

EXCESSIVE CELLPHONE USE, SOCIAL SUPPORT, AND STUDENT ENGAGEMENT AS ATTRIBUTES TO ACADEMIC ACHIEVEMENT: A MEDIATION ANALYSIS

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Abstract

This study investigated the impact of excessive cellphone use on academic achievement, considering the interplay of complex relationships through mediation analyses. It examined the mediating roles of social support, engagement, and excessive cellphone use as attributes to academic performance among 351 senior high school students. A descriptive correlational design was employed, with data analyzed using Structural Equation Modeling (SEM) to examine mechanisms and relationships. Results showed that 75.2% were excessive cellphone users, with females (42.50%) more likely to exhibit addictive behaviors than males (32.80%). Significant differences were found in academic strand, father's education, and Grade Point Average (GPA) in relation to smartphone addiction. STEM and ABM strands had higher GPA and lower smartphone addiction than HUMSS and TVL. Students with fathers with high educational background showed significantly higher academic performance. Interestingly, excessive users demonstrated high GPA. Respondents' perceptions of social support and engagement were moderate. SEM revealed that smartphone addiction negatively predicts academic achievement (total effect = -0.055, $p < 0.001$). Student engagement (estimate = 0.117, $p < 0.001$) and social support (estimate = 0.033, $p = 0.002$) significantly influence academic performance. However, social support and engagement did not predict smartphone addiction and failed to mediate the relationship between smartphone addiction and GPA. In an alternative SEM model, smartphone addiction significantly mediated the link between social support and engagement (indirect effect = -0.103, $p = 0.001$), indicating its undermining effects. The C-HEARTS Program was developed to promote healthy phone habits, student involvement, and peer-family digital strategies to enhance academic outcomes.

Keywords: Excessive Cellphone Use, Smartphone addiction, Social Support, Academic Engagement, Academic Achievement. Mediating Variables

INTRODUCTION

This study explores the issue of excessive cellphone use and its impact on academic achievement among senior high school students. It focuses on how this problematic use—closely linked to smartphone addiction—affects social support and academic engagement, which are both essential factors for students' academic and behavioral development.

Numerous scholars (e.g., Hashemi et al., 2022; Buctot et al., 2021; Samaha & Hawi, 2016) emphasize the negative impact of excessive cellphone use on academic performance, mental health, and social support. Nowak et al. (2022) note the role of low social support in predicting addiction, while Saeed et al. (2023) highlight that support from family and friends influences academic success. Despite these findings, studies exploring these interrelated variables collectively—particularly in the Philippine senior high school context—remain limited.

This gap is evident in Ormoc City Senior High School, where some students show high achievement, but many face academic struggles, cheating incidents, AI dependence, poor digital literacy, and reduced attention due to cellphone use. This highlights a contextual problem needing localized intervention.

To address this, the study will design an intervention program grounded on Social Support Theory (Cohen & Wills, 1985) and Student Engagement Theory (Astin, 1984; Kuh, 2001). It categorizes students based on cellphone use and strengthens social support and engagement.

The expected output is a framework for educators, parents, and policymakers that promotes healthy phone habits, enhances student involvement, and supports evidence-based guidance programs to improve academic outcomes and overall well-being.

Research Questions

The purpose of this descriptive correlational design study using mediation analyses was to examine the relationships among the attributes, namely excessive cellphone use, perceived social support, and student engagement's impact on academic achievement among senior high school students at Ormoc City Senior High School. Specifically, this study answered the following:

What was the profile of the students in terms of:

- 1.1 Gender?
- 1.2 Age?
- 1.3 Grade Level?
- 1.4 Strand?
- 1.5 Parent's Educational Level?
- 1.6 Grade Point Average?

To what extent were the students classified according to excessive cellphone use?

What were the students' levels of perception on the following constructs:

- 3.1 Social Support?
- 3.2 Student Engagement?

Were there significant differences in excessive cellphone use of the students when grouped according to:

- 4.1 Gender?
- 4.2 Age?
- 4.3 Grade Level?
- 4.4 Strand?
- 4.5 Parents' Educational Level?
- 4.6 Grade Point Average (GPA)?

Did perceived social support and student engagement mediate the relationship between excessive cellphone use and academic achievement?

Based on the findings of the study, what psychological intervention program was designed?

LITERATURE REVIEW

Excessive Cellphone Use, Social Support, and Student Engagement as Attributes to Academic Achievement

This study focuses on the examination of a modern-day phenomenon—cellphone's excessive use among students—by investigating the relationship between excessive cellphone use, perceived social support, and academic engagement as attributes to academic achievement. Identifying and defining the variables in this study is the first essential step toward understanding the relationships among them. The demographic profile is necessary for profiling the participants, namely gender, age, grade level, academic strand, parents' education, and Grade Point Average (GPA), to examine whether excessive cellphone use differs across these demographic characteristics.

Although several studies have analyzed substantial differences between these demographic profiles and excessive cellphone use, findings remain mixed. For instance, data indicated that girls' cellphone usage scored higher in the Smartphone Addiction Scale Short-Version (SAS-SV) than boys. However, Kwon et al. (2013) stated in his study that it was not significant, as girls were more self-aware than boys about their consumption. In contrast, other studies found that females use their phones more than males, and those with lower grade levels, age brackets, and parental education were linked to smartphone addiction and low academic performance (Buctot et al., 2021; Van et al., 2015).

The academic strand may also reflect the degree of exposure to gadgets, as curricula with STEM applications emphasize digitally immersed competencies. STEM and TVL-ICT strands are more inclined to technology adoption, and there were observed differences in technology reliance among students from various strands (De Guzman et al., 2020; Liu et al., 2019; Kirschner & De Bruyckere, 2017; Hobbs, 2017).

Thus, this study will investigate excessive cellphone use and significant differences across the demographic profile among Ormoc City Senior High School students to understand the relationships among variables. The second variable is excessive cellphone use, which examines and identifies the extent of risk for smartphone addiction based on the Smartphone Addiction Scale cut-off scores: 31 for boys and 33 for girls (Kwon et al., 2013). Smartphone addiction has been widely reported in recent years with terms such as "smartphone overuse/excessive use," "smartphone abuse," and "maladaptive usage." In this study, excessive cellphone use operationally encompasses terms like problematic cellphone use, cellphone overuse, mobile phone addiction, and smartphone addiction (Fu et al., 2021; Singh et al., 2023; Zhao & Lappierre, 2020; Fernandez & Borda-Mas, 2023).

