

UTILIZATION OF MULTIMODAL-BASED GRAPHIC AND AUDIO MEDIA TO OVERCOME TECHNOLOGICAL LIMITATIONS

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Abstrak

Penelitian ini bertujuan bahwa media bagan dan audio berbasis multimodal dapat menjadi solusi keterbatasan teknologi pembelajaran. Minimnya fasilitas teknologi yang berdampak pada proses pembelajaran yang kurang optimal, terutama pada mata pelajaran Fikih keadaan ini menyebabkan siswa mengalami kesulitan dalam memahami materi pelajaran. Maka dari itu, diperlukan pengembangan media pembelajaran sederhana namun efektif sebagai solusi alternatif terhadap teknologi modern. Penelitian ini diterapkan dengan metode kualitatif deskriptif melalui pendekatan purposive sampling dalam pemilihan subjek. Subjek yang terlibat terdiri dari delapan orang, yaitu tujuh siswa kelas tujuh dari kelas A dan B, serta satu guru mata pelajaran Fikih. Data dikumpulkan melalui tiga teknik yang digunakan meliputi observasi, wawancara, serta dokumentasi. Adapun hasil penelitian memperlihatkan bahwa pemanfaatan media berbasis multimodal terbukti efektif dalam meningkatkan interaktif, pemahaman materi, dan motivasi belajar siswa hal ini didapatkan dari hasil wawancara bersama beberapa siswa yang mengikuti pembelajaran menggunakan media bagan dan audio berbasis multimodal. Media ini dirancang sesuai dengan tujuan pembelajaran. Oleh karena itu, media berbasis multimodal berfungsi sebagai alternatif inovatif dan tepat dalam mengatasi keterbatasan teknologi pembelajaran di sekolah.

Kata Kunci: Audio; Bagan; Keterbatasan Teknologi Pembelajaran; Multimodal

Abstract

This study aims to determine whether multimodal-based chart and audio media can be a solution to the limitations of learning technology. The lack of technological facilities impacts the learning process less than optimal, especially in the subject of Islamic Jurisprudence. This situation causes students to experience difficulties in understanding the subject matter. Therefore, it is necessary to develop simple but effective learning media as an alternative solution to modern technology. This study implemented a descriptive qualitative method through a purposive sampling approach in selecting subjects. The subjects involved consisted of eight people, namely seven seventh-grade students from classes A and B, and one Islamic Jurisprudence teacher. Data were collected through three techniques used including observation, interviews, and documentation. The results of the study show that the use of multimodal-based media has proven effective in increasing interactivity, material understanding, and student learning motivation. This was obtained from the results of interviews with several students who participated in learning using multimodal-based chart and audio media. This media is designed in accordance with learning objectives. Therefore, multimodal-based media serves as an innovative and appropriate alternative in overcoming the limitations of learning technology in schools.

Keywords: Audio; Charts; Limitations of Learning Technology; Multimodal

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INTRODUCTION

The development of human resource competencies within a nation must be accompanied by awareness of the importance of education as a primary priority, in which learning media play a crucial role in the teaching and learning process and in supporting the achievement of instructional objectives (Halean et al., 2021). Teachers are tasked not only with teaching knowledge but also with delivering learning materials effectively (Busthomi, 2023). In the modern era, students tend to be more interested in visual media and interactive technology, making the learning process more effective compared to conventional one-way teaching methods (Ayunitha & Jasiah, 2025).

Along with the rapid development of the times, learning media have become increasingly diverse, ranging from high-technology-based media to conventional media that remain effective when used appropriately. Therefore, the advancement of education demands the utilization of technology in contemporary learning processes, as learning media function as communication tools to convey messages to students so that information can be more easily understood (Azijah et al., 2025). With technological advancement and changes in learning paradigms (Svari & Arlinayanti, 2024), educators are expected not only to assign tasks but also to provide clear explanations of the material so that students can better comprehend the lessons (Svari & Arlinayanti, 2024). One effort to increase students' learning enthusiasm is to create a learning atmosphere that encourages interaction and collaboration among learners. The use of chart and audio media based on a multimodal approach has been shown to motivate students to learn more actively, while also supporting teachers in delivering instructional content (Ramasari et al., 2022). The use of such learning tools can enhance students' interest in understanding new material presented by teachers, thereby making the learning process more effective (Putra et al., 2022). Teachers need to adjust instructional methods to the material being taught and ensure that students receive supporting components that enhance learning effectiveness. Therefore, careful lesson planning and the utilization of interactive media are essential to help students understand the material more easily (Nasution et al., 2024).

