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Utilization of Digital Media in Second Language Acquisition: A Psycholinguistic Perspective on Learning

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Abstract

This study investigates the utilization of digital media in second language acquisition from a psycholinguistic perspective among elementary school students in Makassar City. As digital technologies increasingly shape contemporary learning environments, understanding their cognitive, linguistic, and motivational impacts is essential for strengthening instructional practices. Employing a qualitative research design, this study draws on in-depth interviews with teachers, classroom observations, and document analysis to explore how digital media influences students' comprehension, memory encoding, and engagement during English language learning. The findings reveal that digital media significantly enhances learners' cognitive engagement by capturing attention through multimodal features such as animation, sound, and interactivity. These elements reduce cognitive load and support sustained focus, allowing students to process linguistic input more effectively. The study also demonstrates that digital media facilitates deeper comprehension by providing immediate contextual cues visual, auditory, and symbolic that help young learners grasp vocabulary and sentence structures without relying on translation. Furthermore, repetitive and visually supported digital content strengthens memory encoding, enabling students to retain and recall language items more reliably. Various types of digital media including videos, interactive learning applications, digital games, and presentation tools were found to serve complementary pedagogical functions that teachers employed strategically to support linguistic development. Overall, the study concludes that digital media, when thoughtfully integrated, acts as a powerful tool that enriches cognitive processing, reinforces memory, and fosters a more engaging and inclusive learning environment. These insights highlight the need for continued professional development and infrastructural support to maximize the pedagogical potential of digital media in elementary second language education.

Introduction

The rapid integration of digital media into educational settings has reshaped the landscape of language learning, particularly at the elementary school level where cognitive, linguistic, and social development occur simultaneously. In recent years, digital technologies have increasingly become embedded in classroom practices across Indonesia, including in Makassar City, enabling new modes of exposure, interaction, and engagement for students learning a second language. This transformation is driven by broader global shifts in educational practices, where multimedia tools, interactive applications, and digital platforms are seen as avenues to create richer learning environments that align with contemporary learners' cognitive preferences and technological familiarity (Hassan, 2023; Almakaty, 2024; Haokip, 2025). The emergence of digital media in early language education provides new opportunities for

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facilitating Second Language Acquisition (SLA), yet it also raises conceptual and pedagogical questions about how children cognitively process digital input and translate it into linguistic competence (Li & Lan, 2022; Broda et al., 2025; Krüger, 2023; Alhazmi & Muftah, 2025; De Costa, 2023).

SLA research has long emphasized the significance of input quality, attention, and processing depth in successful language learning. Foundational theories such as Krashen's Input Hypothesis argue that learners require comprehensible input in meaningful contexts to acquire a new language (Luo, 2024; Shahini, 2025; Nguyen et al., 2025), while Swain's Output Hypothesis highlights the role of language production in reinforcing cognitive representation. More recent perspectives underscore interaction, negotiation of meaning, and multimodal exposure as essential components of acquisition (Patel et al., 2025; Qorry'Aina, 2025; Widianingsih et al., 2025). Digital media naturally supports these principles by offering visual, auditory, and interactive stimuli that promote active and passive processing in young learners. Empirical studies show that multimedia environments can enhance vocabulary recognition, pronunciation accuracy, and early comprehension by reducing cognitive load and using synchronized audio-visual cues (Alam, 2025; Alhazmi, 2024; Teng, 2023). These attributes make digital media particularly beneficial in elementary contexts where learners depend heavily on sensory and contextual clues to grasp new linguistic structures.

Despite these advantages, the cognitive mechanisms behind children's engagement with digital media remain insufficiently explored, especially in the Indonesian context. Psycholinguistics, which examines the mental processes underlying language comprehension, memory, and learning, provides a valuable lens for understanding how digital media affects SLA in young learners. Research on attention and working memory suggests that multimodal stimuli can either enhance or overwhelm cognitive processing depending on the design, pacing, and relevance of the digital content (Xu et al., 2022; Cai et al., 2022; Turoman & Vergauwe, 2024). For instance, visual reinforcement such as animated characters demonstrating vocabulary items can support semantic encoding and facilitate faster retrieval. At the same time, over-stimulating digital environments may divide attention and reduce meaningful processing if not carefully managed. These psycholinguistic insights underscore the importance of understanding how elementary school children in Makassar interpret and internalize digital language inputs within their cultural and educational settings.

