

Between Learning Support and Digital Distraction: A Qualitative Analysis of Digital Device Use and Student Learning Outcomes

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ABSTRACT

Digital devices can function simultaneously as learning resources and sources of distraction, making their educational consequences dependent on how and why they are used. This qualitative descriptive study examines parents' accounts of students' digital-device use, focusing on academic use, digital distraction, time and attention management, social interaction, and parental mediation. Primary data were derived from parent interviews and interpreted thematically, while relevant peer-reviewed literature was used to contextualize the findings. The results indicate that digital devices can extend access to learning materials, support homework completion, and enable learning beyond the classroom. However, unstructured recreational use, particularly gaming, social media, and entertainment, was associated in parents' accounts with reduced study time, fragmented attention, and diminished face-to-face interaction. Because the study did not employ objective achievement scores, the findings do not establish a causal effect on academic achievement. Instead, they identify learning conditions through which device use may support or undermine student outcomes. The study contributes an interpretive framework that distinguishes on-task from off-task use and positions parental mediation as a contextual mechanism. Educational guidance should therefore emphasize the quality and purpose of device use rather than screen duration alone.



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INTRODUCTION

Digital transformation has changed how students obtain information, communicate, complete assignments, and participate in learning. Smartphones, tablets, and related digital devices allow students to access textbooks, educational videos, search engines, learning-management systems, and collaborative spaces with little temporal or spatial constraint. The expansion of online learning in Indonesia further demonstrated that digital devices can preserve access to instruction and extend learning beyond the classroom (Dewi, 2020; Firman & Rahayu, 2020; Sadikin & Hamidah, 2020). Consequently, mobile devices are no longer merely communication tools; they have become part of the contemporary learning ecology.

Nevertheless, access to digital technology does not automatically produce better educational outcomes. The consequences of device use depend on the purpose of use, the type of activity, the timing and duration of engagement, the student's capacity to regulate attention, and the social environment in which the device is used. A device used to search for subject material or complete an assignment may expand learning opportunities, whereas the same device can provide continuous access to games, social media, short-form videos, and notifications that compete directly with academic tasks. This distinction makes it analytically inadequate to treat 'screen time' or 'device use' as a single, homogeneous exposure.

Recent international evidence strengthens this argument. A 2024 meta-analysis of adolescent digital-device use found that educational-purpose use was positively associated with academic performance, while the direction of associations varied by context and location of use (Wang et al., 2024). A systematic review and meta-analysis by Paterna et al. (2024) likewise found a small negative association between problematic smartphone use and academic achievement, with the relationship tending to be stronger among elementary and middle-school students. More recently, Pyhältö et al. (2025) reviewed studies of children and adolescents and reported that off-task smartphone and social-

media use was predominantly negatively associated with academic achievement, particularly when use was problematic. These findings reinforce the importance of distinguishing purposeful academic use from recreational or off-task use rather than interpreting device exposure solely through duration.

Earlier Indonesian studies also reveal this dual character. Kurniawati (2020) reported an association between gadget use and student achievement, while Sobon and Mangundap (2019) linked smartphone use with learning motivation among elementary-school students. Conversely, Hudaya (2018), Syifa et al. (2019), Pebriana (2017), and Harmain et al. (2022) documented concerns involving discipline, psychological development, social interaction, and learning outcomes. Taken together, these studies suggest that digital devices can support learning while simultaneously creating conditions that interfere with concentration, self-regulation, and sustained academic engagement.

Digital distraction provides one mechanism through which these contradictory outcomes can coexist. Mobile devices concentrate academic applications and non-academic stimuli within the same interface. Notifications, messaging, games, and entertainment content can prompt repeated task-switching and fragment attention. Dontre (2021) identifies technology-related distraction as a significant academic concern because students' attention can shift rapidly from the focal learning task to competing digital stimuli. Earlier meta-analytic evidence also suggests that mobile-phone use is often negatively associated with academic performance, although effect sizes and causal interpretations vary across studies (Kates et al., 2018; Amez & Baert, 2020).

Family context is equally important, particularly for school-age children. Parental mediation is not limited to prohibiting devices or imposing time restrictions; it may include discussing digital activities, setting expectations, distinguishing educational and recreational use, helping children evaluate content, and gradually supporting self-regulation. Indonesian studies have emphasized the importance of parental guidance in children's technology use (Alia & Irwansyah, 2018; Zaini & Soenarto, 2019). More recent qualitative evidence from Norway also shows that family values and communication shape how children experience digital learning and well-being, indicating that mediation is relational rather than purely restrictive (Lafton et al., 2024).

