



The Relationship between Gadget Use and Elementary School Students' Psychomotor Abilities

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Abstract

This study is based on the fact that elementary school-aged children frequently use gadgets, which can impact their motor skills and the quality of movement in daily life. The purpose of this study was to determine the relationship between electronic device use and the psychomotor abilities of first-grade elementary school students, as well as the contribution of electronic device use to psychomotor development. The study also examined the frequency of children's use of electronic devices. This may impact the balance between digital and physical activity, both of which are important components of child development. This study used a quantitative correlational approach and an ex post facto design. The study involved 60 randomly selected students from Pasir Biru and Cikeusik Elementary Schools. The TGMD2 Test of Gross Motor Development, Second Edition was used to assess students' psychomotor abilities. A questionnaire was also used to measure the level of device use. The data were then analyzed using SPSS version 25 to conduct descriptive statistical analysis, normality tests, Spearman correlation tests, and linear regression analyses. The results of the study showed a negative relationship between device use and psychomotor abilities, but this relationship was not statistically significant, with a correlation coefficient of -0.028. Furthermore, the analysis showed that the contribution of device use to psychomotor abilities was relatively low. This suggests that many other factors outside the study were more influential, such as physical activity, the play environment, and parenting styles. Therefore, it can be concluded that device use is not an important or primary factor influencing students' psychomotor abilities. Therefore, efforts to maximize students' psychomotor development should focus on increasing physical activity and controlling device use wisely and in a balanced manner in everyday life.

How to Cite

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INTRODUCTION

The advancement of digital technology has profoundly altered the lives of elementary school-aged children, especially with the frequency of gadget usage, including smartphones and tablets. This shift affects social interaction patterns and children's learning styles by utilizing more engaging and flexible interactive media (Dezuanni et al., 2015). This corresponds with the findings of (Tripathi et al., 2024) that the utilization of digital technology can enhance student participation in the educational process. Nevertheless, enhanced access to electronic gadgets at a young age also introduces new concerns regarding the equilibrium between digital and physical activity in children. (Novikova et al., 2025) showed that digital device usage alters children's daily routines, a conclusion supported by (Yolcut et al., 2024) effects on physical and mental health. (Robidoux et al., 2019) asserted that excessive digital device usage is associated with children's behavioral development and well-being.

From a theoretical standpoint, psychomotor development, which includes gross and fine motor coordination, is essential for facilitating children's scholastic and daily tasks. (Borrego-Balsalobre et al., 2021) asserted that psychomotor development contributes to enhancing children's learning capabilities. (Escolano-Pérez et al., 2020) also highlighted the correlation between fine motor skills and pupils' academic performance. Excessive use of digital devices may diminish children's physical activity, thereby affecting their motor development. This scenario indicates that a balance between digital and physical activities is essential for optimum psychomotor development.

Numerous prior studies have investigated the correlation between gadget usage and the motor development of children. (Felix et al., 2020) discovered that high screen media consumption correlates with worse motor abilities in children. (Páez-Herrera et al., 2025) established a correlation between screen usage and motor development in school-aged children. (Rogović et al., 2022) identified a correlation between screen time and children's motor skills, but (Guglielminetti et al., 2022) determined in their literature review that excessive screen usage can adversely affect motor skill development. Nevertheless, the majority of this research concentrates on generic contexts and has not precisely investigated the equilibrium between digital and physical activities within particular elementary school environments.

Children typically prefer interacting with electronic gadgets to engaging in physical activities or traditional play, according to empirical field research. This circumstance suggests a change in activity patterns that may have an adverse effect on kids' psychomotor development. This issue is made worse by a lack of supervision and limitations on device usage, highlighting the significance of community and family involvement in controlling digital device use to preserve equilibrium with kids' social and physical engagement.

The research problem can be formulated as follows: how does gadget use affect the psychomotor development of elementary school-aged children, and how does the balance between digital and physical activities facilitate this development? This study aims to examine the correlation between gadget use and children's psychomotor development, as well as to underscore the importance of regulating the duration of digital device use. The research hypothesis states that the level of gadget use substantially affects the psychomotor development of elementary school-aged children.

This study is innovative as it investigates the correlation between gadget usage and psychomotor skills within the specific setting of primary schools in Indonesia, namely pasir biru primary school and cikeusik elementary school. This study focuses on local empirical situations, in contrast to prior studies that were typically undertaken in a broader or worldwide setting. This study explores the association between gadget use and psychomotor development, while also quantifying the contribution of gadget use to psychomotor skills by regression analysis. Another innovation is its focus on the significance of balancing digital and physical activities to foster children's growth. This study reveals data that contrast with the majority of prior research, specifically demonstrating a negligible and statistically insignificant correlation, suggesting that gadget use is not a principal determinant affecting children's psychomotor skills. This study offers a novel perspective on the significance of elements outside gadget usage in children's psychomotor development.