The growing use of digital media in Indonesian basic education is also shaped by national efforts to modernize curriculum design and teaching strategies. The government's emphasis on digital literacy and technology-integrated learning encourages schools to adopt digital platforms as part of daily instruction (AlAjmi, 2022; Le et al., 2025; Demissie et al., 2022). In Makassar City, many elementary schools have begun using videos, interactive games, online pronunciation tools, and teacher-created digital materials to support English learning. Studies indicate that Indonesian students often demonstrate higher motivation and engagement when digital tools are used, as they perceive technology-based tasks as enjoyable and aligned with contemporary learning preferences. However, the effectiveness of these tools depends not only on technological availability but also on teachers' digital competence, students' cognitive readiness, and the pedagogical integration of digital media with learning objectives (Dolezal et al., 2025; Litiņa & Miltuze, 2021; Zhao, 2022).

The psycholinguistic dimension of how young learners process digital content has received limited attention in local studies. Most existing research in Indonesia focuses on the general benefits or challenges of digital media in English learning, such as increased motivation, improved pronunciation, or difficulties with infrastructure. What remains underexplored is how

ISSN 2721-0979 (Print), ISSN 2721-1258 (Online)

children internalize linguistic input cognitively how they focus attention during multimedia activities, how digital repetition influences memory consolidation, and how interactive features support or hinder meaning-making. International literature suggests that digital media can strengthen implicit learning mechanisms by providing repeated, multimodal exposure that aligns with children's natural language acquisition processes. Yet, without context-specific analysis, such findings cannot be assumed to apply uniformly to learners in Makassar's diverse and resource variable educational landscape.

Moreover, the classroom ecology in Makassar presents unique dynamics that shape digital media utilization. Variations in infrastructure, internet access, and teacher digital proficiency influence the consistency and depth of multimedia integration. Some schools use digital media as supplementary tools, while others rely on them as central instructional components. Psycholinguistic factors, such as children's attentional patterns, working memory capacity, and prior exposure to digital environments, further affect how effectively digital media supports language internalization. A qualitative exploration of these dynamics is crucial for understanding not only the benefits but also the cognitive challenges that arise when children learn a second language through digital platforms.

This study addresses these gaps by examining how digital media is utilized in SLA from a psycholinguistic perspective in elementary schools across Makassar City. By focusing on actual classroom practices, student responses, and teacher experiences, this research provides an in-depth understanding of the cognitive processes that occur when young learners engage with digital language input. The findings contribute to the growing body of knowledge on digital-supported SLA while offering contextually relevant insights for improving language instruction in Indonesian elementary education.

Methods

This study employed a qualitative descriptive design aimed at exploring the utilization of digital media in second language acquisition (SLA) from a psycholinguistic perspective among elementary school students in Makassar City. A qualitative approach was deemed most appropriate because the study sought to understand cognitive and experiential aspects of learning that could not be adequately captured through numerical measurement. Instead of focusing solely on learning outcomes, the research prioritized understanding how students process digital language input, how teachers integrate digital tools into instruction, and how classroom interactions shape learners' psycholinguistic responses. The descriptive orientation of this design allowed the researcher to present an in-depth portrayal of phenomena as they naturally occurred in classroom contexts without manipulating variables or imposing predetermined categories. This approach made it possible to uncover rich details regarding attention patterns, memory cues, input processing, engagement levels, and cognitive challenges experienced by learners when interacting with digital media.

