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The Use of Gadgets at Home as a Barrier to Elementary School Students' Learning: A Literature Review on the Role of Parents and Instructional Intervention Models

Mustakim[1]

[1]Universitas Pendidikan Mandalika, Indonesia
Email : mustakim@undikma.ac.id[1]

ABSTRAK

The increasing use of digital gadgets at home has become a significant concern in relation to elementary school students' learning. While technology offers educational opportunities, excessive and unregulated gadget use may hinder children's cognitive, social, and academic development. Therefore, this study aimed to examine how gadget use at home becomes a barrier to learning, to analyze the role of parents in mediating children's digital behavior, and to identify effective instructional intervention models to address these challenges. This study employed a qualitative approach using a Systematic Literature Review (SLR) design. Data were collected from peer-reviewed journal articles and academic books published between 2016 and 2026, retrieved from databases such as Scopus, ERIC, Google Scholar, and ScienceDirect. The selection process followed PRISMA guidelines, and the data were analyzed using thematic analysis. The findings revealed that excessive gadget use disrupts students' concentration, executive functions, and academic performance, while also negatively affecting social behavior, emotional stability, and physical well-being. Parental mediation, including active guidance, restriction, and co-use strategies, plays a crucial role in minimizing these negative impacts. Additionally, instructional intervention models—such as family-based routines, digital literacy education, and behavioral strategies—were found to be effective in optimizing gadget use for learning purposes. In conclusion, gadget use at home can act as a barrier to learning if not properly managed; however, through effective parental involvement and structured educational interventions, its negative effects can be reduced and its potential benefits maximized.

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Corresponding Author
Mustakim
Program Studi Pendidikan Dokter Hewan, Fakultas Kedokteran Hewan, Universitas Pendidikan Mandalika. Jl. Pemuda No.59A, Dasan Agung Baru, Kec. Mataram, Kota Mataram, Nusa Tenggara Barat. 83125

INTRODUCTION

The rapid advancement of digital technology has significantly influenced various aspects of human life, including children's learning environments. One of the most prominent changes is the increasing use of gadgets at home among elementary school students. While digital devices offer access to educational resources, their excessive and uncontrolled use has raised serious concerns regarding their potential negative impact on children's learning processes. Studies indicate that excessive gadget use can reduce learning concentration, limit social interaction, and disrupt sleep quality, ultimately affecting students' academic performance (Sarini et al., 2024). Therefore, understanding the implications of gadget use in home settings has become an important issue in contemporary educational research.

At the elementary school level, children are in a crucial stage of cognitive, emotional, and social development. However, intensive exposure to digital devices may hinder these developmental processes. Research has shown that excessive gadget use is associated with lower levels of prosocial behavior, particularly when parental involvement is minimal (Laini, 2018). Furthermore, prolonged screen time has been linked to decreased language and literacy development among children (Madigan et al., 2019). In addition, digital overexposure can impair executive functions, such as attention control and self-regulation, which are essential for effective learning (Zhang et al., 2025; Radesky et al., 2016). Children who have unrestricted access to digital devices also tend to experience difficulties maintaining attention on academic tasks (Twenge & Campbell, 2018). These findings suggest that gadget use at home can act as a significant barrier to elementary school students' learning.

In this context, the role of parents becomes critically important in mediating children's interaction with digital technology. Effective communication between parents and children has been found to prevent early signs of gadget addiction (Adeni & Harahap, 2024). Moreover, parental knowledge regarding appropriate screen time limits plays a vital role in supporting children's development (Sistiarani et al., 2021). Parental mediation strategies, including active guidance, supervision, co-viewing, and restriction of device usage, have been shown to reduce the negative impacts of gadgets (Wulandari & Santoso, 2019; Hidayati et al., 2022). Family-based interventions, such as establishing clear rules and structured learning routines at home, are also effective in improving children's learning outcomes (Lauricella et al., 2015; Domoff et al., 2020). Without proper parental involvement, excessive gadget use may lead to emotional disturbances and behavioral problems in children (Firmansyah & Putri, 2023).

