

# Smartphones and Early Childhood Development: A Double-Edged Sword in the Digital Age of South East Nigeria

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## ABSTRACT

*The rapid proliferation of smartphones has significantly transformed communication, information access, and social interaction, with notable implications for early childhood development. This study examined the behavioural, cognitive, social, and general impacts of smartphone use among children in South East Nigeria. A descriptive survey design integrating quantitative and qualitative approaches was adopted. Data were collected through structured Likert-scale questionnaires, researcher observations, and informal interviews. A sample of 350 respondents was drawn from a population of approximately 5,000 smartphone users. Before the main study, a pilot study involving 30 participants was conducted to refine the instrument, while the final instrument demonstrated high reliability with a Cronbach's alpha coefficient of 0.86. Findings revealed that excessive smartphone use distracts children from academic activities, reduces outdoor play, weakens family communication, and contributes to aggressive tendencies. Although smartphones provide access to educational content, excessive usage was associated with reduced attention span, declining handwriting skills, and poorer classroom performance. Socially, prolonged smartphone exposure diminished face-to-face interaction, weakened family bonds, and increased exposure to cyberbullying. Parents and teachers acknowledged the educational benefits of smartphones but generally perceived unregulated use as more harmful than beneficial. Anchored in Social Learning Theory and Ecological Systems Theory, the study concludes that smartphones can serve as valuable educational tools when used under structured supervision; otherwise, they pose significant developmental risks. The study recommends stronger parental monitoring, improved digital literacy, and effective policy interventions to promote healthy smartphone usage among children.*

## KEYWORDS

*Smartphones, early childhood development, behaviour, cognitive growth, South East Nigeria, technology and education*

## I. INTRODUCTION

The emergence of smart phones as a dominant feature of contemporary life represents one of the most profound technological shifts of the twenty-first century. Globally, the transition from basic mobile telephony to internet-enabled smart devices has redefined how individuals communicate, access information, and engages socially. Indeed, the smart phone is

arguably one of the most disruptive inventions of the modern era, consolidating the functions of multiple technologies—such as the landline telephone, television, camera, radio, desk calendar, and even the wallet—into a single portable device. In Nigeria, this transformation gained momentum in the early 2010s, following the expansion of mobile broadband services by telecommunications companies such as MTN Nigeria, Glaucoma, and Airtel Nigeria. The introduction of affordable Android smart phones, coupled with increased internet penetration, facilitated widespread adoption across urban and rural communities (Nigerian Communications Commission, 2023). Today, smart phones are no longer luxury items but essential tools embedded in everyday Nigerian life.

Across sectors, smart phones have produced far-reaching impacts. In education, they have enabled access to digital learning platforms, online libraries, and virtual classrooms, thereby democratising knowledge and bridging geographical barriers (UNESCO, 2020). In commerce, smart phones have supported the growth of digital banking, e-commerce, and mobile entrepreneurship. Socially, they have reshaped patterns of interaction through platforms such as What Sapp, Facebook, and Tik Tok, fostering real-time communication and global connectivity. For many Nigerian families, smart phones serve as multifunctional devices for communication, entertainment, education, and even parenting support.

A smart phone is a mobile device that combines traditional telecommunication functions with advanced computing capabilities, including internet connectivity, multimedia processing, and access to a wide range of applications. Unlike basic mobile phones, smart phones operate on sophisticated operating systems such as Android and iOS, enabling users to perform tasks such as web browsing, instant messaging, video streaming, online learning, and digital transactions. In the context of this study, a smart phone is operationally defined as "A handheld, internet-enabled mobile device used by children for communication, entertainment, and access to digital content, including social media, games, and educational applications, within home and school environments."

Notwithstanding these benefits, the increasing integration of smart phones into the lives of young children has generated considerable concern among educators, psychologists, and parents. Early childhood, widely recognised as a critical period for holistic development, requires rich physical interaction, play-based learning, and direct social engagement (World Health Organization, 2019). However, the pervasive presence of smart phones has altered childhood experiences, often replacing traditional forms of play and interpersonal communication with screen-based engagement.

