Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

From learning tool to digital distraction: Mobile phone and social media use and its impact on children's academic performance in rural Bangladesh

Tariqul Howlader
Khulna University
2. Dr. Taufiq-E-Ahmed Shovo
taufiq@soc.ku.ac.bd

Khulna University

Article

Keywords: mobile phone use, academic performance, self-regulated learning, Displacement Hypothesis, rural Bangladesh

Posted Date: November 10th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11137657/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

From learning tool to digital distraction: Mobile phone and social media use and its impact on children's academic performance in rural Bangladesh

Abstract

This study investigates the dual impact of mobile phone usage on children's academic performance in *Sarankhola* Upazila, Bagerhat District, Bangladesh. Using a qualitative exploratory design, data were gathered through in-depth interviews and a focus group discussion with twenty-eight participants, including children and their parents. Grounded in Self-Regulated Learning Theory and the Displacement Hypothesis, the findings reveal that mobile phones simultaneously enhance and undermine academic outcomes. Children who strategically accessed educational platforms including YouTube tutorials, Ten-Minute School, and applications such as Photomath, reported improved subject comprehension and acquired skills beyond the formal curriculum. Conversely, the majority of participants experienced attentional disruption, fragmented study habits, and declining performance attributable to recreational engagement with social media and gaming. The mere proximity of a device was sufficient to impair concentration. A clear bifurcation emerged between a minority of self-regulated learners who leveraged phones for academic gain and a larger group whose unregulated recreational use displaced study time, physical activity, and reading. Teachers occupied an ambivalent but critical mediating role, opposing unstructured use while endorsing specific educational applications. The study provides evidence that academic outcomes depend not on the technology itself but on children's self-regulatory capacity, parental guidance, and teacher-directed integration.

Keywords: *mobile phone use; academic performance; self-regulated learning; Displacement Hypothesis; rural Bangladesh*

1. Introduction

The relationship between mobile phone usage and children's academic performance has emerged as one of the most contested topics in contemporary educational research. While proponents argue that smartphones serve as powerful learning tools providing unprecedented access to educational resources (Gikas and Grant 2013, Sharples, de Roock et al. 2016), critics contend that the attentional demands of mobile devices fundamentally undermine sustained academic engagement (Rosen, Mark Carrier et al. 2013, Carrier, Rosen et al. 2015). This debate has intensified as smartphone ownership among school-age children has surged globally, with recent estimates indicating that 95% of adolescents in the United States have access to a smartphone (Vogels, Gelles-Watnick et al. 2022), and ownership rates are rising rapidly in developing countries including Bangladesh (BTRC 2023). Despite this ubiquity, the academic consequences of mobile phone use among children in low- and middle-income countries remain insufficiently examined, particularly in rural settings where digital infrastructure, educational resources, and parental guidance capacities differ markedly from urban contexts.

Existing evidence on the academic impact of mobile phones presents a complex and often contradictory picture. A recent meta-analysis synthesizing 45 studies found a statistically significant but small negative relationship between problematic smartphone use and academic achievement (pooled $r = -0.16$), with the strength of this association moderated by students' age and the specific measure of academic performance employed (Albacete-Maza, Combalia et al. 2025). However, this aggregate finding masks considerable heterogeneity: some children leverage mobile devices to access educational videos and tutorial platforms that substantially improve their understanding of core subjects (Lai 2019), while others experience declining

academic performance as recreational phone use displaces study time and fragments attention (Felisoni and Godoi 2018). This within-population variation where the same technology produces divergent academic outcomes across children constitutes a critical puzzle that existing quantitative research, with its emphasis on average effects, has struggled to explain.

The role of teachers in mediating children's academic engagement with mobile technology represents a further underexplored dimension. While school-level mobile phone bans have been implemented in numerous countries (Kessel, Hardardottir et al. 2020), the effectiveness of such policies remains debated, and the nuanced ways in which teachers navigate between prohibition and conditional educational endorsement have received limited qualitative investigation (Bonal, Zancajo et al. 2021). In rural Bangladesh, where teachers often serve as both disciplinary enforcers and the primary conduit for digital literacy, understanding their attitudes toward mobile phone integration is essential for designing effective educational interventions.

This study addresses these gaps by qualitatively examining the dual impact of mobile phone usage on academic performance among children in *Sarankhola* Upazila, Bagerhat District, Bangladesh. Grounded in Self-Regulated Learning Theory (Ahad and Anshari 2017) and the Displacement Hypothesis (Neuman 1988) and drawing on semi-structured interviews and focus group discussions with twenty-eight participants, the study investigates how mobile phones simultaneously enhance and undermine children's educational outcomes. By capturing the perspectives of both children and parents, and incorporating teacher attitudes through participant accounts, this research provides contextually rich evidence that complements the predominantly quantitative, Western-centric literature on technology and academic performance.

1.1 Theoretical Framework

1.1.1 Self-Regulated Learning Theory (SRL)

The primary theoretical foundation for this article is Zimmerman (1990) Self-Regulated Learning (SRL) Theory, which provides a comprehensive framework for understanding the divergent academic outcomes observed among children who use mobile phones in *Sarankhola* Upazila. SRL theory conceptualizes learning as a cyclical, self-directed process through which students actively set goals, monitor their performance, and adaptively regulate their cognitive, motivational, and behavioral strategies to optimize academic outcomes (Zimmerman 1990, Zimmerman 2002). The theory posits that learners who effectively self-regulate by planning study sessions, monitoring comprehension, managing distractions, and reflecting on their learning achieve significantly better academic results than those who lack such regulatory capacities (Zimmerman 2002).

SRL theory is operationalized through Zimmerman's three-phase cyclical model comprising forethought (goal setting and strategic planning), performance (self-monitoring and strategy implementation), and self-reflection (evaluating outcomes and adapting approaches) (Zimmerman 1990, Tinajero Vacas, Castelo et al. 2010). In the context of children's mobile phone use, this model illuminates why some children in the present study leveraged mobile technology to improve their academic performance while others experienced declining results. Children who demonstrated effective self-regulation such as Participant 4, who limited phone use to educational applications like Ten-Minute School exhibited the forethought and performance control phases of Zimmerman's model. In contrast, children who reported being overwhelmed by social media notifications and entertainment content displayed deficits in the self-regulation cycle, particularly in the performance phase, where they failed to maintain attentional focus and manage environmental distractions.

The application of SRL theory to smartphone use in educational contexts has received substantial empirical support. Hartley, Bendixen et al. (2020) demonstrated that students who exhibit higher levels of self-regulated learning behaviors, such as time management and focused effort, report significantly lower levels of smartphone multitasking during study sessions. Their findings indicate that the smartphone itself is not inherently detrimental to academic performance; rather, it is the learner's capacity for self-regulation that determines whether the device functions as an educational tool or a source of distraction. Similarly, Joshi, Woodward et al. (2023) found that cell phone multitasking during academic activities relates negatively to academic performance, while self-regulated learning behaviors mediated by phone use showed no significant positive relationship, suggesting that merely using a phone for study purposes does not guarantee academic benefit without effective self-regulatory skills.

Furthermore, the well self-regulated learner recognizes limits on cognitive capacity and the necessity to be strategic in the deployment of attentional resources (Schunk and Zimmerman 2011). This insight is directly applicable to the present study's findings, where the mere physical proximity of a mobile phone during study time was consistently reported as impairing concentration. Hadwin, Sukhawathanakul et al. (2022) confirmed that SRL practices effectively mitigate the impact of academic challenges and environmental disruptions on academic performance, particularly in the context of online and technology-mediated learning environments. This finding supports the present study's observation that children who adopted self-regulatory strategies such as keeping phones away during study sessions or turning off the internet reported better concentration and academic outcomes.

1.1.2 The Displacement Hypothesis

Complementing SRL theory, this study draws upon the Displacement Hypothesis (Neuman 1988, Mutz, Roberts et al. 1993) to explain how mobile phone use restructures

children's time allocation patterns, displacing developmentally beneficial activities such as reading, physical play, and sustained study. The Displacement Hypothesis proposes that time spent on screen-based media directly reduces time available for other activities, with the magnitude of negative impact increasing proportionally with the amount of screen time (Neuman 1988). This theoretical perspective has been widely applied to examine the relationships between screen media and children's cognitive, physical, and social development.

Recent empirical research has provided substantial support for the displacement mechanism in the context of mobile phone use among children and adolescents. Putnick, Trinh et al. (2022) examined whether screen time displaces reading and peer play among toddlers, finding significant evidence for displacement of peer play and partial evidence for displacement of reading activities. Their longitudinal analysis demonstrated that screen time at earlier ages predicted reduced engagement in developmentally important activities at later ages, establishing a temporal sequence consistent with a displacement mechanism. This finding resonates strongly with the present study's observation that children in *Sarankhola* reported replacing sports, outdoor play, and book reading with mobile phone activities a pattern that was explicitly described by multiple participants and visually documented in Project Map 4.

The displacement mechanism is particularly relevant for understanding the negative academic outcomes observed in the present study. Hale and Guan (2015) established through systematic review and meta-analysis that screen time is consistently associated with delayed bedtimes and decreased total sleep duration among children and adolescents, with displacement of sleep being a primary pathway. The present study's participants corroborated this mechanism, with thirteen out of twenty-eight reporting sleep disturbances attributable to late-night phone use. Furthermore, Gerosa, Gui et al. (2022) argued that empirical studies and public

debates frequently invoke the displacement hypothesis to explain negative developmental effects of mobile phone use, though they cautioned that robust longitudinal testing of this hypothesis remains limited a gap that the present qualitative study helps address by providing rich, contextualized accounts of how displacement manifests in the daily lives of rural Bangladeshi children.

