



Gadget Use and Social-Emotional Growth: Does It Connect or Detach Children from Their Peers?

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Abstract

This study examines the relationship between gadget use and the social and emotional development of early childhood. Concerns over the increasing intensity of gadget use in early childhood and its potential negative impact on social interaction and emotional regulation prompted this quantitative correlational study involving 25 children aged 5-6 years at Pembina Kindergarten, Kampar, selected using a total sampling technique. Data were collected through a Likert-scale questionnaire completed by parents and teachers, accompanied by documentation. Data analysis, conducted using SPSS 25.0, included a nonparametric Spearman's Rank correlation test and the coefficient of determination. The results showed a significant negative correlation ($r = -0.639$, $p = 0.001 < 0.05$) between gadget use and social and emotional development, indicating a strong association. Furthermore, gadget use explained 41.8% (Adjusted $R^2 = 0.418$) of the variation in children's social and emotional development, with the remaining variation related to other factors such as parenting styles, environment, and external social interactions. These findings emphasize the need for wise gadget management to support optimal social and emotional growth. Longitudinal studies with larger, more diverse samples could help better understand the long-term impact of gadget use on early childhood and are recommended for further research. Qualitative research could also be conducted to explore the role of parenting styles and the family environment in moderating the relationship between gadget use and children's social and emotional development.

Keywords: Early Childhood; Gadget Use; Social-Emotional Development



A. INTRODUCTION

Children's social and emotional development constitutes a crucial foundation during the preschool years (Anzani & Insan, 2020), as it significantly influences their ability to interact with others and adapt to social environments (Ningsih, 2024). This stage represents a golden period in which children begin to construct an understanding of themselves, others, and the surrounding world through complex and dynamic interactions (Widjayatri et al., 2023). Positive interactions are essential for optimal growth and development (Simanjuntak et al., 2022), shaping adaptive personality traits and strong interpersonal skills in children (Wijayanti & Fauzi, 2024). These competencies not only affect children's success in school settings but also serve as important predictors of well-being in adulthood.

However, alongside the rapid advancement of information and communication technology, a growing phenomenon has emerged in the form of increased gadget use among young children. Gadgets, defined as small electronic or mechanical devices with specific practical functions (Ensiklopedia, 2024), such as smartphones, tablets, and laptops, have become an integral part of children's daily lives. Many parents utilize these devices as a source of entertainment or even as an instant means of calming children (Riyanto et al., 2023). Statistical data indicate a significant rise in digital device usage among children, reflecting a shift in interaction patterns and play activities from the physical world to the digital domain.

Numerous international studies have confirmed the negative impacts of excessive gadget use. Longitudinal and systematic research demonstrates that increased screen time is negatively correlated with children's social skills, emotional regulation, and behavioral development (Madigan et al., 2019; Kostyrka-Allchorne et al., 2017). Excessive exposure has been shown to pose clinical and psychological risks to emotional development and social interaction, underscoring the urgency of close parental supervision (Radesky et al., 2015; Domingues-Montanari, 2017; Radesky & Christakis, 2016).

Ironically, in Indonesia, children continue to exhibit challenges in social-emotional development, which should be a primary focus during the preschool years (Maria & Novianti, 2020). These problems manifest in various behaviors, such as excessive crying, difficulty waiting for turns, poor anger regulation (Astuti et al., 2024; Herdiyana et al., 2023), and tendencies toward social withdrawal. This phenomenon is frequently associated with the intensity of gadget use at home (Fauzy, 2023), which reduces opportunities for direct social interaction (Laila & Darmiyanti, 2024). Several local studies have also identified a relationship between the duration of gadget use and delays in children's socialization abilities (Yasinta & Putri, 2020; Muslikah et al., 2024).

This gap was further confirmed through preliminary observations at TK Negeri Pembina 02 Kampar. A prominent pattern of intensive gadget use among students was evident, coinciding with the frequent occurrence of social-emotional developmental challenges, such as difficulties in interaction, emotional regulation, and tendencies toward social withdrawal. The discrepancy between high levels of gadget exposure and suboptimal social-emotional development constitutes the central focus of this study.

