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Mobile-Assisted Interactive Multimedia in Language Literacy Class: Exploring Primary School Teachers' Voices

[1*]Choiroh Nurussyifa, [1]Akbar Al Masjid, [1]Zainnur Wijayanto
[1]Universitas Sarjanawiyata Tamansiswa, Indonesia
[1]Email: choirohnurussyifa73@gmail.com

Abstract

In primary education, language literacy has become a central focus particularly as learners are increasingly exposed to digital-based learning environments. However, the integration of interactive multimedia to support literacy development remains under-explored, especially in contexts where teachers face pedagogical, technological, and infrastructural challenges. This study aims to describe teachers' perceptions regarding the use of mobile-based interactive multimedia in language literacy class in primary schools. This qualitative case study employed close-ended questionnaires and semi-structured interviews with forty primary school teachers from diverse teaching backgrounds. Findings revealed that effective digital multimedia should relate to appearance and design, interactivity, ease of use, audio-visual quality, and alignment of media with learning objectives. It was also found that teachers experience difficulties in fostering literacy due to poor integration of literacy learning within the subject content, use of varied learning media, interactive literacy learning, and innovation in literacy instruction. Findings showed that teachers expect digital interactive platforms which had high interactivity, built-in scaffolding, meaningful feedback, and contextualized content. The study highlights the need for more systematic professional development, inclusive multimedia design, and collaborative approaches in supporting teachers to optimize digital interactive multimedia for literacy instruction.

Keywords: mobile-assisted interactive multimedia, language literacy, primary school, teachers' voices

Abstrak

Di Pendidikan dasar, literasi bahasa menjadi fokus utama karena siswa berhubungan dengan lingkungan pembelajaran digital. Namun, integrasi multimedia interaktif digital untuk mendukung peningkatan literasi masih jarang diteliti Ketika guru mengalami hambatan pedagogis, teknologi, dan infrastruktur. Penelitian ini bertujuan untuk mendeskripsikan persepsi guru dalam pemanfaatan multimedia interaktif berbasis mobile di kelas literasi bahasa di sekolah dasar. Metode penelitian studi kasus kualitatif diterapkan melalui kuesioner tertutup dan wawancara semi terstruktur pada 40 guru sekolah dasar dari berbagai latar belakang. Temuan menunjukkan bahwa multimedia interaktif berbasis mobile yang efektif harus berkaitan dengan tampilan dan desain, interaktivitas, kemudahan penggunaan, kualitas audio visual, dan kesesuaian media dengan tujuan pembelajaran. Temuan lain menunjukkan bahwa guru mengalami kesulitan dalam meningkatkan literasi dikarenakan kurangnya integrasi pembelajaran literasi dengan materi ajar, media pembelajaran yang beragam, pembelajaran bahasa yang interaktif, dan inovasi dalam pengajaran literasi. Temuan juga menunjukkan bahwa guru mengharapkan platform yang interaktivitasnya tinggi, dukungan bawaan, feedback bermakna dan isi yan kontekstual. Hasil penelitian menunjukkan kebutuhan pengembangan profesionalisme yang lebih sistematis, desain multimedia inklusif, dan pendekatan kolaboratif dalam mendukung guru untuk mengoptimalkan multimedia interaktif digital dalam pembelajaran literasi.

Kata Kunci: multimedia interaktif berbasis mobile, literasi bahasa, sekolah dasar, persepsi guru

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INTRODUCTION

Language literacy constitutes a fundamental cognitive and communicative competence for young learners, serving as the basis for subsequent academic achievement across subject areas. The main goal of language literacy instruction in the primary level is to develop students' skills to read, to understand, to interpret and to create meanings from different types of texts (Marnita, et al., 2023). However, scientific studies keep on revealing that large numbers of primary school students are constantly facing problems in language literacy like poor vocabulary mastery, poor phonemic awareness, limited reading comprehension, and lack of critical thinking toward texts. Such barriers are usually attributed to differences in students' previous literacy learning, lack of suitable age learning materials, and poor teaching support in the classroom (Wong & Cheng, 2019). The shift to digital-based learning is an opportunity for new teaching practices but it also raises the problem of tackling the already existing literacy gaps in the process.