One example is the use of multimodal-based chart and audio media, which enable teachers to create learning environments that are not only flexible but also effective (Anwar & Jasiah, 2025). However, not all educational institutions have adequate access to or capacity for optimal use of educational technology. Thus, efforts are needed to understand and reduce the digital divide in education so that all students have equal opportunities to achieve academic success (Sinambela et al., 2024). One such case is MTs Muslimat NU Palangka Raya, which faces limitations in technological infrastructure. Under these conditions, teachers are required to creatively utilize alternative media, such as simple chart and audio media, while still adhering to multimodal learning principles to ensure students can understand the material effectively (Savitri et al., 2025). Based on the testimony of teacher RM, technological limitations at MTs Muslimat NU Palangka Raya—particularly the lack of adequate projectors—have caused the learning process, especially in Fiqh subjects, to be less optimal (Setyorini et al., 2025). As a result, some students experience difficulties in fully understanding the material (Ulum, 2024). These limitations in visual media also make it difficult for teachers to implement varied learning strategies, preventing the learning process from reaching its full potential. In this study, a multimodal learning strategy is applied by combining two media—charts and audio—implemented in the teaching and learning process of the Fiqh subject on the topic of tayammum.

According to Suryaman, one form of media that can be utilized in learning is charts (Nurdin, 2024). Chart media can provide clear and easily understood illustrations of the stages of tayammum accompanied by prayers, enabling students to comprehend each step of the process in detail. The

images presented in the charts illustrate the sequence of tayammum procedures, making it easier for students to understand (Mariana, 2025). These charts are designed interactively with detachable and reattachable image elements, aiming to train students to be more attentive, improve memory retention, and independently practice the tayammum procedure. On the other hand, audio media in the form of recordings are used to help students gain a deeper understanding of tayammum. These recordings provide detailed verbal explanations of the requirements and procedures of tayammum. Through audio media, students can better comprehend the explanations and stages involved in performing tayammum (Datunsolang et al., 2022). Listening to these recordings provides additional insights for students who may not fully grasp the material through visual media alone.

Previous studies on the use of multimodal-based learning media have revealed that this approach is effective in improving student learning outcomes. Research conducted by Harahap et al. (2025) demonstrated that multimodal-based media can enhance students' literacy skills. Additionally, a study by Norman et al. (2018) showed that chart media contributed to improved learning outcomes in social studies. Furthermore, research by Ramadhana et al. (2025) confirmed that the use of audiovisual media has a positive impact on improving students' comprehension.

Based on these previous studies, it can be concluded that this research differs from others in that it offers distinct advantages, particularly in the utilization of multimodal-based chart and audio media. This study combines two types of media to produce effective learning outcomes in environments with limited educational technology infrastructure. The chart media used are also designed to be interactive and manipulable, encouraging students to become more actively engaged in the learning process. This research also supports educators in becoming more creative when technological learning resources are inadequate, as teachers can employ or combine these two media types—an approach that has not been previously examined in other studies focusing on multimodal-based chart and audio media.

Therefore, this study offers a solution for teachers to continue utilizing learning media despite limitations in school facilities and infrastructure. The proposed solution is the use of multimodal-based chart and audio media as an alternative to visual-based learning media.