The literature therefore indicates two persistent limitations. First, many studies frame digital-device use as either beneficial or harmful without sufficiently distinguishing the function of the activity. Second, academic use, distraction, and parental mediation are often examined separately, even though they operate together in students' everyday routines. This study addresses that conceptual gap by interpreting parents' accounts through an integrated framework that distinguishes on-task academic use from off-task recreational use and positions parental mediation as a contextual mechanism that may influence movement between these two forms of use.

The novelty of the present study does not lie in estimating the magnitude of a causal effect on grades, because the available data do not include standardized achievement scores, report-card comparisons, or pre-post measures. Instead, the contribution is interpretive: the study explains how digital devices may shape learning conditions through access to information, time allocation, attentional regulation, social interaction, and parental mediation. This more carefully bounded contribution aligns the claims with the qualitative evidence and avoids overstating what the data can demonstrate.

Accordingly, this study aims to analyze how parents perceive the role of digital-device use in students' learning by examining (1) the academic functions of devices, (2) off-task digital distraction and its implications for study time and concentration, (3) social and psychological conditions associated with intensive use, and (4) parental mediation as a mechanism for structuring responsible use. The study is intended to provide a balanced framework for parents, teachers, and schools seeking to maximize the educational value of digital technology while reducing avoidable distraction.

RESEARCH METHOD

This study employed a qualitative descriptive design to develop a contextual understanding of how digital-device use is perceived to shape students' learning conditions. A qualitative approach is appropriate when the objective is to describe experiences, observations, and meanings without manipulating the setting or claiming causal effects that the available data cannot support (Fadli, 2021). The study should therefore be read as an exploratory interpretation of parental accounts rather than as an experimental or correlational estimate of the effect of device use on measured academic achievement.

The study combined primary interview material with a supporting review of scholarly literature. Primary data consisted of interviews with parents of school-age students who had direct experience

observing their children's use of digital devices at home. The interview focus included learning-related use, recreational use, changes in study time and concentration, social interaction, and forms of parental supervision or guidance. Secondary sources consisted of peer-reviewed studies relevant to digital-device use, academic performance, digital distraction, self-regulation, and parental mediation. The literature was used to contextualize and critically compare the patterns emerging from the primary data rather than to replace the interview evidence.

Primary data were collected through interviews centered on parents' experiences of accompanying and observing their children's digital-device use. The interview domains covered the purposes for which devices were used, perceived academic benefits, recreational activities such as gaming and social media, changes in concentration and study time, social interaction, and the rules or forms of assistance provided by parents. To strengthen methodological transparency, the final submitted manuscript should specify whether the interviews were structured, semi-structured, or unstructured; how the interview guide was developed; whether interviews were recorded and transcribed; and how data saturation or information adequacy was determined.

The literature component was assembled from scholarly sources directly related to the study focus. In this revision, recent international evidence from 2024–2025 was added to strengthen the discussion of educational-purpose use, problematic smartphone use, off-task behavior, and parental mediation (Lafton et al., 2024; Paterna et al., 2024; Wang et al., 2024; Pyhältö et al., 2025). These sources complement, rather than supersede, the Indonesian literature that frames the local context.

The interview material was analyzed thematically through an iterative process of data organization, reduction, coding, theme development, interpretation, and comparison with relevant literature. The analysis began by identifying meaning units related to academic access, distraction, time and attention, social interaction, and parental mediation. Similar meaning units were then grouped into provisional categories and refined into broader themes. This procedure is consistent with thematic approaches that move from dispersed qualitative material toward coherent patterns while preserving the relationship between interpretation and source data (Rijali, 2018; Nowell et al., 2017).

Analytically, the revised manuscript distinguishes between on-task and off-task use. On-task use refers to device activities directly oriented toward learning, such as searching for subject material, completing assignments, or accessing educational resources. Off-task use refers to recreational or non-academic activities that compete with the focal learning task, including gaming, social media, and entertainment. Parental mediation is treated as a contextual mechanism that can orient use, set boundaries, and support content selection. This framework makes the coding logic explicit and sharpens the connection between the study's research problem, findings, and contribution.

