The Impact of Smartphone usage on the Learning Activities of Grade 05 Students

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Abstract

In today's digital era, smartphones have become an integral part of students' daily lives. In particular, the increasing use of smartphones among primary-level students has raised signif--icant concerns regarding their ultimate impact on formal and informal learning activities.

Against this background, the present study primarily investigates the multifaceted impact of smartphone usage on the learning activities of Grade 05 students. The study was conducted based on Tamil-medium schools located in the Beruwala Educational Zone. A quantitative research approach was successfully employed, and primary data were comprehensively collected from students, parents, and teachers using structured, closed-ended questionnaires. The collected data were meticulously analyzed using descriptive and inferential statistical methods via SPSS software. The empirical findings of the study reveal that the extent of smartphone usage time, the specific purpose of use, the nature of the accessed content, parental and teacher supervision levels, and the social/family environment have significant influences on students' learning performance, attention span, classroom participation, and homework completion. In particular, students who spent excessive time using smartphones for pure entertainment purposes demonstrated higher levels of continuous cognitive distrac--tion and significantly lower engagement in core academic activities. Conversely, students who utilized smartphones in a highly controll--ed manner for education-oriented purposes displayed improved learning motivation, self-directed learning skills, and overall academic achievement. Furthermore, continuous supervi--sion and robust guidance from both parents and teachers were found to promote highly responsible smartphone usage and enhance students' long-term academic discipline.

Overall, the study strongly emphasizes that smartphone usage can have both positive and negative effects on students' learning activities. However, with proper guidance, structural regulation, and educationally oriented use, smartphones can be successfully transformed into highly effective learning tools. The empirical findings of this study provide critical practical insights for educators, parents, and educational policymakers in developing holistic strategies to enhance students' learning outcomes within the modern digital age.

Keywords:

Smartphone usage; Learning activities; Grade 05 students; Academic performance; Attent--ion span; Parental supervision.

Chapter 1: Introduction and Research Background

1.1 Background of the Study

According to comprehensive sociological and educational studies published globally, a child's education serves as a true mirror reflecting the civilizational advancement and prosperity of future generations (UNICEF, 2020). In the contemporary digital age, information techno--logy and smartphone devices have dramatic--ally shifted from being luxury items to becoming deeply embedded, essential compon--ents of children's daily lives. Particularly, primary school students have started utilizing smart devices, computers, and internet platf--orms extensively not only for formal educational requirements but also heavily for interactive entertainment, social media networ--king, consumption of digital videos, and online gaming (Radesky, Christakis, & Moreno, 2016).

While these modern devices present unparalleled avenues for immediate information access and interactive learning, their frequent, unregulated, and excessive usage introduces

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massive challenges to children's psychological development, cognitive growth, emotional stability, and overall academic progression.

The primary schooling phase, particularly focusing on children aged between 6 and 10 years, represents an extremely sensitive and critical foundation stage for human developme--nt. During this formative period, core behavi--oral traits such as disciplined time managem--ent, personal accountability, mutual respect, self-control, and structural adherence are deeply rooted within a child's cognitive architecture (Shin & Lwin, 2017). Continuous engagement with digital screens and immersive electronic media during these years threatens to disrupt the normal assimilation of these fundamental virtues, putting children at risk of developing digital dependency, short attention spans, and social alienation (Chaudron, Di Gioia, & Gemo, 2018). Without systematic parental oversight and teacher intervention, the likelihood of primary school children encountering age-inappropriate, violent, or unwholesome digital content increases exponentially, thereby undermining their moral development and academic focus.

1.2 Statement of the Research Problem

In developing nations like Sri Lanka, the rapid proliferation of smartphone technology has brought about a profound socio-educational transformation. Government statistics indicate that approximately 70% of school-going children possess regular access to smartphones or digital devices within their household environments (UNICEF, 2020). This extensive accessibility was further accelerated by the global shifts toward online learning paradigms during emergency educational crises. However, post-crisis observations indicate a persistent, unregul--ated usage pattern among young students.