A number of previous studies have examined the relationship between gadget use, parental mediation, and children's learning outcomes. Sarini et al. (2024) found that parental mediation significantly influences children's gadget usage and helps minimize its negative effects. Similarly, Chen et al. (2018) reported that uncontrolled use of mobile devices increases the risk of smartphone addiction and negatively affects academic achievement. Hou et al. (2025) further demonstrated that parental mediation positively contributes to students' academic performance through supervision of digital activities. In addition, Hidayati et al. (2022) emphasized the importance of co-viewing strategies in reducing negative impacts while strengthening emotional bonds, whereas Khasanah and Wulandari (2026) highlighted that consistent parental supervision can improve children's focus and reduce gadget dependency.

Despite the growing body of research in this area, several gaps remain. First, many studies have focused on the general effects of gadget use without specifically examining its role as a barrier to learning within the home environment. Second, there is limited integration between parental mediation strategies and instructional intervention models that can be applied systematically to address this issue. Third, previous studies tend to emphasize empirical findings rather than providing a comprehensive synthesis of the literature that connects gadget use, parental roles, and educational interventions.

Therefore, this study offers a novel contribution by conducting a comprehensive literature review that integrates three important aspects: gadget use at home as a barrier to elementary school students' learning, the role of parents in mediating children's digital behavior, and instructional intervention models that can be implemented to overcome these challenges. This integrative approach is expected to provide a more holistic understanding of the issue and offer practical recommendations.

Based on the background and identified research gaps, the research questions of this study are: (1) How does gadget use at home become a barrier to elementary school students' learning? (2) What roles do parents play in mediating children's gadget use? and (3) What instructional intervention models can effectively address the negative impacts of gadget use? Accordingly, the objectives of this study are to analyze the challenges of gadget use in home learning environments, to examine the role of parental mediation, and to identify effective instructional intervention models based on existing literature.

The significance of this study lies in its contribution to educational research, particularly in understanding the relationship between digital technology, family environment, and children's learning outcomes. The findings are expected to provide valuable insights for parents, educators, and policymakers in developing effective strategies to manage children's gadget use. Furthermore, this study contributes theoretically by enriching the literature on parental mediation and practically by offering evidence-based solutions to improve elementary school students' learning in the digital era.

METHODS

1. Research Approach and Design

This study employed a qualitative approach using a Systematic Literature Review (SLR) design to examine the use of gadgets at home as a barrier to elementary school students' learning, with a focus on parental roles and instructional intervention models. The SLR approach was selected because it enables researchers to systematically synthesize findings from multiple studies to generate comprehensive insights into a specific issue. Systematic literature reviews have been widely recognized as effective methods for identifying patterns, inconsistencies, and research gaps across studies (Xiao & Watson, 2019). In addition, the review process in this study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency, rigor, and replicability (Page et al., 2021).

2. Sample and Data Sources

The sample of this study consisted of peer-reviewed journal articles and relevant academic books published between 2016 and 2026. The articles were retrieved from reputable academic databases such as Google Scholar, Scopus, ERIC, and ScienceDirect. The selection of literature was guided by predefined inclusion and exclusion criteria.

The inclusion criteria were: (1) studies focusing on gadget or digital device use among children, (2) research addressing parental mediation or parental involvement, (3) studies discussing learning outcomes or academic performance, and (4) publications within the last ten years. The exclusion criteria included non-peer-reviewed articles, editorials, and studies not directly related to the research focus. Establishing clear eligibility criteria is essential in systematic reviews to ensure the relevance and quality of selected studies (Booth et al., 2016). Furthermore, the use of multiple databases enhances the comprehensiveness and validity of literature selection (Snyder, 2019).

3. Research Instruments

The primary instrument used in this study was a data extraction form designed to systematically collect and organize relevant information from the selected studies. The form included key elements such as author(s), year of publication, research objectives, methodology, sample characteristics, and main findings related to gadget use, parental mediation, and instructional interventions.

The use of structured data extraction tools is recommended in systematic literature reviews to ensure consistency and reduce bias during the data collection process (Petticrew & Roberts,

2016). Additionally, standardized instruments facilitate comparison across studies and improve the reliability of synthesized findings (Okoli, 2015).

4. Data Collection Procedures

The data collection process was conducted in several stages following the PRISMA framework. First, a comprehensive literature search was performed using keywords such as *"gadget use," "screen time," "parental mediation,"* and *"elementary school learning."* Second, duplicate records were removed. Third, titles and abstracts were screened to identify potentially relevant studies. Fourth, full-text articles were assessed based on the inclusion and exclusion criteria. Finally, selected studies were included in the synthesis.