The use of web-assisted interactive multimedia in language literacy programs in school has become one of the major forms of learning intervention. Audio, visuals, animation, and interactive features are thought to overcome language literacy barriers among students (Ramadhani et al., 2024). The literature has shown that properly constructed multimedia facilitates reading motivation, vocabulary acquisition, and narrative comprehension (Hartono et al., 2025; Hirsh-Pasek et al., 2015). The success of the use of interactive multimedia is increasingly reliant on teachers' preparedness, teaching efficacy, and the overall support from the school context.

In several primary education institutions, the use of web-based resources by teachers to meet the literacy needs of their students is increasingly promoted (Sari & Santosa, 2025). However, the inclusion of digital interactive multimedia in literacy instruction is quite a complicated affair. Teachers are generally required to play several roles concurrently: making up the significant learning sequences, picking out the digital tools that are suitable for the age group, making sure the digital tools are in line with the curriculum, and giving individualized help to those who are less literate or more literate than others (Kim & Gilman, 2015). Indonesian primary schools face two main problems which include their lack of digital infrastructure and their unprepared teachers who need to use technology for teaching. The reason this problem exists is because digital literacy has become essential in modern 21st-century education which connects to student engagement together with their skills development (Solih & Julianto, 2025). All these tasks often result in an increased workload and doubts about the teaching practices.

Teachers are not only under the pressure of trying to apply the multimedia but also face constant drawbacks. Limited technological infrastructure, lack of professional training, time constraints, and insufficient digital pedagogical knowledge on the part of the teachers are among the

major obstacles reported most frequently (Merchant & Hepworth, 2016). The situation can really limit the teachers' ability to realize the full potential of the digital interactive multimedia in their literacy teaching (Pratiwi & Firdaus, 2025). If teachers can manage to get a good understanding of these challenges, they will be better positioned to come up with primary schools that are innovatively and sustainably replenished with literacy.

To implement students' literacy learning digital multimedia effectively, teachers need to pay attention to the qualities that promote literacy in the young ages (Julia & Jeyanti, 2025). The qualities of the digital product, such as navigability by users with no or little experience, scaffolding through prompts and hints, very appealing visuals, ongoing feedback, and content that is culturally relevant, are already regarded as the main supports (Lee & Tseng, 2017). But still, how the primary school teachers visualize these characteristics is not much discussed, particularly in the case of the Indonesian primary school setting. The study investigates teachers' actual experiences of using interactive multimedia tools for literacy instruction since this particular area of research remains under-explored in Indonesia.

Another important aspect is the teachers' expectations of the digital interactive multimedia. The role of the teachers is crucial in the choice of the multimedia tools related to multimedia incorporation into the class, and how students deal with them. The teachers' expectations regarding the multimedia tools' functionalities, their pedagogical value, their user-friendliness, or their matching with the curriculum competencies will determine the effectiveness of the literacy instruction (Mensan & Anagun, 2022). If the teachers' expectations are clearly considered, they can serve as the basis for the design of digital content and training programs for teachers (Maeda & Juma, 2023).

Despite the advocacy role of earlier works for interactive multimedia, there is still not much research that directly scrutinizes the voices of teachers as regards the characteristics, obstacles, and anticipations of mobile-assisted interactive multimedia in primary literacy instruction ((Martínez & Ang, 2016; Tang, 2017). The gap requires a more thorough study of the teachers' stance to find responsive multimedia solutions. The literature on the impacts of interactive multimedia on children's literacy development is vast, and almost all of it is positive; however, there is a dearth of literature that specifically addresses the teachers' direct and indirect experiences, challenges, and adoption of digital interactive multimedia in primary literacy classes (Kharisma, 2025; Simanjuntak, 2021). Furthermore, only few studies discuss the specific characteristics of multimedia relevant to teachers and on what basis these characteristics correspond to the realities of the classroom (Mishra & Koehler, 2006; Park & Kim, 2017). Thus, this study seeks to overcome this discrepancy by listening to the teachers and thus granting context-specific insights into the development of multimedia-assisted literacy practices.

To address the identified gaps of mobile-assisted interactive multimedia practices in literacy class, this study attempts to answer the following research questions:

1. What are the characteristics of mobile-assisted interactive multimedia needed in language literacy class?
2. What are teachers' difficulties in promoting students' language literacy in primary schools?
3. What are teachers' expectations toward mobile-assisted multimedia practices in language literacy class?