Barriers to social-emotional development in early childhood can have significant implications for children's ability to build healthy social relationships, express emotions appropriately, and develop adaptive coping skills (Azfa et al., 2021). If not addressed

promptly, these conditions may hinder socialization processes and negatively affect children's academic development and long-term psychological well-being. Therefore, timely and systematic early intervention is critically important ([Alcalá-Cerrillo et al., 2024](#)).

Social-emotional development in children is expected to encompass a range of developmental tasks that must be achieved by every individual. However, excessive gadget use may impede children's ability to fulfill these tasks, potentially leading to negative consequences for future social interactions ([Ndari et al., 2019](#)). In line with the findings of Yasinta and Putri (2020), research conducted at TK Negeri Pembina 02 Batam Center revealed a relationship between the duration of gadget use and children's social-emotional development, indicating that excessive gadget use can adversely affect children's ability to socialize optimally.

Many parents rely on electronic devices to entertain their children without fully recognizing the potential long-term consequences ([Fauzy, 2023](#)). Excessive gadget use may disrupt children's social interactions, which are essential for emotional development. Children who frequently engage with screens tend to play less with their peers, which may reduce their social competence ([Laila & Darmiyanti, 2024](#)). This lack of direct interaction can hinder the development of communication skills, empathy, and conflict-resolution abilities, which are typically cultivated through peer play.

It is assumed that one of the contributing factors to these conditions is excessive gadget use in the home environment. Children who are frequently exposed to gadgets tend to have fewer opportunities for direct social experiences with peers, thereby affecting their ability to build social relationships and manage emotions. If left unaddressed, this condition may have long-term consequences for children's social and emotional development ([Muslikah et al., 2024](#)). Therefore, this study is important to determine the extent of the relationship between gadget use and social-emotional development in kindergarten-aged children. Based on the foregoing discussion, this study aims to analyze the relationship between gadget use and the social-emotional development of children aged 5–6 years at TK Negeri Pembina 02 Kampar, with the hypothesis that higher intensity of gadget use is associated with lower levels of social-emotional development in early childhood.

B. METHOD

1. Research Design

This study employed a quantitative approach using a correlational research design to examine the relationship and strength of association between gadget use (independent variable) and children's social-emotional development (dependent variable). A quantitative approach allows for the collection of numerical data that can be statistically analyzed to empirically test hypotheses and generate generalizable findings ([Creswell & Creswell, 2014](#)). The correlational design was selected because the study aimed to identify the presence and degree of association between variables without establishing causal relationships ([Fraenkel et al., 2012](#)).

2. Participants and Research Setting

The study was conducted at TK Negeri Pembina 02 Kampar, Indonesia. The participants consisted of all children aged 5–6 years enrolled in Class B1, along with their parents and classroom teachers. A total sampling technique was applied, in which all members of the target population were included as research participants to ensure comprehensive data representation.

3. Research Instruments

Data were primarily collected using Likert-scale questionnaires with four response options: Always, Often, Sometimes, and Never. The questionnaires were administered to parents and teachers to assess daily observations related to children's gadget use and social-emotional development. The use of a Likert scale enabled the quantification of observed behaviors and perceptions for statistical analysis (DeVellis, 2017).

The research instruments consisted of two main scales:

a. Gadget Use Intensity Scale, measuring aspects such as:

- 1) Duration of gadget use
- 2) Rules and supervision during gadget use
- 3) Types of applications accessed by children

b. Social-Emotional Development Scale, assessing indicators including:

- 1) Independence and personal responsibility
- 2) Social interaction with peers and environment
- 3) Emotional expression and socio-cultural values

In addition to questionnaires, non-participant observations were conducted to obtain contextual insights into children's behavior and classroom dynamics. Documentation, such as school profiles and activity photographs, was also collected to support data triangulation.

