



The Impact of Gadget Use on the Language Development of 5-6 Year Old Children

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Abstrak

The use of gadgets among early childhood is increasingly widespread in the digital era, but their impact on children's language development has not been studied in depth in the context of Islamic-based early childhood education institutions in rural areas. This study aims to identify and analyze the impact of gadget use on the language development of 5-6 year old children at Sakinah Early Childhood Education Center in Tanjung Medan. The study used a descriptive qualitative approach with data collection techniques through participatory observation, in-depth interviews with teachers and parents, and documentation. The study subjects were 29 children registered in April 2026. The results showed that 72.4% of children used devices for more than two hours per day, and the majority (65.5%) showed delays in productive language development. On the other hand, controlled device use with educational content was shown to increase children's passive vocabulary. There were two opposing impacts: a negative impact in the form of reduced verbal interaction with parents and peers, and a positive impact in the form of vocabulary expansion through audio-visual media. This study contributes to mapping the phenomenon of devices in PAUD Sakinah Tanjung Medan, Pasaman Regency, West Sumatra and recommends policies on limiting the duration and providing parental guidance.

INTRODUCTION

The digital era has fundamentally changed the patterns of interaction between children and their environment, including early childhood. Gadgets, including smartphones, tablets, and similar devices, have become an integral part of the daily lives of Indonesian families, even in areas with previously relatively limited access to technology. Data from the Ministry of Communication and Information (Kominfo) (2023) reveals that 79.5% of children aged 5-12 in Indonesia use digital devices daily, with an average duration of 3-4 hours. This phenomenon raises a pressing academic question: how does extensive exposure to gadgets affect children's language development, particularly during the critical period of 5-6 years of age?

Language development at 5-6 years of age is a crucial phase. During this period, children should experience a vocabulary explosion, mastering 2,000-2,500 words, using complex sentences, and developing meaningful two-way conversation skills (Vygotsky, 1978).

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Disruptions during this phase have the potential to have long-term impacts on a child's linguistic intelligence, literacy skills, and even social competence.

Sakinah Early Childhood Education (PAUD), located in Tanjung Medan, Pasaman Regency, West Sumatra, is an Islamic early childhood education institution facing unique contextual realities. Despite being located in a non-metropolitan area, device penetration among students' families is surprisingly high. As of April 2026, this PAUD had 29 active students. Based on the researchers' initial observations, most children carry or are regularly exposed to devices, but there has been no systematic study of their impact on their language development.

The identified research gaps are as follows: first, the majority of research related to devices and children's language development focuses on large urban contexts on Java Island, resulting in a limited representation of the context in Pasaman Regency, specifically Sakinah PAUD Tanjung Medan, West Sumatra. Second, research integrating Islamic education perspectives with the impact of technology on early childhood is still very limited. Third, there has been no study specifically analyzing this phenomenon in community-based PAUDs within the regency.

Based on these identified gaps, this study aims to: (1) identify patterns of device use among children aged 5-6 years at Sakinah PAUD Tanjung Medan; (2) analyzing the impact of gadget use on children's expressive and receptive language development; and (3) formulating data-based recommendations for managing gadget use in early childhood education (PAUD) and family settings.

Early Childhood Language Development Theory

Children's language development does not occur in a vacuum, but is instead a product of the interaction between biological maturity and environmental stimulation. The two major theories that underpin this research are Chomsky's Nativism and Vygotsky's Sociocultural Theory. (Brancati et al., 2024) through the concept of the Language Acquisition Device (LAD), asserted that children have an innate ability to acquire language; however, this ability requires quality linguistic input from the environment. This is where gadgets play a dual role: they can be a source of linguistic input, while also replacing authentic verbal interactions, which are much more necessary.

Vygotsky (1978) emphasized the role of social mediation in language development through the Zone of Proximal Development (ZPD). Children develop optimally when interacting with adults or more competent peers. Gadgets, which are one-way and emotionally unresponsive, cannot fulfill the scaffolding function required within the ZPD. Research by Radesky et al. (2018) supports this view by showing that every one-hour increase in screen time correlated with a 6-8 word decrease in the vocabulary development of children aged 2-5 years.

