

Analysis of the Negative Impact of Gadgets on Elementary School Students

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ABSTRACT

The development of digital technology has a significant impact on students' lives, particularly regarding the intensity of gadget usage at the elementary school level. This study aimed to analyze the negative impacts of gadget usage among students at SD Muhammadiyah 01 Kuripan Kidul, Pekalongan City, and to formulate coping strategies. Utilizing a descriptive qualitative approach, primary data were gathered through interviews, observations, and documentation, involving teachers, students, and parents as informants. Meanwhile, secondary data were obtained through document studies and scientific journals. All data were subsequently analyzed using an interactive model comprising data reduction, data display, and conclusion drawing. The results indicated that gadget usage among students at the school was relatively high and predominantly used for entertainment activities. The negative impacts identified by the researcher included decreased learning concentration, lack of social interaction, and behavioral changes such as lack of discipline and irritability. Furthermore, the recommended coping strategies focused on building synergy between parents and the school to limit and strictly monitor gadget screen time. Additionally, providing digital literacy education and alternative non-gadget activities could be implemented to foster a positive developmental environment for students at SD Muhammadiyah 01 Kuripan Kidul, Pekalongan City.

1. INTRODUCTION

The development of digital technology in the era of globalization has brought significant changes to people's lives, including in elementary education. The use of gadgets, such as smartphones and tablets, is now part of the daily activities of elementary school-aged children, both for learning and entertainment (Astuti, 2023). Social phenomena indicate that children tend to spend more time with digital devices than in learning activities or direct social interactions. Smartphone, tablet, and computer use often replaces non-screen activities, including social activities, play, and other recreational activities (Mullan & Hofferth, 2022). This situation has led to changes in students' behavioral patterns, learning habits, and social interactions, which require further study. In addition to impacting psychological aspects, excessive use of digital devices also has the potential to cause various physical health problems in children. A systematic review conducted by Jain et al. (2023) showed that excessive use of digital devices is associated with an increased risk of sleep disorders, reduced physical activity, obesity, eye health problems, and musculoskeletal disorders in children. These findings are supported by Priftis & Panagiotakos (2023), who stated that high screen time can lead to decreased physical fitness, impaired posture, and various other health problems due to reduced physical activity in children. Thus, uncontrolled gadget use not only impacts mental and social development but also students' physical health. In elementary schools, including Muhammadiyah 01 Kuripan Kidul Elementary School in Pekalongan

City, student gadget use has increased significantly. Initial observations indicate that students are not only using gadgets for learning purposes, but are increasingly using them for entertainment activities such as playing games, watching videos, and accessing social media. This phenomenon has resulted in decreased concentration, low motivation, and reduced social interaction among students. This situation indicates complex and contextual behavioral changes, necessitating a research approach capable of exploring meaning and experience in depth.

Several previous studies have shown that excessive gadget use can negatively impact children's development. Presta et al. (2024) suggested that excessive use of digital devices can affect children's physical health. Furthermore, Nur Azizah et al. (2025) also stated that high screen exposure in children can disrupt cognitive development and focus. Another study conducted by Madigan et al. (2019) also showed a relationship between the duration of gadget use and decreased student academic performance. Furthermore, Kardefelt-Winther (2017) explained that the impact of internet use on children is greatly influenced by the context of use and supervision patterns. These findings indicate that the problem of gadget use for children, especially elementary school-aged children, is not only quantitative (how long it is used), but also qualitative (how it is used). All of these expert opinions were presented using quantitative research methods that focus on cause-and-effect relationships and statistical measurement of variables. Therefore, they are unable to delve deeply into the experiences and perceptions from the perspectives of students, teachers, and parents. Therefore, this study will examine the phenomenon of gadget use among students at Muhammadiyah 01 Kuripan Kidul Elementary School in Pekalongan City, identify negative impacts, and formulate recommended strategies for addressing them through qualitative research methods, exploring experiences and perceptions with teachers, parents, and students as relevant stakeholders. Based on previous research, a research gap remains that requires attention. Most studies on gadget use among elementary school-aged children use a quantitative approach, focusing on measuring the relationship between the duration of gadget use and various aspects of child development, such as academic achievement, physical health, and cognitive development. While these studies have successfully explained the effects of gadget use statistically, studies that delve deeply into the experiences, perceptions, and meanings of gadget use from the perspectives of students, teachers, and parents are relatively limited. Furthermore, previous research generally focuses only on identifying the impacts of gadget use without developing contextualized management strategies tailored to the specific conditions of the elementary school environment. Therefore, research is needed that can provide a more comprehensive understanding of the phenomenon of gadget use through a qualitative approach by directly involving various related parties.