1.1.3 Relevance to the Present Study

The integration of Self-Regulated Learning Theory with the Displacement Hypothesis provides a comprehensive framework for interpreting the dual academic impact of mobile phone use identified in this study. SRL theory explains the individual-level variance in academic outcomes: children who effectively regulate their mobile phone use by setting educational goals, monitoring their screen time, and managing distractions achieve improved academic results, while those who lack self-regulatory skills experience declining performance. The Displacement Hypothesis complements this individual-level explanation by illuminating the structural mechanism through which mobile phone use erodes the time budget available for study, reading, and physical activity. Together, these theories explain both why the same technology produces divergent outcomes across children and how excessive engagement progressively displaces the activities that sustain academic achievement.

2. Methods and Materials

2.1 Study Design

This study adopted a qualitative exploratory research design to investigate the complex social phenomenon of children's mobile phone usage in a rural Bangladeshi context (Stevens and Wrenn 2013). The qualitative approach was chosen to probe deeper into participants'

perceptions and the meanings they construct from their everyday experiences (Alan 2016, Creswell and Creswell 2017). The study was conducted in *Sarankhola* Upazila, Bagerhat District, southwestern Bangladesh. According to the 2022 census, *Sarankhola* has a population of approximately 119,084, of which 48,783 (44.21%) are children aged 0–19 years. The area was purposively selected for its diverse child population, increasingly engaging with mobile technology (Tenny, Brannan et al. 2017).

2.2 Participant Recruitment

Twenty-eight participants were recruited across two stakeholder categories children (n = 23) and parents/caregivers (n = 5) using purposive sampling (Creswell and Creswell 2017, Bhardwaj 2019). Fifteen children (aged 12–18) and five parents were selected for in-depth interviews (IDIs), ensuring diversity in age, gender, and educational background. Eight additional children (aged 12–17), not previously interviewed, were recruited for a Focus Group Discussion (FGD) to capture peer-level perspectives (Krueger 2014). This sampling strategy prioritized depth and thematic saturation over numerical representativeness (Alan 2016). The demographic profiles of all participants are presented in Tables 1 and 2.

Table 1: Demographic Profile of IDI Participants (N = 20)

SL	Participant ID	Sex	Age	Education Level	Category	Method
1	Participant 1	Male	15	7	Children	IDI
2	Participant 2	Female	14	7	Children	IDI
3	Participant 3	Female	13	8	Children	IDI
4	Participant 4	Male	14	9	Children	IDI
5	Participant 5	Female	14	9	Children	IDI
6	Participant 6	Male	16	9	Children	IDI
7	Participant 7	Male	15	9	Children	IDI
8	Participant 8	Male	17	11	Children	IDI
9	Participant 9	Male	13	7	Children	IDI

10	Participant 10	Male	16	11	Children	IDI
11	Participant 11	Female	15	9	Children	IDI
12	Participant 12	Male	14	7	Children	IDI
13	Participant 13	Female	17	11	Children	IDI
14	Participant 14	Male	12	6	Children	IDI
15	Participant 15	Male	17	11	Children	IDI
16	Participant 16	Female	45	16	Parents	IDI
17	Participant 17	Male	30	12	Parents	IDI
18	Participant 18	Male	45	12	Parents	IDI
19	Participant 19	Female	50	12	Parents	IDI
20	Participant 20	Female	38	10	Parents	IDI

Table 2: Demographic Profile of FGD Participants (N = 8)

SL	Participant ID	Sex	Age	Education Level	Category	Method
1	Participant 1	Male	17	11	Children	FGD
2	Participant 2	Male	13	8	Children	FGD
3	Participant 3	Male	14	10	Children	FGD
4	Participant 4	Male	12	7	Children	FGD
5	Participant 5	Male	17	11	Children	FGD
6	Participant 6	Male	16	10	Children	FGD
7	Participant 7	Male	13	7	Children	FGD
8	Participant 8	Male	17	11	Children	FGD

2.2.1 Inclusion Criteria

Inclusion criteria were tailored to each participant group to ensure comprehensive coverage of the research phenomenon. Table 3 summarizes these criteria and their rationale.

Table 3: Inclusion Criteria for Study Participants

Participant Group	Inclusion Criteria	Rationale
Children (12–18 years) for IDI	✓ Regular mobile phone user ✓ Aged 12–18 years ✓ Residing in *Sarankhola* Upazila	To directly explore patterns and impacts of mobile phone use; age range ensures capacity to articulate experiences.

Parents/Caregivers for IDI	✓ Have children aged 12–18 using mobile phones ✓ Residing in *Sarankhola* Upazila	To understand parental perceptions, control strategies, and socio-cultural context.
Children (12–17 years) for FGD	✓ Regular mobile phone user ✓ Aged 12–17 years ✓ Diverse school grades ✓ Not interviewed in IDI phase	To capture peer perspectives and social norms not emergent in individual interviews.

2.3 Data Collection Tools Development

A semi-structured interview guide with open-ended questions was developed in Bengali, serving as the primary instrument for both IDIs and the FGD. This format enables participants to speak freely while ensuring systematic coverage of core research themes (Alan 2016). The guide was developed through an extensive literature review, pretested with a small number of respondents, and iteratively refined for clarity, cultural appropriateness, and alignment with the research objectives (Creswell 2009). The core thematic areas and their informing literature are presented in Table 4.

Table 4: Thematic Framework Informing the Data Collection Instrument

Core Thematic Area	Key Literature Sources
Constructive Academic Gains Through Mobile Phone Use	Gikas and Grant (2013); Sharples, Adams et al. (2014); Lai (2019); Sung, Chang et al. (2015)
Detrimental Effects on Academic Engagement and Study Habits	Carrier, Rosen et al. (2015); Rosen, Carrier et al. (2013); Felisoni and Godoi (2018); Alcaraz-Ibáñez, Paterna et al. (2024)
Comparative Academic Outcomes: Achievers versus Underperformers	Junco and Cotten (2012); Lepp, Barkley et al. (2015); Hawi and Samaha (2016); Kibona and Mgaya (2015)
Teacher Perspectives on Mobile Phone Integration in Learning	Selwyn and Aagaard (2020); Kessel, Hardardottir et al. (2020); Beland and Murphy (2016); O'Bannon and Thomas (2014)

The guide addressed four domains: (i) constructive academic gains derived from strategic mobile phone use; (ii) detrimental effects on academic engagement, including

attentional disruption and displacement of study time; (iii) comparative academic outcomes between strategic and recreational users; and (iv) teacher perspectives on mobile phone integration in learning environments.

2.4 Ethical Considerations

This study received ethical approval from the Ethical Clearance Committee of Khulna University (Reference Number: 2025-08-83). Prior to each interview, the purpose, procedures, and voluntary nature of participation were fully disclosed. Parental consent was obtained for all child participants, and children provided their own assent. The researcher served as the sole data collector, maintaining neutrality throughout. Pseudonyms were assigned to all respondents, and data were stored securely and used exclusively for academic purposes. Data analysis was conducted free of manipulation, and ethical integrity and objectivity were upheld throughout the research process (Alan 2016, Creswell and Creswell 2017)

2.5 Data Collection

Primary data were collected through face-to-face IDIs and one FGD during fieldwork conducted from 1 June to 30 October 2025 in *Sarankhola* Upazila. Twenty IDIs were conducted to explore individual experiences, perceptions, and challenges related to mobile phone use (Kozioł-Nadolna and Wiśniewska 2020). Each interview lasted approximately 35–40 minutes, was conducted in Bengali, and was audio-recorded with prior informed consent using a digital voice recorder. Interview locations and times were determined by participants' preferences. One FGD with eight children was conducted to examine shared experiences and peer perspectives, as group discussions reveal social norms and peer-driven patterns not emergent in individual settings (Krueger 2014). Secondary data from journals, articles, and credible academic sources supplemented the analysis (Alan 2016).

2.6 Data Analysis

Audio-recorded interviews were processed weekly. Each interview was transcribed verbatim in Bengali and subsequently translated into English by the lead researcher. To ensure translation accuracy and conceptual equivalence, a back-translation procedure was employed: the English transcripts were independently translated back into Bengali by a bilingual research colleague, and discrepancies were resolved through discussion, consistent with established cross-language qualitative research practices (Brislin 1970, Temple and Young 2004).

The verified English transcripts were imported into NVivo 15 qualitative data analysis software (Lumivero 2023) for systematic coding and thematic analysis. Following Braun and Clarke (2006) six-phase framework, the analysis proceeded through: (1) familiarization with the data through repeated reading and note-taking; (2) generation of initial semantic and latent codes across the dataset; (3) collation of codes into potential themes based on recurring patterns of shared meaning; (4) review and refinement of themes against coded data and the overall dataset; (5) defining and naming each theme and identifying sub-themes where necessary; and (6) integration of thematic findings into a coherent analytical narrative supported by anonymized participant excerpts. This systematic approach enabled identification of key patterns and deeper insights into the dynamics of children's mobile phone engagement in rural Bangladesh.

3. Results

The thematic analysis of qualitative data from twenty-eight participants revealed that mobile phone usage exerts a multifaceted and often contradictory impact on children's academic performance in *Sarankhola* Upazila, Bagerhat District. The findings are organized into four principal themes: constructive academic gains, detrimental effects on academic

engagement, comparative academic outcomes, and teacher perspectives on mobile phone integration. The following project map (**See Figure 1 (Project Map): Impact Variation of Mobile Use**) provides an overarching illustration of these dual impacts, demonstrating how the same technology can simultaneously enhance and undermine children's educational experiences.

[Insert Figure 1 (Project Map): Impact Variation of Mobile Use]

As the project map (**See Figure 1 (Project Map): Impact Variation of Mobile Use**) illustrates, mobile phones can serve as powerful learning tools enabling access to YouTube lessons, educational applications, and online courses. Several participants emphasized the importance of developing creative and technical skills. However, excessive use leads to distraction, reduced academic performance, decreased physical activity, and disrupted sleep patterns. The following themes examine these contradictory impacts in detail.

3.1 Constructive Academic Gains Through Mobile Phone Use

The analysis revealed that mobile phones offer significant educational benefits when used purposefully. Participants reported that access to online educational resources, particularly YouTube tutorials and educational applications, enhanced their understanding of core academic subjects and facilitated the acquisition of skills beyond the traditional school curriculum.