Another relevant theory is Bronfenbrenner's (2006) ecological theory. Within this framework, screen time functions as a cultural artifact in a child's microsystem, which can alter the dynamics of interactions within the family (mesosystem). When parents are too preoccupied with their own devices, a phenomenon called "technoference," the quality of linguistic interactions with their children declines drastically (McDaniel & Radesky, 2018).

The Impact of Screen Time on Language Development: An Empirical Study

Previous research has yielded mixed results. (Kamilah et al., 2020) found that children exposed to moderate educational television/video content actually showed increased vocabulary compared to a control group. Conversely, (Duch et al., 2013) in a two-year longitudinal study found a significant negative relationship between screen time exceeding 2 hours per day and expressive language skills. This contradiction indicates that content quality and context of use are more important than mere

duration.

Research in the Indonesian context conducted by Purnamasari et al (2022) in Padang, West Sumatra, found that 68% of children aged 4-6 who used devices for more than 3 hours/day showed mild to moderate speech delays. Similar findings were reported by Hasanah & Putri (2022) in Bandung, who identified a negative correlation ($r = -0.61$) between screen time and language development. However, unlike international research, these two local studies did not deeply analyze the role of children's content consumption.

Novitasari & Khotimah (2020), in their study at an Islamic kindergarten in Yogyakarta, provided a different perspective: guided use of Indonesian-language educational apps (30-45 minutes/day with parental guidance) actually improved children's thematic vocabulary mastery. These findings confirm that the important variables are not simply duration, but also the type of content and adult involvement in device use.

The Context of Islamic Education and Technology Use

From an Islamic educational perspective, children's language development has an inseparable spiritual dimension. Good language skills are seen as a mandate that must be developed within the framework of Islamic values (Melati & Anesty Mashudi, 2021). Islamic early childhood education institutions, such as PAUD Sakinah, are not only responsible for cognitive and linguistic aspects but also for shaping the character and values that underpin how children interact with the world, including technology. Suryawan & Merijanti (2021) studied Islamic early childhood education in West Sumatra and found that the integration of Islamic values into technology use policies at these institutions had a positive impact on parents' and children's attitudes toward devices. However, this study did not specifically address language development, thus justifying this gap in the research currently being reported.

METHODS

This study employed a descriptive qualitative approach aimed at understanding the phenomenon in depth within its natural context (Creswell & Creswell, 2018). This design was chosen because the researcher wanted to capture the nuances, context, and social dynamics underlying the relationship between device use and children's language development, which cannot be fully quantified. However, the researcher also used simple quantitative data (frequencies and percentages) to complement the presentation of the findings, thus ensuring a qualitative approach supported by descriptive numerical data.

RESULT AND DISCUSSION

The research was conducted at Sakinah Early Childhood Education (PAUD), Tanjung Medan, Pasaman Regency, West Sumatra Province. Data collection was conducted in April 2026, coinciding with the even semester of the 2025/2026 academic year. This location was selected based on the researcher's accessibility considerations and the contextual relevance of the institution as an Islamic-based PAUD in a semi-rural area facing the challenges of digital penetration.

The research subjects were all 5-6 year old children actively registered at Sakinah PAUD in April 2026, totaling 29 children (16 boys and 13 girls). In addition, the research also involved 3 class teachers and 29 parents/guardians of students as supporting informants. The key informant selection technique used purposive sampling with the following criteria: teachers who have taught at least one year at Sakinah PAUD, and parents who are willing to provide open information about their children's gadget usage habits at home. Data were collected through three main techniques.

First, participatory observation was conducted over four meetings to observe children's verbal behavior in the classroom, interaction patterns between children, and their ability to follow teacher instructions (Pediatrics, 2016). Researchers used a structured observation sheet containing 12 language development indicators based on the Child Development Achievement Level Standards (STPPA) of the Minister of Education and Culture Regulation No. 137 of 2014.