Moreover, the third variable, perceived social support, is conceptually defined as the students' perception of the levels of support from their interpersonal networks—namely family, peers or friends, and significant others—measured by

the Multidimensional Scale of Perceived Social Support (MSPSS) (Ma et al., 2024; Cohen & Wills, 1985; Zimet et al., 1988).

Additionally, the fourth variable, academic engagement, refers to the extent to which students actively participate in and are involved in pedagogical activities within formal education. It is indicated in three dimensions—vigor, dedication, and absorption—and is pivotal in evaluating student learning outcomes and well-being (Fredericks, 2019; Schaufeli et al., 2017). The Utrecht Work Engagement Scale for Students (UWES-S; Schaufeli et al., 2002a) is a student version of the widely used Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2000b). A shortened 9-item version (UWES-9) (Schaufeli et al., 2006) will be used in this study. The Cronbach's alpha for this scale is .90 (Olson et al., 2023; Carmona et al., 2019; Schaufeli et al., 2006). The concept of work engagement—an optimistic, rewarding activity—has also been applied to student activities, referred to as student engagement (Schaufeli et al., 2006; Tayama et al., 2018), as these are goal-directed and structured, and often compulsory in nature.

Finally, the fifth variable is academic achievement, referring to the students' competence and ability. Its measurement is directly seen through the Grade Point Average (GPA), the most typical measure of academic achievement. It is used to determine student performance, honor roll status, class rank, and Latin honors, as guided by Department of Education classifications from Outstanding to Did Not Meet Expectations (Ensoy & Lavega, 2015; DepEd Order No. 8, s. 2015).

Numerous prior studies reveal that excessive cellphone use has negative correlations with academic achievement, social support, and academic engagement (Zhang & Zheng, 2024; Nowak et al., 2023; Singh & Srivastava, 2021; Buctot et al., 2021; Rashid et al., 2020). Specifically, studies by Zhang & Zeng (2024), Roshanayi (2022), Rashid et al. (2020), and Buctot et al. (2021) among students in China, Iran, Malaysia, and the Philippines consistently show a significant negative relationship between smartphone addiction and academic achievement.

Aligned with other studies, negative associations exist between problematic smartphone use and perceived social support in adolescents and young adults (Nowak et al., 2022). A meta-analysis among mainland Chinese teenagers suggests that mobile phone addiction could be reduced by increasing social support (Wan et al., 2022; Herrero et al., 2019). There is also a significant negative association between technology addiction—particularly social media and internet addiction—and academic engagement (Singh & Srivastava, 2021; Choi, 2018).

Overall findings suggest that social media addiction inversely affects both academic engagement and achievement, while social support positively correlates with student engagement (Landa-Blanco et al., 2024; Wu et al., 2023). Perceived social support and academic engagement correlate with successful academic performance and student integration into the educational environment (Rickert, 2019; Konold et al., 2018). High engagement fosters academic achievement, facilitates positive adjustment, and enhances well-being while reducing the likelihood of educational abandonment (Zhao et al., 2021).

Aligned with these studies, academic engagement is positively associated with greater student involvement (Loscalzo & Giannini, 2018), higher well-being (Tayama et al., 2018), and better performance (Singh & Srivastava, 2021). Wu et al. (2023) found a statistically significant relationship between social support and academic engagement, where greater social support enhances school belonging and academic involvement. Other studies also highlight the positive impact of peer, parental, and teacher support on student engagement (Kilday & Ryan, 2019; Garcia-Reid et al., 2015).

Hence, social support has been shown to increase academic engagement, consequently improving academic achievement and reducing smartphone addiction (Tortosa et al., 2024; Wu et al., 2023; Wan et al., 2024; Saeed et al., 2023; Chen et al., 2023).

Despite the widespread issue of smartphone addiction and its correlations with key academic attributes, many interventions have not been proven effective, and localized interventions remain scarce (Buctot et al., 2018; Velthoven et al., 2018). This present study investigates excessive cellphone use among senior high school students at Ormoc City Senior High School and its relationship to academic achievement to assess the phenomenon within the local context. It examines complex variables to develop an effective, relevant intervention. This is grounded in Social Support Theory (Cohen & Wills, 1985) and Student Engagement Theory (Astin, 1984; Kuh, 2001).

In connection with this, conducting the study at Ormoc City Senior High School is highly relevant, given the common classroom scenarios where excessive cellphone use is evident. Students exhibiting such behaviors often show signs of sleep disturbance, low social support (Roshanayi, 2022; Nowak et al., 2023), high risk for smartphone addiction, reduced focus, low engagement, and poor academic performance (Zhang & Zeng, 2024; Blanco et al., 2024; Singh & Srivastava, 2021; Buctot et al., 2021; Rashid et al., 2020; Choi, 2018). These are often reflected in low GPAs (Buctot et al., 2021; Roshanayi, 2022; Rashid et al., 2020; Ensoy & Lavega, 2015).

This study will analyze the relationships among excessive cellphone use, academic achievement, and other related factors to determine significant correlations and contribute to the existing literature, ultimately recommending an effective and contextualized intervention.

RESEARCH METHODOLOGY

Design

This study was conducted using a structural mediation analysis method among senior high school students in Ormoc City Senior High School to ensure equal representation in all six strands. A quantitative approach with a descriptive correlational design was used to examine the relationship between excessive cellphone use and academic achievement, with social support and academic engagement as mediating variables. This design was suitable because the main goal of the study was to identify relationships among four variables: excessive cellphone use, perceived social support, academic engagement, and academic achievement. A correlational design allowed the researchers to determine the direction and strength of associations without manipulating any variables.

Environment

The study was conducted in Ormoc City Senior High School, a senior high school located in the center of Ormoc City, where some students were observed to have academic and behavioral challenges due to excessive cellphone use. Many of these students aside from being a digital generation and 21st century learners, were inclined to modernization and technology, owned a cellphone, had a stable wifi- or internet connection, especially in the TVL-ICT and STEM strands students whose curriculum were focused on using Information and Technology applications and computerizations made these students ideal respondents as they were prone to the excessive cellphone use as described in the context of the study.