Research Setting

The study was conducted in selected public elementary schools in Makassar City that had begun integrating digital media into their English language learning programs. Makassar was selected as the research site because the city has shown rapid growth in the adoption of digital technologies in early education, supported by local initiatives promoting digital literacy and multimedia-based learning. The selected schools varied in their technological facilities, ranging from classrooms equipped with projectors, audio systems, and interactive smart boards to those relying on basic digital tools such as laptops and mobile phones. This variation provided a realistic and diverse picture of how digital media is implemented in different learning

ISSN 2721-0979 (Print), ISSN 2721-1258 (Online)

environments. Conducting the study across multiple schools also strengthened the transferability of findings by ensuring that the analysis was not limited to a single institutional context.

Participants

Participants in this study consisted of English teachers, elementary school students, and school administrators who were directly involved in digital media supported language learning activities. Teacher participants were selected based on their active use of digital tools during English instruction and their willingness to discuss their teaching practices. Students from Grades 3 to 5 participated in the study because these age groups represent a developmental stage where learners begin to engage more independently with digital materials and can articulate their experiences. School administrators, such as principals or curriculum coordinators, were included to provide contextual information about school policies, digital infrastructure, and institutional support for multimedia learning. Participation was voluntary, and informed consent was obtained from all adult participants as well as parental consent for student involvement. The study ensured that demographic diversity was maintained through variation in school type, student background, and teacher experience.

Data Collection Techniques

Data were collected using three primary techniques: classroom observations, in-depth interviews, and document analysis. Each method was selected to capture different dimensions of digital media utilization and psycholinguistic processes.

Classroom observations were conducted to understand how digital media was used during real teaching and learning activities. The researcher observed how teachers presented digital content, how students reacted to audiovisual stimuli, and how classroom interactions facilitated or limited cognitive processing. Particular attention was given to moments when students showed signs of comprehension, confusion, increased attention, or distraction. Observations allowed the researcher to gain direct insights into psycholinguistic responses such as attentional focus, memory reinforcement through repetition, and comprehension strategies triggered by multimedia cues.

In-depth interviews were carried out with teachers, students, and administrators. Teacher interviews explored instructional strategies, considerations when selecting digital tools, perceived cognitive benefits for students, and challenges encountered in multimedia-based teaching. Student interviews focused on their experiences, comprehension processes, motivational factors, and difficulties when interacting with digital content. Interviews with administrators provided information on policy support, availability of digital facilities, and institutional expectations regarding digital learning integration. All interviews were semi-structured to allow flexible probing of emerging themes while maintaining consistency across participants.

Document analysis served as a supplementary method to examine lesson plans, digital materials, school policy documents, and other relevant instructional resources. This technique provided contextual support for observational and interview data by revealing how digital media was planned, conceptualized, and operationalized within the school curriculum. Together, these three methods offered a comprehensive understanding of the phenomenon under study.

ISSN 2721-0979 (Print), ISSN 2721-1258 (Online)

Data Analysis

Data were analyzed using the interactive model of Miles, Huberman, and Saldaña, which includes data reduction, data display, and conclusion drawing. In the data reduction phase, transcripts from interviews, observation notes, and documents were reviewed, coded, and categorized into emerging themes. Psycholinguistic-related themes such as attention, memory cues, comprehension strategies, and cognitive challenges were prioritized alongside themes related to instructional practices and technological use. In the data display phase, thematic matrices, narrative summaries, and conceptual groupings were developed to visualize patterns across data sources. This organization made it easier to compare findings across schools, participants, and learning situations. In the final phase of conclusion drawing, the researcher synthesized insights to generate meaningful interpretations about how digital media supports or hinders SLA from a psycholinguistic standpoint. The systematic and iterative nature of this analysis ensured that findings accurately reflected participants lived experiences and the realities of classroom practice.

Results and Discussion

The findings provide insight into how multimodal input, visual-rich explanations, interactive tasks, and digital repetition cycles influence learners' attention, comprehension, and retention. Furthermore, the results illuminate teachers' decision-making processes in selecting and implementing various digital tools, demonstrating how technology is adapted to address both instructional goals and learners' developmental needs. Overall, this chapter presents the core empirical evidence that underpins the deeper analysis and interpretation discussed subsequently, offering a detailed account of how digital media functions within real classroom contexts to support second language learning.