METHOD

This study used a correlational design and quantitative methods to investigate the association between children's psychomotor skills and gadget use. An *ex post facto* research strategy was employed, meaning the study was conducted

by tracking and evaluating correlations between factors based on available data, rather than by providing specific therapy to patients. Because it successfully allows for empirical exploration of cause-and-effect relationships without altering the study variables, this approach was chosen..

The study population for this research comprised 60 primary school kids from pasir biru primary school and cikeusik elementary school, aged 10 to 11 years, including 18 girls and 12 boys. Purposive sampling, which selects participants based on specific characteristics pertinent to the research aims, such as age and grade level, was employed to determine the sample.

The research instruments used were questionnaires and assessments. The questionnaires assessed gadget use, including duration, frequency, and type of use. Psychomotor skills were also evaluated using the TGMD (Test of Gross Motor Development, Second Edition), a commonly used assessment for children's gross motor skills. The instruments used in this study displayed pre-determined variable indicators, thus accurately representing the actual situation on the ground.

The basic data used in this study was collected directly from respondents using field measurements. Students were given questionnaires and psychomotor tests were used as data collection techniques. To guarantee the precision and consistency of the data acquired, data collection was carried out carefully in compliance with study protocols.

Using SPSS version 25 software, inferential statistical techniques were used to analyse the gathered data. The relationship between children's use of gadgets and their psychomotor abilities was examined. To verify a significant association between the two variables, hypothesis testing was carried out using a significance value at the 95% confidence level ($\alpha = 0.05$).

RESULTS AND DISCUSSION

Table 1. Descriptive Statistics

Variable	N	Max	Mean	Std. Deviation
Gadget Usage	60	-	40.08	3.76
Psychomotor Ability	60	25,00	17.80	4.48

According to **Table 1** descriptive analysis, the average score for gadget utilisation was 40.08, with a standard deviation of 3.757. With a standard deviation of 4.475, the average psychomotor ability score was 17.80. The psychomotor ability score varied from 10.00 to 25.00, whereas the gadget usage variable had minimum and maximum scores of 31.00 and 48.00, respectively.

These results show that the data for both variables vary significantly, which calls for more research.

The descriptive analysis presented in **Table 1** shows that the average gadget usage was 40.08, with a standard deviation of 3.757, while the average psychomotor ability was 17.80, accompanied by a standard deviation of 4.475. The minimum and maximum values for the gadget usage variable were 31.00 and 48.00, respectively, while psychomotor ability ranged from 10.00 to 25.00. These results indicate sufficient data variation in both variables, thus requiring further research.

Table 2. One-Sample Komogorov-Smirnov Test

Indicator	Gadget Usage (Z-score)	Psychomotor Ability (Z-score)
N	60	60
Mean	0.00	0.00
Std. Deviation	0.00	0.00
Absolute Difference	0.123	0.109
Positive Difference	0.097	0.108
Negative Difference	-0.123	-0.109
Test Statistic	0.123	0.109
Asymp. Sig. (2-tailed)	0.025	0.072

Additionally, **Table 2** normality test findings from the One-Sample Kolmogorov-Smirnov Test produced a significant value of 0.072 for the psychomotor ability variable and 0.025 for the gadget usage variable. This suggests that while the psychomotor ability data are typically distributed, the gadget usage statistics are not. As a result, non-parametric techniques more especially, the Spearman test are used to examine the relationship between variables.

Table 3. Spearman Correlation

Variable	Gadget Usage	Psychomotor Ability
Gadget Usage Correlation Coefficient	1.000	-0.028
Sig. (2-tailed)	—	0.829
N	60	60
Psychomotor Ability Correlation Coefficient	-0.028	1.000
Sig. (2-tailed)	0.829	—
N	60	60

Table 3 presents the results of the Spearman correlation test, which shows a correlation coefficient of -0.028 between gadget use and psychomotor abilities, accompanied by a significance value of 0.829 (>0.05). This indicates a

negative, though not significant, relationship between the two variables. Consequently, increased gadget use does not directly lead to substantial changes in children's psychomotor abilities.

