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Smartphone Distraction and Time Management in Learning Mathematics

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Abstract

The increasing use of smartphones among students has raised concerns about their potential impact on their ability to manage time effectively, particularly in learning mathematics. This study examined the relationship between smartphone distraction and time management among first-year pre-service teachers. Specifically, it aimed to determine smartphone distraction and time management levels and assess the relationship between the two variables. Using a correlational research design, the study involved 110 respondents who answered a validated Likert-scale questionnaire. The results revealed that students demonstrated moderate smartphone distraction and time management levels. A significant positive relationship was found between the two variables, suggesting that while students may experience frequent smartphone distractions, they also make efforts to manage their time effectively. These findings underscore the importance of promoting digital self-awareness and reinforcing time management practices to support students' academic journey, particularly in mathematics learning.

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Introduction

Technology's rapid advancement has significantly changed how people communicate, interact, and acquire knowledge. Smartphones are now indispensable for students, offering convenience and easy access to information. It has become a means for facilitating self-paced learning, where one can acquire the concepts at one's own pace. However, the increasing accessibility of smartphones has raised concerns about their impact on students' time management and academic success. Research indicates that smartphone use can distract students, hindering their focus and effective learning time management (Aljomaa et al., 2016; Chen and Yan, 2016). In subjects like Mathematics, which require problem-solving and critical thinking, these distractions can negatively affect students' comprehension and retention. Balancing technology use, specifically smartphone use, with effective study habits is a crucial challenge in contemporary education.

Managing time effectively is vital to students' academic success, as it helps them manage their study time efficiently, enhance their problem-solving skills, and engage in meaningful learning activities. Students who actively plan, set goals, and regulate their study habits perform better academically (Wolters and Brady, 2021). Difficulties in prioritization and self-regulation often contribute to lower academic outcomes (Wolters and Brady, 2021). Moreover, smartphone distractions have been associated with higher levels of procrastination and lower study effectiveness (Rozgonjuk et al., 2018). With the widespread use of smartphones for academic and social purposes, examining whether these distractions significantly impact pre-service teachers' capacity to manage their study time effectively is essential. Understanding these factors is crucial to developing strategies to improve students' learning experience and productivity in mathematics education.

Several solutions have been proposed to mitigate the detrimental impacts of smartphone distractions on students' time management. Digital well-being applications and self-regulatory strategies have been suggested to improve students' focus and time management (Parry et al., 2022). Additionally, schools have implemented policies that limit smartphone usage during class hours to reduce distractions and enhance the learning environment (The Lancet, 2023).

Even the mere presence of a smartphone in the classroom can reduce students' attentional capacity, making it harder for them to stay focused (Skowrownek et al., 2023). It suggests that creating smartphone-free learning spaces may improve students' concentration and academic outcomes. Although these solutions show promise, their effectiveness can vary depending on the learning environment and individual student behaviors, with some students facing ongoing challenges in self-regulation.

Among the available strategies to mitigate smartphone distractions, fostering self-discipline and awareness has been identified as sustainable. Research suggests that digital detox programs, which encourage individuals to take intentional breaks from smartphone use, can help reduce adverse effects on well-being and enhance focus (Wiederhold, 2021). Additionally, mindfulness-based interventions have been shown to support students in managing digital distractions by improving their ability to regulate attention and maintain academic engagement. Students who practiced mindfulness techniques were better able to control impulsive smartphone use, improving

concentration and academic performance (Bostock et al., 2019). However, the effectiveness of these strategies depends on individual motivation and self-regulation. Moreover, external factors such as peer influence and the pervasive nature of social media continue to contribute to digital distractions, making it challenging to achieve consistent results across diverse student populations.

This study investigates the relationship between smartphone distraction and time management in learning mathematics among pre-service teachers. It aims to understand how smartphone use impacts students' ability to manage their time effectively, particularly in the context of mathematics learning. The findings will support the development of targeted strategies to improve time management skills and promote academic success. Educators and policymakers can use these findings to develop more balanced, focused learning environments that appropriately utilize technology.