Due to intense economic pressures and demanding occupational schedules, many parents are unable to allocate sufficient time to observe, track, or regulate their children's device interactions. Consequently, primary students frequently engage with smartphones completely unsupervised, spending extended hours on digital platforms, which leads to time mismanagement and a severe deterioration of their focus on academic tasks.

This situation has directly resulted in noticeable declines in classroom concentration, structural assignment completion, active participation, and scholastic achievements. Grade 05 is a particularly pivotal juncture in the Sri Lankan primary education system, characterized by high-stakes examinations and the transition toward secondary education. Despite the obvious visibility of this issue, there remains a critical lack of empirical, localized research investigating how specific variables—such as total daily usage time, underlying purpose of device access, nature of content, and the quality of parental/teacher supervision—interact to impact the learning activities of Tamil-medium primary students. This study addresses this vital research gap by executing a rigorous empirical investigation within the Beruwala Educational Zone.

1.3 Objectives of the Study

The primary objective of this research is to investigate and evaluate the comprehensive impact of smartphone usage on the learning activities of Grade 05 students in Tamil-medium schools within the Beruwala Educati--onal Zone. The specific research objectives formulated to guide this study are as follows:

- To measure the average daily time spent by Grade 05 students on smartphones and determine its relationship with their academic performance.
- To analyze the primary purposes (educational vs. entertainment) for which smartphones are utilized by primary school students.
- To assess the nature and appropriateness of the digital content accessed by students and its subsequent behavioral implications.
- To evaluate the extent and effectiveness of parental and teacher supervision on children's smartphone habits.
- To examine the influence of the socio-familial environment on the smartphone usage and learning patterns of students.

1.4.Research Questions

To systematically address the research problem, the following primary research questions were postulated:

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1. What is the current status and extent of smartphone usage among Grade 05 students in the Beruwala Educational Zone?
2. How does the total duration of daily smartphone usage influence the classroom attention span and homework completion of students?
3. To what extent does the underlying purpose of smartphone usage (educational vs. entertainment) impact the academic outcomes of students?
4. What role do parental oversight and teacher supervision play in mitigating the negative impacts of smartphone usage on learning?
5. How does the family's socioeconomic and domestic environment shape the digital habits of primary school children?

1.5.Significance of the Study

This study holds immense value for a wide spectrum of educational stakeholders. For primary school teachers and school administrators, it offers empirical evidence regarding the modern behavioral challenges stemming from digital overexposure, enabling the formulation of proactive classroom management strategies. For parents, the study highlights the critical necessity of active digital parenting and structural supervision rather than passive restriction. Furthermore, educational policymakers, curriculum developers, and regional administrators can leverage these localized insights to design robust digital literacy frameworks, guidelines for healthy device usage, and supportive community-level interventions that optimize smartphones as educational assets while minimizing their distractive hazards.

Chapter 2: Literature Review and Theoretical Framework

2.1 Theoretical Framework

To establish a solid scientific basis for analyzing the interaction between digital technology and student learning, this study integrates four prominent foundational theories:

1.Piaget's Cognitive Development Theory: This theory emphasizes that children in the concrete operational stage (around ages 7–11) learn optimally through physical manipulation, concrete experiences, and real-world social interactions. Excessive screen-time abstracts these experiences, replacing multidimensional physical learning with passive, two-dimensional digital consumption, which can potentially delay or distort optimal cognitive framework construction.

2.Cognitive Load Theory (Mayer, 2001): Developed in the context of multimedia learning, this theory argues that human working memory has a strictly limited capacity. High-intensity sensory inputs from smartphones —such as fast-paced video animations, persistent gaming notifications, and hyper-stimulating digital content—inflict a severe "extraneous cognitive load" on the child's mind. This depletes the cognitive resources required for long-term memory consolidation and deep learning processing.

3.Bandura's Social Learning Theory: This framework asserts that children acquire behaviors, language patterns, and social attitudes through the observation and imitation of models within their environment. When exposed to unmonitored digital content containing vulgar language, aggressive behavior, or unwholesome social paradigms, children absorb and mirror these negative actions within their classrooms and households.