In the context of South East Nigeria, the researcher's preliminary observations and informal interviews with teachers and parents reveal a growing pattern of excessive and, in many cases, unregulated smart phone use among young children. Teachers report that children frequently exhibit reduced attention spans, diminished interest in classroom activities, and increasing dependence on digital stimulation. Parents similarly express concern over children's preference for screen time over outdoor play, family interaction, and creative engagement. Instances of behavioural changes, including irritability, aggression, and withdrawal, have also been noted, particularly when access to smart phones is restricted.

Furthermore, the misuse of smart phones among children has become a critical issue. Many children are exposed to age-inappropriate content, excessive gaming, and unregulated

social media interactions, raising concerns about cyberbullying, digital addiction, and moral development. The ease with which children navigate digital platforms—often surpassing adult supervision—has intensified these risks. In contexts where parental digital literacy is limited, effective monitoring becomes increasingly difficult.

These emerging patterns underscore a fundamental tension: while smart phones offer undeniable educational and developmental opportunities, their unregulated use may undermine essential aspects of early childhood development. Drawing on frameworks such as Social Learning Theory and Ecological Systems Theory, it becomes evident that children's interactions with digital devices are shaped by—and in turn shape—their immediate and broader environments. The home, school, and digital ecosystem collectively influence how smart phone use affects children's behavioural, cognitive, and social outcomes.

It is against this backdrop that the present study is situated. Motivated by observable trends and corroborated by informal stakeholder insights, the research seeks to critically examine smart phones as a "double-edged sword" in early childhood development within South East Nigeria. The study aims to contribute empirical evidence to an ongoing debate, while also informing educators, parents, and policymakers on the need for balanced, guided, and developmentally appropriate smart phone use among young children.

Ideally, early childhood should be characterised by rich, hands-on learning experiences, active play, and meaningful social interaction within the family and school environment. At this stage, children are expected to develop foundational cognitive, behavioural, and social skills through guided exploration, imitation, and interpersonal engagement. Digital technologies, including smart phones, ought to serve as supportive tools—carefully regulated by adults to enhance learning without displacing essential developmental experiences.

However, the reality observed by the researcher in South East Nigeria presents a different picture. With the rapid expansion of mobile connectivity, driven by providers such as MTN Nigeria, Glaucoma, and Airtel Nigeria, smart phones have become deeply embedded in children's daily lives. Through direct observation and informal interviews with parents and teachers, the researcher has noted that many children are increasingly exposed to smart phones in ways that are largely unregulated. Rather than serving as occasional educational aids, these devices often dominate children's routines—replacing outdoor play, limiting face-to-face interaction, and fostering dependence on digital entertainment. Teachers report declining attention spans and reduced classroom engagement, while parents express concern over behavioural changes such as irritability and withdrawal. Moreover, children's early exposure to platforms like What Sapp, TikTok, and Facebook raises concerns about inappropriate content and premature socialisation.

This contrast between the ideal and the observed reality reveals a critical gap. While smart phones possess significant educational potential, their unregulated use appears to undermine key aspects of early childhood development. More importantly, there is limited context-specific empirical evidence within South East Nigeria to clearly define the nature and extent of these impacts. This study, therefore, seeks to bridge this gap by systematically examining the behavioural, cognitive, and social implications of smart phone use among

young children, with a view to informing effective parental guidance, educational practice, and policy intervention.

## **II. LITERATURE REVIEW**

Empirical studies across global contexts have documented both the opportunities and risks associated with smart phone use in early childhood, particularly in relation to key developmental domains such as cognition, behaviour, and social interaction. On the one hand, scholars such as Neumann (2015) and Papadakos (2020) emphasise the potential of smart phones to enhance digital literacy, facilitate early exposure to information, and support innovative, interactive learning experiences. From this perspective, smart phones function as cognitive tools that can stimulate curiosity, improve problem-solving skills, and provide access to diverse educational resources, thereby contributing positively to children's intellectual development when used appropriately.

