the need to actively interact with various modalities (Lazaridou et al., 2016).

The use of multimodality also helps students build a sense of accomplishment and self-esteem. Choi and Yi (2016) found that multimodal approaches not only improve linguistic comprehension but also provide psychological space for students to better express themselves and find a sense of accomplishment through the integration of diverse modalities.

The purpose of this study is to evaluate the effectiveness of multimodal methods in improving students' language comprehension compared to monomodal approaches, and to identify the role of technology in supporting the integration of modalities such as text, images, sound, and movement in language learning.

The problem is how a multimodal approach can improve students' communication skills, both oral and written, and how to identify challenges and obstacles to implementing this approach in the curriculum, including technological constraints and limitations in teacher training.

2. Method

To obtain more comprehensive data on the effectiveness of the multimodal approach in language learning, this study uses a mixed-methods approach that combines qualitative and quantitative methods (Creswell, 2016).

The research design was quasi-experimental, with participants divided into two groups: the control group and the experimental group. The control group would be taught using a monomodal approach (e.g., text or sound), while the experimental group would be taught using a multimodal approach integrating various modalities (e.g., text, images, sound, video, and digital technology). The study population consisted of high school students or language majors from several educational institutions, and the sample would be selected using a purposive sampling technique, with 60 students divided evenly between the two groups.

The research instruments included a pre-test and post-test to measure students' language comprehension and communication skills before and after the intervention, as well as a questionnaire to assess students' perceptions of the use of technology and different language-learning modalities (Amumpuni et al., 2023). In addition, classroom observations and semi-structured interviews with students and teachers will be conducted to obtain in-depth qualitative data. Quantitative data from the pre-test and post-test will be analyzed using a t-test to see if there are significant differences between the two groups.

Meanwhile, qualitative data from interviews and observations will be analyzed using thematic analysis to identify students' perceptions and challenges faced in implementing the multimodal approach. The integration of both types of data is expected to provide a more comprehensive picture of how effective the multimodal approach is in improving students' comprehension and communication skills in language learning

3. Result

Pre-Test and Post-Test Results

This study presents both quantitative and qualitative findings to provide a comprehensive understanding of the effectiveness of multimodal learning compared to a monomodal approach. The quantitative data were derived from the pre-test and post-test scores, while the qualitative data were obtained from

questionnaires, classroom observations, and interviews.

The pre-test results indicate that there was no significant difference between the experimental and control groups prior to the intervention. Both groups demonstrated relatively similar levels of language comprehension, as reflected in their comparable mean scores. A t-test for independent samples confirmed that the difference between the two groups was not significant ($p > 0.05$). This finding suggests that participants' initial abilities were equivalent, providing a reliable basis for comparing the effects of the two instructional approaches.

This study began with a pre-test conducted on both the experimental and control groups to measure students' language comprehension and skills before the intervention. The pre-test results showed that both groups had relatively similar levels of language comprehension and there was no statistically significant difference between them ($p > 0.05$). This indicates that both groups were at comparable levels of ability before the learning began.

Table 1. T-Test analysis in the pretest of both groups

	Test	Mean	N	SD	SE Mean	<i>r</i>	<i>p</i>	
Group	1 (One)	68.19	30	5.65	1.23	.153	.109	
	2 (Two)	65.14	30	12.95	2.82			
Paired Difference								
Pretest - Posttest	Mean	SD	SE Mean	95% Confidence Interval of the Difference		<i>t</i>	<i>df</i>	<i>p</i>
				Lower	Upper			
Test Results	3.04	13.32	2.90	-3.01	9.11	1.04	20	0.15

After 6 weeks of intervention, a post-test was conducted to assess improvements in students' comprehension and communication skills. The post-test results showed a significant improvement in the experimental group taught using the multimodal approach. The experimental group's average score increased by 25%, while the control group's increased by only 10%. The t-test analysis revealed that the difference between the two groups was statistically significant ($p < 0.05$), indicating that the multimodal approach had a greater impact on improving students' language comprehension compared to the monomodal method.