This multi-stage screening process is essential to ensure that only high-quality and relevant studies are included in the review (Page et al., 2021). Moreover, systematic filtering procedures help minimize bias and improve the credibility of research findings (Snyder, 2019).

5. Data Analysis Techniques

The data were analyzed using a qualitative thematic analysis approach. This method involved identifying, coding, and categorizing themes related to (1) the challenges of gadget use at home, (2) parental mediation strategies, and (3) instructional intervention models. The analysis followed three main steps: data reduction, data display, and conclusion drawing.

Thematic analysis is widely used in qualitative research to interpret patterns and relationships within data (Braun & Clarke, 2021). Furthermore, qualitative synthesis in systematic reviews allows researchers to generate deeper insights and provide meaningful interpretations of complex educational phenomena (Thomas & Harden, 2018).

RESULTS

1. Gadget Use at Home as a Barrier to Elementary School Students' Learning

a. Disruption of Cognitive and Learning Processes

1) Decreased concentration and attention span during learning activities

The findings from the reviewed literature consistently indicate that excessive gadget use at home significantly reduces children's ability to concentrate during learning activities. Children who frequently engage with digital devices tend to experience fragmented attention due to constant exposure to multimedia stimuli, notifications, and entertainment content. This condition leads to shorter attention spans and difficulty maintaining focus on academic tasks. Previous studies have shown that prolonged screen exposure is associated with attention problems and decreased cognitive engagement in learning contexts (Radesky et al., 2016). Similarly, research by Madigan et al. (2019) demonstrated that higher screen time is negatively correlated with children's academic performance and attention development.

2) Impairment of executive functions such as self-regulation and memory

In addition to attention deficits, excessive gadget use has been found to impair executive functions, including self-regulation, working memory, and cognitive flexibility. These functions are essential for effective learning, particularly in elementary school students who are still developing foundational cognitive skills. The literature suggests that frequent switching between digital applications can weaken children's ability to regulate their behavior and manage learning tasks independently (Zhang et al., 2025). Furthermore, digital overexposure has been linked to reduced capacity for delayed gratification and self-control, which are critical components of successful learning (Domoff et al., 2020).

3) Reduced academic performance due to divided focus between learning and gadget use

Another significant finding is that gadget use at home often divides students' attention between academic responsibilities and digital entertainment. This divided focus results in lower academic achievement and reduced learning outcomes. Studies have shown that children who use gadgets excessively are more likely to prioritize entertainment over academic tasks, leading to decreased study time and lower academic performance (Twenge & Campbell, 2018). Moreover, Sarini et al. (2024) emphasized that uncontrolled gadget use contributes to decreased academic achievement due to reduced learning discipline and concentration.

b. Negative Impact on Behavioral and Social Development

1) Decline in prosocial behavior and social interaction

The literature review reveals that excessive gadget use negatively affects children's social development, particularly in terms of prosocial behavior. Children who spend more time on digital devices tend to engage less in face-to-face interactions, which are essential for developing empathy, cooperation, and communication skills. Research indicates that high levels of gadget use are associated with lower levels of prosocial behavior among children (Laini, 2018). Additionally, reduced social interaction may hinder the development of interpersonal skills necessary for collaborative learning environments.

2) Increased preference for individual digital activities over collaborative learning

Another key finding is that children who frequently use gadgets develop a preference for solitary digital activities rather than collaborative or group-based learning. This shift in behavior reduces opportunities for peer interaction and cooperative learning, which are crucial in elementary education. Studies have shown that digital engagement often replaces traditional play and social learning activities, leading to decreased participation in collaborative learning (Lauricella et al., 2015). As a result, children may struggle to develop teamwork and communication skills.