Participants

All senior high school students who had been enrolled in Ormoc City Senior High School, from all six strands and grade levels 11 and 12 with parent's consent to participate in the study for those below 18 years old and an informed consent for 18 years old and above. Those students who own a cellphone and bring their cellphones inside the school premises.

Students who are below 18 years old without consent from their parents and those 18 and above that do not have informed consent cannot participate in the study. Also, students who do not own a cellphone cannot participate in the study.

The study involved a sample of senior high school students who were enrolled at Ormoc City Senior High School in the school year 2024-2025. The number is determined by the large population of the school through Slovin's Formula with a 0.05 margin of error. The population is about 1,700 students having to get a sample size of a total 351 students coming from all six strands: Science and Technology, Engineering and Mathematics, (STEM), Humanities and Social Sciences (HUMSS), Accounting and Business Management (ABM), Technical-Vocational Livelihood-Information and Communications Technology (TVL-ICT), TVL-Home Economics (TVL-HE), General Academics (GAS) for both year levels, Grade 11 and Grade 12. The number of participants for each strand was determined by the proportion of each stratum calculated by the population of the sample size as a stratified random sampling technique is chosen for this study. The number of participants are as follows, STEM – 146 participants, HUMSS-69, TVL-ICT-42, TVL-HE- 36, ABM- 45, and GAS-13 participants.

A stratified random sampling technique was used to identify the number of participants from different strands and grade levels, Grade 11 and 12 as stated above. The relevance of stratified random sampling by strand is that the academic strands STEM and TVL-ICT in senior high school has the most exposure to Information and Communications Technology applications, computerizations and media information literacy programs aligned in their curriculum which may interfere and encourage them to use their cellphones more compared to other strands. Although, to increase generalizability and avoid bias, all students from every strand may have the equal chance to answer the survey questionnaires if they show a parent's consent prior to the survey for participants below 18 years old. Survey questionnaires were randomly distributed through a hybrid method of data collection either online or face-to-face at school venues.

Instrument

To measure excessive cellphone use, the study used the Short Version of the Smartphone Addiction Scale (SAS-SV) developed by Kwon et al. (2013). This 10-item questionnaire uses a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Cut-off scores were 31 for boys and 33 for girls, which help identify students at risk of smartphone addiction. The scale has a good reliability score with a Cronbach's alpha of 0.831 and has been used

in studies to predict problematic cellphone use among students (Hamamura et al., 2023; Buctot et al., 2021). The questionnaire also included basic demographic information such as age, gender, grade level, strand, parents' education, and the student's latest Grade Point Average (GPA).

Perceived social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS) by Zimet et al. (1988). This 12-item tool uses a 7-point Likert scale from 1 (very strongly disagree) to 7 (very strongly agree), and measures support from three sources: family, friends, and significant others. Each subscale score is computed by averaging four related items, while the overall score is the average of all 12 items. Scores between 1–2.9 indicate low support, 3–5 indicate average support, and 5.1–7 indicate high support. The scale shows strong reliability, with subscale scores ranging from 0.78 to 0.88 and an overall Cronbach's alpha of 0.88 (Saeed et al., 2023).

To assess student engagement, the study used the Utrecht Work Engagement Scale for Students (UWES-9) developed by Schaufeli et al. (2006). It includes 9 items grouped into three subscales: vigor, dedication, and absorption. Each item is rated on a 7-point scale from 0 (never) to 6 (always). Subscale reliabilities range from 0.731 to 0.822, with an overall reliability of 0.902. Engagement scores are classified as very low, low, average, high, or very high based on specific score ranges, with higher scores indicating greater academic engagement.

Data Gathering Procedure

The data gathering process followed carefully planned and ethical steps to ensure the accuracy and reliability of results. The researcher began by selecting a topic that aligned with both personal interest and educational relevance—focusing on the relationship among excessive cellphone use, perceived social support, academic engagement, and academic achievement. A research framework was developed, including the objectives, methodology, and instruments to be used.

Next, an extensive review of related literature was conducted to support the study's context, establish theoretical frameworks, and ensure ethical compliance. After the review, the researcher sought approval to conduct the study from the principal of Ormoc City Senior High School. Coordination with school personnel was done to identify qualified participants. Since the study involved minors, informed consent was obtained from parents or legal guardians through a detailed consent form outlining the study's purpose, procedures, potential risks and benefits, and participant rights. Students aged 18 and above signed the consent form themselves.

Survey questionnaires were distributed after explaining the study's purpose to the participants. Students were briefed on the importance of their participation and the ethical safeguards in place. Parental consent was required for students under 18, while those 18 and above gave their own consent.

Participants then answered the survey, which included: (1) Demographic section (age, gender, grade level, academic strand, parents' educational background, and most recent Grade Point Average); (2) Smartphone Addiction Scale – Short Version (SAS-SV) to measure the extent of cellphone use; (3) Multidimensional Scale of Perceived Social Support (MSPSS) to assess support from family, friends, and significant others (a special person perceived as supportive), and (4) Utrecht Work Engagement Scale for Students (UWES-9) to assess academic engagement through vigor, dedication, and absorption.

Data collection was done either face-to-face or online through Microsoft Forms. Students were given enough time and guidance in a neutral setting, such as classrooms, without the presence of teachers or school officials, to maintain confidentiality and encourage honest responses.

After data collection, responses were reviewed, organized, and encoded for analysis. This phase focused on identifying the relationships among excessive cellphone use, perceived social support, student engagement, and academic achievement, based on the research questions.

Each questionnaire was checked for completeness and consistency. Responses with errors or incomplete data were carefully reviewed, and only valid responses were included. The final dataset was then prepared for statistical analysis.

Appropriate statistical tools were applied to test hypotheses and identify patterns among the variables. The analysis helped interpret findings, linking them to existing literature and theories. These insights contribute to the understanding of student behavior and academic performance, especially in the context of Philippine senior high schools.