The novelty of this research lies in the use of a qualitative approach to in-depth exploration of gadget usage patterns, their negative impacts on students' academic and behavioral aspects, and relevant management strategies based on the experiences and perceptions of students, teachers, and parents simultaneously. Unlike previous studies that tend to measure the influence of gadget use quantitatively, this study seeks to uncover the social and educational dynamics underlying gadget use among elementary school students in the specific context of Muhammadiyah 01 Elementary School, Kuripan Kidul, Pekalongan City. Furthermore, this study not only identifies problems arising from gadget use but also recommends contextual and applicable management strategies to prevent and control the negative impacts of gadget use in the elementary school environment. Furthermore, Muhammadiyah 01 Elementary School, Kuripan Kidul, Pekalongan City, is located in a community experiencing social transformation due to the rapid development of digital technology. Pekalongan City, as an urban-semi-urban area, has relatively high levels of internet access and digital devices, enabling children to easily use gadgets in their daily lives. On the other hand, some parents have quite busy work schedules, whether in the trade, service, or home industry

sectors, which are characteristic of the Pekalongan community's economy. This situation has the potential to reduce the intensity of parental supervision of children's gadget use at home. These characteristics make Muhammadiyah 01 Elementary School, Kuripan Kidul, a relevant location for studying the phenomenon of gadget use among elementary school students. This in-depth study in the local context is important because it can provide a realistic picture of gadget use patterns, their impacts, and appropriate management strategies for the local social, cultural, and educational context. Therefore, the research findings are expected to provide not only theoretical contributions but also serve as a basis for schools and parents in formulating preventive and educational measures related to gadget use among elementary school-aged children. This study aims to examine in-depth gadget use among students at Muhammadiyah 01 Elementary School, Kuripan Kidul, Pekalongan City, by examining the patterns and intensity of gadget use in daily life. Furthermore, this study aims to analyze the negative impacts of gadget use, particularly on students' academic and behavioral outcomes, to obtain a comprehensive picture of its influence on the learning process and students' social and emotional development. Furthermore, this study aims to formulate and describe effective handling strategies to overcome the negative impacts of gadget use, both through the role of schools, teachers, and parents, so that gadget use can be directed more wisely and support student development and learning achievement.

2. METHODS

This research employs a descriptive qualitative approach to holistically and contextually explore phenomena in natural settings, emphasizing processes, meanings, and participants' perspectives (Rijal Fadli, 2021). Qualitative research is appropriate for understanding the meanings, perceptions, and real-life experiences related to the negative impacts of mobile device use among elementary school students and the strategies implemented to address these impacts. The study was conducted at Muhammadiyah Elementary School. Research informants were selected using purposive sampling, a technique that identifies participants based on specific criteria relevant to the research objectives and their capacity to provide rich and in-depth information regarding the phenomenon under investigation (Campbell et al., 2020). The informants consisted of classroom teachers, students, and parents who were directly involved in and experienced the issues related to mobile device use among children.

Table 1. Research Informants

Informant Group	Code	Number of Informants	Selection Criteria
Classroom Teachers	G1–G3	3 teachers	Homeroom teachers responsible for supervising students' academic and behavioral development at school
Students	S1–S5	5 students	Students identified by teachers and parents as having relatively high screen time and frequent mobile device use
Parents	O1–O5	5 parents	Parents or guardians of the selected students who actively accompany and supervise children at home
Total		13 informants	

The three classroom teachers provided information regarding students' academic performance, classroom behavior, and school disciplinary practices. The five students served as the primary subjects of the study and provided firsthand accounts of their experiences with mobile device use. The five parents contributed information concerning parenting practices, monitoring patterns, and children's behavior at home. Primary data were collected directly by the researcher through semi-structured in-depth interviews. Interviews are a data collection technique used to explore phenomena comprehensively through direct interaction between researchers and participants (Hansen, 2020). To support the interview findings, observations and documentation studies were also conducted. In accordance with the research objectives, interviews and observations focused on two main indicators: (1) the decline in students' cognitive-academic functioning in the classroom and (2) changes in students' psychosocial behavior associated with excessive mobile device use. The primary instrument in this study was the researcher as a human instrument, supported by interview guides and observation sheets. Data analysis employed the interactive model of Miles and Huberman, consisting of three stages: data reduction, data display, and conclusion drawing/verification. To ensure the trustworthiness of the findings, source triangulation was conducted by comparing information obtained from teachers, students, and parents, while technique triangulation was performed by comparing interview, observation, and documentation data. The validated findings were subsequently interpreted and synthesized using relevant child development theories.