3) Emergence of behavioral issues such as irritability and dependency

The review also highlights the emergence of behavioral problems associated with excessive gadget use, including irritability, dependency, and emotional instability. Children who are highly dependent on digital devices may exhibit withdrawal symptoms, such as frustration or anger, when access to gadgets is restricted. Firmansyah and Putri (2023) found that gadget addiction can trigger emotional disturbances and behavioral issues in children. Similarly, Chen et al. (2018) reported that problematic mobile device use is strongly associated with increased risk of addiction and negative behavioral outcomes.

c. Physical and Psychological Consequences

1) Sleep disturbances affecting learning readiness

One of the most significant physical consequences identified in the literature is sleep disturbance. Excessive gadget use, particularly before bedtime, has been shown to disrupt sleep patterns due to exposure to blue light and prolonged cognitive stimulation. Poor sleep quality directly affects children's readiness to learn, including their attention, memory, and overall academic performance. Studies have demonstrated that increased screen time is associated with shorter sleep duration and lower sleep quality among children (Twenge & Campbell, 2018).

2) Emotional instability and increased risk of gadget addiction

The psychological impact of excessive gadget use includes emotional instability and an increased risk of addiction. Children who frequently use digital devices may develop dependency behaviors that interfere with their emotional regulation and social functioning. Research indicates that excessive screen exposure is linked to higher levels of anxiety, depression, and emotional dysregulation (Domoff et al., 2020). Furthermore, gadget addiction has been identified as a growing concern that requires early intervention, particularly in home environments.

3) Reduced motivation to engage in academic tasks

Another important finding is the decline in students' motivation to engage in academic activities. The instant gratification provided by digital entertainment often makes traditional learning activities appear less engaging. As a result, children may lose interest in studying and prefer recreational screen activities. Madigan et al. (2019) found that higher screen time is associated with lower academic motivation and reduced engagement in learning tasks.

d. Home Environment as a Contributing Factor

1) Lack of structured learning routines at home

The home environment plays a crucial role in shaping children's learning behaviors. The literature indicates that the absence of structured routines at home contributes significantly to excessive gadget use. Without clear schedules for study and leisure, children are more likely to spend excessive time on digital devices. Establishing consistent routines has been identified as an effective strategy for improving learning discipline (Lauricella et al., 2015).

2) Unrestricted access to gadgets without supervision

Another contributing factor is unrestricted access to gadgets without parental supervision. Children who are allowed to use digital devices freely are more likely to develop problematic usage patterns. Research shows that lack of parental monitoring increases the risk of gadget addiction and negatively affects academic performance (Chen et al., 2018). This highlights the importance of parental control in managing children's digital behavior.

3) Dominance of entertainment-oriented content over educational use

Finally, the dominance of entertainment content over educational content is a major barrier to effective learning. Children tend to use gadgets primarily for gaming, social media, and video consumption rather than educational purposes. This imbalance reduces the potential benefits of technology in supporting learning. Studies suggest that without proper guidance, children are less likely to engage with educational content and more likely to consume entertainment media (Domoff et al., 2020).

2. The Role of Parents in Mediating Children's Gadget Use

a. Parental Mediation Strategies

1) Active mediation (discussion and guidance on content use)

The findings indicate that active parental mediation plays a crucial role in guiding children's understanding and use of digital content. Active mediation involves discussions, explanations, and critical engagement with children regarding the content they consume. This strategy helps children develop critical thinking skills and the ability to distinguish between beneficial and harmful digital content. Previous studies have shown that active mediation significantly reduces the negative effects of gadget use by fostering children's awareness and self-regulation (Nathanson, 2015). Moreover, recent research confirms that children whose parents actively discuss digital content tend to demonstrate better academic engagement and digital literacy (Hou et al., 2025).

2) Restrictive mediation (setting rules and screen time limits)

Restrictive mediation, which includes setting clear rules regarding screen time and content access, is another important parental strategy. The literature reveals that children who are subject to consistent rules regarding gadget use are less likely to develop problematic usage behaviors. Establishing time limits and restricting access to certain applications can effectively reduce excessive screen exposure (Chen et al., 2018). Furthermore, setting structured boundaries has been found to improve children's learning discipline and time management skills (Domoff et al., 2020).