Table 2. T-Test Analysis in the Posttest of both groups

	Test	Mean	N	SD	SE Mean	r	p	
Group	Experimental	88.19	30	5.85	1.23	.153	.200	
	Control	68.14	30	14.95	2.82			
Paired Difference								
Pretest - Posttest	Mean	SD	SE Mean	95% Confidence Interval of the Difference		t	df	p
				Lower	Upper			
Test Results	3.04	12.32	4.25	-2.12	10.11	1.04	24	0.18

Following the implementation of the instructional treatments, post-test results reveal improvement in both groups, with a more noticeable increase in the experimental group. Students who were exposed to multimodal learning materials demonstrated greater improvement in their comprehension scores than those who received monomodal instruction. Specifically, the experimental group showed an average increase of approximately 25%, while the control group showed an improvement of around 10%. These findings indicate that multimodal learning may enhance learning outcomes, particularly students' ability to understand and process language input.

However, despite the observed difference in improvement between the two groups, the statistical analysis indicated that the difference was not significant ($p > 0.05$). This suggests that although the multimodal approach appears to produce better results descriptively, the effect cannot be considered statistically significant within the scope of this study. The lack of statistical significance may be influenced by factors such as the relatively small sample size, the short duration of the intervention, and variability in students' individual learning characteristics.

To further clarify the results described above, here is a graph showing the comparison of the increase in pre-test and post-test scores between the control group and the experimental group:

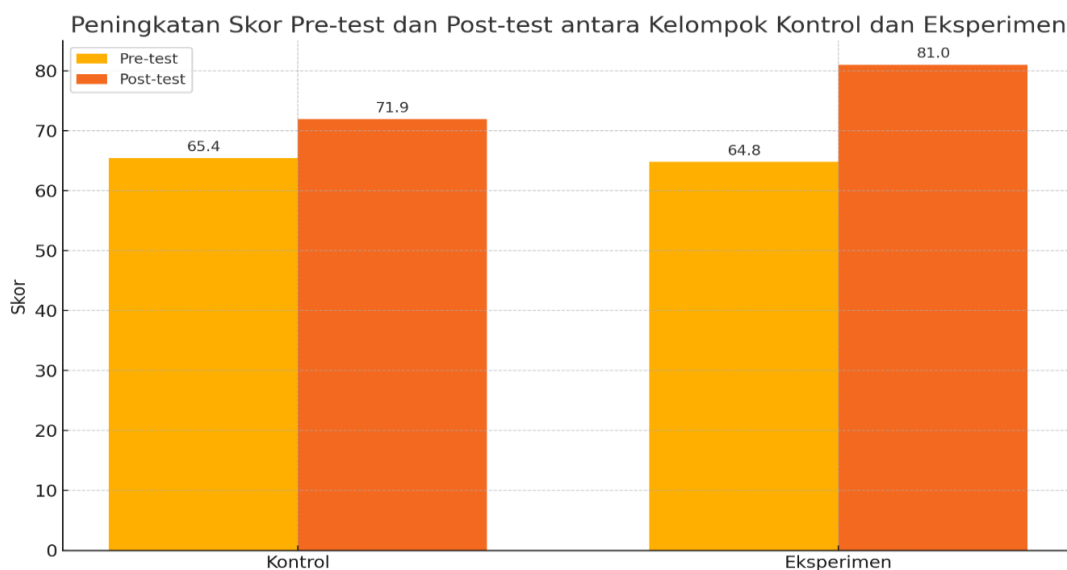


Figure 1: Improvement in Pre-test and Post-test Scores between Control and Experimental Groups.

The following graph shows the Pre-test and Post-test Scores that increased between the experimental and control groups. This graph illustrates the significant difference in score improvement between the two groups after using the multimodal approach.

Students' Perceptions of the Use of Multimodal Approaches

A questionnaire given to the experimental group after the intervention showed that the majority of students felt that the multimodal approach made it easier for them to understand the language material with 55% of students stated that the combination of text, images, and videos helped them understand the language context more quickly, and 30% felt more motivated to learn the language when using a variety of methods. However, 15% of students reported technical challenges, such as limited access to technological devices at home, which slightly hampered their learning.