Table 1. Table 1. Instrument Indicators

No.	Variable	Indicator	Number of Items
1.	Gadget Use	Duration of use	8
		Rules of use	8
		Application content	4
2.	Social-Emotional Development	Independence and responsibility	2
		Social relationships	2
		Emotional expression and socio-cultural values	2

4. Validity and Reliability

The instruments were adapted from previous validated studies (Wulansari, 2017; Wijanarko & Setiawati, 2016) and adjusted to the research context. Prior to the main data collection, a pilot test was conducted with respondents outside the main sample who had similar characteristics.

Validity: Item validity was tested using the Pearson Product–Moment correlation. Items were considered valid if $r_{\text{calculated}} > r_{\text{table}}$ at a significance level of 0.05. Invalid

items were revised or removed.

Reliability: Instrument reliability was assessed using Cronbach's Alpha, with a coefficient of $\alpha \geq 0.60$ indicating acceptable reliability.

5. Research Procedures

The research procedures were conducted in the following stages:

a. Instrument Preparation and Pilot Testing

Developing Likert-scale questionnaires based on validated indicators and testing their validity and reliability.

b. Sampling

Applying total sampling to all children aged 5–6 years in Class B1 of TK Negeri Pembina 02 Kampar.

c. Data Collection

Obtaining research permits, distributing informed consent forms to parents, administering questionnaires to parents and teachers, and conducting observations and documentation.

d. Data Processing

Scoring questionnaire responses and entering data into SPSS version 25.0.

e. Data Analysis

Conducting descriptive and inferential statistical analyses.

6. Data Analysis Techniques

Data analysis involved descriptive statistics (mean, median, mode, frequency, and percentage) to describe data characteristics. Inferential analysis was conducted using the Spearman Rank correlation test to examine the relationship between gadget use and social-emotional development. This non-parametric test was selected due to the ordinal data scale and the difficulty of meeting normality assumptions in small samples (Field, 2013). Additionally, the coefficient of determination (R^2) was calculated to determine the proportion of variance in social-emotional development explained by gadget use.

C. RESULT AND DISCUSSION

1. Result

a. The Use of Gadget

The following section presents an overview of children's gadget use based on descriptive statistical analysis. This analysis aims to describe the general tendency, variability, and spread of gadget use scores among the participants, providing an initial picture of how intensively digital devices are used in daily activities. Table 2 presents the descriptive statistical results of children's gadget use.

Table 2. Descriptive Statistics of Children's Gadget Use

No.	Descriptive Statistics	Value
1.	Mean	62.92
2.	Median	67.00
3.	Mode	79
4.	Std. Deviation	15.650
5.	Variance	244.910
6.	Range	40
7.	Minimum	40
8.	Maximum	80
9.	Total	1573
Number of Respondents		25

Source: Data processed using SPSS version 25

The proximity between the mean and median values indicates a relatively balanced distribution of scores. The wide score range reflects differences in gadget use levels among children. These descriptive statistics provide an overview of the distribution and dispersion of gadget use data collected from respondents. The frequency distribution of gadget use scores is shown in Table 3.

Table 3. Frequency Distribution of Gadget Use Scores

Score	Frequency (n)	Percentage (&)
40	3	12.0
41	1	4.0
44	2	8.0
46	1	4.0
49	1	4.0
50	1	4.0
63	1	4.0
65	1	4.0
66	1	4.0
67	1	4.0
68	1	4.0
69	1	4.0
72	1	4.0
75	1	4.0
78	1	4.0
79	4	16.0
80	3	12.0
Total	25	100.0

Source: Data processed using SPSS version 25

The distribution shows that several score levels appear only once, while a small number of scores occur more frequently. This pattern indicates that gadget use among

children is not evenly distributed, with certain intensity levels being more dominant than others.

To facilitate interpretation, gadget use scores were further classified into categorical levels, as shown in Table 4.

