Smartphone Usage Intensity and Its Relationship with Learning Interest Among Primary School Students

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Research Article

Smartphone Usage Intensity and Its Relationship with Learning Interest Among Primary School Students

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ABSTRACT

Smartphones have become an essential part of students' lives, influencing their learning interest. This study examines the relationship between smartphone usage intensity and primary school students' learning interest using a quantitative survey approach. A total of 64 students from SDN Bandar Lor 1 Kota Kediri participated, with data analyzed using the Chi-Square test ($\chi^2 = 218.439$, $df = 30$, $p < 0.05$). Findings show that higher smartphone usage is significantly linked to increased learning interest. 80% of students use smartphones for study-related searches, 75% for learning apps, and 70% for completing homework efficiently. Additionally, over 70% reported enhanced learning motivation. However, 77% also spend excessive time on smartphones, mainly for entertainment, leading to potential distractions and dependency. These results highlight that smartphones can be effective learning tools when used appropriately, but unregulated use may negatively impact focus. Guidance from parents and teachers is crucial to maximizing educational benefits while minimizing risks. This study is limited to a single school; future research should expand the sample size and explore long-term effects of smartphone use on cognitive and emotional development.

Keywords: *Digital Learning; Learning Interest; Primary School; Smartphone Usage.*

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1. Introduction

The rapid advancement of information and communication technology in the digital era has profoundly transformed various aspects of life, including education (Maharani & Meynawati, 2024). Among the most influential technological tools are smartphones, which have become almost inseparable from daily life, even for primary school-age children. Smartphones offer numerous advantages, such as instant access to information and educational applications that facilitate the learning process (Senge, 2023; Mandias, 2017; Agung, 2024). However, despite their potential to enhance education, the use of smartphones also presents challenges, particularly when they are used inappropriately or excessively.

In recent years, smartphones have become integral to students' lives, providing opportunities for both academic and non-academic activities. These devices are not only used for communication but also serve as tools for searching for information, accessing learning materials, and interacting on social media platforms. For instance, smartphones provide quick and easy access to diverse educational resources, enabling students to study anytime and anywhere through platforms such as Coursera, Duolingo, or Khan Academy. Interactive learning applications and gamified platforms have demonstrated the ability to increase student motivation and engagement in their studies (Abidin, et al., 2023). However, these benefits come with challenges, particularly when smartphones are used for non-educational purposes such as playing games or browsing social media excessively. Studies have shown that such usage patterns are associated with

decreased concentration, reduced productivity, and a decline in interest in learning (Prodyanatasari et al., 2024; Balqis & Syaikhu, 2023).

While the intensity of smartphone use is often linked to academic challenges, other studies reveal that its wise and purposeful use can positively influence learning outcomes (Andriyana, 2023). This dual nature of smartphone use raises an important question: does the intensity of smartphone use correlate with students' interest in learning? Understanding this relationship is particularly critical for primary school students who are in a formative phase of developing effective study habits. On the one hand, smartphones offer opportunities for interactive and engaging learning experiences. On the other hand, they expose students to distractions such as games and social media, which may undermine their academic focus and cognitive development. These competing dynamics underscore the need for educators, parents, and policymakers to better understand how smartphone use can be managed to maximize its benefits while mitigating its risks (Hapzia & Yarni, 2023).

Empirical evidence highlights the widespread adoption of smartphones among students and its increasing relevance to their academic and social lives. A study by Suhendra et al. (2023) reported a sharp increase in smartphone ownership among students as they progress through school levels. For instance, only 8.7% of first-grade students owned a personal smartphone, but this figure rose dramatically to 82% by grade six. Similarly, research by Sari et al. (2023) revealed that 56.7% of students at SMPN 2 Enam Lingkung demonstrated high levels of smartphone use, which negatively impacted their ability to concentrate on academic tasks. These studies highlight the growing dependence on smartphones among students and the need for effective strategies to ensure their appropriate use.