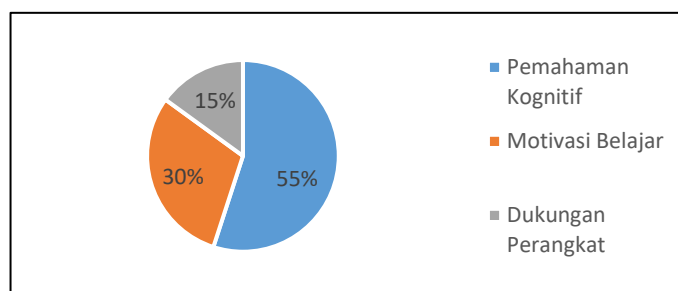


Figure 1. Student Perception Diagram in the Multimodal Approach

From classroom observations, it was seen that students participated more actively in the learning process. The use of interactive video and audio stimulated more dynamic discussions among students and helped them relate the concepts learned to real situations. Students also used other modalities, such as gestures and visuals, more frequently to support their oral explanations, thereby improving their overall communication skills.

In addition to the quantitative findings, the qualitative data provide further insights into students' learning experiences. The results of the questionnaire indicate that the majority of students in the experimental group perceived multimodal learning as beneficial and engaging. Many students reported that integrating videos, images, and interactive digital tools helped them better understand the learning materials and increased their interest in participating in classroom activities.

For instance, one student stated, *"Learning with videos and pictures makes it easier to understand the material because I can see real examples, not only text."* Another respondent expressed that *"I feel more motivated because the learning is not boring and I can follow the lesson more easily."*

Furthermore, some students emphasized that multimodal learning enhanced their communication skills by offering multiple ways to express their ideas. As one participant noted, *"I can explain my ideas better when I use pictures or examples, not just words."* This suggests that multimodal learning allows students to utilize multiple forms of representation, which may enhance both comprehension and expression.

Classroom observations further support these findings, as students in the experimental group were observed to be more active and participatory during the learning process. They engaged more frequently in discussions, asked questions, and responded to tasks using both verbal and nonverbal communication. In contrast, students in the control group tended to rely more heavily on written texts and showed lower levels of interaction. This difference in classroom dynamics indicates that multimodal learning creates a more interactive and student-centered learning environment.

The interview data also reveal that students generally had positive perceptions of the use of technology in learning. One student commented, *"Using technology helps me learn faster because I can access materials anytime and repeat them if I don't understand."* However, some students reported challenges related to technological limitations. For example, a respondent stated that *"sometimes I have difficulty because the internet connection is not stable, so I cannot follow the lesson properly."* This highlights the importance of considering infrastructural factors in implementing multimodal learning.

Overall, this study's results suggest that multimodal learning can enhance students' language comprehension, motivation, and participation. Although the statistical findings do not indicate a significant difference between the two approaches, the qualitative evidence demonstrates that students perceive

multimodal learning as more engaging and supportive of their learning process. The combination of quantitative and qualitative data thus provides a more comprehensive understanding of how multimodal approaches function in real classroom settings.

4. Discussion

The results of the study showed that the multimodal method improved students' language comprehension significantly better than the monomodal method. The results align with previous studies showing that integrating various modalities can enrich students' cognitive processes during language learning. Lazaridou et al. (2016) stated that the use of multimodal approaches, such as interactive video and audio, allows students to better understand the language through visual and auditory repetition, which strengthens cognitive learning. (Lazaridou et al., 2016).

This approach allows students to process information from multiple angles, resulting in deeper and more varied understanding. A 25% increase in the experimental group's post-test scores indicates that multimodality not only makes learning more interesting but also increases the efficiency of the learning process. These results provide strong support for the hypothesis that multimodality can enrich the language learning experience and facilitate faster comprehension.