METHOD

This study employed a descriptive qualitative approach aimed at describing field conditions based on the data obtained. According to scientific sources, quantitative research is generally regarded as an objective and structured scientific method for collecting measurable data, conducting statistical analysis, and drawing conclusions based on the results of such analysis (Susanto et al., 2024). This research sought to obtain comprehensive insights into students' activeness in participating in learning activities through the implementation of multimodal-based chart and audio media. The subjects of this study were students of classes VII A and VII B, totaling eight participants, consisting of seven students from classes VII A and VII B and one Fiqh subject teacher for grade VII. The research instruments included observation, in which the researcher directly visited MTs Muslimat NU Palangka Raya, located at Jl. Jati No. 41, Pahandut District, Palangka Raya City, Central Kalimantan, to observe classroom activities. Through this observation, the researcher identified problems in the learning process, particularly related to inadequate educational technology facilities. Furthermore, the researcher conducted interviews with one Fiqh teacher who served as a key informant in this study to gain a deeper understanding of the challenges faced by the school during the learning process. In addition, documentation was carried out to present visual evidence or findings from the series of observed events.

Data management analysis was conducted through several stages, beginning with data reduction, in which data relevant and significant to the research objectives were selected. Next, data obtained from observations and interviews were presented in descriptive form and systematically organized into coherent sentences. The final stage was verification, where the researcher formulated conclusions based on the analysis of the findings that had been obtained (Septiani et al., 2022).

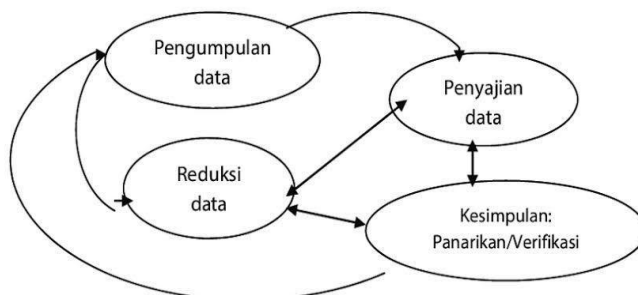


Figure 1. Interactive Model Data Analysis

The data analysis technique employed in this study used the Miles and Huberman model, as illustrated in Figure 1, which states that activities in qualitative data analysis are conducted interactively and continuously until completion (Aziz & Zakir, 2022). According to Miles and Huberman, this interactive data analysis model consists of three components: (1) data reduction, (2) data display, and (3) conclusion drawing/verification. Through this approach, the research process is able to capture and understand the perspectives and experiences of the research subjects. This analytical approach emphasizes in-depth exploration and theoretical perspectives (Sani et al., 2025).

RESULT

Based on in-depth interviews with teacher RM, a Fikih teacher at MTs Muslimat NU Palangka Raya, it was found that the chart and audio media were systematically designed following the sequential procedures of tayammum as the main subject of instruction. The teacher explained that the media were developed to ensure that students not only master the material conceptually but are also able to practice it independently. The use of this media supports the achievement of learning objectives, particularly in the aspect of basic competencies that emphasize understanding and performing tayammum in accordance with Islamic teachings. One statement from RM, the Fikih teacher at MTs Muslimat NU Palangka Raya, is as follows:

“The media are appropriate because they cover all explanations of tayammum, so students can immediately understand since there are two aspects involved—knowledge and skills. This media includes both aspects, allowing students to read the material and practice it at the same time.”



Figure 2. Chart Media

The statements above indicate that teachers must design the best possible learning media so that instructional content can be delivered and received effectively (Irawani, 2020). The explanation

also shows that the advantages of multimodal chart and audio media facilitate learning activities involving students by enabling them to more easily develop their thinking skills, imagination, and visualization of the presented material (Rahmat et al., 2023). Chart and audio media play a crucial role in teaching students because learners tend to grasp the material more quickly when teachers utilize instructional media in the learning process. This view is supported by Derek Rowntree (as cited in Rohani, 1997), who states that learning media function to increase students' learning motivation, reinforce previously taught material, provide learning stimuli, encourage student participation and responses, offer immediate feedback, and promote appropriate practice (Lestari, 2023). These findings were revealed through an interview with H, who stated:

“This chart media aligns with the learning objectives because it includes detachable images of tayammum, making it suitable for the material being taught.”