Statement of the Problem

This study aimed to examine the relationship between smartphone distraction and time management in learning mathematics among pre-service teachers. This study aimed at answering the following questions:

1. What is the level of time management among pre-service teachers in learning Mathematics?
2. What is the level of smartphone distraction among pre-service teachers?
3. Is there a significant relationship between smartphone distraction and time management among pre-service teachers in learning Mathematics?

Methodology

This chapter presents the methods and procedures in the study. It describes the research design, research participants, research locale, research instruments, treatment of data, and research ethical considerations.

Research Design

This study employed quantitative research, specifically utilizing a correlational research design to examine the relationship between smartphone distraction and time management in learning mathematics.

Participants and Sampling

The participants of this study were first-year pre-service teachers enrolled in the Bachelor of Secondary Education (BSE) program at the College of Education, Bukidnon State University Casisang Annex Campus, who were taking the course Mathematics in the Modern World during the academic year 2024–2025. Since the study aims to gather data from the entire population of BSE students taking this subject, the researchers used a total population sampling method. This approach ensured that all eligible participants were included, providing comprehensive insights into their experiences with smartphone distraction and time management in learning mathematics.

Research Instruments

The research instrument used in this study consisted of three primary components: an informed consent form, a demographic profile section for first-year Bachelor of Secondary Education (BSE) pre-service teachers—including name, age, course/program, and year level—and a survey designed to assess smartphone distraction and time management in learning mathematics.

The survey items were adapted from two reliable and validated instruments. To examine how smartphone use may hinder students' academic focus, the researchers adopted the Chinese version of the Smartphone Distraction Scale (C-SDS) introduced by Zhao et al. (2022). This instrument has been proven reliable, with a Cronbach's alpha of 0.88, indicating strong internal consistency. The Student Time Management Scale (STMS) was adopted from Balamurugan (2013) to evaluate students' time management capabilities, which also reported high reliability, evidenced by a Cronbach's alpha of 0.885.

The Smartphone Distraction Scale (C-SDS) included 16 items, while the Student Time Management Scale (STMS) consisted of 28 items. Both used a five-point Likert scale, with options ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Each response was assigned a numerical value. The interpretation of composite scores was categorized as follows:

Table 1 Time Management Scale Interpretation

Responses	Scale	Range	Qualitative Interpretation
Strongly Agree	5	4.21-5.00	Very High Time Management (VHTM)
Agree	4	3.41-4.20	High Time Management (HTM)
Neutral	3	2.61-3.40	Moderate Time Management (MTM)
Disagree	2	1.81-2.60	Low Time Management (LTM)
Strongly Disagree	1	1.81-2.60	Very Low Time Management (VLTM)

Table 2 Smartphone Distraction Scale Interpretation

Responses	Scale	Range	Qualitative Interpretation
Strongly Agree	5	4.21-5.00	Very High Smartphone Distraction (VHSD)
Agree	4	3.41-4.20	High Smartphone Distraction (HSD)
Neutral	3	2.61-3.40	Moderate Smartphone Distraction (MSD)
Disagree	2	1.81-2.60	Low Smartphone Distraction (LSD)
Strongly Disagree	1	1.81-2.60	Very Low Smartphone Distraction (VLSD)

Data Gathering Procedure

A letter of approval to conduct this study will has been sent to the Dean of the College of Education of Bukidnon State University. After the approval, letters of intent will be provided to the respondents to inform them of the study's conduct. Survey questionnaires were distributed face-to-face to the intended respondents using printed

forms. A consent form was attached along with the survey questionnaires. The collection of data was be given a one-week time frame.

Treatment of Data

The collected data were reviewed, and appropriate statistical tools were used to present, interpret, and analyze the results. The data were imported into JASP (Version 0.18.1; JASP Team, 2020) statistical software for analysis. Descriptive statistics such as mean, median, mode, and standard deviation were employed to determine the levels of smartphone distraction and time management among the participants. Additionally, Pearson product-moment correlation was used to examine the significant relationship between smartphone distraction and time management in learning mathematics.