RESEARCH METHODS

Research Design

This study employed a qualitative case study to investigate primary school teachers' perceptions regarding the use of mobile-assisted interactive multimedia in language literacy class. A qualitative methodology was chosen to explore teachers' beliefs and practices of the application of mobile-assisted interactive multimedia through *E-Pintar Ki Hajar* in *Bahasa Indonesia* subjects. The case study was implemented because it could describe thorough and contextual explanations experienced by the research participants.

Research Participants

The research participants consisted of forty teachers from six public primary schools in Purworejo, Central Java, Indonesia. These teachers not only taught different language literacy levels (grades 1-6) but also had various teaching experiences. Their teaching experiences were 1-5 years (15%) , 6-10 years (30%), 11-15 years (30%), and 16-20 years (25%). A purposive sampling technique was applied so that all participants would be teachers with involvement in literacy teaching activities so that their involvement could be termed as direct and substantial.

Instruments and Procedures

The research instruments used questionnaires and interviews. A closed-ended questionnaire which was based on a four-point Likert scale made up of *strongly agree* (4), *agree* (3), *disagree* (2), and *strongly disagree* (1). The items on the questionnaire were designed to obtain the opinions of the teachers on the characteristics of mobile-based interactive multimedia involving five indicators, namely appearance and design, interactivity, ease of use, audio-visual quality, and alignment of media with learning objectives. The second instrument was made up of semi-structured interviews with the teachers who participated in the study to gain a deeper understanding of the difficulties they encountered and their expectations for the development of future multimedia.

Prior to data collection, informed consents were obtained from all participants to participate voluntarily in the research. The primary school teachers filled in the questionnaires in 15 minutes. Once the questionnaires had been gathered and checked for being complete, interviews in the semi-structured format were set up with 12 representative teachers. The interviews were held in a quiet room in the school so that the participants could feel comfortable and have their privacy. Each interview lasted around 20-30 minutes and was recorded on tape with the consent of the participants.

Data Analysis

A thematic analysis was employed with the aid of quantitative descriptive support. The questionnaire data were descriptively analyzed through the calculation of the frequency and percentage of the responses for each item on the Likert scale. After that, the results were compared with the themes and patterns to achieve the research objectives. Interview tapes were accurately transmitted and subjected to thematic coding, which enabled the researchers to gain deeper insights into the teachers' outlooks, reasons and expectations. The themes derived from the interviews were correlated with the findings from questionnaires to strengthen the validity and minimize the bias. The final themes derived from all three instruments combined the insights to give a thorough understanding that was consistent with the research objectives of the study.

RESULTS AND DISCUSSION

Results

To find the characteristics of mobile-assisted interactive multimedia to enhance language literacy, close-ended questionnaires were employed. Forty primary school teachers were asked to fill in the questionnaires. The percentage results of fifteen statements in the questionnaires could be seen from the following table.

Table 1
Results of the questionnaires

No	Statements	Strongly agree	Agree	Disagree	Strongly disagree
1	The design is attractive and appropriate for the characteristics of the students.	20%	67.5%	5%	7.5%
2	The layout of media elements is neat and proportional.	32.5%	55%	10%	2.5%
3	The choice of colors, fonts, and icons is easy to read.	12.5%	75%	7.5%	5%
4	The media allows users to interact actively.	25%	62.5%	5%	7.5%
5	The responses to user actions are clear.	20%	60%	10%	10%
6	The media increases student engagement during learning.	30%	52.5%	12.5%	5%
7	Navigation is easy and not confusing.	12.5%	70%	10%	7,5%
8	Instructions for use are clear.	30%	57.5%	10%	2.5%
9	Loading time and transitions between sections are fast.	20%	62.5%	12.5%	5%
10	The sound, images, and videos are clear.	10%	67.5%	12.5%	10%
11	The graphic quality supports material comprehension.	27.5%	55%	10%	7.5%
12	There are no visual or audio disturbances.	22.5%	57.5%	15%	5%
13	The media supports the achievement of learning objectives.	20%	62.5%	10%	7.5%
14	The material is presented logically and systematically.	32.5%	52.5%	12.5%	2.5%
15	The media strengthens students' conceptual understanding.	20%	67.5%	5%	7.5%

Table 1 revealed that the highest percentage of nearly all statements were in the "agree" point. This percentage was followed by the "strongly agree" and "disagree" points. Furthermore, "strongly disagree" point was in the lowest percentage of the statements.