3.1.1 Enhanced Understanding of Core Subjects

Mobile phone use among children offered several benefits in learning and skill development. Multiple participants reported that educational videos helped them grasp

complex topics and improve academic performance, particularly in subjects where they previously struggled.

Participant 4 provided a detailed account of how mobile-based learning transformed his academic competence:

> *"Yes, mobile phone usage has brought significant changes in my learning. Specifically, I have learned a lot about math and English by watching YouTube videos. Previously, I was somewhat weak in math and English, but now, through the mobile phone, I have gained proficiency in these subjects. As a result, my exam results have improved."* **(Participant 4, Male)**

Corroborating this experience, Participant 3 described an even more comprehensive academic transformation:

> *"My exam results have become better than before due to using a mobile phone. I was weak in mathematics and ICT before, but now I can understand it easily by watching YouTube videos. This has increased my confidence and interest in studying has also increased. I solve questions, make notes, and practice with the help of my phone. Mobile has made me self-reliant in education. What I could not do before, now I can learn on my own initiative."* **(Participant 3, Female)**

From the parental perspective, Participant 20 (parent) confirmed the educational value:

> *"Mobile phones are very helpful for learning. When something is not clear, I can search on YouTube or Google to understand it better. They especially help in learning English and in studying beyond what is taught in school."* **(Participant 20, Parent, Female)**

The triangulation of these three accounts, two children experiencing direct academic improvement and one parent validating the educational utility, demonstrates that when mobile phones are used with educational intent, they can meaningfully enhance academic

performance, particularly in subjects like mathematics, English, and ICT. The convergence of child and parent perspectives strengthens the validity of this finding.

3.1.2 Encouragement in Education and Learning New Skills Beyond the Classroom

Beyond core academic subjects, mobile phones facilitated the acquisition of diverse skills not taught within the traditional school curriculum. The following framework matrix (**See Table 5**) presents the framework matrix detailing participants' experiences across two domains: encouragement in education and learning new skills.

Participants	*A: Encourages in Education*	*Interpretation*	*B: Learning New Skills*	*Interpretation*
1: FGD 01 Sex = Male	*Again, there are good sides to it, such as if I do not understand something, I can watch it on YouTube or solve it, and when I create assignments, these are good sides, I can watch it on YouTube and understand it, and I use English dictionaries.*	*Mobile phones are a helpful tool for searching for educational content on YouTube and Google.*	*P1-I can learn many things using my mobile phone that I could not learn in school. For example, I can learn about the sun, news, world events, and how to solve problems. I can also teach others what I learn and understand other countries' languages and cultures by watching movies.* *P2-Our school sometimes has art exams. However, using mobile and YouTube, I can learn well how to draw pictures and how to color pictures.*	*Helps him to explore the world, learn about other countries' cultures, languages, and paint that school cannot teach.*
2: Participant_1 Sex = Male			*I have learned many useful skills from my mobile that school doesn't teach. For example, I learned video editing and photography by watching YouTube. I even tried making a stop motion animation video. Though it wasn't perfect, I gained new experience and improved my skills.*	*Shows learning video editing, photography, and improving communication skills.*
3: Participant_10 Sex = Male			*Using a mobile phone has improved my learning and practical experience. I watch educational videos and learn new things. Before, I didn't know much, but now I can do many things, especially photography. I had no idea at first, but now I can take good photos, and my skills have helped me create many new things.*	*Increases his educational and personal experiences.*

4: Participant_14 Sex = Male			*Yes, I watch various information on YouTube. For example, English pronunciation, shortcuts in arithmetic, and sometimes learning to draw. These are not taught in school. So, I can learn many new things through my phone.*	*Learns English punctuation, shortcut math, and painting.*
5: Participant_4 Sex = Male	*Mobile phones help me stay motivated to study. I use apps like YouTube and Ten Minutes School to understand lessons better. When I don't understand something, I watch videos to learn it. This makes me more interested in studying, though I must stay focused because using the phone too much can cause distraction.*	*It makes learning easier and more interesting through apps and videos that keep him motivated to study.*	*Yes, I have learned things from my mobile phone that are not taught in school. Specifically, I have learned a lot by watching tutorial videos on topics such as photography, various vocabulary in English, and many other things.*	*Improves English vocabulary and drawing and photography capacity.*
6: Participant_6 Sex = Male	*Mobile phones help me in my studies, though they can also create distractions. When I miss a class, I can learn the lesson from friends using my phone. If I don't understand something, I watch YouTube videos to learn it. I also watch educational and motivational videos, which help and inspire me to study better.*	*It encourages learning by helping catch up on lessons, understanding topics through videos, and staying motivated with educational and inspirational content.*	*I have learned many things from my mobile that are not taught in school. For example, I improved my football skills by watching videos. I learned ball control, techniques, and how to be a better player. Before, I just played for fun, but now I understand the game better and play more skillfully.*	*Knowing different types of football techniques and improving his football skills.*

7: Participant_7 Sex = Male	*But when used properly, it supports learning by facilitating online classes, discovering new topics on YouTube, or finding information online.*	*Learning anytime through online classes, YouTube lessons, and easy access to information.*	*I have learned many creative things from my mobile, like photography, photo editing, and drawing. This increased my creativity and confidence. Watching YouTube videos also improved my communication skills- before I was shy, but now I can ask questions confidently and express myself better.*	*Increase confidence in communication skills.*
8: Participant_8 Sex = Male	*Mobile phones both help and hinder. I use them to do assignments and check practical work. They also help me understand topics I don't know, though I use them for studying only sometimes.*	*Motivates easier access to educational videos and learning easily.*	*I am learning many new things from my mobile, like drawing, video making, and editing. I also learn about social media and different cultures by watching movies, which helps me understand new languages and traditions.*	*Learning about different countries' cultures, traditions, and languages by seeing movies*
9: Participant_9 Sex = Male			*I have learned many words through the dictionary, which were not taught in my school. My teacher taught me to use the dictionary and said that it should act as my teacher. However, no new drawing was taught through the mobile phone.*	*Improves English vocabulary and drawing capacity.*

10: Participant_13 Sex = Female			*I have learned many things from my mobile that are not taught in school, like photography, photo editing, and improving English pronunciation through YouTube. I even edit photos and upload them to my own YouTube channel.*	*Learns English punctuation, shortcut math, photo editing, and painting.*
11: Participant_16(Parents) Sex = Female			*He learns from his phone when he misses lessons or doesn't understand something in class. He has also learned about freelancing by watching videos, which schools don't teach. He watches tips and guidelines to improve his freelancing skills.*	*Improves freelancing skills*
12: Participant_2 Sex = Female			*But when I don't understand something, I can use my phone to look it up and understand. Besides studies, I also learn drawing, stories, and other things on the phone. So, mobile phones sometimes help with learning.*	*Help with how to draw and learn other things.*

13: Participant_20 (Parents) ***Sex = Female***	*Mobile phones are very helpful for learning. When something is not clear, I can search on YouTube or Google to understand it better. They especially help in learning English and in studying beyond what is taught in school.*	*Motivated by learning beyond school lessons, especially improving English and understanding topics through YouTube and Google.*		
14: Participant_3 ***Sex = Female***	*Mobile phones motivate me to study and learn new things from YouTube, Google, and other platforms. They make learning easier and increase my interest. I can now understand difficult topics and review lessons on my own, which makes me more self-reliant.*	*Encourages education by making learning easy and interesting through YouTube, Google, and other platforms.*	*Using my mobile phone has improved my studies and skills. I can now understand difficult topics easily and gain more knowledge by watching educational videos. I also watch entertainment videos but keep a time limit. Personally, I've learned drawing through YouTube, which has increased my creativity and imagination. I use my time to learn new things and gain new ideas.*	*Making studies easier, improving creativity through drawing, and gaining new ideas*

Table 5 (Framework Matrice): Encouragement in Education and Learning New Skills

The framework matrix (**See Table 5**) illustrates that mobile phones provide easy access to educational resources such as YouTube tutorials, which help learners grasp complex concepts, foster creativity, and explore areas beyond the traditional curriculum. The following participant accounts provide qualitative depth to these matrix findings.

Participant 1 described learning entirely new creative and technical skills:

> *"I have learned many useful skills from my mobile that school doesn't teach. For example, I learned video editing and photography by watching YouTube. I even tried making a stop motion animation video. Though it wasn't perfect, I gained new experience and improved my skills."* **(Participant 1, Male)**

Participant 7 extended this observation, emphasizing how mobile-based learning enhanced his confidence:

> *"I have learned many creative things from my mobile, like photography, photo editing, and drawing. This increased my creativity and confidence. Watching YouTube videos also improved my communication skills before I was shy, but now I can ask questions confidently and express myself better."* **(Participant 7, Male)**

From a parental perspective, Participant 16 (parent) confirmed that mobile phones enabled skill acquisition that schools do not provide:

> *"He learns from his phone when he misses lessons or doesn't understand something in class. He has also learned about freelancing by watching videos, which schools don't teach. He watches tips and guidelines to improve his freelancing skills."* **(Participant 16, Parent, Female)**

The triangulation of these three verbatim accounts with the framework Matrix (**See Table 5**) data confirms that mobile phones serve as a significant catalyst for self-directed learning and skill diversification. The convergence between the quantitative distribution shown in the matrix (where the majority of participants reported learning new skills) and the

qualitative depth of individual narratives (video editing, photography, freelancing, communication skills) demonstrates that mobile phones fill a critical gap in the rural educational ecosystem by providing access to learning opportunities unavailable through formal schooling.

3.2 Detrimental Effects of Mobile Phone Use on Academic Engagement

This theme highlights the negative effects of mobile phone use. Participants reported that mobile phones have become one of the main factors contributing to declining academic performance, as they significantly distract students from their studies. Notifications, social media, videos, games, and entertainment content frequently interrupted concentration, especially during the lockdown period.

3.2.1 Attentional Disruption and Loss of Concentration

The analysis of thirteen participants' experiences revealed that mobile phones significantly disrupt children's ability to concentrate during study hours. The following framework Matrice (**See Table 6**) presents the framework matrix of distracting attention, capturing how both children and parents experience this phenomenon.