Data Analysis

This study used statistical tests to examine the relationships between excessive cellphone use and the mediating role of perceived social support and academic achievement through Jamovi version 2.3.4 software. The analyses align with the study's objectives and data type. Descriptive statistics (frequencies, percentages, median, and quartile variation) described the students' demographic characteristics, excessive cellphone use classification, level of perception of perceived social support, level of academic engagement, and academic achievement through Grade Point Average. Then, Analysis of Variance (ANOVA), T-Test, Mann-Whitney U and Kruskal- Wallis tests were used to assess whether excessive cellphone usage differs significantly across demographic characteristics. Finally, structural equation modeling was used for mediation analyses using R software to examine the mediating roles of perceived social support and academic achievement on the relationship between excessive cellphone use and academic achievement. It applies the common threshold of significance level when p-value is less than 0.05.

Ethical Considerations

The study was conducted in accordance with the guidelines outlined in the Declaration of Helsinki (World Medical Association, 2013). Approval was obtained from the Research and Ethics Committee of the University of the Visayas, with Reference No. 2025-0226 dated May 20, 2025. Furthermore, the study involved adults who voluntarily participated either on an online survey or face-to-face manner. Prior to completing the questionnaires, participants received an informed consent form detailing the study's purpose, procedures, risks and benefits, confidentiality measures, voluntary participation, and contact information. No financial incentives was offered for participation. The authors declared no conflicts of interest.

RESULTS AND DISCUSSION

This part presents the results and discussions of the study, highlighting the key findings on the relationships among excessive cellphone use, social support, and student engagement as contributing attributes to academic achievement. The section is supported by relevant analyses and interpretations that underscore the mediating role of student engagement in the influence of excessive cellphone use and social support on students' academic performance.

The Profile of the Respondents

The demographic profile of the senior high school students presented an overview of the participants' characteristics in term of gender, age, grade level, strand, parents' education, and Grade Point Average. This is important to inform the context for understanding the prevalence of cellphone use patterns among respondents. (See table 1).

Table 1
Demographic Profile of Senior High School Student Respondents

Variable	Category	Frequency	Percentage
Gender	Female	180	51.3
	Male	171	48.7
Age	16 and below	120	34.2
	17	108	30.8
	18	100	28.5
	19 and above	23	6.6
Grade Level	Grade 11	203	57.8
	Grade 12	148	42.2
	ABM	45	12.8
Strand	GA	13	3.7
	HUMSS	69	19.7
	STEM	146	41.6
	TVL-HE	36	10.3
Mother's Education	Primary Education	60	17.1
	Secondary Education	127	36.2
	College Education	121	34.5
	Post Graduate Education	43	12.3
Father's Education	Primary Education	68	19.4
	Secondary Education	126	35.9
	College Education	117	33.3
	Post Graduate Education	40	11.4

Note: n=351

Table 1 The demographic profile of the senior high school student respondents showed several important implications for gaining insights relevant to the context of cellphone use prevalence, levels of social support, engagement and academic outcomes.

First, the sample presented an evenly fair gender distribution, with slightly more female (51.3%) than male (48.7%) respondents. This indicated an almost equal representation suitable for gender-based comparisons and may provide insights into any gender-related based interventions.

In terms of age, the distribution reveals that most students are within the normal age range for senior high school, indicating the same developmental characteristics across the group in terms of preferences, interests, maturity, and cognitive advancement.

The grade level data shows that a higher number of respondents are in Grade 11 (57.8%) compared to Grade 12 (42.2%). This imbalance might influence findings related to educational curriculum differences and class schedules, as more Grade 12 students are more likely to be engaged in work immersions, career making and occupied with curriculum exits activities.

STEM strand has the most representation (41.6%), followed by HUMSS (19.7%), ABM (12.8%), TVL-HE (10.3%), and GA (3.7%). This indicates students are more strongly inclined toward science, technology, engineering, and mathematics career paths, which could be influenced by the digital age and modern job opportunities, personal preferences, and societal influences. Conversely, a more significant implication could be that STEM students may be more task-oriented and more inclined toward productive use of smartphones. Alternatively, their curriculum may encourage productive digital use. This finding may inform and tailor targeted interventions for non-STEM students who are at higher risk of maladaptive cellphone behavior. However, the difference in representation among strands was mainly predetermined and identified through random sampling technique which characterized that STEM has an overwhelming population in the school compared to other strands, implying more promotions on awareness on GA and TVL strands since fewer students would want to enroll in these strands characterized by their low population and lowest turnout among respondents.

Parental education, often impacts the extent of academic support and student performance, shows that the majority of mothers and fathers have attained at least secondary education and a notable percentage have only primary education (17.1% of mothers and 19.4% of fathers), which may suggest minimal academic support for some students. On the other hand, a combined 46.8% of mothers and 44.7% of fathers have completed college or post-graduate studies, which might be positively linked with higher academic outcomes an motivation among their children. This suggest schools and parents should collaborate to bridge the gap between limited formal educational attainment among parents and support to promote academic success as supported by a body of literature, parents' educational background are significant factors of students' academic success as it also related to socio-economic status and family dynamics (Buctot et al., 2021).

These demographic trends are foundational in understanding the contextual background information to provide careful interpretations and relevant implications of the findings of the study as to the investigation of the attributes to academic achievement. Policymakers and educators may consider these personal variables when designing targeted interventions, academic engagement and support systems programs, and career guidance programs to address the changing and varying needs of senior high school students.

Academic Achievement of Respondents

The academic performance of the respondents is shown in their General Point Average (GPA). The shows the descriptive statistics of the respondents' GPA, providing insights into their academic achievement.

Table 2
Frequency and Percentage Distribution of Student Grades According to DepEd Standards

Grade Descriptions	Frequency	Percentage	Descriptive Characteristics	GPA
<i>Did not meet Expectations.</i>	5	1.40	Mean	89.7
<i>Fairly Satisfactory</i>	3	0.90.	Median	91
<i>Satisfactory</i>	46	13.10	SD	4.77
<i>Very Satisfactory</i>	88	25.10.	Minimum	75
<i>Outstanding</i>	209	59.50	Maximum	98

Note: n=351 Outstanding (90-100); Very Satisfactory (85-89); (80-84); Fairly Satisfactory (75-79); Did Not Meet Expectations (Below 35)

The general academic performance of the respondents, as reflected in their General Point Average (GPA), indicates a relatively high level of achievement. suggesting that most students perform well academically. However, the lowest

reported GPA is 75, while the highest is 98, showing a wide range of academic achievement levels among the respondents. This may mean that a portion of the students' population need to be identified in order to give specific intervention to increase their GPA examining further implications of the study on academic achievement attributes.