Conversely, a substantial body of literature highlights the adverse implications of excessive or unregulated smart phone use. Researchers such as Twinge (2018) and Montage and Walla (2016) report that prolonged exposure to digital devices is associated with reduced attention span, impaired cognitive processing, sleep disruption, and increased risk of behavioural problems, including aggression and dependency. Socially, these studies further suggest that excessive screen engagement may lead to diminished face-to-face interaction, social withdrawal, and vulnerability to cyber bullying. These findings collectively underscore the behavioural, cognitive, and social risks that align closely with the core variables of the present study.

Within the Nigerian context, emerging research reflects similar concerns, albeit with context-specific nuances. Papadakos (2020) observe a growing trend of unsupervised smart phone use among children, often resulting in exposure to inappropriate content and premature engagement with adult-oriented digital spaces. This perspective highlights the role of parental mediation and digital literacy, suggesting that the risks associated with smart phone use are exacerbated in environments where monitoring is limited or inconsistent. The Nigerian evidence, therefore, reinforces global findings while pointing to contextual factors such as socio-cultural practices, parental awareness, and access patterns.

The interrelatedness of these perspectives reveals a consistent pattern: while smart phones offer measurable cognitive and educational benefits, these advantages are often undermined by behavioural and social risks when usage is not effectively regulated. Thus, the expected outcome across the literature suggests a dual-effect phenomenon—where positive developmental gains coexist with potential harm, depending largely on the context, duration, and supervision of use.

The theoretical underpinning of this study is anchored in Ecological Systems Theory, proposed by Urie Bronfenbrenner. This theory posits that child development occurs within a network of interconnected systems, including the family, school, peer group, and broader media environment. Smart phones, in this regard, function both as micro-system influences (direct interaction with the child) and exo-system factors (indirect environmental

influences), shaping developmental outcomes through their integration into everyday life. Complementing this is Social Learning Theory by Albert Bandura, which emphasises that children learn behaviours through observation and imitation. Smart phones, with their rich multimedia content, serve as powerful modelling agents, potentially reinforcing both positive and negative behaviours depending on the nature of the content consumed.

From the researcher's standpoint, the reviewed literature converges on a critical insight: smart phones are neither inherently beneficial nor harmful; rather, their impact is contingent upon patterns of use, supervision, and contextual factors. While global and Nigerian studies acknowledge both advantages and risks, there remains a need to empirically examine how these dynamics manifest within specific socio-cultural settings, particularly in relation to observable behavioural, cognitive, and social outcomes among children.

Despite the growing body of scholarship, there is a noticeable paucity of comprehensive studies in Nigeria that simultaneously examine smart phone use across multiple stakeholders, including parents, teachers, and children. Furthermore, limited research has empirically linked stakeholder perceptions with measurable developmental outcomes in children. This gap is particularly significant within the South East Nigerian context, where socio-cultural dynamics and patterns of technology adoption may uniquely influence children's experiences. This study, therefore, seeks to bridge this gap by providing a systematic and context-sensitive analysis of smart phone use as a "double-edged sword" in early childhood development, integrating behavioural, cognitive, and social dimensions within the Nigerian socio-cultural and technological landscape.

#### A. *Purpose of the Study*

The general purpose of this study is to investigate the behavioural, cognitive, and social implications of smart phone use on children in South East Nigeria, as perceived by parents, teachers, children, and other community members. Specifically, the purpose is to:

- Examine the behavioural impacts of smart phone use on children as perceived by parents, teachers, and other users.
- Analyse the influence of smart phone use on children's cognitive and academic development.
- Investigate the social implications of smart phone use on family cohesion and peer relationships.
- Evaluate whether significant differences exist in the perceptions of parents, teachers, children, and other community members regarding smart phone use and child development.

#### B. *Research Questions*

- What are the behavioural impacts of smart phone use on children as perceived by parents, teachers, and other users?
- How does smart phone use influence children's cognitive and academic development?
- What are the social implications of smart phone use on family cohesion and peer relationships?

- Are there significant differences in perceptions among parents, teachers, children, and other community members regarding smart phone use and child development?