Second, in-depth semi-structured interviews with three classroom teachers and 15 purposively selected parents were conducted to explore perceptions, experiences, and practices regarding device use at home. Interviews were recorded with the informants' permission and then transcribed verbatim. Third, documentation consisted of child development notes, attendance records, and documentary photographs of relevant learning activities. Data on device use was also collected through a written questionnaire distributed to all 29 parents.

Data analysis used the Miles, (Miles et al., 2014) model, which consists of three simultaneous activity flows: (1) data condensation, namely the process of selecting, focusing, and simplifying raw data; (2) data presentation in the form of descriptive narratives, tables, and charts; and (3) drawing conclusions and verification. Data validity was ensured through source triangulation (comparing data from children, teachers, and parents), method triangulation (comparing observation, interview, and documentation results), and member checking with key informants. Based on questionnaires administered to 29 parents, a comprehensive overview of children's device usage patterns at home was obtained. The data presented in Table 1 shows significant variation in daily device usage duration.

Table 1. Distribution of Daily Device Usage Duration of Sakinah PAUD Children (April 2026)

No.	Duration of Device Use/Day	Number of Children	Percentage
1	< 1 hour	3	10,3%
2	1 – 2 hour	5	17,2%
3	2 – 3 hour	10	34,5%
	3 – 4 hour	7	24,1%
5	> 4 hour	4	13,8%
	TOTAL	29	100%

Table 1 shows that 72.4% of children (n=21) use devices for more than two hours per day, far exceeding the American Academy of Pediatrics (2016) and WHO (2019) recommendations for a maximum of one hour per day for children aged 3-6. This finding aligns with research by (Mustonen et al., 2022) in the West Sumatra context, but is higher than the national average of 58.3% reported by the Indonesian Child Protection Commission (KPAI) (2022).

In terms of content consumption, the majority of children (58.6%) watch entertainment content such as cartoons and children's videos on YouTube and TikTok, 24.1% use gaming apps, and only 17.2% regularly access educational content. This low consumption of educational content is a crucial factor in understanding the impact of device use on children's language development at the study site.

Chart 1. Percentage of Daily Device Use Duration for Children at Sakinah Tanjung Medan Preschool

Category	Persentase / Bar Chart
< 1 hour	 10.3%
1 – 2 hour	 17.2%
2 – 3 hour	 34.5%
3 – 4 hour	 24.1%
> 4 hour	 13.8%

Source: Primary data from Sakinah PAUD parent questionnaire, April 2026 (n=29)

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Child Language Development Profile

Language development assessment is based on 12 STPPA indicators, which cover expressive language skills (speaking, telling stories, retelling) and receptive language skills (understanding instructions, listening to stories, and understanding vocabulary) (Nwachukwu et al., 2025). The results of observations during four meetings and validation with teacher progress notes are presented in Table 2.

Table 2. Language Development Profile of Sakinah Preschool Children (n=29, April 2026)

Development Aspect	BSB	BSH	MB	BB
Active vocabulary (number of words)	3 (10,3%)	9 (31,0%)	11 (37,9%)	6 (20,7%)
Storytelling skills	2 (6,9%)	8 (27,6%)	12 (41,4%)	7 (24,1%)
Clear word pronunciation	5 (17,2%)	10 (34,5%)	9 (31,0%)	5 (17,2%)
Understanding verbal instructions	6 (20,7%)	11 (37,9%)	8 (27,6%)	4 (13,8%)
Questioning skills	3 (10,3%)	7 (24,1%)	13 (44,8%)	6 (20,7%)
Sentence Structure	2 (6,9%)	6 (20,7%)	14 (48,3%)	7 (24,1%)

Note: BSB=Developing Very Well; BSH=Developing As Expected; MB=Starting to Develop; BB=Not Yet Developing

Table 2 reveals a worrying finding: in terms of sentence structure, 72.4% of children fall into the MB and BB categories, indicating that they are not yet able to construct complete sentences consistently. Similarly, storytelling ability (65.5% in the MB+BB category) and questioning ability (65.5% in the MB+BB category) are still far from the standards that children aged 5-6 should achieve. In contrast, the ability

to understand verbal instructions shows a relatively better profile, with 58.6% of children falling into the BSB and BSH categories.