Participants	***A: Distracting Attention***	***Interpretation***
1: FGD 01 (8 participants) *Sex = Male*	*P7- The mobile phone keeps distracting me. I feel like I always need to check it, especially when I get a notification or a call. I get curious about who sent the message or what the notification is about. I've often noticed that while I'm reading, I suddenly feel like looking at my phone. One day, it happened that two hours passed while I was replying to a friend's message, but I did not study anymore.* *P3- I have realized that if I have my phone with me, I can't focus while studying. My mind keeps drifting to Facebook or TikTok. But when I study without my phone, I can concentrate for a long time. For example, one day I was solving a math problem, but halfway through, I started watching a video on my phone. After that, I couldn't get back into the math problem and lost my focus completely.* *p5- The mobile phone distracts me a lot. It messes with my concentration, especially when I get calls or messages. Even though we're not supposed to bring phones to school, we still do, and it just wastes my time and focus.*	Mobile phones distract them with notifications, calls, and social media, severely impacting their concentration and study time.
2: Participant_1 *Sex = Male*	*Mobile phones really affect my focus. While YouTube and Google help with tough topics, notifications and distractions like Facebook or videos pull me away from studying, especially before exams. I feel phones create more barriers than benefits for studying because of the entertainment distractions.*	Mobile phones hinder their focus, as distractions like social media and videos outweigh the educational benefits of apps like YouTube and Google, especially before exams.
3: Participant_12 *Sex = Male*	*Mobile phones really affect my concentration while studying. When the phone is nearby, I constantly feel tempted to check it, whether it's a call from relatives or the urge to watch TikTok. But when I keep the phone away and focus solely on studying, I can work faster and stay focused. So, having the phone nearby directly reduces my concentration, while keeping it away helps me concentrate better.*	Having phone nearby affects his concentration during study.

4: Participant_14 *Sex = Male*	*Using a phone really lowers my focus during studies. When I sit down to study, I feel the constant urge to check my phone, which distracts me. On days when my phone is not nearby, I can concentrate much better. Notifications and calls easily break my focus, and my attraction to the phone has become so strong that it's tough to stay focused on reading, even when I want to.*	He cannot stay focused on his study due to frequently checking their phone but concentrates more easily when the phone is not nearby.
5: Participant_17 *Sex = Male*	*There has been a noticeable change in my attention. Before I got the phone, I was focused on both studies and sports, but now I don't pay attention to my studies at all, and I don't do any sports either. Even when I try to study, I can't concentrate for more than half an hour. My attention has shifted to spending all day on social media.*	Social media has significantly decreased its focus on studies and sports.
6: Participant_18(parents) *Sex = Male*	*If phones are nearby with constant notifications, concentration is disrupted. Younger children initially struggled with exams due to excessive social media and videos, but now that phone usage is restricted during study time, their focus has improved. Still, when phones are nearby, they tend to focus on the phone instead of studying. To improve focus, no phones are allowed during study hours.*	Frequent notifications and nearby phones disrupt their concentration, but restricting phone use during study time helps improve focus.
7: Participant_6 *Sex = Male*	*Mobile phones have harmed my focus during studies. Whenever I sit down to study, notifications from my phone distract me, and if the phone is nearby, I constantly feel the urge to check it. This makes it hard to concentrate on studying. I also end up using my phone for unnecessary tasks, which affect the quality of those tasks. The biggest impact is on my exam preparation, which has led to bad results and my parents getting angry.*	Mobile phones have severely impacted on his focus, with constant notifications and the urge to check his phone distracting him from studying.
8: Participant_7 *Sex = Male*	*Initially, mobile phones helped with studying, but excessive use disrupts concentration. When the phone is nearby, notifications and chat temptations make it difficult to focus on tasks like math. Time passes quickly on the phone, interrupting study plans. For example, I might plan to solve a math problem but get distracted by a chat notification and spend too much time on the phone without finishing the problem.*	Excessive use disrupts concentration, with notifications and chats causing distractions that prevent one from completing study.

9: Participant_9 *Sex = Male*	*My attention has decreased a lot due to using a mobile phone. When I study with the phone nearby, notifications or calls distract me, breaking my focus. If I study without the phone, I can concentrate for longer. Once distracted by the phone, it's hard to get back on track. My teachers and parents have noticed this, and they now tell me to study first and then use my phone.*	Phones are significantly affecting his focus, and others have noticed, advising him to prioritize studying before using it.
10: Participant_11 *Sex = Female*	*Having a mobile phone nearby significantly reduces my focus on studying. Frequent calls, messages, and notifications disrupt my concentration. Sometimes, the desire to watch videos further decreases the time I dedicate to studying. For example, when I try to solve a difficult math problem and my phone is nearby, I keep checking it, which slows down my progress. But if the phone is away, I can focus better and solve problems more quickly.*	Having a phone nearby during study sessions leads to distractions like calls, messages, and the urge to watch videos
11: Participant_16 *Sex = Female*	*It has affected me a lot. If the phone is nearby during study, concentration is lost. A notification sound distracts him. He leaves his study and goes to check his phone, wasting an hour or two. That reduces study time. So, I told him to keep the phone silent during study. Studying without the phone nearby gives better focus. Before he had a phone, he studied for long hours and achieved good results. But now his concentration is disrupted.*	The phone's distractions reduce focus and study time, while keeping it away helps to concentrate.
12: Participant_19 *Sex = Female*	*Mobile use affects his concentration both positively and negatively. On the positive side, it helps him quickly find information and understand complex topics through YouTube videos. On the negative side, notifications often break his focus. For example, one day he was watching a math tutorial when suddenly a call came in on Messenger. He stopped the video to answer, which broke his study flow. For this reason, we advise him to turn off the internet while studying so that the phone helps learning instead of causing distractions.*	By interrupting focus with notifications and advising to turn off the internet to minimize distractions.
13: Participant_20 *Sex = Female*	*I have clearly noticed that whenever the phone is within their reach, their attention easily drifts away from studies to the phone. Even if a notification pops up, they get distracted. That is why I make it a point to keep the phone away from them during study time. When there is no phone nearby, they can concentrate better and continue studying for longer periods.*	When the phone is nearby, distractions increase, so keeping it away during study time helps them concentrate better and study for longer periods.

Table 6 (Framework Matrice): Distracting Attention for Using Mobile

The framework Matrice (**See Table 6**) reveals that frequent notifications, incoming calls, and the constant lure of social media contribute to continuous interruptions. The following verbatim accounts provide individual-level depth to these patterns.

During the Focus Group Discussion, Participant 3 (male, FGD 01) described the acute conflict between phone use and study concentration:

> *"I have realized that if I have my phone with me, I can't focus while studying. My mind keeps drifting to Facebook or TikTok. But when I study without my phone, I can concentrate for a long time. For example, one day I was solving a math problem, but halfway through, I started watching a video on my phone. After that, I couldn't get back into the math problem and lost my focus completely."* **(FGD 01, Participant 3, Male)**

Participant 14 elaborated on the compulsive quality of phone-checking behavior:

> *"Using a phone really lowers my focus during studies. When I sit down to study, I feel the constant urge to check my phone, which distracts me. On days when my phone is not nearby, I can concentrate much better. Notifications and calls easily break my focus, and my attraction to the phone has become so strong that it's tough to stay focused on reading, even when I want to."* **(Participant 14, Male)**

From a parental perspective, Participant 20 (parent) confirmed this pattern through direct observation of her children:

> *"I have clearly noticed that whenever the phone is within their reach, their attention easily drifts away from studies to the phone. Even if a notification pops up, they get distracted. That is why I make it a point to keep the phone away from them during study time. When there is no phone nearby, they can concentrate better and continue studying for longer periods."* **(Participant 20, Parent, Female)**

The triangulation of the framework Matrix (**See Table 6**) with these three verbatim accounts from an FGD participant, an individual child interview, and a parent observation

demonstrates convergent evidence that the mere physical proximity of a mobile phone during study time significantly impairs concentration. The consistency across different data collection methods (group discussion, individual interview, parent report) strengthens the reliability of this finding and suggests that attentional disruption is the primary mechanism through which mobile phones undermine academic performance.

3.2.2 Mobile Phones as a Hindrance to Study Habits

Beyond momentary distraction, mobile phones were perceived as a structural hindrance to sustained study habits. Participants reported that the habitual pattern of checking phones, responding to notifications, and consuming entertainment content gradually eroded their capacity for extended periods of focused study.

Participant 10 described a representative experience that illustrates this hindrance pattern:

> *"I think mobile phones have hindered my learning rather than helped me. When I use my mobile for studying, my attention often goes to other apps or videos, making it difficult to stay focused on studying. For instance, I was reading at night to finish an essay. Just then, a notification came from YouTube. I thought I would watch it for a minute, but then I kept watching the reel for an hour. This wasted my study time, and I couldn't finish writing properly. From that experience, I understood that the phone hinders my concentration."* **(Participant 10, Female)**

Participant 13 corroborated this assessment with a broader critical evaluation:

> *"In my opinion, mobile phones have more negative aspects. At our age, it is difficult to control usage. Playing games or watching videos wastes a lot of time. There are positive aspects too, such as learning new things and helping with studies, but in practice, negative usage is more common."* **(Participant 13, Female)**

Participant 6 added how the cumulative effect of phone-based distraction translated into tangible academic consequences:

> *"Mobile phones have harmed my focus during studies. Whenever I sit down to study, notifications from my phone distract me, and if the phone is nearby, I constantly feel the urge to check it. This makes it hard to concentrate on studying. I also end up using my phone for unnecessary tasks, which affect the quality of those tasks. The biggest impact is on my exam preparation, which has led to bad results and my parents getting angry."* **(Participant 6, Male)**

Triangulating these three accounts reveals a progressive pattern: initial distraction (Participant 10), recognition of the imbalance between positive and negative usage (Participant 13), and tangible academic consequences including poor exam results and parental conflict (Participant 6). Together, these narratives demonstrate that mobile phones function as a structural hindrance to study habits when recreational features compete with educational applications for children's limited attention.