### C. *Hypotheses*

- H<sub>01</sub>: There is no significant difference in the perceptions of parents, teachers, children, and other community members regarding the behavioural impacts of smartphone use on children.
- H<sub>02</sub>: There is no significant relationship between smartphone use and children's behavioural challenges.
- H<sub>03</sub>: Smartphone use has no significant impact on family cohesion and peer relationships among children.
- H<sub>04</sub>: There is no significant difference in the overall perception of smartphone impacts on children's development among parents, teachers, children, and community members.

## III. METHODOLOGY

### A. *Research Design*

The study employed a descriptive survey design with both quantitative and qualitative components. This design enabled the collection of broad-based data from multiple stakeholders while capturing nuanced insights through informal interviews and researcher observations.

### B. *Area of the Study*

The research was carried out in South East Nigeria, a region with increasing smart phone penetration across both urban and rural areas. The socio-cultural emphasis on education and family values made this setting particularly appropriate for examining how smart phones intersect with childhood development.

### C. *Population and Sampling*

The study population consisted of 5,000 smart phone users, including parents, teachers, children, and other adult users. Using Yamane's (1967) formula, a sample size of 350 respondents was drawn, ensuring a 95% confidence level and a 5% margin of error.

A multi-stage sampling technique was adopted:

- Stratification: The population was divided into parents, teachers, children, and Other users.
- Proportional Allocation: Each group was sampled proportionately (93 parents, 78 Teachers, 96 children, 83 other users).
- Random Selection: Respondents within each stratum were randomly chosen.

### D. *Reliability of the instrument*

A pilot study involving 30 respondents was conducted. Cronbach's alpha was calculated at 0.78, indicating acceptable internal consistency.

*E. Instrumentation*

A structured questionnaire with 20 items was developed across three domains: behavioural, cognitive, and social implications. Items were rated on a 4-point Liker scale (Strongly Agree – 4, Agree – 3, Disagree – 2, Strongly Disagree – 1). Supplementary notes from informal interviews and field observations enriched the data.

*F. Data Analysis*

Descriptive statistics (means, standard deviations) were used to summarise responses. Inferential statistics (t-tests, ANOVA, Pearson correlations) tested the hypotheses. Qualitative insights were thematically analysed and integrated into the discussion.

**IV. RESULTS**

*A. Research Question 1*

What are the behavioural impacts of smartphone use on children as perceived by parents, teachers, and other users?

Table 4.1: Mean Scores of Behavioural Impacts

<b>Behavioural Indicator</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
Children easily distracted by phones	3.42	0.65	High impact
Decline in outdoor play	3.25	0.72	High impact
Increased aggression/impatience	2.87	0.81	Moderate impact
Reduced family communication	3.36	0.70	High impact

*B. Interpretation*

The results indicate that smartphone use has a substantial behavioural impact on children. High mean scores for distraction (M = 3.42), reduced outdoor play (M = 3.25), and weakened family communication (M = 3.36) suggest that smartphones significantly alter children’s behavioural patterns. Although aggression shows a moderate impact (M = 2.87), it remains a notable concern. Thus, smartphone use appears to contribute to behavioural disruptions and reduced engagement in developmentally appropriate activities.

*C. Research Question 2*

How does smartphone use influence children’s cognitive and academic development?

Table 4.2: Mean Scores of Cognitive/Academic Impacts

<b>Cognitive Indicator</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
Smart phones help in quick information access	3.18	0.66	Positive impact

Reduced attention span in school	3.29	0.74	Negative impact
Decline in handwriting/reading culture	3.11	0.79	Negative impact
Support for digital learning apps	2.96	0.68	Moderate positive

*D. Interpretation*

The findings reveal a dual impact of smart phones on cognitive development. While access to information (M = 3.18) and support for digital learning (M = 2.96) indicate educational benefits, these are offset by negative outcomes such as reduced attention span (M = 3.29) and declining handwriting and reading culture (M = 3.11). This suggests that although smart phones can support learning, excessive or unguided use may undermine core academic skills.

*E. Research Question 3*

What are the social implications of smart phone use on family cohesion and peer relationships?