Findings from the questionnaire and observations indicate that technology plays an important role in the multimodal approach, which supports the statement (Zhang et al., 2020) that technology integration with multimodality can create a more interactive and efficient learning environment. Students in the experimental group felt more motivated and helped in understanding language materials through the use of videos, animations, and digital learning applications. This shows that technology-supported multimodality can create a more dynamic and enjoyable learning atmosphere.

However, technical challenges such as limited access to technological devices at home indicate the need for improved technological infrastructure to support this approach, especially in less developed areas. This factor should be taken into account in the wider implementation of multimodality, as unequal access to technology can hinder its successful implementation.

Observations during the learning process showed that students were more active and more able to communicate effectively than the control group. This is relevant to Choi & Yi's (2016) findings, which state that multimodality helps students develop better communication skills by enabling them to use various forms of expression to explain their ideas (Choi & Yi, 2016).

By integrating visual, auditory, and kinesthetic modalities, students can communicate more confidently and clearly. For example, they do not rely solely on words to explain concepts but also use images and gestures to clarify meaning. This shows that multimodality not only enhances students' understanding but also

improves their ability to communicate effectively across various contexts.

As a text literacy medium, multimodal texts encompass meanings beyond written and spoken texts (Subagio, 2023). According to him, in the text there are two terms that can be used: their meanings can be exchanged for the meanings of the elements in the text, or they can be considered places where the elements provide meaning. This shows that "text" can mean a more complex combination of images, sounds, spoken and written sentences, and movement, not just writing consisting solely of sentences and images. Multimodal text is the term used to describe this type of text.

Multimodal texts bring new colors to literacy and Indonesian language learning. Educators can use multimodal texts to create different teaching materials and learning approaches. They can also use multimodal texts as literacy media during the learning stage with the idea that when literacy-based learning is applied, students must read books (Suryanti et al., 2024).

One way to improve literacy, especially during the learning stage, is to use multimodal texts. Another goal of multimodal literacy learning is to help students prepare for the era of the Industrial Revolution 4.0. This is because students gain a broader understanding of all aspects of the text, whether verbal, visual, or audio.

Because students receive different and more engaging text exposure, multimodal texts can also serve as a literacy medium that increases students' enthusiasm and attention to reading and writing. Students have the freedom to choose the type of text they like most, and that is closest to their lives. Multimodal texts combine audio, visual, and motion elements into a single text. In literacy, the use of multimodal texts can help accommodate various student learning styles. This aligns with Firmansyah's (2019) view that multimodal literacy learning strategies can enhance students' attention and abilities across multiple preferences.

Utilizing multimodal texts will help students improve their literacy skills at various levels, including finding, interpreting, integrating, reflecting, and evaluating. Learners will find it easier to locate, identify, and describe clear information in texts from sources such as written texts, videos, or audio at the finding level. They will also find it easier to interpret and integrate information at the integrating level, and learners can also analyze, predict, and assess language content and text elements at the reflecting and evaluating levels.

The findings of this study support the hypothesis that a multimodal approach not only improves language comprehension but also enriches the overall learning process.(Setyaningsih, 2023). This study provides clear evidence that combining multiple modalities can result in a more interactive and immersive learning experience. However, it is critical to ensure that all students have adequate access to the technology that supports these modalities to achieve optimal outcomes. In addition, teacher training in the use of various technologies and modalities is needed to overcome technical challenges and enhance the effectiveness of this approach in language learning.

In conclusion, this study demonstrates that a technology-supported multimodal approach has a significant impact on language learning, with greater improvements in comprehension and communication skills than a traditional monomodal approach

5. Conclusion

This study shows that when compared to a monomodal approach to language learning, a multimodal approach significantly improves students' comprehension and communication skills. The post-test results for the experimental group using the multimodal method showed greater improvement than those of the control group, with a statistically significant difference. In addition, students taught using the multimodal approach were more motivated, active, and engaged in the learning process, indicating that this method can create a more interactive and immersive learning experience. The integration of technologies, such as video, audio, and digital applications, proved important in supporting the multimodal approach, though some technical barriers needed to be overcome.

Thus, this study provides evidence that a well-implemented multimodal approach can be an effective means of improving the quality of language learning, both in language comprehension and in communication skills.

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