3.2.3 Displacement of Physical Activity and Reading Time

The analysis further revealed that mobile phones have displaced traditional activities that formerly contributed to children's holistic development. The following map (**See Figure 2 (Project Map): Reducing Playing and Reading Time for Mobile Use**) illustrates this shift from sports and reading toward screen-based engagement.

[Insert Figure 2 (Project Map): Reducing Playing and Reading Time for Mobile Use]

As the project map (**See Figure 2 (Project Map): Reducing Playing and Reading Time for Mobile Use**) depicts, social media, online games, and video content now occupy much of the time that was once dedicated to sports or studies. The following participants elaborate on this displacement effect.

Participant 15 articulated the comprehensive nature of this lifestyle shift:

> *"Earlier, I used to play sports in the afternoon, read books, and spend time with friends in the field. Now, watching videos, playing games, or spending time on social media has become my main habit at that time. My friends are also busy with their phones most of the time, so there is no time to play with friends in the field. Gradually, my interest in sports and reading books has decreased. Spending time on the phone seems easier and more interesting."* **(Participant 15, Male)**

Participant 17 confirmed the dramatic reduction in both sports and academic engagement:

> *"There has been a noticeable change in my attention. Before I got the phone, I was focused on both studies and sports, but now I don't pay attention to my studies at all, and I don't do any sports either. Even when I try to study, I can't concentrate for more than half an hour. My attention has shifted to spending all day on social media."* **(Participant 17, Male)**

Parent Participant 18 validated these children's accounts through direct observation:

> *"If phones are nearby with constant notifications, concentration is disrupted. Younger children initially struggled with exams due to excessive social media and videos, but now that phone usage is restricted during study time, their focus has improved. Still, when phones are nearby, they tend to focus on the phone instead of studying."* **(Participant 18, Parent, Male)**

The triangulation of Project Map 4 with these three verbatim accounts two children describing the displacement of sports and reading, and one parent confirming the pattern through observation, demonstrates that mobile phones have fundamentally altered children's daily routines in *Sarankhola* Upazila. The visual evidence from the project map, combined with the narrative depth of participant accounts, reveals a social dimension to this displacement:

as more peers spend time on phones, the opportunity and motivation for collective outdoor activities diminish further.

3.3 Comparative Academic Outcomes: Achievers versus Underperformers

The data revealed a clear bifurcation among participants regarding academic outcomes following mobile phone adoption. The following project map (**See Figure 3** (**Project Map): Better Academic Results vs Low Academic Results after Using Phone**) illustrates this distinction between those who achieved improved academic results and those who experienced declining performance.

[Insert Figure 3 (**Project Map): Better Academic Results vs Low Academic Results after Using Phone]**

The project map (**See Figure 3** (**Project Map): Better Academic Results vs Low Academic Results after Using Phone**) shows that while some participants leveraged mobile phones to enhance their academic performance through strategic use of educational resources, the majority experienced declining results due to excessive engagement with entertainment and social media. The following sub-themes examine each trajectory.

3.3.1 Improved Examination Results Through Strategic Mobile Use

Several participants reported measurable improvements in academic performance attributable to purposeful mobile phone use. Participants 1, 3, and 4 specifically described enhanced understanding of subjects like Mathematics, English, and ICT.

Participant 3 provided the most comprehensive account of academic improvement:

"My exam results have become better than before due to using a mobile phone. I was weak in mathematics and ICT before, but now I can understand it easily by watching

YouTube videos. This has increased my confidence and interest in studying has also increased. I solve questions, make notes, and practice with the help of my phone. Mobile has made me self-reliant in education. What I could not do before, now I can learn on my own initiative." **(Participant 3, Female)**

Participant 4 confirmed this positive trajectory:

"Yes, mobile phone usage has brought significant changes in my learning. Specifically, I have learned a lot about math and English by watching YouTube videos. Previously, I was somewhat weak in math and English, but now, through the mobile phone, I have gained proficiency in these subjects. As a result, my exam results have improved." **(Participant 4, Male)**

Participant 6 described how mobile phones supported both primary learning and motivational reinforcement:

"Mobile phones help me in my studies, though they can also create distractions. When I miss a class, I can learn the lesson from friends using my phone. If I don't understand something, I watch YouTube videos to learn it. I also watch educational and motivational videos, which help and inspire me to study better." **(Participant 6, Male)**

Triangulating these three accounts with Project Map (**See Figure 2** (**Project Map): Reducing Playing and Reading Time for Mobile Use**) reveals that academic improvement is associated with deliberate, educationally focused phone use. The common characteristics among achievers include targeted use of educational platforms (YouTube tutorials, Ten-Minute School), active learning behaviors (solving questions, making notes), and increased self-reliance in education. This pattern contrasts sharply with the underperformers described in the following sub-theme.

3.3.2 Declining Performance Linked to Recreational Mobile Use

Over 20 participants reported that excessive mobile phone use negatively affected academic performance. Activities such as social media, games, and entertainment consistently distract children from their studies, reducing the time allocated for learning.

Participant 12 described the before-and-after contrast starkly:

> *"Mobile phone use has negatively affected my academic performance. Previously, when I did not have a mobile phone, I could study attentively during exams, and my results were good. Now, because of the phone, I spend time on entertainment instead of focusing on studies, which distracts me from learning. Teachers and parents have noticed that my attention in class is not what it used to be, and my exam results have declined."* **(Participant 12, Male)**

Participant 9 confirmed how persistent distraction from mobile phones led to parental and teacher intervention:

> *"My attention has decreased a lot due to using a mobile phone. When I study with the phone nearby, notifications or calls distract me, breaking my focus. If I study without the phone, I can concentrate for longer. Once distracted by the phone, it's hard to get back on track. My teachers and parents have noticed this, and they now tell me to study first and then use my phone."* **(Participant 9, Male)**

Parent Participant 16 corroborated the declining trajectory through direct observation of her child:

> *"It has affected a lot. If the phone is nearby during study, concentration is lost. A notification sound distracts him. He leaves his study and goes to check his phone, wasting an hour or two. That reduces study time. So, I told him to keep the phone on silent during study. Studying without the phone nearby gives better focus. Before he had a phone, he studied for long hours and achieved good results. But now his concentration is disrupted."* **(Participant 16, Parent, Female)**

The triangulation of these three accounts with Project Map (**See Figure 2** (**Project Map): Reducing Playing and Reading Time for Mobile Use**) reveals a clear causal pathway: recreational mobile phone use leads to attentional distraction, which reduces study time, which in turn produces declining academic results. The convergence of child self-reports and parental observations strengthens the evidence that this relationship is not merely perceptual but reflects genuine changes in academic performance visible to multiple stakeholders.

3.4 Teacher Perspectives on Mobile Phone Integration in Learning

The analysis revealed that teachers hold mixed attitudes toward mobile phones. The following framework Matrice (**See Table 7**) presents the framework metrics capturing these diverse perspectives.

Participants	*A: Teachers' Attitudes*	**Interpretation**
2: Participant_16 (parents) Education Level = Higher	*Teachers encourage good use of phones, but children do not always use them positively. Still, I believe teachers encourage proper usage and warn against harmful activities. They give guidelines for good use. I am also a teacher, and I often encourage students to use mobile phones for learning and positive purposes.*	Some teachers have a positive perception of mobile use for good purposes and provide guidelines for positive use.
3: Participant_1 Education Level = Secondary	*Some teachers discourage using mobile phones, saying they harm studies and create addiction. However, a few teachers encourage using them for learning, like watching educational videos on YouTube. Once, when I brought my phone to class, a teacher scolded me, warning me that if I got addicted, it would affect my future studies.*	Most of them discourage children from using phones due to harming their concentration but also encourage learning.
5: Participant_12 Education Level = Secondary	*Teachers have mixed responses to mobile phone use. Sometimes they encourage it, but more often they discourage it. For example, if I didn't finish my homework because I was using the phone, the teacher would ask why and remind me that the phone shouldn't interfere with studies. They advise finishing work first before using the phone and often recommend doing assignments without the phone to stay focused.*	They have a mixed attitude toward mobile use. And they provide advice after completing the study, children use it for social learning.
9: Participant_3 Education Level = Secondary	*Our teachers usually discourage the use of mobile phones. They think that it can cause distraction. However, I think that if used correctly, phones can be helpful in education. If teachers guide us on how to use mobile phones properly, then it can be beneficial instead of harmful. Many times, teachers share videos related to lessons.*	They said that mobile phones are a cause of distraction and influence proper use.
10: Participant_4 Education Level = Secondary	*Our teachers generally discourage mobile phone usage. They believe that mobile phones can often distract us from our studies and concentration. However, if mobile phones are used for educational purposes, they do not see a problem with it.*	Most teachers discourage children from using phones, as it can harm their concentration, yet they also encourage using them for learning purposes.

Table 7 (Framework Matrice): Teacher Attitude on Mobile Use

The framework Matrix (**See Table 7**) indicates that while some teachers discourage phone use due to its distraction potential, others support it for educational purposes. The following verbatim illuminates these contrasting positions.

Participant 1 described the ambivalence teachers display:

> *"Some teachers discourage using mobile phones, saying they harm studies and create addiction. However, a few teachers encourage using them for learning, like watching educational videos on YouTube. Once, when I brought my phone to class, a teacher scolded me, warning that if I got addicted, it would affect my future studies."* **(Participant 1, Male)**

Participant 3 articulated the potential for constructive teacher guidance:

> *"Our teachers usually discourage the use of mobile phones. They think that it can cause distraction. However, I think that if used correctly, phones can be helpful in education. If teachers guide us on how to use mobile phones properly, then it can be beneficial instead of harmful. Many times, teachers share videos related to lessons."* **(Participant 3, Female)**

Participant 16, who serves as both parent and teacher, offered the most balanced educator perspective:

> *"Teachers encourage good use of phones, but children do not always use them positively. Still, I believe teachers encourage proper usage and warn against harmful activities. They give guidelines for good use. I am also a teacher, and I often encourage students to use mobile phones for learning and positive purposes."* **(Participant 16, Parent/Teacher, Female)**

The triangulation of the framework Matrix (**See Table 7**) with these three verbatim accounts for a student experiencing teacher ambivalence, a student advocating for teacher-guided phone use, and a teacher-parent articulating the balanced approach reveals that

educators in *Sarankhola* are navigating a complex tension between protecting students from distraction and leveraging technology for educational benefit. The data suggests that a structured, teacher-mediated approach to mobile phone integration could optimize the educational benefits while minimizing the risks.