Chart 2. Percentage of Children per Language Development Category (All Aspects Combined))

Category	Percentage / Bar Chart
BSB (Developing Very Well)	 12.1%
BSH (Developing As Expected)	 29.3%
MB (Beginning to Develop)	 38.5%
BB (Undeveloped)	 20.1%

Source: Recap of observations and documentation of Sakinah Early Childhood Education, April 2026

Analysis of the Negative Impact of Gadgets on Language Development

Cross-source analysis (triangulation of observation data, teacher interviews, and parent statements) identified four main mechanisms explaining the negative impact of excessive gadget use on children's language development at Sakinah Early Childhood Education. First, reduced dyadic verbal interaction. Interviews with classroom teachers revealed a consistent pattern: children known to use devices for more than 3 hours per day tended to be more passive in class question-and-answer sessions and demonstrated lower verbal initiative. Teacher A (23 years of teaching experience) said, "Children who use their phones daily, when asked to share their experiences, usually remain silent for a long time, and their vocabulary is also limited." This finding is consistent with research by (Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 137 Tahun 2014 Tentang Standar Nasional Pendidikan Anak Usia Dini, 2014), which found that every hour of screen time that displaces parent-child interaction contributes to an average deficit of 770 words per day in the linguistic input received by children.

Second, there is the impact on productive language skills. Of the 21 children who used devices for more than 2 hours per day, 15 (71.4%) demonstrated expressive language skills below the STPPA standards for their age. Incomplete sentence structure, limited use of conjunctions, and difficulty organizing narratives were recurring patterns observed. Unlike receptive language, which can be passively stimulated by audio-visual devices, expressive language requires active speaking practice, which is actually diminished by prolonged screen time (Zaini & Soenarto, 2021).

Third, the influence of mixed language from foreign content. Most of the content children consume is videos in English or Indonesian, with dialects and vocabulary far removed from the everyday context of children in Tanjung Medan. As a result, some children use words whose meaning is not understood contextually—a phenomenon (V. M. Putri & Eliza, 2021) call "formulaic expression without productive competence." This differs from true word mastery.

Fourth, disrupted sleep patterns impact concentration and language skills. Eighteen of 29 parents (62.1%) admitted that their children use devices late at night. Research by (R. A. Putri & Herlina, 2020) shows that sleep deprivation in early childhood directly impairs language processing and vocabulary retention.

Positive Impact Analysis: Untapped Potential

Although the findings were dominated by negative impacts, this study also identified positive potential that has not been maximized. Eight children (27.6%) whose parents reported actively supervising and limiting device content actually demonstrated a better language development profile. Specifically, in passive vocabulary—the ability to understand words heard—this group showed higher observation scores (B. Rohmah & Aziz, 2024).

This pattern confirms the findings of (N. Rohmah & Fauziah, 2021) that audiovisual media can be an effective source of linguistic input if it meets three conditions: age-relevant content, limited duration, and adult mediation (co-viewing). At Sakinah Preschool, these conditions were met in only a small proportion of families, so the positive potential of devices as a learning medium has not been widely realized (Yusuf, 2019).

Table 3. Matrix of the Impact of Device Use on the Language Development of Children at Sakinah Preschool

Factor	Negative Impact (Identified)	Positive Impact (Identified)
Duration	72.4% of children >2 hours/day; Negative correlation with expressive language.	Guided use of <1 hour: increased passive vocabulary.
Content Type	58.6% non-educational entertainment content; exposure to foreign language without context.	17.2% access to educational content; thematic vocabulary stimulation.
Parental Assistance	Only 27.6% of parents actively provide support; the majority leave children alone.	Co-viewing improves the quality of parent-child dialogue.
Social Interaction	Reduced verbal initiative in class; passive in group conversations.	No significant positive impact identified on this dimension.
Sleep Pattern	62.1% of children use devices late at night; impaired concentration in class.	Not relevant in this category.