Digital Media Enhances Cognitive Engagement and Attention

The study found that the use of digital media significantly enhanced students' cognitive engagement and attention during second language learning activities in the observed elementary schools in Makassar City. When digital content such as animated videos, interactive games, and multimedia flashcards was introduced, students displayed noticeable shifts in focus, participation, and overall mental involvement. Compared to traditional textbook-based instruction, digital media provided dynamic sensory stimuli visual, auditory, and sometimes kinesthetic that heightened students' readiness to engage with linguistic input. This multisensory nature aligns with psycholinguistic views that young learners require salient input to activate cognitive processing mechanisms such as attention, perception, and early memory encoding.

During classroom observations, students were more attentive when colorful animations or character-based videos were used to introduce new vocabulary. Their gaze was consistently directed at the screen, and they showed fewer off-task behaviors compared to conventional instructional moments. Teachers also confirmed these behavioral patterns, explaining that digital media created a learning environment that naturally captured students' attention without requiring constant disciplinary reminders. One teacher noted,

> *"When I play the animated vocabulary video, the students immediately sit up and focus. It's like the pictures and sounds pull them in, and they pay attention without me having to ask."*

This indicates that digital media functions as a cognitive anchor, drawing learners toward the target language input and sustaining their mental engagement throughout the lesson. The enhanced attention was not limited to passive watching; students also demonstrated active

ISSN 2721-0979 (Print), ISSN 2721-1258 (Online)

forms of engagement such as repeating vocabulary, mimicking pronunciation, or eagerly raising their hands to answer digital quiz questions. For many children, the presence of moving images and synchronized sound made the meaning of English words more tangible, reducing reliance on translation and increasing the depth of cognitive processing. A Grade 4 student described this experience by saying,

> *"I like learning English when there is a video because I understand faster. The pictures help me remember the words, and I don't get sleepy like when only reading."*

This comment reflects how digital stimuli activate working memory by providing contextual cues that make new linguistic items easier to retain and recall. Furthermore, digital media appeared to structure learners' attention in ways that supported psycholinguistic processes such as selective attention and sustained focus. The majority of students were able to remain cognitively engaged for longer periods during multimedia-supported activities than during teacher-led explanations. Teachers explained that the rhythmic patterns, background sounds, and clear segmentation of information in digital materials helped students concentrate on key language elements. As one teacher stated,

> *"They can stay focused longer when I use videos or interactive games. The content is broken into small parts, so they don't feel overwhelmed, and they keep following until the end."*

This observation highlights how digital media can reduce cognitive overload by presenting input in manageable sequences, consistent with cognitive load theory. Another important aspect of engagement observed in the classrooms was emotional and motivational involvement, which played a crucial role in sustaining cognitive attention. Students frequently expressed excitement and anticipation when digital activities were planned, demonstrating higher voluntary participation. For example, a student remarked, **"**

> *If the teacher says we will play the English game on the screen, I feel happy. I want to try and get the answers right."*

Emotional engagement is intertwined with cognitive attention; when students feel enjoyment or curiosity, their mental resources become more focused, allowing for deeper processing of linguistic input. The use of sound effects, character voices, and interactive elements also strengthened attention by making the learning experience immersive. Instead of processing information in isolated chunks, students were exposed to cohesive multimodal inputs that held their interest and reinforced comprehension. Teachers observed that even students who typically struggled with concentration were noticeably more focused during digital media sessions. One teacher explained,

> *"Some students who usually cannot sit still suddenly become very focused when the video is playing. The movement and sound help them concentrate better."*

This suggests that digital media may help bridge attentional gaps caused by individual differences in cognitive processing styles or learning preferences. Overall, the findings show that digital media does more than provide entertainment; it acts as a powerful psycholinguistic tool that enhances students' attentional capacity, stimulates cognitive engagement, and facilitates meaningful interaction with the target language. By presenting input in an attractive, contextualized, and multimodal format, digital media supports the mental processes necessary for successful second language acquisition among young learners in Makassar's elementary schools.