Interpretive credibility was strengthened by examining whether similar patterns recurred across the parental accounts and by comparing those patterns with established empirical findings. The literature comparison should be understood as analytical corroboration, not as a substitute for participant-level validation. Because the source manuscript supplied for revision did not include transcripts, coding files, or respondent-by-respondent matrices, this revised version does not introduce fabricated frequency counts or invented quotations.

The validity of the claims was protected primarily by matching the level of inference to the available evidence. The study does not report grade-point averages, test scores, report-card changes, objective screen-time logs, or before-and-after comparisons. Therefore, statements such as 'digital devices reduce academic achievement' are avoided. The evidence supports a more limited conclusion: parents described patterns of device use that may strengthen or weaken conditions associated with learning, particularly access to resources, study time, concentration, social support, and self-regulation.

Transferability is likewise limited by the absence of fully reported participant characteristics in the source manuscript. The findings should not be generalized statistically to all students. Their value is conceptual and contextual: they identify mechanisms and conditions that can guide more precisely designed quantitative, mixed-methods, or multi-informant research.

RESULTS AND DISCUSSION

The findings indicate that digital-device use cannot be classified as uniformly beneficial or harmful. Parents' accounts reflected two concurrent tendencies. Devices supported learning when students used them to find information, access learning materials, complete assignments, and continue studying at home. At the same time, unstructured use created opportunities for gaming, social media,

and entertainment to displace study time and fragment attention. The central issue was therefore not the existence of the device itself but the activity performed through it, the organization of time and attention, and the quality of adult guidance.

Because the source dataset did not provide quantitative frequencies, measured screen duration, or objective academic scores, the results are presented as qualitative themes rather than as estimates of effect size. Table 1 summarizes the major thematic patterns and the analytical meaning assigned to each pattern.

Table 1. Thematic Synthesis of Digital-Device Use in Students' Learning Activities

Theme	Indications in Parent Accounts	Analytical Interpretation
Access to learning resources	Devices facilitated access to information and subject materials and enabled learning to continue at home.	Digital devices can extend learning opportunities when use is explicitly oriented toward academic goals.
Digital distraction	Games, social media, and entertainment competed with study activities for students' attention.	Educational potential can become a risk when off-task activities dominate device use.
Time and concentration	Unstructured use was associated with reduced study time and weaker concentration on academic tasks.	Possible academic consequences operate through time displacement and fragmented attention rather than through the device alone.
Social interaction	Prolonged use was perceived to reduce direct interaction with family members and peers.	Digital-device use may affect social conditions that support engagement, communication, and learning.
Parental mediation	Parents considered guidance, boundaries, and supervision necessary to keep device use aligned with educational purposes.	Family mediation is a contextual mechanism that may strengthen benefits and reduce risks.

Digital Devices as Learning Resources and Extensions of Academic Opportunity

The first theme concerns the academic value of devices when use is purposeful. Parents described devices as tools that helped students locate information not immediately available in printed materials, obtain supplementary explanations, and continue learning outside school hours. In this context, digital access reduces dependence on a single textbook or the next face-to-face lesson and allows students to revisit or extend material at home. Indonesian research on online learning similarly shows that digital access can increase flexibility and broaden access to educational resources (Dewi, 2020; Firman & Rahayu, 2020; Sadikin & Hamidah, 2020).

Importantly, access to information should not be equated with improved achievement. Information becomes educationally useful only when students select credible material, connect it with curricular tasks, and use it to deepen understanding. Kurniawati (2020) and Sobon and Mangundap (2019) suggest that smartphone use can be related to achievement or learning motivation, but such relationships depend on the nature of use. Recent meta-analytic evidence offers a stronger conceptual basis for this interpretation: Wang et al. (2024) found that educational-purpose digital-device use was positively related to academic performance, underscoring the importance of activity quality rather than duration alone.

The findings therefore support a shift from asking how long students use devices to asking what they do with them. Two students can accumulate similar screen time while experiencing very different educational consequences if one primarily accesses learning resources and the other primarily engages in entertainment. This distinction is essential for both research design and educational policy because aggregate measures of device use can conceal meaningful differences in purpose and context.

Off-Task Use, Digital Distraction, and the Displacement of Study Time

The second theme concerns the transition from educational use to off-task use. Parents observed that students could become absorbed in games, social media, and entertainment when no clear boundaries were in place. Under these conditions, digital devices no longer function primarily as learning tools; they become environments containing multiple competing stimuli. The reported consequences included less time allocated to study and reduced concentration on academic tasks.