Table 4.3: Mean Scores of Social Impacts

Social Indicator	Mean	SD	Interpretation
Weakening of family bonds	3.28	0.71	High impact
Cyber bullying/peer influence	2.91	0.80	Moderate impact
Reduced face-to-face friendships	3.22	0.75	High impact

*F. Interpretation*

The results indicate that smart phone use significantly affects children’s social development. High mean scores for weakened family bonds (M = 3.28) and reduced face-to-face friendships (M = 3.22) suggest diminished interpersonal interaction. Cyber bullying and peer influence (M = 2.91) also present moderate concerns. These findings imply that smart phones may be contributing to social disconnection and altered peer dynamics.

**V. TEST OF HYPOTHESES**

*A. Hypothesis 1*

H<sub>0</sub>1: There is no significant difference in the perceptions of parents, teachers, children, and other community members regarding the behavioural impacts of smart phone use on children.

Result: A one-way ANOVA revealed a statistically significant difference among groups (p < 0.05).

Decision: H<sub>0</sub>1 is rejected.

*B. Interpretation:*

This indicates that stakeholders differ significantly in their perceptions of behavioural impacts. Teachers expressed stronger concerns about classroom distraction, while parents emphasised reduced family interaction.

*C. Hypothesis 2*

H<sub>02</sub>: Smartphone use has no significant influence on children's cognitive and academic development.

Result: A one-sample t-test comparing the cognitive composite mean ( $M \approx 3.14$ ) to the neutral midpoint revealed a significant difference ( $p < 0.05$ ).

Decision: H<sub>02</sub> is rejected.

*D. Interpretation:*

Smartphone use significantly influences children's cognitive and academic development, reflecting both positive (information access) and negative (reduced attention span) effects.

*E. Hypothesis 3*

H<sub>03</sub>: Smartphone use has no significant impact on family cohesion and peer relationships among children.

Result: A one-sample t-test showed that the social composite score was significantly higher than the neutral midpoint ( $t(349) = 15.81, p < 0.001$ ).

Decision: H<sub>03</sub> is rejected.

*F. Interpretation:*

Smartphone use has significant social implications, particularly in weakening family cohesion and reducing face-to-face peer interaction.

*G. Hypothesis 4*

H<sub>04</sub>: There is no significant difference in the overall perception of smartphone impacts on children's development among parents, teachers, children, and community members.

Result:

A one-way ANOVA revealed a statistically significant difference among stakeholder groups ( $F(3, 346) = \_\_\_, p < 0.05$ ).

Decision: H<sub>04</sub> is rejected.

*H. Interpretation:*

There are significant differences in the overall perception of smartphone impacts on children's behavioural, cognitive, and social development. This suggests that stakeholders interpret smartphone effects differently based on their roles and experiences.

## VI. SUMMARY OF FINDINGS

The study was designed to investigate the impact of smartphone use on children's development across three key domains: behavioural, cognitive/academic, and social. It also explored differences in perceptions among parents, teachers, children, and other community members. A descriptive survey design integrating quantitative and qualitative approaches was adopted. Data were collected using a structured Likert-scale questionnaire, supported by researcher observations and informal interviews. A sample of 350 respondents was drawn from a population of approximately 5,000 smartphone users. The instrument demonstrated high reliability (Cronbach's  $\alpha = 0.86$ ).

Findings revealed that smart phone use significantly influences children's behaviour, cognition, and social relationships. While certain educational benefits were identified, the overall pattern suggested that unregulated use poses notable developmental risks. In addition, significant differences were found in stakeholder perceptions of smart phone impacts:

- Smart phone use significantly affects children's behaviour, leading to distraction and reduced outdoor engagement.
- It has both positive and negative cognitive implications, enhancing information access while reducing attention span.
- It negatively impacts social relationships, weakening family cohesion and peer interaction.
- Stakeholders differ significantly in their perceptions of smart phone impacts.

## VII. DISCUSSION

The findings affirm both theoretical frameworks guiding this study. Bronfenbrenner's ecological systems theory is evident as smartphones reshape micro-level interactions (home, school) and influence ecosystem factors (media, peer culture). Children's development is increasingly mediated by digital devices, underscoring the dynamic interplay between environment and growth.