ISSN 2721-0979 (Print), ISSN 2721-1258 (Online)

Digital Media Facilitates Input Comprehension and Memory Encoding

The study revealed that digital media played a crucial role in facilitating students' comprehension of linguistic input and strengthening memory encoding processes during second language learning. In all observed classrooms, students demonstrated a clearer and quicker understanding of new vocabulary, phrases, and sentence structures when these were presented through videos, animations, and other multimedia tools. Digital media provided learners with contextual clues such as images, gestures, movement, and sound that significantly reduced ambiguity and supported the immediate processing of meaning. From a psycholinguistic standpoint, these multimodal cues helped students draw connections between auditory input and visual representations, making comprehension more intuitive and less reliant on translation or rote memorization.

Classroom observations showed that students understood new language items more efficiently when digital visuals accompanied the teacher's verbal explanations. For example, when animated videos displayed characters performing actions while narrating the corresponding English verbs, students quickly grasped the meaning without requiring additional explanation. The alignment of verbal and visual input created dual coding, which helped learners process information through both auditory and visual channels, thereby deepening comprehension. One teacher emphasized this benefit, stating,

> *"When I show them the animation, they immediately understand the word. They don't need me to explain in Indonesian because the picture already shows the meaning."*

This illustrates how digital media reduces cognitive load by providing immediate semantic clarity.

Beyond comprehension, digital media also enhanced students' ability to retain and recall learned vocabulary. The repetitive structure of many digital learning tools such as looping pronunciation videos, animated flashcards, and quiz-based learning apps reinforced memory encoding. Students not only heard the words multiple times but also saw them displayed alongside meaningful imagery, which strengthened long-term memory formation. During observations, many students were able to recall vocabulary more accurately after digital activities than after paper-based learning. A Grade 5 student shared,

> *"I remember the words better when I watch the video. The pictures stay in my mind, so later I can say the words again."*

This statement reflects how visual memory anchors help build durable linguistic representations. Teachers consistently reported that students exhibited improved retention when instruction incorporated digital repetition and multimodal presentation. Several teachers noted that students could recall previously learned vocabulary weeks later if the content had been reinforced through digital media. One teacher explained,

> *"Sometimes I am surprised that they still remember the words from the video we used last month. It seems the combination of sound and images makes the memory stronger for them."*

These insights underscore the psycholinguistic principle that memory encoding is more effective when learners receive input that is emotionally engaging, visually rich, and repeatedly accessible. Moreover, digital media allowed students to process linguistic input at their own pace, which further enhanced comprehension and memory building. Some teachers paused videos or replayed specific segments to allow students to focus on challenging words or complex sentences. This flexibility catered to individual processing differences and provided

ISSN 2721-0979 (Print), ISSN 2721-1258 (Online)

students with multiple opportunities to internalize input. Learners expressed that being able to rewatch or rehear digital content helped them gain confidence and reinforce memory. A student mentioned,

> *"If I don't understand the first time, the teacher plays it again, and then I get it. The sound and picture make it easier to remember."*

This aligns with research indicating that repeated exposure to multimodal input strengthens both short-term and long-term memory pathways. In addition, digital interactive platforms supported active recall by encouraging students to practice and retrieve learned language items in real time. When students engaged with digital quizzes or games that required selecting images corresponding to spoken words, they activated retrieval processes essential for memory consolidation. These interactive moments allowed students to test their comprehension while reinforcing neural connections related to vocabulary and meaning. Teachers observed that students tended to perform better in digital recall activities than in traditional oral questioning, suggesting that digital scaffolding supported more confident and accurate retrieval. Overall, the findings demonstrate that digital media not only enhances immediate comprehension through multimodal input but also strengthens memory encoding by providing repetition, emotional engagement, contextual richness, and opportunities for retrieval. These combined features make digital media an effective psycholinguistic tool in supporting second language acquisition among young learners in Makassar City's elementary schools.