At SDN Bandar Lor 1 in Kediri, the phenomenon of smartphone use among students has become a growing concern. Observations at the school indicate that most students have access to smartphones, either through personal ownership or shared use with their parents. However, these devices are frequently used for non-educational purposes, particularly outside school hours. Preliminary data reveals that 80% of students engage with smartphones excessively, often prioritizing games, videos, and social media over physical activities or social interactions with their peers. For example, it was observed that during weekends, a significant number of students spend an average of five hours per day on smartphones, primarily for entertainment purposes. This behavior has raised concerns among educators and parents about its potential impact on students' interest in learning and overall academic performance.

Beyond concerns about time management, unsupervised smartphone use poses broader risks to students' physical, psychological, and cognitive development. Frequent and prolonged screen time has been linked to various health issues, such as eye strain, disrupted sleep patterns, and reduced physical activity (Nurrita, 2018). Moreover, the lack of parental supervision can expose students to inappropriate or harmful online content, further compounding the risks associated with unregulated smartphone use (Riwu & Barus, 2023). Parents at SDN Bandar Lor 1 have reported struggling to regulate their children's smartphone use due to their own busy schedules, which exacerbates the issue. This dependency not only affects academic performance but also hinders students' ability to engage in meaningful social interactions with their peers and family members.

Despite these challenges, smartphones hold tremendous potential to enhance education when used wisely and purposefully. For instance, smartphones provide access to reliable and wide-ranging information, enabling students to explore topics of interest and broaden their horizons (Rara, 2024; Masadeh, 2021). Interactive learning

applications, such as Duolingo and Khan Academy, employ gamified elements like quizzes, progress tracking, and achievements to make studying more engaging and enjoyable. Furthermore, platforms like Google Classroom and Microsoft Teams allow students to collaborate on group projects and communicate effectively with their teachers, removing barriers imposed by time or location.

Personalized learning is another significant benefit of smartphones. They allow students to learn at their own pace and adapt materials to their preferred styles. Platforms such as Coursera and Udemy offer flexibility in accessing online courses, enabling students to organize their study schedules and revisit difficult topics as needed. Additionally, smartphones support multimedia learning through videos, animations, and audio, which simplify complex concepts and make them more accessible to young learners. Beyond academic outcomes, smartphones also help students develop essential digital skills, such as navigating applications, critically evaluating online resources, and managing technology effectively. These competencies are crucial for success in an increasingly technology-driven society.

When managed effectively, smartphones have the potential to transform the educational landscape. They can empower students by enhancing their motivation, expanding their access to resources, and equipping them with critical skills for the future. However, this transformative potential hinges on the proper guidance and oversight of smartphone use, particularly for primary school students who are more susceptible to the negative impacts of excessive screen time and online distractions.

Given the dual impact of smartphones on students' learning, it is crucial to conduct a focused investigation into their role in shaping learning interest. At SDN Bandar Lor 1, where smartphone use is prevalent and often excessive, understanding how its intensity affects students' interest in learning can provide valuable insights for educators and parents alike. Research has shown that structured smartphone use supervised by parents and teachers correlates positively with improved academic achievement and reduced distractions. Conversely, unregulated use, especially for durations exceeding four hours daily, has been linked to declining academic performance and behavioral issues.

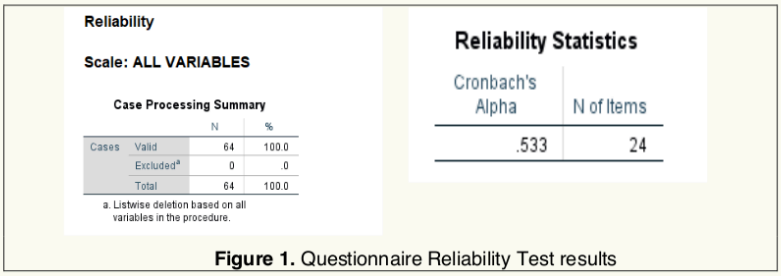
This study aims to explore the relationship between smartphone use intensity and primary school students' interest in learning. By focusing on the students of SDN Bandar Lor 1, this research seeks to address a significant gap in the literature on the intersection of technology use and learning outcomes in Indonesian primary schools. The findings are expected to provide practical recommendations for parents, teachers, and policymakers to create a balanced and supportive learning environment. By emphasizing the importance of purposeful and supervised smartphone use, this study hopes to maximize the educational benefits of smartphones while minimizing their risks. Ultimately, it aspires to provide actionable strategies for harnessing technology to enhance learning outcomes in a sustainable and effective manner.