Ethical Considerations

The researchers followed ethical considerations to ensure research integrity throughout the study. Consent letters were provided to the individuals involved when seeking permission to conduct the study. This process ensured that respondents were not pressured or compelled to answer the survey questionnaire. Participation in this study was voluntary, and respondents had the right to withdraw without consequences. Confidentiality was strictly maintained, with the researchers upholding the Data Privacy Act of 2012 provisions, specifically Sections 11 and 12. Section 11, which outlines General Data Privacy Principles, requires that personal information be "collected for specified and legitimate purposes determined and declared before, or as soon as reasonably practicable after collection and later processed in a way compatible with such purposes only." Personal information was not included in any published materials or reports nor disclosed to anyone outside the research team. Additionally, the data collected followed the Section 12 criteria for the lawful processing of personal information and was only be published with the respondent's consent. Furthermore, the results of this research were based solely on the data obtained through the survey and were analyzed and presented with equality and honesty.

Results and Discussion

This chapter presents the analysis of data on smartphone distraction and time management among first-year pre-service teachers in mathematics learning and examines their correlation. Table 3 summarizes the self-reported time management practices of first-year preservice teachers in the context of mathematics learning. The results reveal an overall mean of 3.21, which falls under Moderate Time Management (MTM). Among the 28 statements, the top three highest-rated practices were "I keep a record of the math exercises and tasks I have completed" (Mean = 3.82), "I have control over my daily study routine in mathematics" (Mean = 3.78), and "I set short-term goals to improve my performance in math" (Mean = 3.52), all categorized as High Time Management (HTM). However, the results also highlight weaker areas of time management. The three lowest-rated items were “My study plans for math sometimes get interrupted or canceled” (Mean = 2.22), “I prepare my math materials (books, calculator, notebook) for the next day” (Mean = 2.82), and “I use a planner or diary to organize my math study schedule” (Mean = 2.90), all of which indicate inconsistencies in structured preparation and advanced planning

Table 3. Time Management among Pre-service Teachers in Learning Mathematics

	Statements	Mean	SD	Interpretation
1.	I postpone working on my mathematics tasks.	3.03	1.06192737	MTM
2.	I give up easily when I struggle with solving math problems.	3.25	0.91306886	MTM
3.	I use a planner or diary to organize my math study schedule	2.90	0.97632526	MTM
4.	I adjust my short-term math learning goals based on my progress.	2.97	0.70981443	MTM
5.	I prepare my math materials (books, calculator, notebook) for the next day.	2.82	0.99707663	MTM
6.	I set priorities when managing my daily math tasks	3.06	0.93138225	MTM
7.	I write reminder notes for important math deadlines.	3.16	0.69766679	MTM
8.	I keep a record of the math exercises and tasks I have completed.	3.82	1.07670767	HTM
9.	I create a checklist of math-related tasks to complete each day	3.50	1.02400677	HTM
10.	I plan ahead for upcoming math lessons and assessments.	3.28	0.75579496	MTM
11.	I set long-term goals for improving my math skills	3.36	0.91598719	MTM
12.	My study plans for math sometimes get interrupted or canceled.	2.22	1.18385018	MTM
13.	I struggle with managing my time for studying mathematics.	3.49	1.09833447	HTM
14.	I consider time management essential for learning mathematics.	3.17	0.89708080	MTM
15.	I review my math learning progress at the end of the day.	3.30	0.95350633	MTM
16.	I find it difficult to follow a structured schedule for my math studies.	2.91	0.84098516	MTM
17.	I take on too many academic tasks at once, affecting my math studies.	3.05	0.97101445	MTM
18.	I set short-term goals to improve my performance in math.	3.52	0.94560129	HTM
19.	I feel I spend too much time on entertainment instead of studying math.	3.08	0.86874177	MTM
20.	I am punctual when attending math classes and activities.	3.44	1.07964718	HTM
21.	I have difficulty completing my assigned math tasks on time.	3.06	0.91146895	MTM
22.	I sometimes feel bored while doing my daily math activities	3.02	0.85651115	MTM
23.	I think planning a study schedule for math is a waste of time	3.49	0.98377157	HTM
24.	I allocate specific time for leisure activities without affecting my math studies.	3.18	0.96907994	MTM
25.	I submit my math homework and assignments before the deadline.	3.37	1.01239194	MTM
26.	I feel unimportant activities take up too much of my study time	3.29	0.98935114	MTM
27.	I have control over my daily study routine in mathematics.	3.78	1.09529283	HTM
28.	I sometimes use shortcuts to complete my math tasks	3.23	0.90522531	MTM
	Overall Mean Interpretation	3.21	0.95077188	MTM