4. Discussion

This study examined how mobile phone usage exerts a dual impact on children's academic performance in *Sarankhola* Upazila, theoretically grounded in Self-Regulated Learning (SRL) Theory and the Displacement Hypothesis. The findings reveal that the same technology simultaneously enhances and undermines educational outcomes, with the direction of impact contingent upon children's self-regulatory capacities and the nature of their engagement. This section discusses the principal findings in relation to existing scholarly literature.

4.1 Constructive Academic Gains

The finding that mobile phones enabled children to improve their understanding of mathematics, English, and ICT through YouTube tutorials and educational applications aligns with Sung, Chang et al. (2015) whose meta-analysis of 110 experimental and quasi-experimental studies found a moderate-to-large positive effect of mobile devices on academic achievement when used for educational purposes. Similarly, Crompton and Burke (2018) demonstrated that mobile learning facilitates access to supplementary educational resources in contexts where formal schooling is limited. The participants' reports of acquiring skills beyond the school curriculum photography, video editing, freelancing corroborate Ito et al. (2020), who conceptualized these as "connected learning" opportunities where interest-driven digital engagement produces meaningful skill development. From an SRL perspective, the children who achieved improved academic outcomes demonstrated the forethought and performance phases of Zimmerman (1990) model, exhibiting goal-directed, strategically managed phone use consistent with the self-regulatory behaviours that Pintrich (2004) identified as critical for academic success.

4.2 Detrimental Effects on Academic Engagement

The predominant finding that mobile phones distract children from their studies is consistent with the meta-analysis by Alcaraz-Ibáñez, Paterna et al. (2024), who synthesized 45 studies and found a significant negative relationship between problematic smartphone use and academic achievement (pooled $r = -0.16$). The framework matrix data showing that the mere proximity of a phone impairs concentration aligns with Ward, Duke et al. (2017), whose experimental research demonstrated that the presence of a smartphone reduces available cognitive capacity even when the device is not in active use a phenomenon they termed "brain drain." The attentional disruption pattern identified across 13 participants resonates with Flanigan and Babchuk (2022), who found that smartphone notifications activate compulsive checking behaviours that fragment sustained attention. Stevic, Schmuck et al. (2024) confirmed this pattern longitudinally, demonstrating that nighttime smartphone use among children is associated with increased attentional problems and subsequently poorer school performance over time. These findings are theoretically consistent with the cognitive resource limitations that SRL theory emphasizes: children lacking self-regulatory skills fail to manage the attentional demands created by competing digital stimuli (Schunk and Zimmerman 2011).

4.3 Displacement of Physical Activity and Reading

The shift from outdoor sports and book reading toward screen-based engagement documented in this study provides qualitative depth to the Displacement Hypothesis. Putnick, Trinh et al. (2022) found significant evidence for displacement of peer play by screen time in toddlers, and the present study extends this finding to school-age children in a developing country context. The participants' descriptions of declining interest in sports due to phone availability aligns with Stiglic and Viner (2019), whose systematic reviews confirmed that higher screen time is associated with reduced physical activity in children. Furthermore,

Twenge, Martin et al. (2019) documented that smartphone-era cohorts read significantly less than prior generations, with reading displacement being particularly pronounced among heavy social media users, a pattern echoed by the participants in this study who described replacing book reading with Facebook and TikTok browsing.

4.4 Comparative Academic Outcomes

The bifurcation between academic achievers and underperformers following mobile phone adoption is theoretically explained by differential self-regulation capacity. Children who demonstrated strategic educational use (Participants 3 and 4) exhibited the metacognitive monitoring and adaptive strategy selection that Zimmerman (2002) identified as hallmarks of effective self-regulated learners. In contrast, those reporting declining results (over 20 participants) displayed the self-regulation failures that Reinecke and Hofmann (2016) documented in their research on media-induced procrastination. This within-sample variation mirrors the findings of Amez, Vujić et al. (2023), who provided longitudinal evidence that increased smartphone use is associated with lower academic performance, and of Mendoza, Pody et al. (2018), who experimentally demonstrated that the presence of a cell phone during learning reduces attention and impairs academic outcomes regardless of whether the phone is the learner's own device.

4.5 Teacher Perspectives on Integration

The mixed teacher attitudes identified in this study, combining resistance with conditional endorsement of educational use, reflect the global ambivalence documented by Selwyn and Aagaard (2020), who argued that educators are caught between the promised benefits of educational technology and the practical reality of digital distraction in classrooms. The finding that teacher-recommended applications (such as Photomath) produce positive outcomes when adopted by students supports the evidence from Lai (2019) whose systematic

review concluded that teacher-mediated mobile learning interventions are significantly more effective than unstructured student-directed phone use. These findings suggest that the teacher's role as mediator of children's mobile phone engagement is critical for translating technological access into educational benefits.

5. Conclusion

This study explored how children and their parents perceive the academic implications of mobile phone use in Sarankhola Upazila, Bangladesh, based on qualitative data from twenty-eight participants. The findings suggest that mobile phone use can have both supportive and disruptive implications for children's educational experiences, depending on how the technology is used, the extent of self-regulation, and the guidance provided by parents and teachers. Rather than indicating a uniform effect of mobile phone use, participants' accounts point to substantial variation in how children engage with mobile devices and how such engagement is perceived to relate to their academic lives.

Some participants described purposeful educational uses of mobile phones, including accessing tutorials through platforms such as YouTube and Ten-Minute School and using applications such as Photomath to support learning in mathematics, English, and information technology. Participants also reported developing practical digital skills, including photography, video editing, and freelancing-related skills. These accounts indicate that mobile phones may provide children with additional opportunities for learning and skill development when their use is purposeful and education-oriented.

At the same time, many participants described recreational mobile phone use as interfering with concentration, study routines, reading habits, and physical activities. Social media engagement and gaming were frequently identified in participants' accounts as sources of distraction and reduced study time. However, these findings should be interpreted as

participants' perceptions and experiences rather than as evidence that mobile phone use directly causes lower academic performance. The accounts also suggest that the consequences of mobile phone use may vary according to children's patterns of engagement, their ability to regulate their use, and the nature of parental and educational guidance.

The findings are consistent with the study's theoretical framing through Self-Regulated Learning Theory and the Displacement Hypothesis. From the perspective of self-regulated learning, children's ability to manage attention, time, and digital activities appears relevant to how mobile phones are incorporated into their educational routines. The displacement perspective further helps explain participants' accounts of recreational phone use replacing study time, reading, and physical activities. Parents and teachers also appeared to play an important contextual role in shaping children's mobile phone practices, particularly through monitoring, guidance, and encouragement of educational uses.

Overall, the study suggests that the educational implications of mobile phone use should not be understood solely in terms of the presence or absence of the technology. Instead, attention should be given to the purposes, patterns, and contexts of use. The findings may inform discussions about age-appropriate digital literacy, parental guidance, and structured educational use of mobile devices. However, these implications should be considered in light of the study's qualitative design and context-specific evidence rather than interpreted as evidence of a general causal relationship between mobile phone use and academic performance.

5.1 Limitations

Several limitations should be considered when interpreting the findings. First, the study relied primarily on participants' self-reported accounts and perceptions of children's academic experiences rather than independently verified examination results or school records. Such accounts may be influenced by recall difficulties, subjective interpretation, or social

desirability, and therefore should not be treated as objective measures of academic performance.

Second, the qualitative design was intended to provide an in-depth understanding of participants' experiences and perceptions rather than to estimate the prevalence or magnitude of relationships between mobile phone use and academic performance. Consequently, the study cannot establish a causal relationship between mobile phone use and changes in academic performance. The findings should instead be understood as context-specific accounts of how participants perceive and experience the educational implications of mobile phone use.

Third, the study was conducted in a single rural upazila of Bangladesh. Differences in socioeconomic conditions, digital access, school environments, parental practices, and patterns of technology use may limit the transferability of these findings to urban, peri-urban, or other rural settings. The findings therefore require contextual consideration before being applied to broader populations of children in Bangladesh.

Fourth, although parents' and children's accounts provided insights into teachers' roles, teachers were not directly interviewed in the present study. Consequently, interpretations concerning teacher guidance and attitudes toward mobile phone use are based on participants' accounts rather than on teachers' own perspectives. Future research could address this limitation by incorporating direct interviews with teachers and other relevant educational stakeholders.

Finally, the study provides a cross-sectional account of participants' experiences and does not examine how mobile phone use and academic experiences may change over time. Future studies could combine qualitative inquiry with longitudinal or mixed-methods approaches and, where ethically and practically feasible, incorporate objective academic indicators to examine changes in educational outcomes over time. Such approaches could

provide a stronger basis for understanding the longer-term and potentially differentiated educational implications of children's mobile phone use.

References

Ahad, A. D. and M. Anshari (2017). "Smartphone Habits Among Youth: Uses and Gratification Theory." Int. J. Cyber Behav. Psychol. Learn. **7**(1): 65–75.

Alan, B. (2016). Social research methods (5th ed.), European Organization for Nuclear Research.

Albacete-Maza, J., X. C. Combalia and C. Montañola-Sales (2025). "Determinants of early smartphone ownership: a research gap in the study of problematic smartphone use in children and adolescents." Humanities and Social Sciences Communications **12**(1).

Alcaraz-Ibáñez, M., A. Paterna, A. Sicilia and M. D. Griffiths (2024). "A systematic review and meta-analysis on the association between problematic smartphone use and academic performance." Computers & Education **210**: 104967-104967.