Types of Digital Media Used in Schools

The integration of digital media in contemporary educational settings has expanded rapidly, driven by the increasing availability of technological resources, changing pedagogical needs, and the shift toward more student-centered learning environments. Schools now employ a diverse range of digital tools that serve various instructional purposes, from delivering content to facilitating interaction and assessment. These digital media types not only support multimodal learning but also provide teachers with flexible options to adapt classroom practices to students' learning preferences and cognitive abilities. The findings from the fieldwork clearly indicate that teachers utilize a combination of video-based materials, interactive learning applications, presentation software, learning management systems (LMS), and digital game-based platforms to enhance their instructional strategies. Each type of digital media plays a distinct role in the learning process and contributes differently to student engagement, comprehension, and learning outcomes.

One of the most commonly used forms of digital media in schools is video-based learning content, including animated videos, documentary clips, and instructional explainers. Teachers rely on video materials because they present complex ideas in simplified visual forms, making them easier for students to grasp. Videos also help sustain student attention by combining motion, sound, and visual cues, which makes abstract concepts more concrete. During interviews, several teachers stated that videos are particularly effective for subjects that require visualization, such as science or social studies. One teacher explained,

> *"We often use animated videos to explain scientific processes because students understand faster when they can see the steps happening, not just read about them."*

Another participant emphasized how videos help students who struggle with traditional text-based content, stating,

> *"Some students find it difficult to read long paragraphs, but when the same information is provided through videos, they follow it much more easily."*

ISSN 2721-0979 (Print), ISSN 2721-1258 (Online)

These insights confirm that video-based media address diverse learning needs while improving clarity and comprehension. Schools also frequently use interactive learning applications, such as mobile apps and web-based educational platforms that provide quizzes, simulations, and interactive exercises. These applications are valued for their ability to promote active learning and immediate feedback, which helps students monitor their own progress. Many teachers noted that interactive tools motivate students by presenting tasks in a game-like format. For instance, one teacher shared,

> *"Students love using interactive quiz apps because they can answer quickly and see their scores right away. It makes them more enthusiastic compared to traditional written exercises."*

Another teacher pointed out that interactive applications support differentiated learning, saying,

> *"With these apps, I can assign different levels of difficulty depending on the student's ability, so everyone can work at their own pace."*

This demonstrates how digital interactive tools contribute to inclusive learning environments, ensuring that all students remain actively involved. Another essential type of digital media used in schools is presentation software, such as PowerPoint or Google Slides, which teachers use to structure lessons and present information in organized visual formats. These tools allow educators to combine text, images, diagrams, and charts, making lessons more visually appealing and easier to follow. Several teachers reported that presentation tools help them maintain the flow of teaching and ensure that key points are delivered clearly. One interviewee remarked,

> *"Using slides helps me present the lesson in a structured way. Students can focus better because the points are displayed one by one."*

Another added,

> *"Slides give me the flexibility to add pictures and diagrams, which makes explanations easier, especially for complex topics."*

The widespread use of presentation software reflects its importance in standardizing classroom instruction while enhancing clarity and focus.

In addition to presentation tools, many schools have adopted Learning Management Systems (LMS) such as Google Classroom, Moodle, or Edmodo to organize learning materials, assignments, and communication. LMS platforms offer centralized spaces where teachers can upload resources, track student submissions, give feedback, and facilitate discussions beyond classroom hours. Teachers interviewed for the study described LMS as essential for maintaining learning continuity, especially when students need to review lessons independently. One teacher commented,

> *"LMS makes it easy for students to access materials anytime. Even if they miss a class, they can still read or watch the content uploaded."*

Another teacher noted the communication advantage, saying,

> *"Through the LMS, students can ask questions even after school, and I can respond when I have time. It creates better interaction."*

These platforms therefore extend learning opportunities beyond the physical classroom and foster sustained engagement. Finally, digital game-based learning tools are increasingly used

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in schools to strengthen student motivation and foster a more enjoyable learning atmosphere. Educational games integrate learning objectives within interactive challenge-based formats, supporting both cognitive and emotional engagement. Teachers observed that students tend to participate more actively when lessons incorporate game elements, such as points, levels, and rewards. One teacher expressed this clearly:

> *"When we use educational games, students are more excited and participate more actively. They feel like they are playing, but at the same time, they are learning."*

Another interviewee mentioned the positive effect on group learning, saying,

> *"Games help students collaborate better because they work together to solve problems or complete tasks."*

These findings suggest that game-based tools not only enhance motivation but also nurture social interaction and teamwork. Collectively, the wide range of digital media employed in schools reflects a dynamic shift toward technology-enhanced learning environments. Teachers strategically select media types based on the subject matter, classroom conditions, and student needs, ensuring that digital tools complement pedagogical goals. The interviews demonstrate that digital media is not merely an accessory but an integral component of modern instruction, improving accessibility, engagement, and comprehension. As schools continue to integrate digital tools, these varied media types will remain central to shaping effective and inclusive learning experiences.

The findings of this study reveal that the integration of digital media in school learning environments serves as a transformative force that reshapes instructional practices, student engagement, and cognitive processing. While previous studies have emphasized that digital technologies can enrich learning experiences when implemented appropriately (Mhlongo et al., 2023; Timotheou et al., 2023; Wekerle et al., 2022), the present research extends this understanding by showing how teachers strategically combine various types of digital media to optimize learning across cognitive, motivational, and social dimensions. The discussion below synthesizes the key themes, critically interprets the interview findings, and situates them in relation to contemporary scholarship.

One of the most significant findings concerns the role of digital media in enhancing cognitive engagement and sustained attention. Teachers strongly emphasized that digital materials particularly animated videos and interactive applications captured students' focus more effectively than traditional print-based methods. This aligns with cognitive theory suggesting that perceptual richness, motion, and multimodality can strengthen attentional allocation and maintain cognitive arousal (Seijdel et al., 2024; Andersen et al., 2021; Zou et al., 2025). In this study, teachers repeatedly described how students were visibly more focused during lessons incorporating visual animations or game-like elements. Their observations resonate with research demonstrating that multimedia stimuli activate broader neural pathways associated with selective attention and working memory. However, the present findings extend previous work by showing that digital media not only increases attention but also shifts the *quality* of engagement from passive reception to active mental participation especially when learners interact with quizzes, simulations, and gamified platforms. Thus, digital media appears to function as a cognitive regulator that scaffolds attentional control, particularly for students who struggle with conventional text-dominant instruction.

A second major finding concerns the capacity of digital media to facilitate input comprehension and memory encoding, enabling learners to process information more efficiently and retain it longer. Teachers consistently reported that students demonstrated improved recall when

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lessons were supported by visual or interactive content. This observation is supported by dual-coding theory, which argues that learning is strengthened when information is encoded simultaneously in visual and verbal forms (Mir et al., 2023; Wong & Samudra, 2021; Li et al., 2022). Likewise, Mayer's Cognitive Theory of Multimedia Learning posits that animation, narration, and imagery reduce extraneous cognitive load and facilitate deeper processing. The interview data enrich these theoretical propositions by illustrating how digital media becomes a compensatory mechanism for students with limited reading proficiency or short attention spans. Teachers noted that digital media made abstract concepts "visible," helping students form mental models more easily. These results reinforce findings from neuroscience research showing that multimodal input stimulates synaptic consolidation and enhances the stability of long-term memory traces. The contribution of this study, however, lies in showing the practical classroom-level implications: digital media serves as a cognitive equalizer, helping diverse learners access, process, and store information that would otherwise be difficult to grasp.

Another core theme concerns the variety of digital media types used in schools, each fulfilling specific pedagogical functions. This study documents the extensive use of video materials, interactive learning applications, presentation software, learning management systems (LMS), and digital game-based platforms. While prior studies often examine particular tools in isolation (e.g., video learning or game-based learning), the present findings show how teachers combine them strategically to create layered learning environments. For example, videos introduce foundational understanding, interactive apps support practice and reinforcement, slides organize conceptual explanations, and LMS platforms ensure continuity of learning beyond class hours. This multi-tool ecosystem aligns with contemporary frameworks of technology-enhanced learning that emphasize the need for integrated digital ecologies rather than single-tool solutions (Ismael, 2024; Hamzaoui et al., 2025). Importantly, the study reveals that teachers do not adopt digital tools blindly; their choices reflect deliberate pedagogical judgments about students' needs, content complexity, and instructional pacing. This demonstrates a level of digital pedagogical literacy that goes beyond simple tool use, illustrating a more mature, reflective integration of technology into teaching practice.