2. Method

This study uses a quantitative approach with a survey method to identify the effect of smartphone use on elementary school student's interest in learning. The research was conducted at SDN Bandar Lor 1 Kediri City by involving students as research subjects. The research was conducted in October-November 2024 with a descriptive correlational research design that aims to analyse the relationship between smartphone use (as the independent variable) and student learning interest (as the dependent variable). The population in this study were students in grades 3, 4, and 5 at SDN Bandar Lor 1, Kediri

City, totalling 64 students. The sampling technique used totality sampling, where all students in grades 3, 4, and 5 were respondents. The research instruments used were questionnaires and interviews. The questionnaire was the main instrument in the study and consisted of 24 questions which were divided into two parts, namely; (1) part 1: to measure the level of smartphone use (including: frequency, duration, and purpose of use) and (2) part 2: to measure student's interest in learning based on indicators such as learning motivation, concentration, and active participation in learning activities. The answer options on the questionnaire used a Likert scale of 1 to 4. The research procedure was conducted through 4 (four) stages, namely: (1) planning and initial observation, (2) research implementation and data collection, (3) data analysis, and (4) reporting of research results.

The questionnaire used as a data collection instrument had previously been tested for reliability and validity. The validity test of the questionnaire was carried out by experts in the field of educational technology. This expert will assess each question item whether it is in accordance with the research objectives and has covered the important aspects to be studied. In addition to the validity test, a reliability test was also conducted to measure the internal consistency of the questionnaire to produce stable and reliable data. The reliability test used Cronbach's Alpha with the following results.



Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	64	100.0
	Excluded[a]	0	.0
	Total	64	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.533	24

Figure 1. Questionnaire Reliability Test results

In the interview session, representatives of 5 students from each class were interviewed. The selection of respondents was based on the highest intensity of smartphone usage. The questions posed to the respondents consisted of both open-ended and closed-ended questions. Open-ended questions were used to explore respondents' opinions, experiences, and insights about smartphone utilization. Meanwhile, closed-ended questions aimed to determine the extent of students' knowledge about the impact of smartphone usage. The closed-ended questions comprised 5 structured questions, while the open-ended questions included 10 structured questions.

In the third stage, data analysis techniques were implemented, including: (1) Validity and Reliability Testing: To ensure that the questionnaire instruments used were valid and reliable; (2) Pearson Correlation Analysis: To identify the relationship between smartphone usage and learning interest; and (3) Simple Linear Regression Test: To measure the influence of smartphone usage on students' learning interest. In conducting this research, respondent identities were codified to maintain confidentiality. In addition to analyzing the questionnaire results, an analysis was also conducted on the interview responses.

3. Result

This section presents the findings of the research conducted to analyze the relationship between the intensity of smartphone use and the learning interest of primary school students. The results are divided into several subsections, starting with the respondent profile to provide an overview of the study participants, followed by statistical analyses to evaluate the correlation and potential impacts of smartphone use on learning interest. These findings aim to shed light on how smartphone usage patterns among young learners influence their motivation and engagement in educational activities.

a. Respondent profile

This study, conducted in October-November 2024, focused on the effect of smartphone use on the learning interest of elementary school students in grades 3, 4, and 5 at SDN Bandar Lor 1, Kota Kediri. A total of 64 students participated as respondents. The detailed distribution of respondents is shown in Table 1 below:

Tabel 1. Distribution of Respondents by Class and Gender

Class	Student's amount		Total
	Male	Female	
3	14	13	27
4	18	8	26
5	6	5	11
Amount	38	26	64

Table above demonstrates the distribution of respondents across three different grades and gender. Grade 3 students made up the largest proportion of respondents, totaling 27 students (42.2%), followed by grade 4 with 26 students (40.6%), and grade 5 with the smallest group of 11 students (17.2%).