Excessive Cellphone Use of Respondents Based on Smartphone Addiction Scale- Short Version (SAS-SV) Indicators

The respondents' cellphone usage habits were examined using the Kwon et al. (2013b) scale, which measures smartphone addiction across various addictive behavioral indicators. The following table shows the mean, standard deviation, and descriptions of the respondents' answers to these indicators, describing their smartphone addiction tendencies

Table 4
Descriptive Profile of Smartphone Addiction Indicators Based on Kwon et al. (2013b) Scale

Category	Mean	Standard deviation	Description
1. Missing planned work due to smartphone use.	4.02	1.28	Weakly Agree
2. Having a hard time concentrating in class, while doing assignments or while working due to smartphone use.	4	1.26	Weakly Agree
3. Feeling pain in the wrists or at the back of the neck while using a smartphone.	3.98	1.3	Weakly Agree
4. Will not be able to stand not having a smartphone.	3.95	1.4	Weakly Agree
5. Feeling impatient and fretful when I am not holding my smartphone.	3.95	1.42	Weakly Agree
6. Having my smartphone in my mind even when I am not using it. .	3.97	1.4	Weakly Agree
7. I will never give up using my smartphone even when my daily life is already greatly affected by it.	3.93	1.38	Weakly Agree
8. Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook.	4.13	1.36	Weakly Agree
9. Using my smartphone longer than I had intended	4.24	1.35	Weakly Agree
10. The people around me tell me that I use my smartphone too much.	4.16	1.29	Weakly Agree
Smartphone Addictions	4.03	1.06	Weakly Agree

Note: n=351 1- Strongly disagree/ Very Low Risk 2- Disagree/ Low risk 3- Weakly disagree/Somewhat Low Risk 4- Weakly Agree/Somewhat High 5- Agree/ High 6-Strongly Agree/ Very High

The data reveals a consistent pattern in respondents' attitudes toward smartphone use, with all individual indicators and the overall "Smartphone Addiction" score receiving "Weakly Agree" on the scale by Kwon et al. (2013b), indicating "Somewhat High Risk". This suggests a mild acknowledgment of problematic smartphone behaviors among the respondents. Despite this, a central tendency points to weak agreement with addiction-related behaviors (such as overuse, physical discomfort, and emotional dependence), which may reflect differences in personal awareness or willingness to admit addictive behavior (Kwon et al., 2013; Lee et al., 2022; Kim et al, 2020). Although numerous studies concluded that smartphone addiction is a predictive factor for academic performance (Buctot et al., 2021; Omer, 2020; Grant et al., 2019), a weakly agreement or somewhat high risk on the excessive cellphone use problem supported by a good GPA or achievement from most respondents as the data indicated in this study showed inconsistencies with previous studies that poor academic performance was associated with prolonged smartphone usage (Zhang & Zeng, 2024; Blanco et al., 2024; Singh & Srivastava, 2021; Rashid, 2020). It is may be because longer cellphone usage was spent for the purpose of learning, for educational applications, and motivations to student engagement consequently resulting to good GPA. This yield similar findings to recent studies that interestingly revealed students who use their cellphones more frequently and much longer and those who own cellphones longer over a period were associated with positive perceptions of academic performance and outcomes in the Philippines (Buctot et al, 2021; Han et al., 2019;) and Singapore (Zhao et al., 2018) respectively. This study findings implied the identification of specific population that need an intervention on healthy cellphone use that aim to promote academic achievement as data described considerable risk, though not high risk, early intervention is essential not to escalate the manifestations to high risk of smartphone addiction as these individual indicators should be carefully assessed and relevant to prevent smartphone addiction. This emphasizes the use of needs assessment tools as students are to be identified and assessed as to their excessive cellphone use and GPA first before a contextualized intervention can be designed, implemented and evaluated.

The Classification of Respondents According to Excessive Cellphone Use

This classification among respondents is as shown in the following table, classify students as excessive or non-excessive users based on gender and criteria established by Kwon et al. (2013b).

Table 5

Classification of Respondents According to Excessive Cellphone Use by Gender-Based Cut-Off Scores on Kwon et al. (2013b) Criteria

Respondents	Excessive Users		Non-Excessive User	
	Freq	%	Freq	%
Female	149	42.5	31	8.8
Male	115	32.8	56	16
Total	264	75.3	87	24.8

Note: n=351 Total Smartphone Addiction Score; Excessive Users: Boys (score ≥ 31), Girls (score ≥ 33); Non-Average Users: Boys (score < 31), Girls (score < 33)

This study revealed that 75.2 % of the total sample size were classified as excessive users. This finding yield similar data as Buctot et al. (2021) found that 62.6% of Filipino high school students were at risk of smartphone addiction. The findings suggest that smartphone addiction is widespread among both genders, but slightly more pronounced in females according to the gender-specific scoring thresholds set by Kwon et al. (2013). To be classified as excessive user and yet to indicate somewhat high risk on the manifested behavior of smartphone addiction with a good GPA mark among respondents show inconsistencies with previous studies that smartphone addiction as excessive users may decrease academic performance and achievement (Zhang & Zeng, 2024; Rashid et al., 2020). On the other hand, align with several findings from other recent studies that explained that Filipino high school students perhaps use smartphone to boost their confidence to perform well in their studies, that way, it enhanced their academic performance (Buctot et al., 2021; Zhao et al., 2018). This could guide positive technology adaptation, digital literacy, and proper integration of cellphone use to education. Our schools, programs, and policies may be informed and interventions may be designed and implemented in view of this important findings as smartphone problem can be viewed not only as a behavioral problem but also as an academic strategy to compare excessive and non- excessive users and how their academic performance differ significantly based on the GPA. However, interestingly, excessive users were also achievers and indicated high GPAs compared to non-excessive users as data revealed in this current study. The important emphasis on the productive use and non-productive use or maladaptive cellphone behavior as technology adoption and exposure varies as well as digital literacy an critical thinking in using cellphones.