4.Bronfenbrenner's Ecological Systems Theory: This holistic theory posits that child development is profoundly shaped by nested environmental systems. The "microsystem" encapsulates immediate environments like the home, school, and peer groups. This study views the smartphone as a highly influential modern technological catalyst that alters the interactions within the child's microsystem, directly influencing how parents, teachers, and peers communicate and engage with the student.

2.2.Empirical Review of International and Local Literature

A broad body of international literature underscores the global nature of this dilemma. Studies conducted by Livingstone and Blum-Ross (2020) demonstrated that across various cultural contexts, the uncontrolled escalation of screen time among primary students is inversely correlated with reading comprehen--sion and mathematical problem- solving competencies.

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Similarly, research by Shin and Lwin (2017) highlighted that structural parental monitoring acts as a critical buffer, significantly reducing behavioral abnormalities and enhancing online safety for young children. In the domestic cont--ext of Sri Lanka, contemporary research highlights unique challenges. Local studies indicate that due to the language barrier and limited availability of high-quality, localized Tamil-medium digital educational resources, students often shift toward English or foreign-language entertainment content, which exacerbates the disconnect between their digital leisure activities and their school curriculum. Furthermore, economic challenges in rural and semi-urban educational zones often force parents to work extended hours, leaving a severe vacuum in domestic supervision, which leads to a higher prevalence of smartphone misuse among primary school children.

Chapter 3: Research Methodology

3.1 Research Design

This study adopts a rigorous cross-sectional quantitative survey research design. This approach allows for the systematic collection of quantifiable data from a substantial sample size, facilitating objective statistical analysis, hypothesis testing, and the generalization of findings to the broader target population within the educational zone.

3.2 Population and Sample Selection

The target population for this study comprises all Grade 05 students, their corresponding parents, and primary school teachers within the Tamil-medium schools of the Beruwala Educational Zone. To ensure a representative and unbiased sample, a multi-stage stratified random sampling technique was utilized. First, schools were stratified based on their geographical location and institutional classification. From these strata, a total sample of 295 students, 295 parents, and 35 primary school teachers was randomly selected, yielding a robust composite dataset for comprehensive tri-angulation.

3.3 Data Collection Instruments

Primary data were gathered using three separate, custom-designed, structured Likert-scale questionnaires tailored specifically for students, parents, and teachers. The questionnaires were meticulously translated into clear, age-appropriate Tamil. The items were structured around five core independent variables: Smartphone Usage Time, Purpose of Use, Nature of Content, Level of Supervision, and Socio-Familial Environment. The dependent variable was the student's Learning Activity performance (encompassing classroom attention, participation, and homework completion). To guarantee validity and reliability, the instruments underwent rigorous expert panel review for content validity, followed by a pilot test to calculate internal consistency metrics.

Chapter 4: Data Analysis and Empirical Results

4.1.Instrument Reliability Analysis

To assess the internal consistency and reliability of the measurement scales, Cronbach's Alpha coefficients (α) were computed for all key construct dimensions across the three respondent groups. A value of $\alpha \geq 0.70$ was established as the threshold for acceptable reliability. The empirical results are summarized in the tables below:

Table 4.1: Reliability Analysis for Student Questionnaire Scales (n = 295)

Research Construct Dimension	Number of Items	Cronbach's Alpha (α)	Reliability Status
Smartphone Usage Time (Duration)	5	0.785	Highly Reliable
Purpose of Smartphone Use	5	0.812	Highly Reliable
Nature of Accessed Content	6	0.764	Highly Reliable
Parental / Teacher Supervision	5	0.831	Highly Reliable
Social & Family Environment	5	0.916	Excellent Reliability
Student Learning Activities (DV)	8	0.929	Excellent Reliability

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Table 4.2: Reliability Analysis for Teacher and Parent Questionnaires

Respondent Group	Construct Dimension Evaluated	Number of Items	Cronbach's Alpha (α)
Teachers (n = 35)	Educational Purpose & Alignment	6	0.798
	Classroom Learning Outcomes	8	0.845
Parents (n = 295)	Domestic Supervision & Rules	5	0.811
	Home Learning Environment	6	0.876

The reliability analysis confirms that all scales demonstrate strong internal consistency, with alpha values safely exceeding the 0.70 standard, thereby validating the suitability of the data for advanced inferential statistical testing.