In addition, YY, a Grade X student, supported H's statement by saying:

“It fits, because it's fun and makes learning activities more exciting.”

The statements above indicate that the chart and audio media are suitable for the needs of students at MTs Muslimat NU Palangka Raya, as the appropriate use of learning media plays an important role in supporting the successful achievement of predetermined learning objectives (Wijaksono & Prima, 2022). Moreover, the use of detachable tayammum chart media is considered appropriate because it is directly related to the instructional material being taught. In addition, this media enhances the enjoyment of learning activities, thereby encouraging students to participate more actively in the learning process.

The results of classroom observations involving the research subjects showed that the majority of students were more enthusiastic and active when participating in learning activities that utilized chart and audio media, particularly when the media contained game-like elements (Anwar & Jasiah, 2025). This is further supported by a statement from RM, the Fikih teacher, who stated:

“Each child has different characteristics, but this media covers all of them because students can see, listen, and practice. Therefore, this media suits the characteristics of the learners.”

The statements above indicate that the chart and audio media are suitable for the characteristics of learners. Because each learner has different characteristics, teachers must understand these differences in order to more effectively manage aspects related to the learning process, including making appropriate choices in selecting instructional media (Estari, 2020). The presence of learning media in classroom instruction can encourage students' interest in learning (Batlawi & Hamid, 2022). This statement is also supported by a study conducted by Fatqurrohman and Huda (2025), which found that most students showed improvement in understanding and applying character values through the use of instructional media.

School conditions that involve limited technological resources, such as the lack of adequate projectors, also influence instructional practices (Venty, 2023). Therefore, teachers creatively replace technological teaching aids with simpler yet effective media (Hendrilia et al., 2025). These media are still able to support optimal material delivery without requiring advanced technology, making them an appropriate solution under limited conditions (Muliana et al., 2024). This is supported by a statement from RM, the Fikih teacher, who stated:

“This media is appropriate to the available learning resources, especially since the instructional material is also taken from the textbooks used by students.”

This statement is further supported by one of the students, H, who stated:

“It is appropriate because it does not go beyond the textbook.”

During the implementation of this media, teachers observed an increase in students' engagement during tayammum practice activities (Hidayat et al., 2024). The detachable chart media encouraged students to become more enthusiastic in the learning process, transforming students who were initially less motivated into actively participating learners through the use of multimodal chart and audio media (Wirdani & Wahyuni, 2025), as the audio media facilitated deeper understanding of verbal explanations. RM, the Fikih teacher, stated:

“This media saves time and is clearly understandable, and it is also safe because if students use mobile phones, they might access other things, but with this media, students can stay focused.”

This statement is also supported by several students, including H, who stated:

“I understand the tayammum material better, and this media is also safe.”

The statements above indicate that multimodal chart and audio media are able to create an enjoyable and interactive learning atmosphere. This finding is supported by research conducted by Rizqi et al. (2022), which reported that based on evaluations by media and content experts, the validation results showed that the media fell into the category of “very feasible” with an average score of 89.5%. The strengths of this media lie in its attractiveness and interactivity. Its use also offers advantages in terms of time efficiency, clarity of understanding, and safety in learning (Rahmadhea, 2024). Students feel more focused because they are less easily distracted compared to learning using mobile phones (Rahmadhea, 2024). In addition, this media helps students better understand the tayammum material while remaining safe to use in the learning process.

Detachables chart media combined with audio support that clarifies teachers' explanations successfully increased student engagement through visual, auditory, and kinesthetic stimulation (S. S. Septiani et al., 2025). This made students more enthusiastic in participating in the learning process, particularly during tayammum practice activities (Thalita et al., 2019). Learning activities became more dynamic, less monotonous, and felt like learning through play. This was especially evident among Grade VII students, who tend to prefer visual learning and hands-on activities. RM, the Fikih teacher, stated:

“Students are definitely more active because there is a detachable component to arrange the sequence of tayammum, and this media is more enjoyable due to the game element, which makes the classroom atmosphere more active and lively.”