Respondents' Level of Perception on Social Support

The level of perceived social support among respondents was examined using the Multidimensional Scale of Perceived Social Support (MSPSS). The following table level and interpretation of perceived social support from significant others, family, friends, and overall social support, giving highlights into the respondents' perceived level of support.

Table 6

Perceived Social Support of Respondents Based on the Multidimensional Scale of Perceived Social Support (MSPSS)

Category	Mean	Standard Deviation	Interpretation
Significant Other	4.72	1.48	Somewhat High
Family	4.83	1.25	Somewhat High
Friends	4.93	1.27	Somewhat High
Multidimensional Scale of Perceived Social Support	4.83	1.12	Somewhat High

Note: n=351 (1.00 – 1.49) Very Strongly Disagree/Very Low; (1.50 – 2.49) Strongly Disagree/Low; (2.50 – 3.49) Mildly Disagree/Somewhat Low ; (3.50 – 4.49) Neutral, (4.50 – 5.49) Mildly Agree/Somewhat High; (5.50 – 6.49) Strongly Agree/ High ; (6.50 – 7.00) Very Strongly Agree/ Very High

These findings reflect that while social support is present among the respondents as it indicates somewhat high level of support in all sources, there is still room for improvement. It means social support can be improved as most respondents were classified as excessive users. It poses the need to foster social support intentional to be a protective and preventive factor to enhance student engagement, outcomes, as smartphone addiction in previous studies had negative associations to social support in adolescents and young adults (Nowak et al., 2022). A meta-analysis on numerous studies among mainland Chinese teenagers suggests that the mobile phone addiction level could be reduced by increasing social support and actions to improve their social support levels should be proposed (Wan et al., 2022). Hence, social support should be promoted and strategically applied to impact achievement.

Respondents' Level of Academic Engagement

This was measured using the Utrecht Work Engagement Scale (UWES), which has three dimensions: vigor, dedication, and absorption assessed. The mean scores and descriptive statistics of student engagement, informs into the respondents' level of engagement and enthusiasm in their academic pursuits.

Table 7

Academic Engagement of Respondents Based on the Utrecht Work Engagement Scale-9 (UWES-9)

Category	Mean	SD	Descriptive
Vigor	3.61	1.1	Average Engagement
Dedication	3.81	1.19	Average Engagement
Absorption	3.64	1.15	Average Engagement
Utrecht Work Engagement	3.68	1.08	Average Engagement

Note: n=351

Categories	Vigor	Dedication	Absorption	Total score
Very low	≤ 2.00	≤ 1.33	≤ 1.17	≤ 1.77
Low	2.01 – 3.25	1.34 – 2.90	1.18 – 2.33	1.78 – 2.88
Average	3.26 – 4.80	2.91 – 4.70	2.34 – 4.20	2.89 – 4.66
High	4.81 – 5.65	4.71 – 5.69	4.21 – 5.33	4.67 – 5.50
Very high	≥ 5.66	≥ 5.70	≥ 5.34	≥ 5.5100

Based on the Utrecht Work Engagement Scale (UWES) Preliminary Manual adapted from Schaufeli and Bakker (2004), the respondents exhibited an average level of engagement in their academic activities. The overall mean engagement score was 3.68, falling within the "Average Engagement" category (3.00–3.99) with dedication scored the highest mean of 3.81. These results suggest that students are more likely to feel dedicated to their academic work than they are to feel energetic (vigor) or deeply immersed (absorption) in it. Overall, these findings highlight a healthy but improvable state of student engagement among the participants despite cellphone excessive use. On a positive note, it is observed that cellphone use when linked to academic work, and learning purposes, it is associated with high GPA. However, students can still develop in levels of engagement fueled by both internal and digital motivations and access. Academic engagement is associated with other variables and has positive consequences for students, such as greater involvement in their studies (Loscalzo and Giannini, 2018), higher levels of wellbeing (Tayama et al., 2018), and better academic performance (Singh & Srivastava, 2021).

Test of Significant Differences in Excessive Cellphone Use of the Respondents

The analysis in excessive cellphone use based on various demographic characteristics is shown in Table 8.

Table 8

Test of Significant Differences in Excessive Cellphone Use of Respondents

Category	Group	Mean	Test Stat	Test Used	P Value	Significance
² Gender	Female	41	14293	Mann Whitney	0.248	Not
	Male	39.6				
² Age	16 and below	38.5	6.82	Kruskall Wallis	0.078	Not
	17	41.5				
	18	40.4				
	19 and above	43.6				
² Grade Level	Grade 11	39.8	0.717	Kruskall Wallis	0.302	Not
	Grade 12	41				
² Strand	ABM	^{ab} 40.6	35.7	Kruskall Wallis	<.001	Highly Significant
	GA	^{ab} 41.4				
	HUMSS	^b 43.9				
	STEM	^a 36.5				
	TVL-HE	^a 44.8				
	TVL-ICT	^a 43.1				

² Mother's Education	Primary Education	41	7.46	Kruskall Wallis	0.059	Not
	Secondary Education	42.1				
	College Education	38.6				
	Post Graduate Education	38.8				
² Father's Education	Primary Education	^b 43.6	15.0	Kruskall Wallis	0.002	Highly Significant
	Secondary Education	^b 41.6				
	Post Graduate Education	^a 38.1				
	College Education	^{ab} 37.8				
² GPA	Did not meet Expectations	^{ab} 37.6	38.8	Kruskall Wallis	<0.001	Highly Significant
	Fairly Satisfactory	^{ab} 47.0				
	Satisfactory	^b 46.3				
	Very Satisfactory	^b 43.5				
	Outstanding	^a 47.6				

Pvalue<0.05 Significant, ¹ANOVA/T-test, ²KRUKALL WALLIS/ Mann Whitney, Same letters shows no significant difference

The results of the statistical tests reveal that there are no significant differences in excessive cellphone use when grouped according to gender ($p = 0.248$), age ($p = 0.305$), grade level ($p = 0.302$), and mother's educational attainment ($p = 0.059$). These findings suggest that excessive cellphone use is relatively consistent across these demographic factors. However, significant differences were found based on strand ($p < 0.001$) and father's educational attainment ($p = 0.002$). Among the strands, students from the STEM strand (mean = 36.5) had significantly lower excessive use scores, while those from HUMSS (43.9) and TVL-HE (44.8) recorded higher scores, indicating a highly significant variation in usage. Regarding father's education, students whose fathers attained primary (43.6) and secondary education (41.6) showed significantly higher excessive use scores compared to those whose fathers completed college (37.8) or postgraduate education (38.1).