The findings also illuminate the social and motivational dimensions of digital media use in classrooms. Teachers observed that digital games and interactive quizzes fostered collaboration and peer engagement, increasing students' willingness to participate in group tasks. This supports sociocultural learning theory, which highlights interaction and shared meaning-making as core elements of learning (Twiner et al., 2021; Aldemir et al., 2022). Additionally, self-determination theory suggests that digital environments offering autonomy, competence, and relatedness can enhance intrinsic motivation. The present study confirms these mechanisms, particularly in how digital media cultivates students' sense of competence through immediate feedback and achievable challenges. Teachers' testimonies demonstrate that digital media does not merely support academic learning but also strengthens learners' confidence, social interaction, and emotional involvement.

Nevertheless, the study's findings also raise critical considerations regarding the conditions necessary for digital media to function effectively. While teachers widely acknowledge the benefits of digital tools, they also implicitly point to dependencies such as adequate infrastructure, teacher training, and alignment with curriculum goals. This echo concerns raised in previous literature that technology alone cannot improve learning outcomes without pedagogical coherence and institutional support (Selwyn, 2021; Yeung et al., 2021). The interviews reveal that some teachers still struggle to balance digital tools with traditional methods or to manage class time effectively when using technology. These reflections

ISSN 2721-0979 (Print), ISSN 2721-1258 (Online)

underscore the importance of continuous professional development and the need for school systems to provide structured technological support.

Overall, this study contributes to the growing body of literature on digital learning by presenting empirical evidence that digital media functions as a multifaceted pedagogical asset that enhances attention, comprehension, memory encoding, and social interaction. It offers a nuanced understanding of how different digital media types complement each other and how teachers exercise agency in integrating them within instructional frameworks. Beyond confirming existing theories, the study advances the field by demonstrating that digital media not only enhances learning efficiency but also contributes to a more equitable and inclusive learning environment. Students who typically struggle with text-heavy instruction benefit significantly from multimodal, visually enriched, and interactive content. This suggests that digital media has the potential to reduce learning disparities when used thoughtfully.

The findings call for rethinking how digital media is conceptualized in educational discourse. Rather than viewing digital tools as supplementary materials, this study positions them as central components of modern pedagogy shaping how students attend to information, process it, remember it, and engage with peers (Dudar et al., 2021; Archambault et al., 2022; Kovtoniuk et al., 2022). As digital literacy becomes increasingly vital for academic and professional success, the integration of diverse digital media in schools should be viewed not as an innovation but as an essential pedagogical evolution. The implications of this are profound: future research, policy, and professional development programs must focus on empowering teachers with the competence, confidence, and creativity required to harness the full cognitive and motivational potential of digital media.

Conclusion

The findings of this study conclude that digital media plays a pivotal and multi-dimensional role in supporting second language acquisition among elementary school learners in Makassar City, particularly through its capacity to enhance cognitive engagement, facilitate input comprehension, and strengthen memory encoding. The strategic use of diverse media—such as videos, animations, interactive applications, and digital games—creates rich multimodal learning environments that reduce cognitive load, deepen understanding, and promote long-term retention. Teachers demonstrated thoughtful pedagogical reasoning in selecting and integrating digital tools, showing that effective digital learning is not simply a matter of technology availability but of purposeful design aligned with students' developmental and linguistic needs. Moreover, digital media fosters greater motivation, participation, and social interaction, functioning not only as a cognitive scaffold but also as an affective and collaborative catalyst. Collectively, these insights underscore that digital media, when implemented with pedagogical intentionality, constitutes a powerful resource for advancing equitable, engaging, and cognitively supportive second language learning experiences in contemporary elementary education.

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