These results indicate that while students are relatively effective in monitoring progress, setting goals, and maintaining control over their routines, they struggle with advanced preparation and consistent scheduling. This suggests a partial application of time management strategies, with strengths in self-regulation but weaknesses in proactive planning.

These findings align with Zimmerman's (2000) self-regulated learning theory, which emphasizes that effective learners engage in forethought, performance control, and self-reflection. The students' ability to track tasks and set short-term goals supports this model. Similarly, Liu et al. (2023) found that time management protects against academic procrastination, especially in environments with frequent digital distractions. It reinforces the idea that while students may face obstacles, many still try to apply positive strategies to manage their math learning.

Table 4 shows the level of smartphone distraction among the same respondents, revealing an overall mean of 3.06, interpreted as Moderate Smartphone Distraction (MSD). The three highest-rated items included “I use my phone to relieve stress when struggling with difficult math problems” (Mean = 3.74), “I rely on my phone to take breaks when I feel overwhelmed by math lessons” (Mean = 3.70), and “Using my phone distracts me from tasks that are tedious or difficult” (Mean = 3.46), all under High Smartphone Distraction (HSD).

Table 4. The Smartphone Distraction among Pre-service Teachers

Statements	Mean	SD	Interpretation
1. I get distracted by my phone while solving math problems that require full focus.	3.36	1.055586	MSD
2. I find it difficult to concentrate on math lessons when my phone is near me.	3.19	1.07084340	MSD
3. I think about posting on social media while studying math	2.42	1.23690809	LSD
4. I often check phone notifications instead of focusing on math tasks.	3.00	1.03161048	MSD
5. I lose focus on math activities because of phone apps.	3.19	1.07084340	MSD
6. While working on math problems, I think about how many likes or comments I will get on my posts.	2.09	1.27463220	LSD
7. I frequently think about checking my phone when I should be focusing on math tasks.	3.10	1.12478336	MSD
8. I feel anxious if I don’t check messages while studying math.	2.39	1.18936769	MSD
9. I use my phone to relieve stress when struggling with difficult math problems.	3.74	1.07239997	HSD
10. I use my phone to distract myself when I feel pressured by a math test or assignment.	3.35	1.21599707	MSD
11. Using my phone distracts me from tasks that are tedious or difficult.	3.46	0.90540956	HSD

Statements	Mean	SD	Interpretation
12. I rely on my phone to take breaks when I feel overwhelmed by math lessons.	3.70	0.99124609	HSD
13. I often talk to others while checking what's on my phone.	3.12	1.04689859	MSD
14. I often walk and use my phone at the same time.	3.27	1.14065080	MSD
15. I can easily follow conversations while using my phone.	2.99	0.93352891	MSD
16. I often check my phone while listening to math lectures or discussions.	2.54	1.07239997	LSD
Overall Mean Interpretation	3.06	1.08956910	MSD

Meanwhile, the lowest-rated distractions were "While working on math problems, I think about how many likes or comments I will get on my posts" (Mean = 2.09), "I feel anxious if I don't check messages while studying math" (Mean = 2.39), and "I think about posting on social media while studying math" (Mean = 2.42), all categorized as Low Smartphone Distraction (LSD).