These results suggest that academic track and paternal education level are influential factors in students' smartphone usage behavior. Although, there were several studies that analyze substantial differences between these demographic profiles and excessive cellphone use, there are still mixed findings. For instance, data indicated that girls' cellphone usage scored higher in Smartphone Addiction Scale Short-Version (SAS-SV) than boys however, Kwon et.al. (2013) in his study stated it was not significant as girls were more self-aware than boys about their consumption. In contrast, females were found to have a greater likelihood of spending more time on their phones than males and those with lower grade levels, age brackets and parental education were more likely to manifest symptoms of smartphone addiction and low academic performance (Buctot et al., 2021, Van et al, 2015). The academic strand may also reflect the degree of exposure to gadgets as the curriculum with STEM strand is more on computerizations and modern applications on digitally immersed competencies compared to other strands as STEM strand is more inclined to technology adoption and there were differences in technology reliance among students from various strands (De Guzman et al., 2020; Liu, et al., 2019; Kirschner & De Bruyckere, 2017; Hobbs, 2017). Consistently aligned with previous studies, the educational level of parents particularly the father's education are significant factors of students' academic performance (Buctot et al., 2021; Soharwardi et al., 2020; Boateng et al., 2020; Amoo et al., 2018).

There are significant differences in smartphone addiction grades across DepEd grade categories ($p < 0.002$). Students rated as "Outstanding" had the highest addiction scores (47.6), while those who "Did Not Meet Expectations" had the lowest (37.6). However, overlapping group letters indicate no significant difference between some categories. This suggests that even high-performing students may be highly engaged with smartphones, possibly due to academic or social use.

These findings indicate remarkable implications in excessive cellphone use among selected variables. Policy makers and developers in the educational setting should be careful not to fall into the mistake of only one intervention for all as no one-size-fits-all policies on smartphone use. Instead, data-based needs assessments can help identify students who appropriately need support or intervention as not all excessive users are poor academically instead and some may even be excelling because of proper and effective digital habits.

Intervention should be proposed based on gender-sensitive and appropriate gender-based response-strategies may be necessary. Interventions should be keen and well-tailored to differences in digital behavior, possibly integrating media information literacy, smartphone management strategies, and well-being tracking tools tailored by gender.

The collaboration and coordination between schools and external stakeholders in the community may be developed for parent-focused programs to foster awareness and proper education of families about healthy smartphone habits, academic engagement, and digital citizenship—especially in communities where formal education levels are lower. Early prevention at this stage of adolescents or senior high school life just before higher education is timely for preventive measures to take place. Schools can implement programs and activities centered on digital literacy advocacy workshops, peer-led support groups, and engagement-boosting strategies before higher addiction risks get more severe and declines academic performance as engagement and social support are strengthened to impact academic achievement positively. Similar studies show support as a sense of belonging and participation or involvement within the network of their studies showing vigor, dedication, and absorption, they will be able to succeed academically. (Carmona et al, 20; Tortosa et al, 2024; Wu et al, 2023; Fredericks, 2019).

Mediating Effects of Social Support and Engagement on Cellphone Use and Academic Achievement.

The measurement model's validity was assessed through factor loadings and variance estimates of latent constructs. The following table presents these estimates for smartphone addiction, work engagement, social support, and academic achievement, providing insights into the relationships between these variables.

Table 9
Structural Equation Model Results for the Mediation of Work Engagement between Smart Addiction and GPA

Hypothesis	Estimate	P-Value	Decision on HO	Conclusion
H1a (Direct Effect):	0.117	<0.000	Reject Ho	Work Engagement positively predicts GPA
H1b (Direct Effect):	-0.122	0.103	Fail to Reject Ho	Smart Addiction doesn't affect Student Engagement.
H1c (Direct Effect):	-0.014	<0.001	Reject Ho	Smart Addiction positively predicts GPA
H1d (Indirect Effect):	-0.014	0.098	Fail to Reject Ho	Student Engagement do not mediates the relationship between Smart Addiction and GPA.
Total Effect	-0.055	0.001	Reject Ho	Smart Addiction has negative effect to GPA
CFI = 1.0: Ideal; TLI = 1.0: Ideal; RMSEA = 0.0 Good Fit; SRMR = 0.0: Acceptable				

Pvalue < 0.01 "Highly Significant"; Pvalue < 0.05 "Significant"; CFI: values > 0.95 are ideal but > 0.90 is acceptable; TLI: similar criteria with CFI; RMSEA: values < 0.06 indicate good fit; SRMR: values < 0.08 are acceptable

With 351 observations, the model shows excellent fit (CFI = TLI = 1.000; SRMR = 0.000), indicating a perfect fit due to its saturated structure. RMSEA is also 0, further confirming this. Student engagement significantly predicts GPA ($a1 = 0.117, p < 0.001$), while smart addiction direct effect on academic achievement is significantly negative ($1c: -0.041, p = 0.002$). However, the path from smart addiction to engagement ($b1 = -0.122$) is not statistically significant ($p = 0.103$). The indirect effect via work engagement is small and marginally non-significant (indirect = $-0.014, p = 0.098$), though the total effect of smart addiction on GPA remains significant (total = $-0.055, p < 0.001$). Smart Addiction reduces GPA directly and latter is positively associated with engagement, but engagement does not significantly mediate this relationship.

Consistent with existing literature and previous studies (Rashid et al, 2020; Roshanayi, 2020) that smartphone addiction negatively impacts academic achievement persistently should be recognized by schools, parents, and other stakeholders so that prevention and intervention may be developed as a response service as may be established and offered by the guidance and counseling program of the school with data-based needs assessment and mechanisms to mitigate excessive cellphone among students. Early and timely interventions before the maladaptive cellphone use escalates is crucial and predictor of academic success.