3. RESULTS AND DISCUSSION

3.1 Patterns and Purposes of Student Gadget Use

Field findings at Muhammadiyah 01 Elementary School, Kuripan Kidul, Pekalongan City, indicate that the intensity of gadget use among elementary school students has entered the high and intensive category. Based on in-depth interviews, this digital activity occurs almost daily, with a duration ranging from 3 to 4 hours per day. The class teacher (G1) confirmed that most students access their devices immediately after school. This pattern was validated by statements from students (S1) who routinely use devices in the afternoon and evening, and supported by parents' (O1) statements regarding their children's high level of use at home. In terms of purpose, student device use is dominated by non-educational entertainment activities rather than fulfilling learning needs. Informant G1 observed that students spend more time playing online games and watching videos. This was openly acknowledged by S1, who stated that gaming time far exceeds study time. O1 further confirmed that their children rarely use their devices for academic purposes. This unequal use of digital technology demonstrates the shift in the function of gadgets from being a medium for supporting education to a purely unregulated means of recreation. This phenomenon aligns with Kwon et al. (2024), who stated that high levels of screen time without clear limits are linearly correlated with decreased internal motivation and psychological well-being in children. Kamilova et al. (2023) stated that schoolchildren's use of digital devices and the internet is dominated by digital entertainment and recreational activities. Uncontrolled use has the potential to impact psychological well-being and reduce the use of technology for productive and educational purposes.

3.2 Negative Impact of Gadget Use on Academic Aspects

The dominance of digital entertainment activities has a massive negative impact on students' academic performance at school. Research data shows that intensive device use leads to a drastic decline in students' concentration and attention during classroom learning. Informant G1 revealed symptoms of difficulty focusing and decreased material absorption in many students who indicated excessive device use at home. From a student perspective, S1 admitted that he often

experienced mental distractions and lost interest in class material due to emotional urges to return to his devices. This academic impact is exacerbated by the habit of procrastination within the family environment. A parent (O1) reported that their child tends to ignore learning instructions and delay completing homework due to being too engrossed in their digital devices. This field fact proves that excessive gadget stimulation disrupts students' mental readiness to receive formal learning. Theoretically, this finding confirms the research results of Radesky & Christakis (2016), which asserted that high levels of digital screen exposure can damage the development of children's attention and basic cognitive capacities. When children's attention control function is damaged due to gadget addiction, they will lose their ability to concentrate in school. This inability to focus ultimately leads to a decline in the quality of learning, as empirically proven by Qi et al. (2023), who stated that the duration of uncontrolled gadget use has a causal relationship with decreased academic performance in elementary school students. Similarly, what Nur Khoirani et al. (2025) said that although it provides benefits in improving language skills and creativity, gadget use also has negative impacts such as tantrums, impaired focus, delayed communication, and even addiction. Parents have attempted to address the negative impacts by limiting usage time, accompanying their children, and diverting their attention to other activities. Meanwhile, parents also need practical and more accessible guidance for all groups, including those less familiar with technology.

3.3 The Negative Impact of Gadget Use on Students' Psychosocial and Behavioral Aspects

In addition to threatening academic performance, uncontrolled gadget use contributes to a decline in students' psychosocial and behavioral development. Socially, children's attachment to digital devices reduces the quantity and quality of direct interpersonal interactions with peers and family members. Informant G1 explained that several students tended to become less active in social interactions and preferred solitary activities involving gadgets during breaks. This finding was reinforced by student S1, who admitted spending more free time playing games or watching videos than engaging in outdoor activities with friends. Similarly, parent O1 reported that their child rarely participated in neighborhood play activities and spent most afternoons interacting with digital devices. These findings indicate that excessive gadget use may gradually replace opportunities for developing social skills through face-to-face interaction, which is essential during elementary school years. The reduction in direct social interaction was accompanied by notable emotional and behavioral changes. Based on interview and observation data, several students demonstrated symptoms of emotional dependency on gadgets, including irritability, anxiety, and resistance when gadget access was restricted. Teacher G2 observed that students with intensive gadget use tended to become more easily distracted, impatient, and less responsive to classroom instructions. Parent O3 similarly explained that her child frequently became angry, cried, or displayed tantrum-like behavior when gadget use was suddenly interrupted. Student S3 admitted feeling uncomfortable, restless, and frustrated when unable to access favorite digital entertainment applications. From a developmental psychology perspective, this phenomenon can be explained through Piaget's theory of the concrete operational stage, which generally characterizes children aged 7–11 years. At this stage, children are increasingly capable of logical thinking but still experience limitations in abstract reasoning, emotional self-regulation, and delayed gratification. Consequently, gadgets that provide immediate stimulation, instant rewards, and continuous entertainment become highly attractive to children. When access is abruptly terminated, children often perceive the restriction as a direct loss of pleasure, triggering strong emotional reactions. Modern developmental psychology also explains that repetitive exposure to highly stimulating digital content activates reward-seeking behavior, making children more vulnerable to frustration when expected rewards are suddenly removed. Therefore, tantrums, emotional outbursts, and

oppositional behavior observed in this study can be interpreted as manifestations of emotional dysregulation and dependency rather than merely acts of disobedience. These findings support Odgers and Jensen (2020), who argued that uncontrolled digital technology use contributes to emotional vulnerability, anxiety, and impaired social development among children. Furthermore, Guerrero et al. (2019) emphasized that behavioral disturbances related to excessive screen exposure emerge gradually through prolonged patterns of use rather than through isolated incidents. In the context of the present study, emotional instability appears to result from the interaction between excessive gadget exposure, limited social engagement, and the developmental characteristics of children in the concrete operational stage.