Bandura's social learning theory also finds support, as children imitate behaviours observed in online videos, games, and social media content. Teachers' reports of mimicry and parents' concerns about reduced communication highlight the potency of smartphones as models for behaviour.

Importantly, the divergence between parents' and teachers' perspectives reflects their differing contexts of engagement. While parents view smartphones as intruding upon family cohesion, teachers experience their disruptive influence directly in academic spaces.

Essentially, the study confirms that smartphones function as a double-edged sword—offering both developmental opportunities and significant risks. The balance between these outcomes depends largely on the level of supervision, regulation, and digital literacy among caregivers.

## VIII. CONCLUSION

Based on the findings, the study concludes that smartphones are powerful but ambivalent tools in early childhood development. Behaviourally, they contribute to distraction, reduced outdoor activity, and weakened family interaction. Cognitively, they provide access to information and digital learning opportunities, yet simultaneously undermine attention span and traditional literacy practices. Socially, they weaken interpersonal relationships, reduce face-to-face interaction, and expose children to digital risks such as cyberbullying.

The study further concludes that stakeholders perceive smartphone impacts differently, reflecting their varied roles and experiences within the child's environment. Drawing on Social Learning Theory and Ecological Systems Theory, the findings affirm that children's interactions with smartphones are shaped by—and in turn shape—their immediate and broader environments.

Ultimately, smartphones function as a double-edged sword: their benefits are realised only under structured guidance and supervision, while unregulated use poses significant risks to holistic child development.

### A. *Implications of the Study*

**Educational Implications:** The findings highlight the need for schools to integrate smart phones into teaching and learning in a structured and pedagogically sound manner. Educators must strike a balance between leveraging digital tools for instruction and preserving essential learning practices such as sustained attention, handwriting, and critical thinking.

### B. *Parental Implications*

Parents play a crucial role in mediating children's smart phone use. The study implies that without adequate supervision, children are likely to misuse these devices. Therefore, parents must develop digital literacy skills and actively monitor the type, duration, and context of smart phone usage.

### C. *Social Implications*

The weakening of family bonds and peer relationships suggests a need to re-emphasise interpersonal interaction within homes and communities. Families must intentionally create opportunities for communication and shared activities that do not involve digital devices.

### D. *Policy Implications*

The findings underscore the need for policy frameworks that regulate children's access to digital technologies. Educational authorities and government agencies should develop guidelines on age-appropriate smart phone use, digital safety, and screen-time management in schools and homes.

## RECOMMENDATIONS

Based on the findings and conclusions, the following recommendations are made:

- Parental Guidance and Monitoring: Parents should establish clear rules regarding smartphone use, including time limits, content restrictions, and supervised access.
- Digital Literacy Programmes: Schools and community organisations should organise training programmes for parents and teachers to enhance their capacity to guide children in responsible smart phone use.
- Integration of Controlled Digital Learning: Educators should incorporate smart phones into learning in a controlled manner, using approved educational applications while limiting distractions.
- Promotion of Play-Based Learning: Schools and families should encourage outdoor play, creative activities, and social interaction to counterbalance excessive screen exposure.
- Policy Development: Government and educational stakeholders should formulate and enforce policies on children's digital engagement, including guidelines for safe and age-appropriate use.
- Further Research: Future studies should explore longitudinal effects of smart phone use on child development and examine intervention strategies that promote balanced usage.

### A. *Contribution to Knowledge*

This study contributes to existing literature by providing empirical evidence on the dual impact of smart phones on early childhood development within the South East Nigerian context. It extends the application of established theoretical frameworks by demonstrating how digital technologies function within children's ecological environments. Furthermore, the study offers context-specific insights that can inform educational practice, parental strategies, and policy formulation.

### B. *Limitations of the Study*

The study was limited to a specific geographical region (South East Nigeria), which may affect the generalizability of the findings. Additionally, reliance on self-reported data may introduce response bias. Despite these limitations, the study provides valuable insights into an emerging and critical issue in child development.

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