Amez, S., S. Vujić, L. De Marez and S. Baert (2023). "Smartphone use and academic performance: First evidence from longitudinal data." New Media & Society **25**(3): 584-608.

Beland, L. P. and R. Murphy (2016). "Ill Communication: Technology, distraction & student performance." Labour Economics **41**: 61-76.

Bhardwaj, P. (2019). "Types of sampling in research." Journal of the Practice of Cardiovascular Sciences **5**(3): 157-157.

Bonal, X., A. Zancajo and R. Scandurra (2021). "Student mobility and school segregation in an (un)controlled choice system: A counterfactual approach." British Educational Research Journal **47**(1): 42-64.

Braun, V. and V. Clarke (2006). "Using thematic analysis in psychology." Qualitative Research in Psychology **3**(2): 77-101.

Brislin, R. W. (1970). "Back-Translation for Cross-Cultural Research." Journal of Cross-Cultural Psychology **1**(3): 185-216.

BTRC (2023). Internet subscribers in Bangladesh, Bangladesh Telecommunication Regulatory Commission.

Carrier, L. M., L. D. Rosen, N. A. Cheever and A. Lim (2015). "Causes, effects, and practicalities of everyday multitasking." Developmental Review **35**: 64-78.

Carrier, M., L. Rosen, N. Cheever and A. Lim (2015). "Causes, effects, and practicalities of everyday multitasking." Developmental Review **35**.

Creswell, J. W. (2009). "Research design: Qualitative, quantitative, and mixed methods approaches, 3rd ed."

Creswell, J. W. and J. D. Creswell (2017). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.), Sage Publications.

Crompton, H. and D. Burke (2018). "The use of mobile learning in higher education: A systematic review." Computers & Education **123**: 53-64.

Felisoni, D. D. and A. S. Godoi (2018). "Cell phone usage and academic performance: An experiment." Computers & Education **117**: 175-187.

Flanigan, A. E. and W. A. Babchuk (2022). "Digital distraction in the classroom: exploring instructor perceptions and reactions." Teaching in Higher Education **27**(3): 352-370.

Gerosa, T., M. Gui and M. Büchi (2022). "Smartphone Use and Academic Performance: A Pervasiveness Approach Beyond Addiction." Social Science Computer Review **40**: 1542-1561.

Gikas, J. and M. M. Grant (2013). "Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media." The Internet and Higher Education **19**: 18-26.

Hadwin, A. F., P. Sukhawathanakul, R. Rostampour and L. M. Bahena-Olivares (2022). "Do Self-Regulated Learning Practices and Intervention Mitigate the Impact of Academic Challenges and COVID-19 Distress on Academic Performance During Online Learning?" Frontiers in Psychology **Volume 13 - 2022**.

Hale, L. and S. Guan (2015). "Screen time and sleep among school-aged children and adolescents: A systematic literature review." Sleep Medicine Reviews **21**: 50-58.

Hartley, K., L. D. Bendixen, D. Gianoutsos and E. Shreve (2020). "The smartphone in self-regulated learning and student success: clarifying relationships and testing an intervention." International Journal of Educational Technology in Higher Education **17**(1): 52.

Hawi, N. S. and M. Samaha (2016). "To excel or not to excel: Strong evidence on the adverse effect of smartphone addiction on academic performance." Computers & Education **98**: 81-89.

Joshi, S. C., J. Woodward and S. Woltering (2023). "Cell phone use distracts young adults from academic work with limited benefit to self-regulatory behavior." Current Psychology **42**(31): 27071-27087.

Junco, R. and S. R. Cotten (2012). "No A 4 U: The relationship between multitasking and academic performance." Computers & Education **59**(2): 505-514.

Kessel, D., H. L. Hardardottir and B. Tyrefors (2020). "The impact of banning mobile phones in Swedish secondary schools." Economics of Education Review **77**: 102009.

Kessel, D., H. L. Hardardottir and B. Tyrefors (2020). "The impact of banning mobile phones in Swedish secondary schools." Economics of Education Review **77**: 102009-102009.

Kibona, L. and G. Mgaya (2015). "Smartphones' effects on academic performance of higher learning students." Journal of Multidisciplinary Engineering Science and Technology **2**(4): 777-784.

Kozioł-Nadolna, K. and J. Wiśniewska (2020). "Qualitative methods in management research." European Research Studies Journal **23**(4): 533-547.

Krueger, R. A. (2014). Focus groups: A practical guide for applied research (5th ed.), Sage Publications.

Lai, C. L. (2019). "Trends of mobile learning: A review of the top 100 highly cited papers." British Journal of Educational Technology **51**(3): 721-742.

Lepp, A., J. E. Barkley and A. C. Karpinski (2015). "The Relationship Between Cell Phone Use and Academic Performance in a Sample of U.S. College Students." SAGE Open **5**(1).

Lumivero, L. (2023). NVivo 15, Lumivero.

Mendoza, J. S., B. C. Pody, S. Lee, M. Kim and I. M. McDonough (2018). "The effect of cellphones on attention and learning: The influences of time, distraction, and nomophobia." Computers in Human Behavior **86**: 52-60.

Mutz, D. C., D. F. Roberts and D. P. v. Vuuren (1993). "Reconsidering the Displacement Hypothesis: Television's Influence on Children's Time Use." Communication Research **20**(1): 51-75.

Neuman, S. B. (1988). "The Displacement Effect: Assessing the Relation between Television Viewing and Reading Performance." Reading Research Quarterly **23**(4): 414-414.

O'Bannon, B. and K. Thomas (2014). "Teacher perceptions of using mobile phones in the classroom: Age matters!" Computers & Education **74**: 15-25.

Pintrich, P. R. (2004). "A Conceptual Framework for Assessing Motivation and Self-Regulated Learning in College Students." Educational Psychology Review **16**(4): 385-407.

Putnick, D. L., M.-H. Trinh, R. Sundaram, E. M. Bell, A. Ghassabian, S. L. Robinson and E. Yeung (2022). "Displacement of peer play by screen time: associations with toddler development." Pediatric Research **93**(5): 1425-1431.

Reinecke, L. and W. Hofmann (2016). "Slacking off or Winding down? An Experience Sampling Study on the Drivers and Consequences of Media Use for Recovery versus Procrastination." Human Communication Research **42**(3): 441-461.

Rosen, L. D., L. M. Carrier and N. A. Cheever (2013). "Facebook and texting made me do it: Media-induced task-switching while studying." Computers in Human Behavior **29**(3): 948-958.

Rosen, L. D., L. Mark Carrier and N. A. Cheever (2013). "Facebook and texting made me do it: Media-induced task-switching while studying." Computers in Human Behavior **29**(3): 948-958.

Schunk, D. H. and B. Zimmerman (2011). Handbook of self-regulation of learning and performance, Taylor & Francis.

Selwyn, N. and J. Aagaard (2020). "Banning mobile phones from classrooms—An opportunity to advance understandings of technology addiction, distraction and cyberbullying." British Journal of Educational Technology **52**(1): 8-19.

Sharples, M., A. Adams, R. Ferguson, M. Gaved, P. McAndrew, B. Rienties and D. Whitelock (2014). Innovating pedagogy 2014: Open University innovation report 3, The Open University.

Sharples, M., R. de Roock, R. Ferguson, M. Gaved, C. Herodotou, E. Koh, A. Kukulska-Hulme, C.-K. Looi, P. McAndrew and B. Rienties (2016). Innovating pedagogy 2016: Open University innovation report 5, Institute of Educational Technology, The Open University.

Stevens, R. E. and B. Wrenn (2013). Exploratory and qualitative research methods. Marketing research: Text and cases, Routledge**:** 35-58.

Stevic, A., D. Schmuck, M. F. Thomas, K. Karsay and J. Matthes (2024). "Distracted Children? Nighttime Smartphone Use, Children's Attentional Problems, and School Performance Over Time." The Journal of Early Adolescence **44**(2): 223-249.

Stiglic, N. and R. M. Viner (2019). "Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews." BMJ Open **9**(1): e023191.

Sung, Y. T., K. E. Chang and T. C. Liu (2015). "The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis." Computers & Education **94**: 252-275.

Temple, B. and A. Young (2004). "Qualitative Research and Translation Dilemmas." Qualitative Research **4**(2): 161-178.

Tenny, S., J. M. Brannan and G. D. Brannan (2017). Qualitative study. StatPearls, StatPearls Publishing.

Tinajero Vacas, C., A. Castelo, M. Guisande and M. Páramo (2010). "Self-Regulated Learning in Female Students with Different Cognitive Styles: An Exploratory Study." Perceptual and Motor Skills **111**: 31-44.

Twenge, J. M., G. N. Martin and B. H. Spitzberg (2019). "Trends in US Adolescents' media use, 1976–2016: The rise of digital media, the decline of TV, and the (near) demise of print." Psychology of popular media culture **8**(4): 329.

Vogels, E. A., R. Gelles-Watnick and N. Massarat (2022). "Teens, social media and technology 2022." Pew Research Center **10**: 1-30.

Ward, A. F., K. Duke, A. Gneezy and M. W. Bos (2017). "Brain drain: The mere presence of one's own smartphone reduces available cognitive capacity." Journal of the association for consumer research **2**(2): 140-154.

Zimmerman, B. J. (1990). "Self-Regulated Learning and Academic Achievement: An Overview." Educational Psychologist **25**(1): 3-17.

Zimmerman, B. J. (2002). "Becoming a Self-Regulated Learner: An Overview." Theory Into Practice **41**(2): 64-70.

Declarations

Acknowledgements

The authors would like to thank all study participants for their valuable time, experiences, and contributions to this research. Their participation made this study possible.

Availability of Data and Materials: We declared that the collected data are original, and data were collected by the authors in accordance with the ethical standards. The data and materials used in this study are available upon the responsible request from the corresponding author.

Authors Contributions:

Tariqul Howlader (ORCID ID**: https://orcid.org/0009-0001-8418-7954**)**:** Study conceptualization, design, data collection, writing the original draft manuscript and proofreading.