Table 4. Classification of Gadget Use Scores

No.	Category	Frequency (n)	Percentage (%)
1.	Moderate	9	36.0
2.	High	16	24.0
	Total	25	100.0

Source: Data processed using SPSS version 25

The classification results reveal that more than half of the children fall into the high gadget use category, while the remaining children are classified at a moderate level. This finding suggests that intensive gadget use is a common characteristic among the participants. The dominance of the high gadget use category, reinforcing the pattern observed in the tabulated data and highlighting the prevalence of frequent gadget exposure among children in the study.

b. Social-Emotional Development

This section describes children's social-emotional development based on descriptive statistical analysis. The analysis provides an overview of the general level, variability, and distribution of social-emotional development scores among the participants. The results of the descriptive statistical analysis of children's social-emotional development are presented in Table 5.

Tabel 5. descriptive statistical analysis of children's social-emotional development

No.	Descriptive Statistical	Value
1.	Mean	51.04
2.	Median	47.00
3.	Mode	42
4.	Std. Deviation	11.160
5.	Variance	124.540
6.	Range	36
7.	Minimum	33
8.	Maximum	69
9.	Sum	1276
Number of Respondents		25

Source: Data processed using SPSS version 25

The descriptive statistics indicate that children's social-emotional development scores were distributed across a broad range, reflecting variability among respondents. The dispersion of scores suggests that social-emotional characteristics were not uniform within the sample. Central tendency measures show that most scores

clustered around the mid-range of the scale, while the spread of values demonstrates the presence of both lower and higher score groups. The variability observed in the data is further reflected by the distribution of scores across the full measurement scale, indicating differences in children's social-emotional profiles as captured by the instrument.

Table 6 presents the frequency distribution of social-emotional development scores, showing how children's scores are distributed across different score values.

Table 6. Frequency Distribution of Social-Emotional Development Questionnaire

X	Total (n)	Percentage (%)
34	1	4.0
38	1	4.0
41	1	4.0
42	4	16.0
44	1	4.0
45	2	8.0
46	1	4.0
47	1	4.0
51	1	4.0
55	1	4.0
56	1	4.0
58	1	4.0
60	1	4.0
61	2	8.0
62	1	4.0
66	1	4.0
67	1	4.0
69	2	8.0
Total	25	100.0

Source: Data processed using SPSS version 25

The distribution indicates that one score level appears most frequently, while many other score values occur only once or twice. This pattern suggests that social-emotional development among children is heterogeneous, with varying levels of competence observed across individuals.

To provide a clearer overview of score distribution, the data were further classified into categorical levels, as shown in Table 7.

Table 7. Classification of Social-Emotional Development Questionnaire Scores

No.	Social-Emotional Development	Total (n)	Percentage (%)
1.	Low	3	12.0
2.	Medium	14	56.0
3.	High	8	32.0
	Total	25	100.0

Source: Data processed using SPSS version 25

The classification results show that the majority of children are categorized at a moderate level of social-emotional development. A smaller proportion of children demonstrate high development, while only a few fall into the low category. This distribution suggests that, although most children have developed basic social-emotional skills, there remains room for further enhancement.

Taken together, the descriptive findings suggest that gadget use among children tends to be relatively high, whereas social-emotional development is generally at a moderate level. These patterns provide an important basis for further inferential analysis examining the relationship between the two variables.

c. Hypothesis Testing

To examine the relationship between gadget use and children's social-emotional development, a Spearman's rank correlation test was conducted using IBM SPSS Statistics version 25. This non-parametric test was selected due to the ordinal nature of the data and the relatively small sample size. The results of the correlation analysis are presented in Table 8.

Table 8. Results of the Analysis of the Relationship between Gadget Use and Children's Social-Emotional Development

<i>Correlations</i>			X	Y
Spearman's rho	Gadget Use	Correlation Coefficient	1.000	-.639**
		Sig. (2-tailed)	.	.001
	Social-Emotional Development	Correlation Coefficient	-.639**	1.000
		Sig. (2-tailed)	.001	.
		Total	25	100.0

Source: Data processed using SPSS version 25

The results indicate a statistically significant negative correlation between gadget use and social-emotional development. The correlation coefficient demonstrates a strong inverse relationship, meaning that higher levels of gadget use are associated with lower levels of social-emotional development. The significance value confirms that this relationship is statistically meaningful at the 0.05 level, leading to the rejection of the null hypothesis and acceptance of the alternative hypothesis. These findings suggest that gadget use is significantly associated with variations in children's social-emotional development.