Time displacement provides one plausible mechanism. Time devoted to gaming, scrolling, or entertainment is time that cannot simultaneously be used for reading, completing assignments, resting, or interacting with others. This mechanism does not establish that every minute of recreational use harms achievement, but it explains why excessive or poorly structured use can weaken the routines that

support learning. Paterna et al. (2024) reported a small negative association between problematic smartphone use and academic achievement, while Pyhältö et al. (2025) found that off-task smartphone and social-media use among children and adolescents was predominantly associated with poorer academic outcomes. These recent findings are consistent with the parental observations in the present study.

Attention fragmentation constitutes a second mechanism. A single device may simultaneously host learning materials, messages, notifications, games, videos, and social-media feeds. Students can therefore shift repeatedly between academic and non-academic stimuli without physically leaving the learning environment. Dontre (2021) identifies such technology-related task switching as a source of academic distraction. The present qualitative findings extend that literature by locating distraction within everyday family observations: the concern is not simply total device use but the ease with which students transition from on-task to off-task activity.

These findings also explain why the manuscript's claims must remain cautious. The study does not contain objective measures of academic achievement and therefore cannot demonstrate that device use caused a decline in grades. What the data support is a process-level interpretation: unstructured recreational use may create learning conditions characterized by less study time and weaker sustained attention. This formulation is methodologically stronger because it distinguishes observed parental perceptions from downstream outcomes that were not directly measured.

Social Interaction and Psychological Conditions as Contexts for Learning

The third theme extends the analysis beyond immediate academic activity. Parents reported that prolonged device use could reduce direct interaction with family members and peers. Learning is socially embedded: communication with parents, discussion with classmates, collaborative habits, and access to interpersonal support can all contribute to engagement and persistence. Pebriana (2017) linked gadget use to children's social interaction, while Syifa et al. (2019) discussed psychological consequences among elementary-school children. Although these studies differ in population and design, they support the broader interpretation that intensive digital engagement can intersect with social and psychological conditions relevant to learning.

The relationship between reduced interaction and academic outcomes should be interpreted indirectly. The present data do not show that fewer conversations caused a specific decline in grades. Rather, reduced communication may diminish opportunities for reminders, help with assignments, discussion of learning difficulties, or peer exchange. For this reason, social interaction should be treated as part of the learning environment rather than as an unrelated outcome.

Parents also described difficulty disengaging from devices when use was not structured. Such observations should not be translated into clinical labels because this study did not employ a validated measure of smartphone addiction or conduct psychological assessment. Asif and Rahmadi (2017) reported an association between gadget addiction and emotional or behavioral problems among early adolescents, while Paterna et al. (2024) synthesized evidence on problematic smartphone use. These studies are relevant as contextual comparisons, but the present findings support only the more conservative conclusion that difficulty stopping device use may signal a need for stronger self-regulation and family-level management.

Educational implications therefore extend beyond technical digital literacy. Students also need attentional regulation, judgment about when a device is useful, awareness of when use becomes off-task, and the capacity to disengage. Schools and families that focus only on operational skills may produce competent device users who remain vulnerable to distraction. Digital literacy should consequently include self-regulation, ethical communication, purposeful use, and the preservation of face-to-face relationships.

Parental Mediation as a Contextual Mechanism

The strongest family-level theme was the perceived need for parental guidance and boundaries. Parents did not reject digital devices altogether; they recognized their usefulness for finding information and supporting schoolwork. Concerns emerged when use became unstructured and children had difficulty redirecting attention. Parental mediation is therefore better understood as a mechanism that helps determine when, why, and under what conditions devices are used rather than as simple prohibition.

Three mediation functions can be derived from the data. The first is orientation: directing device use toward school-related purposes when academic tasks are present. The second is boundary setting: structuring duration and timing so that recreational use does not displace study routines. The third is supportive mediation: helping students evaluate sources, select appropriate content, and return to the original learning goal when attention shifts. These functions are consistent with Indonesian discussions of parental guidance (Alia & Irwansyah, 2018; Zaini & Soenarto, 2019) and with more recent evidence showing that family values and communication shape children's digital learning and well-being (Lafton et al., 2024).

Active mediation differs from passive monitoring. Merely checking total screen time does not reveal whether a child is reading educational material, completing homework, gaming, or scrolling through social media. More meaningful guidance involves understanding the activity, discussing its purpose, and helping the child develop criteria for responsible use. The long-term objective should be gradual self-regulation rather than permanent external control.