Dr. Taufiq-E-Ahmed Shovo (ORCID ID: https://orcid.org/0000-0003-0793-3826): Study conceptualization, design, data analysis, manuscript review and editing, supervision, and proofreading.

All authors contributed to the manuscript and approved the submitted version.

Funding: No external funding was received for this study. The research was conducted independently by the authors without financial support from any government agency, non-governmental organization, research institution, commercial entity, or other funding body. The authors also received no funding for the preparation, authorship, submission, or publication of this manuscript.

Competing Interests: The authors declare no conflict of interest.

Human Ethics and Consent to Participate

This study received ethical approval from the Ethical Clearance Committee of Khulna University, Bangladesh (Reference Number: KUECC-2025-08-83). Written informed consent was obtained from all adult participants. For child participants, parental/guardian consent and child assent were obtained prior to participation. All procedures were conducted in accordance with relevant ethical guidelines and regulations.

Ethics Approval: The institutional ethical review board (Khulna University, Bangladesh) has given approval for this study (Reference Number: KUECC-2025-08-83). Additionally, researchers have attested that there are no unethical or fraudulent techniques, including data manipulation, in their work

Consent to Participate

Informed consent was obtained from all adult participants. For participants under 18 years of age, informed consent was obtained from their parents or legal guardians, and assent was obtained from the children before participation.

Figure Legends

Figure 1. **Figure 1 (Project Map): Impact Variation of Mobile Use**

Figure 2 **(Project Map): Reducing Playing and Reading Time for Mobile Use**

Figure 3 **(Project Map): Better Academic Results vs Low Academic Results after Using Phone**

The Dual Impact of Mobile Phone Usage on Academic Performance Among Children: Evidence from Rural Bangladesh

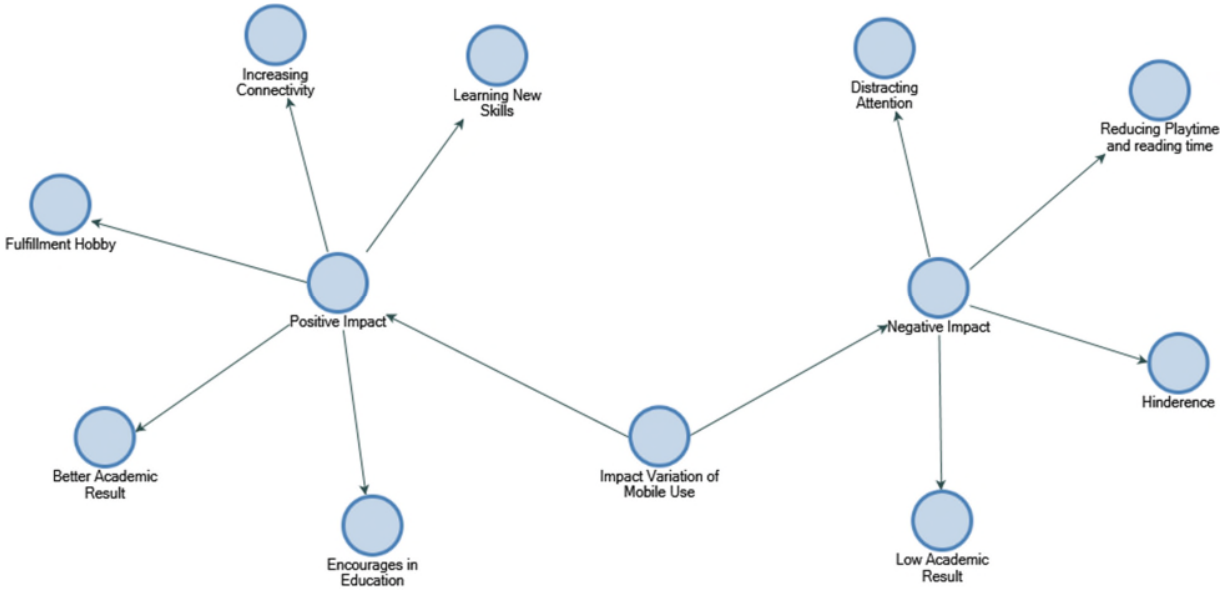


Figure 1 (Project Map): Impact Variation of Mobile Use

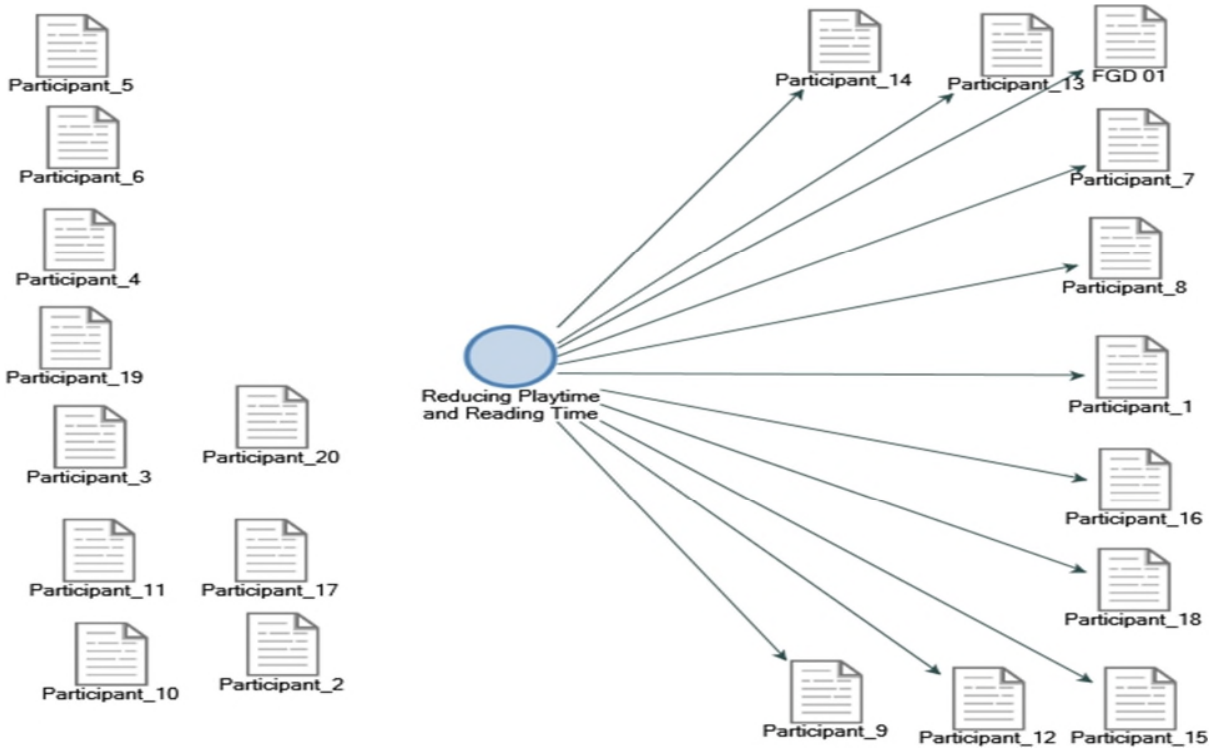


Figure 2 (Project Map): Reducing Playing and Reading Time for Mobile Use

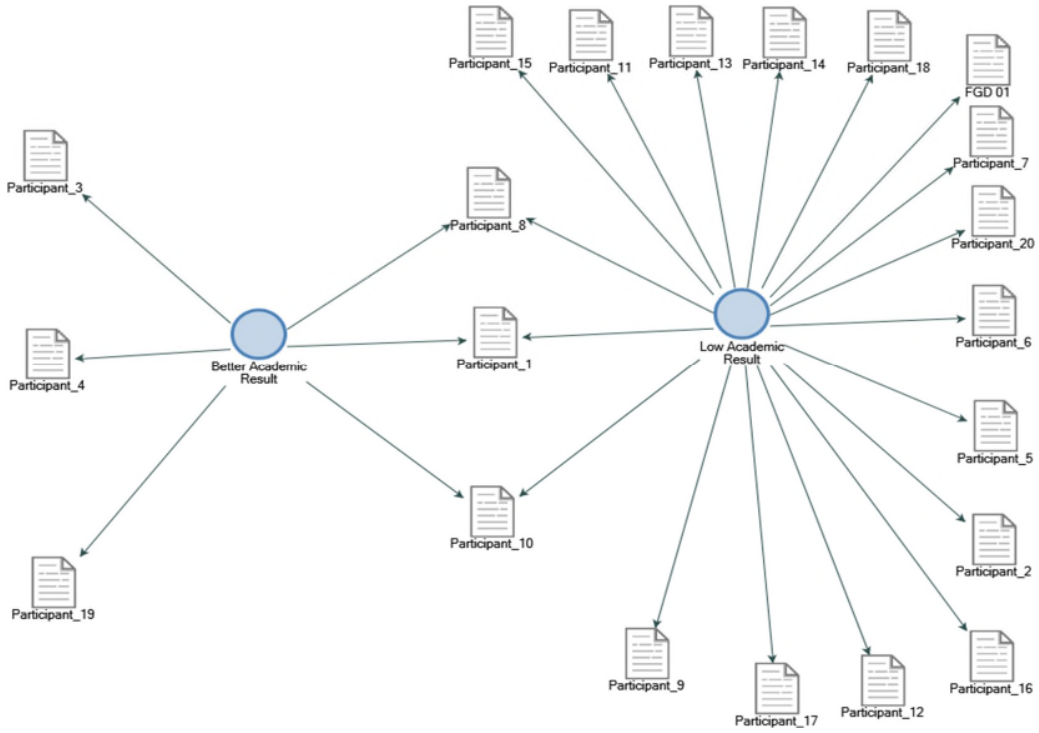


Figure 3 (Project Map): Better Academic Results vs Low Academic Results after Using Phone

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- QuestionnaireFocusGroupDiscussion.docx
- QuestionnaireIDIChildren.docx
- QuestionnaireIDIParents.docx