4.2.Descriptive Statistics of Key Study Variables

Descriptive analysis was performed to calculate the Mean (M) and Standard Deviation (SD) for the core research variables based on the 5-point Likert scale (where 1 = Strongly Disagree and 5 = Strongly Agree). The statistical summaries are detailed below:

Table 4.3: Descriptive Statistics for Main Research Variables

Perspective Group	Core Research Variable	Mean (M)	Standard Deviation (SD)
Students' Perspective	Smartphone Usage Time	3.84	0.72
	Entertainment / Social Media Focus	4.12	0.65
	Parental Monitoring Effectiveness	2.95	0.88
	Learning Activity Engagement	3.12	0.79
Teachers' Perspective	Device-Induced Classroom Distraction	4.25	0.54
	Homework Completion Rates	2.80	0.82
Parents' Perspective	Domestic Device Control Difficulty	3.90	0.71
	Child's Academic Focus at Home	3.05	0.76

The descriptive findings clearly demonstrate a high mean score for smartphone usage time and entertainment focus among students, contrasted with moderate to low scores for parental monitoring effectiveness and student learning engagement, indicating a systemic challenge within the studied region.

To determine the direction and strength of the linear relationships between the independent variables and the dependent variable (Learning Activities), Pearson Correlation Coefficients (r) were computed. The correlation matrices for the different respondent perspectives provide deeply insightful empirical results

4.3.Bivariate Correlation Analysis

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Table 4.4: Pearson Bivariate Correlation Matrix (Student Data, n = 295)

Variables	Usage Time	Usage Purpose	Content Nature	Supervision	Family Env.	Learning Act.
Usage Time	1.000					
Usage Purpose	0.542**	1.000				
Content Nature	0.411**	0.489**	1.000			
Supervision	-0.365**	-0.210**	-0.298**	1.000		
Family Env.	0.288**	0.315**	0.202**	0.422**	1.000	
Learning Act.	-0.589**	-0.412**	-0.374**	0.511**	0.345**	1.000

Note: ** Correlation is highly significant at the 0.01 level (2-tailed).

The correlation results show that total smartphone usage time exhibits a strong, statistically significant negative relationship with student learning activities ($r = -0.589$, $p < 0.01$). Similarly, entertainment-biased usage purposes and improper content nature are negatively correlated with learning outcomes. In contrast, active parental/ teacher supervision ($r = 0.511$, $p < 0.01$) and a positive family environment display significant positive correlations with learning engagement.

4.4.Multiple Linear Regression Analysis

To evaluate the collective predictive capacity of the independent variables and identify the strongest determinants of student learning activities, ordinary least squares (OLS) multiple regression analysis was executed separately across the data models. The results for the primary student model are detailed below:

Table 4.5: Multiple Regression Model Summary (Student Dataset)

Model	R	R Square (R^2)	Adjusted R Square	Standard Error of the Estimate
1	0.818	0.669	0.663	0.65345

The R Square value of 0.669 indicates that the combination of the five independent variables explains a substantial 66.9% of the total variance in Grade 05 students' learning activities. The overall model fit is highly significant, as evidenced by the ANOVA results: $F = 116.963$, $p < 0.001$.

Table 4.6: Regression Coefficients and Significance (Student Model)

Predictor Variables	Unstandardized B	Standard Error	Standardized Beta (β)	t-value	Significance (p)

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(Constant)	**1.845**	**0.214**	**-**	**8.621**	**0.000**
Smartphone Usage Time	**-0.485**	**0.042**	**-0.512**	**-11.548**	**0.000**
Purpose of Use	**-0.182**	**0.039**	**-0.195**	**-4.667**	**0.000**
Nature of Content	**-0.104**	**0.041**	**-0.112**	**-2.537**	**0.012**
Supervision Level	**0.312**	**0.038**	**0.334**	**8.211**	**0.000**
Predictor Variables	**Unstandardized B**	**Standard Error**	**Standardized Beta (β)**	**t-value**	**Significance (p)**
Social & Family Env.	**0.115**	**0.045**	**0.121**	**2.556**	**0.011**

The regression coefficients establish that Smartphone Usage Time is the most potent negative predictor of learning activities ($\beta = -0.512$, $t = -11.548$, $p < 0.001$), indicating that an increase in unmanaged device time severely degrades learning engagement. Conversely, Supervision Level stands out as the most powerful positive determinant ($\beta = 0.334$, $t = 8.211$, $p < 0.001$), underscoring that active guidance and oversight can substantially reverse or mitigate digital distractions.