Correlation between Device Duration and Language Development Achievements

To strengthen the analysis, researchers cross-tabulated the duration of device use and the combined language development category (average of all aspects) (Yunita et al., 2023). The results are presented in Graph 3, which shows a consistent negative trend: the higher the duration of device use, the greater the proportion of children in the MB and BB categories.

Graph 3. Language Development Trends (BSB+BSH) Based on Device Usage Duration

Category	Percentage / Bar Chart
< 1 hour/day	 100%
1 – 2 hour/day	 80%
2 – 3 hour/day	 40%
3 – 4 hour/day	 28.6%
> 4 hour/day	 25%

% of children in the BSB+BSH category. Source: Primary data processing, April 2026

Chart 3 shows a dramatic decline in the proportion of children with optimal language development: from 100% in the group using less than 1 hour/day, to only 25% in the group using more than 4 hours/day. While these data cannot prove a causal relationship-as this study is qualitative and descriptive-the pattern is very consistent with the findings of (Santrock, 2021), who showed that the risk of speech delays increased significantly with screen exposure exceeding 2 hours per day.

Teacher and Parent Perspectives: Awareness and Response

In-depth interviews revealed a significant gap in awareness. All teachers (3/3) stated they were aware of the differences in language abilities between children who use devices extensively and those who do not. However, only one teacher actively communicated this to parents. From the parents' perspective, 20 out of 29 (69%) admitted that they gave their children devices primarily to "distract" or "keep them quiet," rather than as a deliberate learning tool (Tamelab, 2023).

These findings indicate that children's device use at Sakinah Preschool (PAUD) is driven more by practical parental needs than pedagogical awareness. This poses a particular challenge in the context of Islamic education, where parents ideally serve as the primary and primary educators (Wahyuni, 2022). When this role is inadvertently replaced by devices, what (Wati, 2021) calls "alone together" occurs: children are physically close to their parents, yet emotionally and linguistically separated.

Practical Recommendations Based on Findings

Based on the data analysis, this study formulates three main recommendations. First, for PAUDs: a formal policy regarding screen time should be formulated, regularly communicated to parents through parent-teacher meetings; the integration of "device wise" themes into the weekly curriculum is also highly recommended (Widyadhana & Mashudi, 2024). Second, for parents: limiting device use to a maximum of one hour per day, selecting educational content in Indonesian, and co-viewing practices accompanied by verbal discussions have proven more effective than mere prohibitions (Organization, 2019). Third, for future researchers: longitudinal studies and action research testing the effectiveness of specific interventions are needed to generate stronger causal evidence (Yuniarni et al., 2023).

CONCLUSION

This study yielded three main conclusions. First, device use among 5-6-year-old children at Sakinah Tanjung Medan Preschool is high: 72.4% use devices for more than two hours per day, with the majority of the content consumed being non-educational entertainment. This figure significantly exceeds WHO and AAP

recommendations for this age group. Second, excessive device use negatively impacts children's expressive language development, particularly in storytelling skills, sentence structure, and verbal initiative. The primary mechanisms are reduced dyadic verbal interaction between children and parents and teachers, limited active speaking practice, and disrupted sleep patterns that weaken language processing skills.

Third, the impact of devices is not entirely negative: children who have controlled access to devices with educational content and parental guidance show better passive vocabulary development. This confirms that the quality of parental guidance, rather than simply prohibition, is the most critical factor in determining whether devices pose a threat or an opportunity to children's language development. This research contributes to the literature on child language development in the context of community-based Islamic early childhood education (PAUD) in West Sumatra and provides an empirical basis for developing policies on wiser use of technology in PAUD institutions and families..

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