From the explanation above, it can be seen that learning media accompanied by game elements are able to make students more active, create a pleasant classroom atmosphere, and encourage more dynamic interaction during the learning process, particularly in understanding the sequence of tayammum (Maulidah & Amelia, 2023). Detachable media provide a more engaging learning experience because students are directly involved in activities that require them to arrange the correct sequence of tayammum. The inclusion of game elements in the media makes learning more enjoyable, creates a more lively classroom atmosphere, and encourages students to be more interactive in participating in the learning process at school.

This view is also supported by several Grade VII students. MA stated that learning becomes more interesting due to the presence of game elements, which makes students more active in participating in learning activities.

“I become more active because it is interesting and includes games.”

A similar opinion was expressed by ND, who felt more active when the teacher asked questions directly, as this encouraged students to think and become more involved in the learning process.

“Because it makes us more active when we are given questions.”

The statement above indicates that multimodal chart and audio media can make students more active and create a dynamic and enjoyable learning atmosphere, especially during the practice of *tayammum* (Fadhullah et al., 2025). This learning media has also been successful in creating a lively and dynamic classroom environment (S. S. Septiani et al., 2025). The presence of game elements and collaborative activities makes the learning process feel enjoyable and not monotonous. Students reported feeling more enthusiastic when learning using this media, particularly because the activities are conducted directly and engage their motor skills.

DISCUSSION

According to Poerwadarminto, utilization refers to a process, method, or action that transforms something existing into something useful. The term is derived from the root word *manfaat* (benefit), combined with the prefix *pe-an*, which implies a process or act of making use of something (Syafitri & Mayrita, 2025). Davis and Aadam define utilization (usefulness) as the degree to which a person believes that a technology will enhance their job performance, with measurement of this aspect referring to the frequency and variety of technology use. Meanwhile, McKeown in Suyanto (2005) defines information technology as all technologies that function to create, store, modify, and utilize information in various forms (Sanjaya, 2017). The utilization of technology in the field of education has developed very rapidly in recent years, in line with advances in digital technology (Sirait & Dewi, 2024). Learning technologies continue to evolve along with the progression of the times (Firdaus et al., 2024).

Technological advancements in education have given rise to various innovations that support the teaching and learning process. One clear indication is the increasing diversity of learning media as technology develops rapidly (Safira, 2023). Learning technology is also able to create a more interactive learning environment and encourage active participation. However, it must be acknowledged that the use of technology in learning may also present challenges and obstacles. The application of learning technology can be hindered by factors such as user dependency, system disruptions, and limited access, which may affect learning outcomes (Nathaniela & Saphira, 2023). Nevertheless, some educators still lack sufficient understanding of optimal strategies for integrating technology into the learning process or for seeking alternative solutions to replace learning technology, such as utilizing multimodal chart and audio media. Multimodal chart and audio learning media function as an alternative to overcome limitations in the use of learning technology (Bintang et al., 2024).

In the teaching and learning process, there are two main elements: teaching methods and learning media. According to Hamalik (1986), the utilization of learning media can stimulate new interests and motivations, encourage learning activities, and produce psychological effects on students. In line with this, Ibrahim emphasizes the importance of learning media because they bring joy and enthusiasm to students, renew their learning spirit, help reinforce knowledge in students' minds, and enliven the learning process (Sapriyah, 2019). Learning media play an important role in expanding the scope of learning materials, encouraging student involvement, and supporting the knowledge construction process related to the presented content (Fitria et al., 2025), especially in Fiqh learning on the topic of *tayammum*. The learning process becomes more focused on the studied material, making explanations easier to understand and remember (Fitria et al., 2025). The use of multimodal chart and audio media plays an important role because it can attract students' interest and help them gain clearer understanding of complex material (Fanani et al., 2024; Sulaiman &

Amelia, 2022; Afifah, 2023). In addition, multimodal chart and audio media are practical and easy to use, and students find them easier to understand because they accommodate different learning styles such as visual, auditory, and kinesthetic (Tegeh et al., 2025).