3.4 Supervision and Strategies for Handling the Negative Impacts of Gadgets

The findings revealed a significant gap in supervision patterns between school and home environments, which contributed substantially to uncontrolled gadget use among students. Muhammadiyah 01 Kuripan Kidul Elementary School implements strict regulations prohibiting gadget use during school hours except for educational purposes under teacher supervision. However, these regulations become less effective once students return home. Parent informants consistently reported difficulties in maintaining supervision because of work responsibilities, household activities, and limited time available to monitor children's digital behavior. Consequently, students often experience fewer restrictions and greater freedom in accessing digital entertainment outside school. Another challenge identified in this study was the strong dependency that students had developed toward gadget-based entertainment. Student S2 acknowledged experiencing difficulty reducing screen time independently because games and online videos provided immediate enjoyment and relaxation. Teacher G3 also emphasized that schools have limited authority to regulate students' gadget behavior beyond school hours. These findings indicate that efforts to address the negative impacts of gadgets cannot rely solely on school regulations but require active collaboration between schools and families. Based on field findings, an effective intervention model consists of three interconnected strategies. First, parents and children should establish consistent screen-time management through mutually agreed schedules and clear usage rules. Second, schools should strengthen digital literacy education to help students understand the benefits, risks, and responsible use of technology. Third, students should be encouraged to participate in alternative non-digital activities, including sports, extracurricular programs, social interaction, and creative learning experiences that can reduce dependency on digital entertainment.

In practice, parental supervision should be implemented through an integrated approach rather than isolated restrictions. Parents can regulate daily screen time, accompany children during internet use, select age-appropriate content, monitor online activities, and consistently provide alternative recreational activities that do not involve gadgets. Such strategies help children gradually develop self-control without experiencing abrupt restrictions that may trigger emotional resistance. Consistent parental involvement also strengthens emotional bonds and reduces the likelihood of gadget dependency. This finding is consistent with Pitri et al. (2025), who reported that active parental guidance significantly reduces the risk of gadget addiction and supports healthier social and emotional development among elementary school children. The overall findings indicate that successful management of gadget use requires collaborative synergy between schools and families. In accordance with Rajagopal et al. (2026), interventions involving both educational and family ecosystems are more effective than single-setting interventions. Through coordinated supervision, digital literacy reinforcement, structured screen-time management, and meaningful alternative activities, the negative impacts of gadget use can be minimized while supporting students' cognitive, emotional, social, and behavioral development.

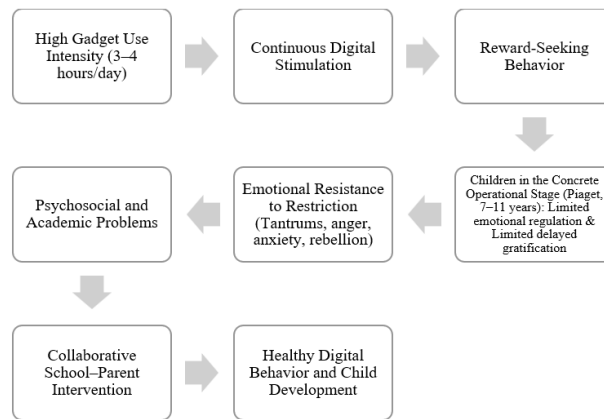


Figure 1. Conceptual Model of Gadget Use Impacts and Intervention Strategies among Elementary School Students

This conceptual model also reinforces the view that children in the concrete operational stage require external guidance and gradual self-regulation support to develop responsible digital behavior and adaptive emotional control in an increasingly technology-oriented environment.

4. CONCLUSION

The intensity of gadget use by students at Muhammadiyah 01 Elementary School, Kuripan Kidul, Pekalongan City is very high. This is especially true for entertainment activities, which negatively impact students' concentration (academic aspects) and trigger emotional instability and the erosion of real interactions (psychosocial aspects). This problem is exacerbated by lax supervision at home due to busy parents and school restrictions on student gadget use during after-school hours outside the school area. Collaborative synergy between parents and the school plays a major role in becoming the main key to handling restrictions on gadget use for students. An integrative management strategy through screen time management, strengthening digital literacy education, and shifting children's focus to extracurricular activities and physical exercise can be consistently implemented to restore the stability of students' cognitive, physical, and social development optimally.

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