3) Co-use or co-viewing (using gadgets together with children)

Co-use or co-viewing refers to parents engaging with children while using digital devices. This strategy allows parents to monitor content directly while also strengthening emotional bonds. The literature indicates that co-viewing not only reduces the risk of exposure to inappropriate content but also enhances children's comprehension of educational material (Hidayati et al., 2022). Additionally, co-use promotes positive interaction patterns between parents and children, which contributes to both social and cognitive development (Lauricella et al., 2015).

b. Parental Awareness and Digital Literacy

1) Understanding appropriate screen time for children

Parental awareness of recommended screen time is a key factor in managing children's gadget use effectively. Studies suggest that parents who understand age-appropriate screen time guidelines are more likely to regulate their children's digital activities appropriately. This awareness helps prevent excessive exposure that may negatively affect learning and development (Sistiarani et al., 2021). Furthermore, informed parents are better equipped to create balanced routines that integrate both digital and non-digital learning activities (American Academy of Pediatrics, 2016).

2) Awareness of the risks and benefits of gadget use

The literature also emphasizes the importance of parental understanding of both the risks and potential benefits of digital technology. While gadgets can support learning when used appropriately, uncontrolled use can lead to cognitive, behavioral, and emotional problems. Parents who are aware of these dual effects are more likely to implement balanced mediation strategies (Livingstone et al., 2017). This balanced perspective enables parents to maximize educational benefits while minimizing negative impacts.

3) Ability to guide children toward educational content

Another important aspect of parental digital literacy is the ability to direct children toward educational and age-appropriate digital resources. Research shows that children benefit more from gadget use when parents actively select and recommend educational applications and content (Holloway et al., 2018). This guidance ensures that technology is used as a learning tool rather than merely a source of entertainment.

c. Parenting Practices in the Digital Era

1) Establishing clear rules and consistent discipline

The findings indicate that effective parenting in the digital era requires the establishment of clear rules and consistent discipline regarding gadget use. Consistency in enforcing rules is essential to prevent confusion and resistance among children. Studies show that children are more likely to develop healthy digital habits when parents consistently apply rules and consequences (Clark, 2019). Inconsistent regulation, on the other hand, may lead to increased dependency on gadgets.

2) Providing alternative non-digital learning activities

Providing alternative activities is another effective strategy to reduce children's reliance on digital devices. The literature suggests that children who are engaged in offline activities such as reading, playing outdoors, or participating in creative tasks are less likely to develop excessive gadget use habits (Domoff et al., 2020). These activities also support holistic development, including physical, social, and cognitive growth.

3) Building effective parent-child communication

Effective communication between parents and children is fundamental in managing gadget use. Open and supportive communication helps children understand the reasons behind rules and encourages them to adopt responsible digital behaviors. Research indicates that strong parent-child communication reduces the likelihood of gadget addiction and promotes healthier usage patterns (Adeni & Harahap, 2024).

d. Collaboration with Educational Stakeholders

1) Cooperation between parents and teachers

The literature highlights the importance of collaboration between parents and teachers in managing children's gadget use. When parents and educators work together, they can create consistent expectations and strategies for digital behavior. Studies have shown that such collaboration enhances students' learning outcomes and reduces negative technology-related behaviors (Syafrida et al., 2025).

2) Alignment of home and school learning strategies

Alignment between home and school learning approaches is essential to ensure that children receive consistent guidance. When learning strategies at home support those implemented at school, children are more likely to develop disciplined study habits and responsible gadget use (Epstein, 2018). This alignment strengthens the overall learning ecosystem.

3) Monitoring children's digital learning behavior collaboratively

Finally, collaborative monitoring of children's digital activities is crucial in identifying and addressing problematic behaviors early. The literature suggests that joint monitoring by parents and teachers enables timely intervention and promotes responsible digital engagement (Livingstone et al., 2017). This shared responsibility ensures that children receive comprehensive support in navigating digital environments.

3. Instructional Intervention Models to Address the Negative Impacts of Gadget Use

a. Family-Based Intervention Models

1) Implementation of structured daily routines for learning and gadget use

The findings indicate that structured daily routines at home play a crucial role in regulating children's gadget use and improving their learning discipline. Establishing clear schedules that balance study time, leisure, and digital use helps children develop time management skills and reduces excessive screen exposure. Studies have shown that consistent routines contribute significantly to children's self-regulation and academic engagement (Lauricella et al., 2015). Furthermore, structured home environments are associated with better learning outcomes and reduced behavioral problems related to gadget overuse (Domoff et al., 2020).