Interestingly, when analyzing the Teacher Dataset Regression ($n = 35$), the overall model was not statistically significant at the traditional 0.05 level ($F = 2.249$, $p = 0.076$), primarily due to the small sample size. However, within the teacher data, the specific variable of Usage Purpose emerged as a significant factor ($B = 0.551$, $t = 2.598$, $p = 0.015$), showing that teachers strictly evaluate the impact of technology based on whether it is explicitly structured for educational tasks or left entirely for entertainment.

Chapter 5: Discussion, Conclusion, and Recommendations

5.1 Discussion of Major Findings

The empirical findings provide clear, statistically robust answers to the research questions. The massive negative weight of smartphone usage time on learning confirms the real-world applicability of Cognitive Load Theory—children who submerge themselves in rapid, multi-sensory digital entertainment deplete their mental bandwidth, resulting in immediate attention fragmentation within the classroom. This is corroborated by teachers' observations, where a high mean score of 4.25 was recorded for device-induced classroom distraction.

However, the study also reveals a dual nature of technology. When the purpose of smartphone use shifts toward educational activities, and when it is paired with strong parental supervision, its negative impacts are minimized. This aligns perfectly with Bronfenbrenner's Ecological Theory, demonstrating that the smartphone is not an isolated threat but a dynamic tool whose impact is shaped by the home and school microsystems. Active digital parenting creates a structured framework that guides children to use these devices responsibly, supporting their academic growth.

5.2.Strategic Recommendations

Based on the empirical insights generated by this study, the following multi-stakeholder strategic recommendations are proposed:

1.For Parents (Domestic Level): Parents must transition from passive screen restriction to active digital parenting. This includes establishing clear domestic device-usage schedules (e.g., maximum 1 hour per day for non-academic tasks), banning device usage

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during designated study hours and in bedrooms, and actively co-viewing and engaging with the digital content their children access.

2.For School Administrators and Teachers (Institutional Level): Schools should introduce regular digital literacy and wellness workshops for both students and parents. Teachers can design creative homework assignments that leverage technology constructively, guiding students toward verified, high-quality educational portals while warning them against the risks of digital overexposure.

3.For Educational Policymakers (Macro Level): The Ministry of Education and regional authorities should collaborate to develop high-quality, localized, Tamil-medium digital learning repositories tailored to the primary school curriculum. This will ensure that when Tamil-medium students access smartphones, they have immediate access to engaging, culturally appropriate, and highly educational resources.

5.3.Research Limitations and Future Directions

While this study offers valuable localized insights, certain limitations must be acknowledged. First, the geographical scope was restricted to the Beruwala Educational Zone, meaning the findings may not fully apply to other regions with different socio-economic dynamics. Second, the study relied primarily on self-reported questionnaire data, which can introduce subjective bias. Future research could adopt a longitudinal mixed-methods approach, tracking students across different educational zones and incorporating objective screen-time tracking data alongside qualitative interviews to gain a deeper, more comprehensive understanding of these trends.

5.4.Conclusion

In conclusion, this study demonstrates that smartphone usage exerts a powerful, dual-edged influence on the learning activities of Grade 05 students. Unregulated, excessive screen time driven by entertainment leads to severe cognit--ive distraction, lower classroom engagement, and poor homework completion. However, when smartphones are used intentionally for educational purposes and backed by strong parental and teacher supervision, they can serve as valuable educational tools. Ultimately, mitigating digital distractions and leveraging the benefits of technology requires a coordinated effort from parents, teachers, and policymakers to cultivate a balanced, structured, and enriching digital ecosystem for the modern child.

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