The profile of the number of respondents based on gender can be seen in Figure 2 below:

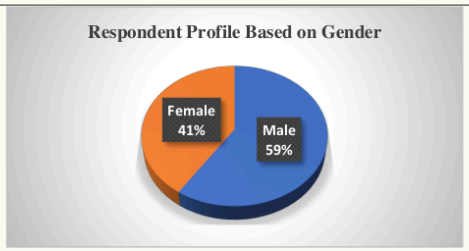


Figure 2. Respondent Profile Based on Gender

When analyzed by gender, male students accounted for 38 participants (59%), while female students totaled 26 participants (41%). This gender imbalance suggests a higher representation of male students, particularly in grades 3 and 4, where male participation was significantly higher than that of females. In grade 5, the difference between male and female participants was less pronounced, with only one additional male participant.

The larger number of male respondents could be due to the class distribution at SDN Bandar Lor 1 or potentially greater willingness or availability of male students to participate in the study. Understanding this distribution is important as it may influence

how the findings on smartphone usage and learning interest are interpreted, especially if gender differences play a role in usage patterns or learning behaviors.

b. Smartphone Usage Patterns Among Primary School Students

The findings from the questionnaire reveal distinct patterns in students' smartphone usage. As illustrated in Figure 3**,** most students use smartphones frequently throughout the day, with a significant proportion engaging in smartphone activities before or after school, during school breaks, and for extended periods on holidays. Additionally, more than half of the respondents reported using their smartphones for over two hours daily, with common activities including gaming, watching videos, and accessing social media**.**

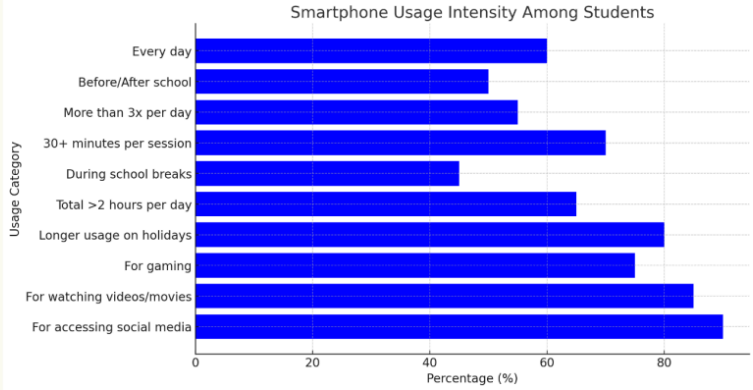


Figure 3. Smartphone Usage Intensity Among Students
Source: Generated by AI, based on questionnaire data analysis, 2025.

These results indicate that smartphones are an integral part of students' daily routines, and their usage is not limited to entertainment but also extends to activities that may contribute to their academic engagement. However, the purpose of smartphone usage varies, with some students using them for educational purposes while others primarily engage in non-academic activities.

c. Students' Learning Interest in Relation to Smartphone Use

To assess the impact of smartphone, use on students' learning interest, the study analyzed various aspects of learning behavior influenced by smartphone utilization. Figure 4 presents students' perceptions of how smartphones affect their learning activities.

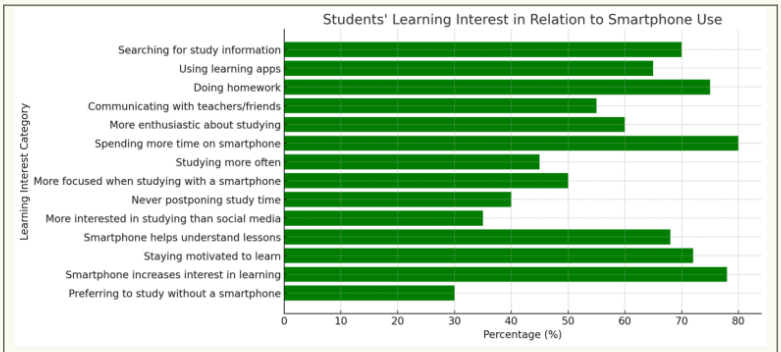


Figure 4. Students' Learning Interest in Relation to Smartphone Use
Source: Generated by AI, based on questionnaire data analysis, 2025.