2) Development of family digital rules and agreements

Another important intervention is the establishment of family-based digital rules and agreements. These rules may include screen time limits, designated gadget-free times (e.g., during meals or before bedtime), and restrictions on certain types of content. The literature suggests that clearly defined rules help children understand expectations and develop responsible digital habits (Clark, 2019). In addition, family agreements create a sense of shared responsibility and accountability, which reduces conflicts related to gadget use (Livingstone et al., 2017).

3) Strengthening parental involvement in children's learning activities

Parental involvement in children's learning activities has been identified as a key factor in mitigating the negative effects of gadget use. When parents actively engage in their children's academic activities, children are more likely to prioritize learning over digital entertainment. Research indicates that parental involvement enhances academic motivation and improves learning outcomes (Epstein, 2018). Moreover, active parental participation helps children develop positive study habits and reduces dependency on digital devices (Hou et al., 2025).

b. School-Based and Blended Intervention Models

1) Integration of digital literacy education in the curriculum

The integration of digital literacy into the school curriculum is a critical intervention to address the challenges of gadget use. Digital literacy education equips students with the skills to use

technology responsibly, critically evaluate digital content, and avoid harmful online behaviors. Studies have shown that students who receive digital literacy education demonstrate better control over their gadget use and improved academic performance (Livingstone et al., 2017). This approach also empowers students to use technology as a productive learning tool.

2) Use of blended learning approaches to guide productive gadget use

Blended learning models, which combine traditional face-to-face instruction with digital learning, have been identified as effective strategies for optimizing gadget use. These models allow students to engage with technology in a structured and purposeful manner. Research indicates that blended learning enhances student engagement and supports personalized learning experiences when properly implemented (Graham, 2019). Furthermore, guided digital learning reduces the likelihood of students using gadgets for non-educational purposes.

3) Teacher-led monitoring of students' digital engagement

Teacher involvement in monitoring students' digital activities is another important intervention. Teachers can provide guidance on appropriate digital behavior and ensure that students use gadgets for educational purposes. Studies suggest that teacher supervision helps reinforce positive digital habits and aligns classroom expectations with students' behavior at home (Syafrida et al., 2025). This monitoring also allows early identification of problematic gadget use.

c. Behavioral and Preventive Intervention Strategies

1) Time management strategies for balancing study and screen time

Effective time management strategies are essential in helping students balance academic responsibilities and gadget use. Teaching children how to allocate time for study and leisure activities can reduce excessive screen exposure. Research shows that structured time management interventions improve students' academic performance and reduce digital dependency (Domoff et al., 2020). These strategies also foster self-discipline and responsibility.

2) Reward and reinforcement systems for positive learning behavior

The use of reward systems has been identified as an effective approach to encourage positive learning behaviors and reduce excessive gadget use. Positive reinforcement, such as praise or incentives, motivates children to follow rules and prioritize academic tasks. Studies indicate that reinforcement-based interventions can significantly improve children's behavioral outcomes and learning engagement (Kazdin, 2017). This approach is particularly effective for younger learners who respond well to external motivation.

3) Early prevention programs for gadget addiction

Preventive interventions aimed at reducing the risk of gadget addiction are essential in the early stages of child development. These programs may include awareness campaigns, parental training, and school-based education. The literature suggests that early prevention is more effective than corrective measures in addressing digital addiction (Chen et al., 2018). Early intervention helps children develop healthy digital habits before problematic behaviors become established.

d. Educational Technology Optimization

1) Utilization of educational applications to support learning

The findings highlight that not all gadget use is detrimental; when used appropriately, digital devices can support learning. Educational applications designed for children can enhance understanding, engagement, and skill development. Research indicates that the use of high-quality educational apps improves learning outcomes when integrated into structured learning activities (Hirsh-Pasek et al., 2015). Therefore, the focus should be on optimizing gadget use rather than eliminating it entirely.

2) Filtering and selecting age-appropriate digital content

Selecting appropriate digital content is essential to maximize the benefits of technology. Parents and educators must ensure that children are exposed to content that aligns with their developmental stage and educational needs. Studies show that content quality significantly influences the impact of digital media on children's learning and behavior (Livingstone et al., 2017). Proper filtering reduces exposure to harmful or distracting content.