Table 2
Characteristics of mobile-assisted interactive multimedia

Category	Statements	Mean
Appearance and design	The design is attractive and appropriate for the characteristics of the students.	3.82
	The layout of media elements is neat and proportional.	3.28
	The choice of colors, fonts, and icons is easy to read.	3.64
Interactivity	The media allows users to interact actively.	3.76
	The responses to user actions are clear.	3.65
	The media increases student engagement during learning.	3.48
Ease of use	Navigation is easy and not confusing.	3.92
	Instructions for use are clear.	3.35
	Loading time and transitions between sections are fast.	3.84
Audio-visual quality	The sound, images, and videos are clear.	3.79
	The graphic quality supports material comprehension.	3.66
	There are no visual or audio disturbances.	3.36
Alignment of media with learning objectives	The media supports the achievement of learning objectives.	3.86
	The material is presented logically and systematically.	3.82
	The media strengthens students' conceptual understanding.	3.75

Table 2 pointed out that the highest mean scores of each category were appearance and design (3.82), interactivity (3.76), ease of use (3.92), audio-visual quality (3.79), and alignment with

learning objectives (3.86). However, the layout of media elements was 3.28 as the lowest mean score. Also, instruction for use of interactive multimedia was 3.35 showing a low mean score.

The second research question was related to teachers' barriers in applying mobile-based interactive multimedia to promote students' language literacy skill. To discover difficulties faced by the teachers, semi-structured interviews were employed among six public primary schools. Of forty teachers, twelve teachers were administered to join interviews within thirty minutes each. The results of interviews could be seen from the following tables.

Table 3
Teachers' difficulties in promoting students' language literacy

Category	Examples of teachers' responses
Integration of literacy learning with the subject content	"The process of combining language literacy activities with subject content becomes challenging for me because I prioritize syllabus completion over helping students develop their reading and writing abilities."
	"The process of combining literacy learning with content instruction becomes difficult for me because I struggle to create tasks which will teach students both language skills and subject understanding."
Use of varied learning media	"The student uses textbooks as their primary resource because they have not yet acquired skills to use different learning materials."
	"The student needs to choose media resources which will help students develop language skills but must also match their current abilities and educational requirements."
Interactive literacy learning	"The implementation of interactive literacy activities presents a challenge for me because I find it difficult to control student participation during their group work and classroom discussions."
	"The process of promoting active student interaction presents me with challenges because I lack confidence in this area."
Innovation in literacy instruction	"The difficulty I face with implementing modern literacy techniques arises from my greater understanding of conventional teaching methods."
	"The limited training which I have received together with my lack of experience with new literacy methods prevents me from developing innovative approaches to teaching literacy."

Semi-structured interviews were also developed to describe teachers' expectations toward mobile-assisted interactive multimedia applications. The results of semi-structured interviews were the following.

Table 4
Teachers' expectations toward mobile-assisted interactive multimedia practices

Category	Examples of teachers' responses
High interactivity	"I look forward to more interactive activities through digital multimedia, such as clickable texts or simple games, so learners are not just passive observers but rather active participants in the content."
	"Learning material that caters to individual students' or groups' needs through selection of sections, responding to questions, or dragging-and-dropping words will hold their attention and keep them motivated in literacy classes."
Built-in scaffolding	"Step-by-step guidance would be a huge help if the multimedia contained these. This is particularly for the students who still have a hard time with reading. Providing hints, highlighting certain words, or offering phonics support are ways to make the tasks simpler and more user-friendly."
	"What I want are digital tools that come with support built in. For example, sample answers and guided prompts should be accessible so that students can learn on their own without needing my explanation every time."
Meaningful feedback	"In my opinion, the use of multimedia would be a great source for students' immediate feedback. If a student makes a mistake in reading or writing, he/she should be informed by the system what correction is needed for the respective task."
	"Besides, it would be a good idea if the application was able to monitor and record each student's progress, not only to show them (and me) the skills that have been improved but also to reveal the areas that still need more practice."
Contextualized content	"I am more inclined to the multimedia that incorporates storytelling or examples from the local culture so that the students can establish a closer bond with the subject and eventually, the comprehension would be at a higher level."
	"Content mirroring students' ordinary lives, such as traditional games, local heroes, or comfortable places, not only facilitates their connection with reading but also adds significance to literacy activities."