The utilization of learning media can stimulate students to analyze and solve emerging problems (Rahmah & Jasiah, 2025). Therefore, teachers are key figures in education who continuously strive to create engaging learning environments. Actively, teachers must seek ways to stimulate students' curiosity and adjust learning to their individual interests (Fatmawati, 2021). Based on Davis and Adam, utilization (usefulness) is defined as the degree to which a person believes that a particular technology can support the achievement of their performance (Rosidah et al., 2024). One example is the use of multimodal chart and audio media to help overcome limitations in learning technology at schools, such as MTs Muslimat NU Palangka Raya, which faces constraints in learning technology such as limited projector availability. As a result, teachers create alternative media by implementing multimodal learning media in the form of charts and audio.

Multimodal chart and audio media combine various modes of information delivery, including visual elements such as images, auditory elements such as sound or narration, and kinesthetic elements such as interactive disassembly and assembly activities, which provide significant benefits to the learning process. Without relying on advanced technology, simple media such as charts and audio are highly flexible for use in rural schools, helping to overcome the digital divide and provide equal access for all students (Ningrum, 2023). These findings are consistent with multimodality theory (Mayer, 2009), which states that integrating visual elements (charts) and auditory elements (audio) strengthens dual information processing in students' brains, thereby enhancing retention and understanding of the taught material. According to Iedema, multimodality is a term that indicates humans utilize various semiotic resources in the process of meaning-making.

Through the use of various semiotic resources, humans are able to convey and interpret meaning in more complex and profound ways. In the current digital era, the development of multimodal literacy in education has become highly essential, involving understanding and competence in various modes of representation and communication, as well as their integration to construct meaning. This literacy emphasizes evaluating the potential and choices of meaning within texts, training students to become proficient readers and creators of multimodal texts, recognizing diverse sources of meaning, and understanding how specific element choices support communicative purposes (Himmah et al., 2024). The appropriate use of learning media facilitates the learning process when unique and clearly understandable media are employed, making learning more effective and practical (Prawati et al., 2025). Thus, multimodal chart and audio media can address issues related to technological limitations.

This statement is also supported by research conducted by Faujianor et al. (2024), which found that the use of multimodal chart and audio learning media was highly efficient in increasing student interaction and engagement. Questionnaire results also indicated that educators found it easier to deliver and understand material through the use of this media. Based on the discussion above, this study outlines that learning media should be designed to achieve predetermined learning objectives, align with students' characteristics, be relevant to available learning resources, efficient and effective in application, safe for use during learning activities, stimulate active participation and creativity, create an enjoyable learning atmosphere, and maintain high quality (Sari et al., 2024). This study also supports the findings of Faujianor et al. (2024), which state that multimodal chart and audio media are effective in overcoming limitations in learning technology.

This study has several limitations that need to be considered, particularly related to the use of a descriptive qualitative method and a relatively limited number of research subjects, consisting of

one teacher and seven students. These conditions limit the generalizability of the findings to broader school contexts. Therefore, future research is recommended to involve a larger number of participants, apply mixed research methods, and examine the effectiveness of learning media over a longer period. The utilization of multimodal chart and audio media provides significant reinforcement to the field of education by enriching learning media theory through empirical evidence that simple media can achieve effectiveness comparable to modern technology, accommodate diverse student learning styles, and offer practical solutions for schools with limited technological infrastructure.

CONCLUSION

The utilization of multimodal-based chart and audio media has a positive impact in overcoming limitations in learning technology, particularly in schools with limited facilities such as MTs Muslimat NU Palangka Raya. This media is effective in supporting the learning process because it is designed in accordance with learning outcomes and adapted to the diverse characteristics of students. This media is aligned with the learning resources used in the school and can be utilized optimally even without the support of modern technological devices such as projectors. Its use is considered practical, efficient, and safe, and it is able to create an enjoyable learning atmosphere. The presence of interactive charts and audio support makes students more active, engaged, and motivated, especially in practical activities such as tayammum. Therefore, simple yet innovative media such as multimodal-based charts and audio serve as an effective alternative for implementation in schools with limited facilities and can be used as an example of inspiring and meaningful learning practices.

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