According to the survey, a considerable percentage of students (above 70%) agreed that smartphones help them search for study-related information, use learning apps, and complete homework more efficiently. Furthermore, many students reported that smartphones enhance their motivation to learn, improve lesson comprehension, and increase their study frequency. However, a smaller percentage (35%) preferred studying without smartphones, indicating that most students have integrated smartphone usage into their learning habits.

These results highlight the dual impact of smartphone use—while it provides valuable learning resources, excessive or unregulated use might lead to distraction. Therefore, structured and guided smartphone usage is essential to maximize its positive educational benefits.

d. The Effect of Smartphone Use on Elementary School Student's Learning Interest in the Digital Era

Based on the questionnaires completed by 64 elementary school students at SDN Bandar Lor 1 Kota Kediri, the data were subjected to a Normality Test to determine whether they were normally distributed.

Table 2. Research Data Normality Test Results

Tests of Normality[a]

		Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	MinatBelajar	Statistic	df	Sig.	Statistic	df	Sig.
IntensitasPenggunaanSmartphone	49.00	.260	2	.			
	50.00	.300	5	.161	.833	5	.146
	51.00	.	11	.	.	11	.
	52.00	.495	19	.000	.460	19	.000
	53.00	.	24	.	.	24	.
	54.00	.	2	.			

a. IntensitasPenggunaanSmartphone is constant when MinatBelajar = 48.00. It has been omitted.

b. Lilliefors Significance Correction

(Sources: author's personal document)

Based on the Normality Test results in Table 2, it was found that the research data are not normally distributed, as indicated by a significance value (sig.) of less than 0.05. Since the data do not meet the assumption of normality, a nonparametric statistical test was utilized for further analysis, specifically the Chi-Square Test. The Chi-Square Test was selected because it aligns with the research objective, which is to examine the relationship between the intensity of smartphone usage and elementary school students' interest in learning. The results of the Chi-Square Test are presented below:

Table 3. Chi-Square Test Results

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	218.439[a]	30	.000
Likelihood Ratio	147.553	30	.000
Linear-by-Linear Association	50.158	1	.000
N of Valid Cases	64		

a. 39 cells (92.9%) have expected count less than 5. The minimum expected count is .02.

(Sources: Personal documents of the author)

The results of the Chi-Square test ($\chi^2 = 218.439$, $df = 30$, $p < 0.05$) provide robust evidence of a statistically significant relationship between smartphone use intensity and learning interest among primary school students. This finding underscores the idea that higher smartphone use intensity, when aligned with educational purposes, can significantly enhance student motivation and engagement in learning activities. Specifically, at SDN Bandar Lor 1 Kediri, students who utilized smartphones more frequently showed a noticeable increase in their interest in learning, suggesting that smartphones, when integrated effectively, can serve as powerful tools to support academic development.

These results emphasize the dual nature of smartphone use—its potential to act as a transformative educational tool while also posing risks if used without proper guidance. Purposeful and supervised smartphone use can foster a more interactive and engaging learning environment, providing students with diverse resources and opportunities to learn at their own pace. This reinforces the importance of collaboration among educators, parents, and policymakers in ensuring that smartphone use contributes positively to students' educational experiences and outcomes.