To further determine the magnitude of the relationship between gadget use and social-emotional development, a coefficient of determination analysis was conducted. The results of this analysis are presented in Table 9.

Table 9. Results of the Coefficient of Determination Test Analysis

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.665 ^a	.442	.418	8.512	

Source: Data processed using SPSS version 25

The results indicate that gadget use accounts for a substantial proportion of variance in children's social-emotional development. This finding suggests that gadget use contributes meaningfully to differences in social-emotional outcomes among children. However, a considerable portion of the variance remains unexplained, indicating that other factors, such as parenting style, family environment, and social interaction opportunities, may also play an important role in shaping children's social-emotional development.

The hypothesis testing results provide empirical evidence of a strong and significant negative relationship between gadget use and social-emotional development in early childhood. These findings form a critical basis for further discussion regarding the potential mechanisms underlying this relationship and its implications for children's developmental experiences.

2. Discussion

The findings of this study reveal a strong and statistically significant negative relationship between the intensity of gadget use and children's social-emotional development at TK Negeri Pembina 02 Kampar. The substantial Spearman's rank correlation coefficient indicates that higher frequency and duration of gadget use are associated with lower levels of social interaction skills, emotional regulation, and adaptive behavior. This result confirms that excessive engagement with digital devices is meaningfully linked to diminished social-emotional competence in early childhood.

These findings are highly consistent with Vygotsky's Sociocultural Theory (Wardani et al., 2023), which emphasizes that children's cognitive and social-emotional development, particularly within the Zone of Proximal Development (ZPD), emerges through active and meaningful interactions with more knowledgeable others (MKO), including adults and peers. Gadgets, when used excessively, function largely as passive media that reduce opportunities for face-to-face interaction, collaborative play, and reciprocal social feedback. Consequently, excessive screen time displaces critical social experiences required for the internalization of social-emotional skills, thereby explaining the observed negative association.

Empirical evidence from prior studies strongly supports this interpretation. Research by McDoniel et al. (2022) demonstrates that children exposed to screen time exceeding two hours per day exhibit significantly lower levels of empathy and emotional regulation compared to peers with limited screen exposure. Similarly,

Kontesa (2022) reports that high gadget use is associated with reduced emotional control and empathic abilities in early childhood. Children accustomed to instant gratification through digital devices may struggle to delay desires, tolerate frustration, or regulate emotions in real-world contexts. Consistent with this, Radliya et al. (2017) found that uncontrolled gadget use is linked to decreased social competence among kindergarten children, including difficulties in sharing, turn-taking, and participating in group play. Likewise, Sari and Mitsalia (2016) reported that excessive gadget use correlates with weakened interpersonal relationships, increasing the risk of social withdrawal and difficulties in forming friendships.

At a broader level, these findings align with international research indicating that prolonged screen exposure is associated with poorer sleep quality and increased behavioral problems in children (Anderson & Subrahmanyam, 2017). More specifically, multiple studies highlight declines in empathy and emotional self-regulation among children with high screen engagement (McDoniel et al., 2022; Kontesa, 2022). Within the Indonesian context, similar patterns have been observed, where intensive gadget use is associated with reduced social participation and cooperative behaviors among kindergarten children (Radliya et al., 2017). The tendency toward instant digital gratification appears to undermine children's capacity for emotional regulation, an essential component of healthy social-emotional development.

The negative relationship identified in this study may be explained by the limited opportunities for direct social interaction experienced by children who frequently use gadgets. Early childhood development relies heavily on concrete experiences and authentic interpersonal relationships. When a substantial portion of children's time is spent in front of screens, opportunities to develop communication skills, cooperation, empathy, and emotional awareness are reduced. As a result, children may become more comfortable interacting with virtual characters than with peers in real-world play environments.