These findings imply that students primarily use smartphones as a mechanism to regulate emotions or cope with academic pressure, particularly during difficult or overwhelming mathematical tasks. Furthermore, it indicates that while smartphones are used frequently during math study, their distraction is less associated with social engagement or validation (e.g., likes, comments) and more with internal emotional processes or task avoidance. This suggests that smartphone distraction is not always about entertainment or social media, but often about emotional regulation. Students are likely turning to their phones for escape or comfort when tasks become difficult or mentally exhausting.

These findings were supported by Zhao et al. (2022) who emphasized that emotional dysregulation is a key factor in smartphone overuse, especially when students are faced with stress. Similarly, Shahidin et al. (2022) noted that students are more likely to turn to their smartphones not for enjoyment, but as a tool to cope with emotional discomfort, particularly when academic demands become overwhelming. These insights underscore that smartphone distraction is not simply a matter of habit but is deeply tied to students' emotional coping mechanisms.

Meanwhile, the data in Table 5 shows the correlation between smartphone distraction and time management among first-year pre-service teachers. The findings show a moderate positive correlation with a coefficient of $r = 0.430$ and a p-value of 0.001, indicating a highly significant relationship at the 0.05 level. It implies that time management scores also tend to increase as smartphone distraction increases. This may appear contradictory, but it suggests a compensatory behavior among students who recognize their distractions and try to improve their time management. Students aware of their tendency to get distracted may be more intentional in organizing their schedules to prevent academic failure. This relationship implies that students balance their smartphone use with responsible time management practices.

Table 5. Correlation between Smartphone Distraction and Time Management in Learning Mathematics

Variable	Correlation Coefficient	p-value
Smartphone Distraction and Time Management	0.430	0.001

These findings are supported by Rozgonjuk et al. (2019), who emphasized that frequent smartphone use is linked to disrupted task management and increased time-related stress. Likewise, Jin et al. (2024) affirmed that smartphone distraction contributes to academic procrastination and impairs students' ability to effectively plan and manage their study time.

However, it contrasts with Zhang and Liu (2024), who reported that mobile phone addiction is negatively associated with time management. Their study found that increased mobile phone addiction significantly impaired students' time management abilities over time, leading to higher levels of procrastination and decreased academic performance. This suggests that the effects of mobile phone addiction may overwhelm students' ability to manage their time effectively in the long term.

Conclusion

Based on the analysis of the data, the following conclusions were drawn:

- The level of time management was found to be moderate, implying that students are aware of the need for effective management of their study schedules but may still face challenges in consistently applying time management strategies.
- The level of smartphone distraction among first-year pre-service teachers was also found to be moderate, suggesting that while smartphones are present during academic activities, students do not exhibit extreme dependence.
- A highly significant moderate positive relationship exists between smartphone distraction and time management, suggesting that students recognize their distraction tendencies and compensate by attempting to manage their time more efficiently.

Recommendations

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

- From the findings, educational institutions may consider formulating policies that promote responsible and mindful smartphone use across the campus. Organizing workshops or seminars centered on digital wellness, academic discipline, and time management techniques will support students in developing better control over distractions and enhance their learning outcomes, particularly in Mathematics.
- Furthermore, educators are encouraged to implement awareness initiatives or incorporate discussions that emphasize smartphone distraction's impact on students' academic behaviors. Integrating classroom activities that encourage focus, setting consistent guidelines on smartphone use, and providing goal-setting support can help strengthen students' time management skills in Mathematics.
- Moreover, it is recommended that pre-service teachers, especially first-year students, actively reflect on

their smartphone use and its influence on their time management in learning Mathematics. They are encouraged to adopt effective strategies such as developing structured study schedules, using productivity applications that limit distractions, and practicing digital self-regulation to minimize non-academic smartphone usage during study periods.

- Finally, it is recommended that future studies further explore the role of other technological distractions and their impact on learning across various academic disciplines. Researchers may also investigate intervention programs to mitigate smartphone distraction and evaluate their effectiveness in improving students' time management and academic performance.

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