4. Discussion

The findings of this study reveal that smartphone usage has the potential to exert both positive and negative effects on elementary school students' learning interest, depending on how these devices are utilized. When used for educational purposes, such as accessing interactive learning applications or digital resources, smartphones can significantly enhance student motivation and engagement by making learning more dynamic, flexible, and enjoyable. Conversely, unregulated or excessive use, especially for non-educational activities like gaming or social media, may result in distractions,

diminished focus, and a decline in academic performance. These outcomes underscore the importance of fostering purposeful and supervised smartphone usage to fully harness their educational benefits while minimizing potential drawbacks. Specifically, the use of smartphones can positively influence student learning motivation through various mechanisms, including the following:

a. Ease of accessing learning resources: Smartphones provide easy access to information sources, such as learning applications, educational videos, e-books, and articles or other information that can improve student's understanding and knowledge. This ease of access can motivate and increase student's interest in learning because students find it easier to connect with interesting and interactive learning materials.

b. Engaging Technology-based Learners: The use of smartphones integrated with learning technology, such as quizziz apps, kahoot!, teachers' room, and so on can make the learning process more interesting and fun. Fun learning methods can increase student's motivation and interest in learning. This is due to the comfort and convenience of technology-based learning felt by the student.

c. Student involvement in independent learning activities: Smartphones allow students to conduct independent learning outside of school hours, access additional materials, and find solutions to problems encountered when learning. This can strengthen student's interest in learning as students feel more empowered in managing their learning. In addition, the use of smartphones makes it easier for students to learn because students can learn anytime and anywhere, whether at home, at school, or other public places.

d. Interactive and engaging learning: the use of visual media, audio, and game-based learning will increase student's enthusiasm in learning. Interesting, interactive and up to date media will provide a positive stimulus to student's interest in learning. In game-based learning, students are invited to play while learning so that learning will take place pleasantly.

e. Personalised learning with customised content: smartphones allow students to choose the type of material that suits their needs and learning style. For example: students who prefer learning through visuals can choose videos or infographics, while those who prefer reading can search for articles or e-books.

f. Learning based on student's pace: by using smartphones, students can learn at their own pace. Students can repeat material that is difficult to understand or move on to the next material according to their ability and do not need to wait for other friends as when learning in a conventional classroom.

g. Developing student's digital skills: The use of mobile phones in learning can help students develop digital skills which are essential in the modern world. Students learn how to use apps, search for information effectively and communicate using technology.

h. Develop student's problem-solving skills: By using smartphones to find solutions or answer questions through apps or online resources, students can improve their problem solving and critical thinking skills.

The positive impact of smartphone use can empower students to achieve optimal academic performance by enhancing their motivation, engagement, and access to diverse learning resources. However, to fully realize these benefits, smartphones must be used wisely and purposefully, ensuring that their use aligns with educational goals and does not become a source of distraction. The critical role of parents, teachers, and

the surrounding environment cannot be overstated in this regard. Supervision and guidance are essential to minimize the potential risks associated with inappropriate or excessive smartphone use, particularly among elementary school students who are more susceptible to its adverse effects.

While the wise and structured use of smartphones has undeniable benefits, improper usage can lead to significant challenges. These negative consequences include various issues such as disruption of focus, academic underperformance, and health concerns. The potential risks are detailed as follows:

a. Disruption of Focus and Academic Performance. Using smartphones for gaming, social media, or videos can distract students from schoolwork and reduce study time, as they tend to prioritize playing with their smartphones. This leads to decreased study time and, over time, a decline in academic performance. This is consistent with research by Ula, W.R.R. (2021), which found that students addicted to smartphones become lazy in studying and rush through school assignments, resulting in less accuracy. They do this to quickly return to playing with their smartphones. Such students also tend to feel irritated when given daily assignment (Ula, 2023).
b. Dependency (Addiction). Students addicted to gadgets may experience academic stress (Hamrat, Hidayat & Sumantri, 2019). Furthermore, gadget addiction can lead to low self-control and emotional regulation (Aulia, R., & Fitriani, Y., 2024).
c. Physical Health Issues. Research by Navarona revealed that among 64 respondents interviewed regarding unsafe gadget usage: Most respondents used gadgets while lying down (60.9%) compared to sitting (39.1%). Many used gadgets at less than 30 cm (56.2%) rather than 30 cm or more (43.8%). A majority used gadgets for more than 2 hours (68.8%) compared to less than 2 hours (31.2%). Bright lighting was more commonly used while operating gadgets (65.6%) compared to dim lighting (34.4%). Subjective complaints among respondents included headaches (68.8%), itchy eyes (64.1%), watery eyes (65.6%), discharge or crusty eyes (57.8%), red eyes (62.5%), eye fatigue, and difficulty seeing long distances (54.7%) (Navarona & Mahawati, 2016).
d. Mental Health Issues. During the pandemic, gadget usage could enhance children's and adolescents' mental health, but it must be monitored and limited to prevent addiction (Fikri, 2023). Research by Oktaviani, S., et al., found that in Pablengan Village, 57.1% of children used gadgets for more than 2 hours (68 children), and 60.5% (72 children) experienced abnormal mental health (Oktaviani, Wulandari & Mirasari, 2022).
e. Sleep Disorders**.** Research by Indriani found that 64.6% of respondents used smartphones for extended periods, and 35.4% experienced sleep disturbances. The analysis showed a correlation between smartphone usage duration and sleep disorders in school-age children. Exposure to smartphones for more than 7 hours/day significantly increases sleep latency, reducing children's total sleep time. Parental control is crucial to addressing this issue. Children should not own smartphones personally, making it easier for parents to monitor their use (Indriani, et al., 2022)
f. Social and Emotional Development Issues. Research by Mahfuji, M., & Lastriani found that smartphones influence children's social and emotional development, such as increased defiance toward parents and preferring smartphone games over interacting with peers. Children who rarely use smartphones maintain their social-emotional development, control their smartphone usage, and remain sociable with peers, unaffected by smartphone influence. Their character reflects their natural traits rather than being shaped by smartphones (Mahfuji & Lastriani, 2023).

The findings of this study, along with supporting research, underscore the dual nature of smartphone use in educational settings. On one hand, smartphones offer remarkable opportunities to enhance student engagement, foster independent learning, and develop essential digital skills. On the other hand, the risks associated with unregulated and excessive use—such as dependency, reduced focus, and physical or mental health issues—cannot be ignored. These contrasting effects highlight the critical importance of striking a balance between leveraging the positive potential of smartphones and mitigating their negative consequences. Therefore, effective strategies for integrating smartphone use into educational frameworks must consider both its benefits and its challenges.

As this discussion has demonstrated, while the potential benefits are promising, addressing the risks requires collective effort from educators, parents, and policymakers. The next step involves identifying actionable measures to promote purposeful and supervised smartphone use, ensuring that its adoption supports student learning without compromising their well-being.

5. Conclusion

The findings of this study, based on the Chi-Square analysis ($\chi^2 = 218.439$, $df = 30$, $p < 0.05$), confirm a statistically significant relationship between the intensity of smartphone use and students' interest in learning. A p-value of less than 0.05 indicates that greater smartphone use intensity is associated with increased student motivation and engagement in learning activities. The survey results reinforce this correlation, showing that 80% of students use smartphones to search for study-related information, 75% utilize learning apps, and 70% believe that smartphones help them complete homework efficiently. These findings highlight the potential of smartphones as effective learning tools, particularly when used purposefully for accessing educational resources, enhancing comprehension, and supporting interactive learning.

However, the study also underscores the dual nature of smartphone use. While smartphones facilitate learning, over 77% of students reported spending extended time on smartphones, and a significant portion used them for entertainment purposes such as gaming and social media. This excessive or unregulated use may lead to reduced focus, dependency, and negative impacts on students' physical and mental health, as suggested by previous research. Additionally, only 35% of students preferred studying without smartphones, indicating that most students have integrated smartphone use into their learning routines. These results highlight the importance of structured and guided smartphone use, where parents and teachers play a critical role in ensuring that smartphones support educational goals while minimizing distractions.

This study is limited by its focus on a single school and a sample size of 64 students, which may affect the generalizability of its findings. Future research should address these limitations by expanding the sample size and including diverse educational settings. Additionally, interdisciplinary collaboration with psychologists and education specialists is recommended to explore the broader cognitive and emotional effects of smartphone use on students. By addressing these challenges, future studies can provide more comprehensive strategies for leveraging smartphone technology to enhance learning outcomes while ensuring student well-being.

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