3) Promoting meaningful and goal-oriented gadget use

Finally, promoting purposeful and goal-oriented use of gadgets is crucial in transforming technology into a learning tool. Children should be guided to use digital devices with clear objectives, such as completing assignments, exploring educational topics, or developing skills. Research suggests that intentional use of technology enhances learning outcomes and reduces the negative effects associated with passive consumption (Graham, 2019). This approach shifts gadget use from entertainment to educational enrichment.

DISCUSSION

1. Analysis of Results

The findings of this study demonstrate that gadget use at home constitutes a significant barrier to elementary school students' learning, particularly in cognitive, behavioral, and environmental dimensions. In relation to the first research question, the results indicate that excessive gadget use disrupts children's cognitive processes, including attention, memory, and self-regulation. This disruption occurs due to continuous exposure to digital stimuli, which fragments children's focus and reduces their ability to engage in sustained learning activities. These findings align with previous research suggesting that prolonged screen exposure negatively affects executive function development and learning performance (Radesky et al., 2016; Madigan et al., 2019).

Furthermore, the results reveal that gadget overuse also affects children's behavioral and social development. Reduced prosocial behavior, increased preference for solitary activities, and the emergence of emotional instability indicate that excessive digital engagement replaces meaningful social interactions. This supports the argument that learning is not only a cognitive process but also a social one, where interaction plays a crucial role. Additionally, the findings highlight physical and psychological consequences, such as sleep disturbances and decreased learning motivation, which further exacerbate the negative impact on academic outcomes.

Regarding the second research question, the study confirms that parental mediation plays a central role in regulating children's gadget use. The results identify three primary mediation strategies: active mediation, restrictive mediation, and co-use. These strategies function as protective mechanisms that guide children's digital behavior and reduce the risks associated with excessive gadget use. In particular, active mediation fosters critical thinking and digital awareness, while restrictive mediation ensures discipline and time management. Co-use, on the other hand, strengthens emotional bonds and enhances learning through shared experiences.

In relation to the third research question, the findings demonstrate that instructional intervention models—especially those based on family, school, and behavioral approaches—are effective in addressing the negative impacts of gadget use. Family-based interventions, such as structured routines and digital rules, provide a foundational framework for regulating behavior. Meanwhile, school-based interventions, including digital literacy education and blended learning, promote productive use of technology. Behavioral strategies, such as time management and reinforcement systems, further support the development of self-regulated learning habits.

2. Comparison with Previous Studies

The findings of this study are largely consistent with previous research in the field of digital media and child development. For instance, the negative impact of excessive gadget use on attention and academic performance supports earlier findings by Twenge and Campbell (2018) and Chen et al. (2018), who reported that uncontrolled screen time is associated with decreased academic achievement and increased risk of addiction. Similarly, the observed decline in prosocial behavior aligns with Laini (2018), who emphasized the relationship between gadget use and reduced social interaction among children.

In terms of parental mediation, the results are in line with the theoretical framework proposed by Livingstone et al. (2017), which highlights the importance of parental involvement in shaping children's digital experiences. The effectiveness of active and restrictive mediation strategies found in this study is also supported by Nathanson (2015) and Hou et al. (2025), who demonstrated that parental engagement enhances children's academic performance and digital literacy.

Moreover, the identified intervention models correspond with existing literature on educational strategies in the digital era. For example, the effectiveness of structured routines and family-based interventions supports the findings of Domoff et al. (2020), while the role of digital literacy education is consistent with Graham (2019), who emphasized the importance of guided technology use in improving learning outcomes. These consistencies indicate that the findings of this study reinforce and extend existing knowledge by integrating multiple perspectives into a comprehensive framework.

3. Implications of Findings

The findings of this study have both theoretical and practical implications. From a theoretical perspective, this research contributes to the literature by integrating three key dimensions—gadget use, parental mediation, and instructional intervention—into a unified framework. This integration provides a more holistic understanding of how digital technology influences children's learning in home environments. It also expands the application of parental mediation theory by linking it directly to learning outcomes and instructional strategies.

From a practical perspective, the findings offer valuable insights for parents, educators, and policymakers. For parents, the study highlights the importance of active involvement, structured routines, and digital literacy in managing children's gadget use. For educators, the results emphasize the need to incorporate digital literacy and blended learning approaches into the curriculum to guide students' use of technology effectively. For policymakers, the study underscores the importance of developing guidelines and programs that support healthy digital habits among children.