At the same time, this study cannot identify which parenting strategy is most effective. The data do not compare families using different mediation styles, nor do they measure changes in academic outcomes after particular rules were introduced. The defensible conclusion is narrower: parents perceived guidance and boundaries as important for balancing learning and recreation. Future studies should compare restrictive, active, and co-use mediation strategies using clearer participant documentation and measurable outcomes.

Schools remain important partners in this process. Family rules can be difficult to interpret when school assignments themselves require intensive device use. Teachers should therefore communicate the educational purpose of digital tasks and design activities that reduce unnecessary multitasking. Consistency between school expectations and family routines can reduce ambiguity about when devices function as academic tools and when recreational use should be postponed.

Synthesis, Novelty, and Contribution of the Study

Across the themes, the relationship between digital-device use and learning is conditional rather than linear. Devices can strengthen access to educational resources and extend learning beyond the classroom, but risk increases when off-task activity dominates, study time is displaced, attention is fragmented, and social engagement is reduced. Parental mediation operates across these pathways by helping students move from unstructured use toward purposeful use.

This interpretation is consistent with earlier reviews showing that the relationship between mobile-device use and academic performance varies according to how use is defined (Kates et al., 2018; Amez & Baert, 2020). It is further strengthened by recent evidence: Wang et al. (2024) emphasize differences by purpose and context of use; Paterna et al. (2024) identify a negative relationship between problematic use and achievement; and Pyhälto et al. (2025) specifically distinguish off-task smartphone and social-media use among school-age populations. By integrating these distinctions with parent-reported mediation, the present study offers a more precise interpretive model for the Indonesian educational context.

The study's novelty therefore lies in shifting the analytic question from 'Are gadgets good or bad for achievement?' to 'Under what conditions does digital-device use support or interfere with learning?' This shift is theoretically meaningful because it places purpose of use, attention allocation, and family mediation within a single explanatory framework. It also improves methodological alignment: the study no longer claims a directly measured effect on grades but instead identifies qualitative mechanisms and learning conditions that can inform future hypothesis testing.

Practically, the findings suggest that blanket prohibition and unrestricted access are both insufficient. The more defensible approach is to distinguish academic from recreational use, create low-distraction periods for focused study, discuss content and purpose with students, and gradually develop self-regulation. For schools, this means designing digital learning tasks with clear instructional value and avoiding technology use merely because devices are available.\

Limitations and Directions for Future Research

The principal limitation concerns methodological reporting in the source manuscript. The number and characteristics of participants, research site, sampling strategy, data-collection period,

interview duration, and verbatim excerpts were not documented in the material provided for revision. These omissions restrict assessment of transferability, dependability, and data adequacy. They should be completed from the original research records before submission.

A second limitation is the absence of objective academic indicators and behavioral measures. The study did not use report-card data, standardized tests, application logs, or directly measured screen duration. Consequently, no causal or quantitative claim about the effect of device use on academic achievement is warranted. Future research should combine qualitative accounts with objective or validated indicators of device use, learning engagement, and academic performance.

Third, the study relies on parents' perspectives. Parent accounts are valuable because they capture home routines, but they may not fully represent students' motivations or teachers' observations. Future studies should triangulate perspectives across students, parents, and teachers and, where possible, combine interview data with observational or digital-trace data. Such a design would allow the proposed framework of on-task use, off-task distraction, and parental mediation to be tested more rigorously.

CONCLUSION

This study concludes that digital-device use does not have a single, uniform relationship with student learning. According to parents' accounts, devices can support learning when they are used to access materials, complete academic tasks, and extend learning beyond the classroom. Conversely, unstructured recreational use can compete with study time, fragment attention, and reduce direct social interaction. The educational significance of digital devices is therefore conditional on purpose, timing, attentional control, and the surrounding guidance.

The study does not demonstrate a causal decline or improvement in measured academic achievement. Its contribution is to identify mechanisms through which device use may shape learning conditions and to place parental mediation within those mechanisms. Parents and teachers should therefore focus not only on duration but also on the quality and purpose of use, the separation of focused study from entertainment, the reduction of avoidable digital interruptions, and the gradual development of students' self-regulation.

For future research, clearer documentation of participants and procedures is essential, together with the use of measurable academic indicators, objective or validated measures of device use, and multi-informant data. These improvements would allow the conditional framework identified here to be evaluated with stronger evidence and would support more precise recommendations for schools and families.

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