Discussion

This study explored how primary school teachers perceived mobile-assisted interactive multimedia practices in language literacy class. The perceptions were related to three key points namely characteristics of interactive multimedia, teachers' barriers in enhancing students' language literacy skill, and teachers' expectation toward the implementation of interactive multimedia. The teachers pointed out certain characteristics such as appearance, interactivity, usability, audio-visual quality, and alignment with learning objectives that were found to be almost on the same line with the principles of multimedia learning. The teachers' stress on good-looking and age-design seems to be based on an instinctive grasp of these principles. Also, interactivity, which is a must by the teachers, is recognized as engagement, motivation, and deep understanding (Csapó & Molnár, 2013); thus, students can actively participate in the construction of meaning rather than being passive recipients of content (Buckingham, 2017). The need for a user-friendly design has been acknowledged as research indicates that simple navigation, clear instruction, and smooth transition are the main factors that keep learners focused and especially children with limited digital skills.

Teachers also pointed out the audio-visual clarity and the media's alignment with the learning goals. This concurs with the findings that less-than-ideal visuals or audio can be a barrier to comprehension while good quality multimedia assists in the understanding and retention of the material. Besides, the demand for compatibility of content, pedagogy, and technology is in line with

the view that educational technology integration is often conceptualized in frameworks like TPACK and is reliant on the alignment of pedagogy, content, and technology (Gay, 2018; González, 2017).

Another finding revealed that teachers are considerably challenged to combine literacy learning with subject matter. It is like the previous studies where a lot of the primary educators are said to have a hard time incorporating multiple levels of literacy skills that include comprehension, interpretation, and critical thinking instead of only the easier level of learning through memorizing (Snow, 2002). The dependence on rote learning and teacher-controlled activities that this research has depicted is a result of established teaching practices and structural limitations which in turn prevent students from acquiring literacy skills in a meaningful way (Guthrie & Humenick, 2000). Hence, the difficulties experienced indicate classroom restrictions at a systemic level that do not allow the development of profound literacy skills.

Teachers had a hard time supplying a wide range of reading materials and setting up engaging, learner-oriented literacy activities. The literature points to the fact that providing various types of texts (narrative, non-narrative, visual) and allowing different reading options is crucial to the meeting of the wide range of students' different literacy levels and interests (Widianingsih, 2025). Multimodal reading texts are required to maximize students' language learning outcomes in literacy classes. These results stress the importance of professional training and institutional support aimed at moving away from standard literacy teaching.

Teachers were specific about their expectations concerning the aspects of interactivity, scaffolding, feedback, and culturally relevant content. They wanted to have interactive digital tools (clickable texts, games, exploratory navigation), and this is in line with research showing that interactive digital environments really help kids to become more motivated, engaged, and good at reading and writing (Lai et al., 2016). The request for scaffolding like hints, highlighting of vocabulary, and prompting is based on the teacher's theory of helping current students in their zone of proximal development, especially students who still need to acquire basic skills (Almasri, 2019).

Moreover, teacher's expectation for significant feedback and culturally relevant content is part and parcel of the modern formative assessment and culturally responsive pedagogy. It is known that very quick, informative feedback is the best way for learners to correct their mistakes and build understanding while being more effective than delayed or general feedback (Nurzhanova, 2024). The teachers' input in this research verifies that for interactive multimedia to be effective; it not only has to work well technically but also to be pedagogically effective and culturally meaningful.

CONCLUSION

Findings indicate that effective mobile-assisted interactive multimedia must have the following features: high quality of design, interactivity, ease of navigation, clear audio-visual components, and alignment with the learning objectives. Teachers must struggle with various problems when it comes to mobile-based interactive multimedia as a means of promoting language literacy, mainly due to little integration of literacy skills into the subject matter, the inconsistent usage of various kinds of media for learning, the lack of interactive activities, and the absence of innovation in teaching methods. They also let their expectations for the types of platforms that offer high interactivity, built-in scaffolding, significant feedback, and content that has been culturally contextualized for students' literacy development.

RECOMMENDATION

Based on the findings, teachers should take a targeted approach when they are using digital literacy tools, focusing on scaffolding techniques and interactive media suitable for different literacy levels. The students must also be given chances for independent inquiry, group work, and frequent practice with kid-friendly mobile tools. Future studies should include the assessment of the long-term effects of mobile-assisted interactive multimedia on literacy growth and the evaluation of the teacher's digital competence impacts on the students' learning outcomes. Accordingly, larger research samples with a longitudinal study might be conducted to obtain more comprehensive findings regarding interactive multimedia applications.

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