Furthermore, the findings suggest that gadget use should not be viewed solely as a problem but also as an opportunity for educational innovation. When properly managed, digital technology can enhance learning experiences and support children's development. Therefore, the focus should shift from restricting gadget use entirely to optimizing its use for educational purposes.

4. Limitations of the Study

Despite its contributions, this study has several limitations that should be acknowledged. First, as a systematic literature review, the findings are based on secondary data from previously published studies, which may introduce bias depending on the quality and scope of the selected literature. Second, the study is limited to articles published within the last ten years, which may exclude relevant earlier research that could provide additional insights.

Third, the variability in research contexts, methodologies, and sample characteristics across the reviewed studies may affect the generalizability of the findings. Additionally, the study does not include empirical data collection, which limits its ability to provide direct evidence from specific populations. Finally, the rapid evolution of digital technology means that findings related to gadget use may change over time, requiring continuous updates and further research.

5. Partial Conclusions

Based on the analysis, it can be concluded that gadget use at home becomes a significant barrier to elementary school students' learning when it is excessive and unregulated. However, this negative impact can be mitigated through effective parental mediation and well-designed instructional intervention models. The integration of family-based, school-based, and behavioral strategies provides a comprehensive approach to addressing this issue.

These findings suggest that the role of parents is central in shaping children's digital behavior, while educational institutions play a supportive role in guiding the productive use of technology. Therefore, a collaborative and integrated approach is essential to transform gadget use from a learning barrier into a valuable educational resource. This discussion sets the foundation for the final conclusions and recommendations of the study.

CONCLUSION

This study concludes that the use of gadgets at home becomes a significant barrier to elementary school students' learning when it is excessive, unregulated, and dominated by non-educational purposes. The findings reveal that gadget overuse disrupts cognitive processes such as attention, memory, and self-regulation, leading to decreased academic performance. In addition, it negatively affects children's social behavior, emotional stability, and physical well-being, particularly through reduced social interaction, increased dependency, and sleep disturbances. These results clearly answer the first research question by demonstrating that the home environment, when lacking structure and supervision, amplifies the negative impact of digital device use on learning. Regarding the second research question, this study highlights that parental mediation plays a central and decisive role in managing children's gadget use. Active mediation, restrictive mediation, and co-use strategies are proven to be effective in guiding children toward responsible and meaningful digital engagement. Parental awareness, digital literacy, and consistent parenting practices further strengthen children's ability to balance technology use with academic responsibilities. Moreover, collaboration between parents and teachers enhances the effectiveness of these mediation efforts, ensuring consistency between home and school environments. In response to the third research question, the study identifies that instructional intervention models—particularly family-based, school-based, and behavioral approaches—are effective in addressing the negative impacts of gadget use. Structured routines, digital rules, and parental involvement serve as foundational strategies at the family level. Meanwhile, the integration of digital literacy and blended learning in schools promotes productive and educational use of technology. Behavioral strategies, such as time management and reinforcement systems, further support the development of self-regulated learning among students. These findings indicate that a comprehensive and integrative approach is essential to transform gadget use from a learning barrier into a supportive educational tool.

The implications of this study are both theoretical and practical. Theoretically, this research contributes to the existing literature by integrating gadget use, parental mediation, and instructional intervention models into a unified framework, offering a more holistic understanding of children's learning in the digital era. Practically, the findings provide actionable insights for parents,

educators, and policymakers to design effective strategies for managing children's digital behavior and improving learning outcomes. This study also emphasizes that technology should not be eliminated but optimized to support children's development. However, this study suggests that future research should move beyond literature-based analysis by incorporating empirical investigations involving students, parents, and teachers in diverse contexts. Longitudinal studies are also recommended to examine the long-term effects of gadget use on children's learning and development. In addition, future research may explore the effectiveness of specific digital learning applications and culturally responsive intervention models. In conclusion, this study underscores the critical importance of balanced and guided gadget use in the home environment. Through effective parental mediation and well-designed instructional interventions, the negative impacts of digital technology can be minimized while its educational potential is maximized. Ultimately, this research contributes to the growing body of knowledge on digital learning and offers a strategic foundation for improving elementary school students' learning outcomes in an increasingly digital world.

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