Table 4. Koefisien Determinasi

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.261	0.068	0.052	37.13

The regression analysis results in **Table 4** yielded a correlation coefficient (R) of 0.261, indicating a weak relationship between gadget use and psychomotor skills. The coefficient of determination (R^2) of 0.068 indicates that gadget use only accounts for 6.8% of the variance in psychomotor skills, with the remaining 93.2% being due to external factors not examined in this study. This suggests that gadget use has a minimal impact on psychomotor skills.

The findings of this study indicate a very weak and negative relationship between gadget use and students' psychomotor abilities, suggesting that gadget use is not a dominant factor influencing motor development. This result aligns with psychomotor development theory, which emphasizes the importance of physical activity as the primary driver of motor skill development in children (Borrego-Balsalobre et al., 2021). Furthermore, fine and gross motor skills are closely related to children's learning outcomes and daily functioning (Escolano-Pérez et al., 2020) also highlighted the correlation, indicating that passive activities such as excessive gadget use may have limited contribution compared to active physical engagement.

Previous studies also support the notion that screen exposure can influence motor development, although the strength of the relationship varies. Research by Felix et al., (2020) found that excessive screen time is associated with poorer motor skills in children, while Páez-Herrera et al., (2025) and Rogović et al., (2022) reported a relationship between screen use and motor development. However, unlike those studies, the present research found that the relationship is extremely weak and not meaningful, suggesting that the impact of gadget use may depend on contextual factors such as duration, supervision, and the type of digital content consumed Guglielminetti et al., (2022)

The weak relationship found in this study indicates that other factors play a more substantial role in shaping children's psychomotor abilities. Factors such as physical activity levels, play

environment, parenting styles, and biological maturation are likely to contribute more significantly to motor development (Yoluut et al., 2024; Novikova et al., 2025). This finding highlights that psychomotor development is multidimensional and cannot be explained solely by gadget usage. Therefore, focusing only on reducing gadget use without improving physical activity opportunities may not lead to optimal developmental outcomes.

On the other hand, gadget use is not entirely detrimental when used appropriately. Digital technology can enhance engagement and learning experiences when integrated effectively into educational contexts (Tripathi et al., 2024). This suggests that the issue is not the presence of technology itself, but rather how it is used and balanced with physical activity. As also emphasized by Robidoux et al., (2019), maintaining a balance between screen time and active play is essential to support children's overall development and well-being.

This study possesses some shortcomings that warrant acknowledgment. The sample size was relatively small and concentrated solely on a particular elementary school, perhaps diminishing the generalizability of the results. Secondly, the research depended on self-reported questionnaire data to assess gadget usage, which, as noted by (Beynon et al., 2024) may induce response bias in investigations of children's digital device utilization. The study failed to consider other crucial variables, such the intensity of physical exercise, the nature of gadget content, and parental supervision, which, as noted by (Vrinda et al., 2022) significantly impact children's overall development.

Moreover, the study's results contradict the original idea that gadget usage would significantly influence psychomotor development. Nevertheless, the findings revealed that the correlation was negligible, suggesting that gadget usage was not a principal determinant. This corresponds with the perspective of (Dadson et al., 2020) who asserted that the impact of screen time on motor development is intricate and indirect. (Malincheva & Shtereva, 2025) Contended that children's motor development is predominantly impacted by physical exercise and the play environment. This mismatch underscores the necessity to re-evaluate ideas about the direct influence of digital technology on children's motor development.

Consequently, it is advisable for future study to incorporate a wider array of factors, larger and more heterogeneous samples, and more objective measurement instruments. Subsequent

research should further investigate the influence of physical activity, environmental variables, and parenting styles. Educators and parents are encouraged to not only restrict gadget usage but also to actively promote physical activity and foster an environment conducive to children's psychomotor development.

CONCLUSION

The results of the study show that pupils' psychomotor skills in rancakalong, sumedang, are related to gadget use, with a negative direction of association. However, the relationship does not demonstrate a meaningful statistical association. Increased gadget use is not associated with improvements in students' psychomotor skills, as indicated by the correlation coefficient of -0.028 with a probability value of 0.829 (>0.05). The relationship is very weak and tends to move in the opposite direction. Furthermore, regression analysis shows that gadget use contributes only 6.8% to psychomotor ability, indicating that most of the variation is influenced by other factors beyond the scope of this study.

According to this study's response to the research question, pupils' psychomotor skills are not primarily influenced by the use of gadgets. The play environment, parenting styles, sports training, and physical activity all have a impact on psychomotor development. As a result, even though the usage of gadgets is correlated with psychomotor skills, its influence in this study is negligible. This study demonstrates that, while not the only factor, gadget use is a contributing factor to psychomotor ability. Thus, it's critical to strike a balance between social interaction and digital involvement. physically in order to maximise students' psychomotor development.

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