Furthermore, many children use gadgets with minimal parental supervision. Devices are often employed as tools for distraction or emotional soothing without clear time limits or adult mediation. This practice may foster dependence on screens for entertainment and emotional regulation while diminishing children's problem-solving abilities and direct social engagement. Such conditions increase the risk of exposure to age-inappropriate content, which can elicit negative emotional responses such as fear, anxiety, or aggressive behavior, as well as contribute to an imbalance between screen-based and physical activities (Kim & Im, 2023; Wulandari & Fauziah, 2024). Inadequate supervision also heightens the likelihood that children will imitate aggressive behaviors observed in digital media (Maria & Novianti, 2020).

Within the specific context of TK Negeri Pembina 02 Kampar, the strength of this negative relationship appears to be intensified by two dominant factors. First, limited parental monitoring and the absence of consistent screen-time boundaries result in gadgets being used as instant calming tools without developmental consideration. Second, children who become highly attached to gadgets lose

opportunities to engage in traditional peer play within their home environments. Direct interactions, such as cooperative play, turn-taking, and shared activities, are essential contexts in which children learn to interpret facial expressions, non-verbal cues, and social norms (Kim & Im, 2023), all of which are central to Vygotsky's ZPD framework. The lack of such concrete experiences contributes to observable behaviors such as difficulty waiting for turns, reduced empathy, and social withdrawal among some children.

Observational data further suggest that rapid digitalization in the local context has normalized the use of gadgets as a primary calming strategy for children, reinforced by permissive cultural attitudes toward excessive screen time. Additionally, limited access to outdoor play spaces and inadequate environmental support for traditional play restrict children's opportunities to practice social skills outside of school. Consequently, several students in Class B1 exhibited difficulties with turn-taking and emotional regulation, underscoring that the negative impact of gadget use is not merely a matter of duration, but also the absence of meaningful social alternatives within the child's environment.

The strong negative association identified in this study carries important implications for both schools and families in Kampar. To counterbalance the dominance of the gadget use at home, schools should strengthen play-based learning approaches that promote cooperation, sharing, and direct conflict resolution. Teachers play a crucial role as more knowledgeable others (MKO) in identifying early signs of social-emotional delays and providing appropriate stimulation. For parents, immediate implementation of responsible gadget management strategies is essential, including clear time limits, careful selection of age-appropriate educational content, and prioritization of direct social interaction and physical activity as alternatives to screen time. Through these measures, the risks of social isolation and emotional difficulties associated with uncontrolled gadget use can be minimized (Sari & Mitsalia, 2016).

Therefore, this study highlights that early childhood social-emotional development is highly sensitive to inappropriate patterns of gadget use. While digital technology can offer developmental benefits when used wisely and in age-appropriate ways, excessive and unsupervised use poses significant risks. Therefore, educators and parents must collaborate to create balanced developmental environments that integrate technological advancement with children's fundamental social-emotional needs. This includes establishing clear screen-time boundaries, selecting educational content thoughtfully, and prioritizing direct social engagement and physical activity to support holistic child development.

D. CONCLUSION

This study aimed to examine the relationship between gadget use and social-emotional development among early childhood learners. The findings reveal a strong and statistically significant negative association between the two variables, indicating that higher intensity of gadget use is associated with lower levels of social-emotional development. The Spearman correlation results confirm that gadget use is meaningfully linked to children's social

interaction skills, emotional regulation, and adaptive behavior. Furthermore, the coefficient of determination shows that gadget use accounts for a substantial proportion of variance in social-emotional development, highlighting its role as an important contributing factor, although other environmental and familial influences remain influential.

The empirical evidence from a localized early childhood education context reinforces global findings while emphasizing the relevance of gadget use patterns in Indonesian kindergarten settings. These results carry important implications for parents, educators, and policymakers, underscoring the need for wise and balanced gadget management in early childhood. Practical efforts should prioritize clear screen-time limits, age-appropriate content, and increased opportunities for direct social interaction and play-based learning. Although limited by sample size and scope, this study provides a foundation for future research involving larger and more diverse samples, deeper examination of content type and parental supervision, and the development of intervention strategies to support holistic social-emotional development in the digital era.

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