However, engagement was not found to be a mediator in the pathway of excessive cellphone use and achievement. Rather, it is a predictor of GPA, which means engagement directly affects GPA, and is beneficial to promote GPA, but it does not affect or reduce cellphone use. Hence engagement can be implemented and used as an intervention independently and/or in parallel to smartphone addiction reduction strategies, not as an alternative strategy. To encourage participation in school activities and in the classrooms may increase academic achievement. Students may be given opportunities and interactions academically, socially, and cognitively through curricular and non-curricular involvement drawing meaning from their effort, experience in vigor, dedication and absorption the teaching-learning process.

Table 10

Structural Equation Model Results for the Mediation of MSPSS between Smart Addiction and GPA

Hypothesis	Estimate	P-Value	Decision On HO	Conclusion
H1a (Direct Effect):	0.033	0.002	Reject Ho	MSPSS positively predicts GPA
H1b (Direct Effect):	-0.026	0.654	Fail to Reject Ho	Smart Addiction doesn't affect MSPSS
H1c (Direct Effect):	-0.054	0.000	Reject Ho	Smartphone Addiction predicts GPA
H1d (Indirect Effect):	-0.001	0.670	Fail to Reject Ho	MSPSS do not mediates the relationship between Smart Addiction and GPA.
Total Effect	-0.055	0.001	Reject Ho	Smartphone Addiction has negative effect to GPA

CFI = 1.0: Ideal; TLI = 1.0: Ideal; RMSEA = 0.0 Good Fit; SRMR = 0.0: Acceptable

Pvalue < 0.01 "Highly Significant", Pvalue < 0.05 "Significant"; CFI: values > 0.95 are ideal but > 0.90 is acceptable; TLI: similar criteria with CFI; RMSEA: values < 0.06 indicate good fit; SRMR: values < 0.08 are acceptable

With 351 observations, the model shows excellent fit ($CFI = TLI = 1.000$; $SRMR = 0.000$), indicating a perfect fit due to its saturated structure. RMSEA is also 0, further confirming this. MSPSS significantly predicts GPA ($a_1 = 0.033$, $p = 0.002$), while smartphone addiction direct effect on GPA is significantly negative ($1c: -0.054$, $p = 0.002$). However, the path from smartphone addiction to social support ($b_1 = -0.026$) is not statistically significant ($p = 0.654$). The indirect effect via MSPSS is small and marginally non-significant (indirect = -0.001 , $p = 0.60$), though the total effect of smart addiction on GPA remains significant (total = -0.055 , $p < 0.001$).

Smart Addiction directly affects GPA negatively, but social support does not significantly mediate this relationship. Data revealed social support positively impacts GPA, as a predictor not a mediator. This highlights the role of social support in promoting achievement align with recent studies (Saeed et al., 2023; Wan et al., 2020). However, results were found to contrast with other studies that smartphone addiction lowers social support (Nowak et al., 2022; Herrero et al., 2019). Instead, this study found out that smartphone addiction does not affect social support. Despite these inconsistent findings with other recent studies, social support as a predictor of achievement can be a separate, independent intervention. Thus, social support should be positively identified, made available, easily accessed, and fortified to assist students' academic development. However, social support does not mediate cellphones and GPA-link, rather acts as an independent variable to promoting achievement. Overall, these three attributes social support, engagement, and excessive cellphone use are separate predictors of achievement and not pathways or mediators.

The Moderating Role of Smartphone Addiction to the Relationship Between Social Support and Student Engagement

Implications for the effect on academic performance. The moderating role of smartphone addiction was examined using structural equation modeling. The following table presents the results of the analysis, including the estimates, p-values, and conclusions for each hypothesis, indicating insights into the complex relationships between these variables.

Table 11

The Moderating Role of Smart Addiction on the Relationship Between Support and Engagement: Implications for the effect in academic performance

Hypothesis	Estimate	P-value	Decision on HO	Conclusion
H1a (Direct Effect):	0.326	<0.001	Reject Ho	Perceived social support significantly predicts student engagement.
H1b (Mediator Relationship 1)	-0.067	0.186	Fail to reject	Smartphone addiction does not significantly mediate the effect of social support.
H1c (Mediator Relationship 2):	-0.036	0.031	Reject Ho	Smartphone addiction significantly affects student engagement.
H1d (Indirect Effect):	-0.103	0.001	Reject Ho	There is a significant indirect effect of social support on engagement via smartphone addiction to student's GPA

CFI = 0.915: Good fit; TLI = 0.899: Good fit; RMSEA = 0.088: Acceptable; SRMR = 0.101: Good fit

Pvalue < 0.01 "Highly Significant", Pvalue < 0.05 "Significant"; CFI: values > 0.95 are ideal but > 0.90 is acceptable; TLI: similar criteria with CFI; RMSEA: values < 0.06 indicate good fit; SRMR: values < 0.08 are acceptable

Table 11 presents the results of the mediation analysis examining the moderating role of smartphone addiction in the relationship between perceived social support, student engagement, and academic performance. The direct effect

(H1a) between perceived social support and student engagement was statistically significant (estimate = 0.326, $p < 0.001$), leading to the rejection of the null hypothesis. This indicates that higher levels of perceived social support are directly associated with increased student engagement. Wu et al. (2023), findings show statistically significant relationship between the two variables, the greater any of the sources of social support, the more students' sense of school belonging, and academic involvement. Previous studies have highlighted a positive relationship between peer support, parental support, teacher support and student engagement (Kilday & Ryan, 2019; Garcia-Reid et al., 2015). Hence, in the studies, it is important to note that social support was found to have increased academic engagement, consequently academic achievement, and lower smartphone addiction (Tortosa et al., 2024; Wu et al., 2023; Wan et al., 2024; Saeed et al., 2023, Chen et al., 2023).

However, the first mediating path (H1b), which assessed the relationship between perceived social support and smart addiction, yielded a non-significant result (estimate = -0.067, $p = 0.186$), suggesting no sufficient evidence to reject the null hypothesis. In contrast, the second mediating relationship (H1c), examining the effect of smart addiction on student engagement, was statistically significant (estimate = -0.036, $p = 0.031$), indicating that higher levels of smart addiction are associated with reduced student engagement. Furthermore, the indirect effect (H1d) was significant (estimate = -0.103, $p = 0.001$), supporting the moderating role of smart addiction in the pathway between social support and engagement. These findings imply that while social support positively influences engagement, the presence of smart addiction can partially suppress this effect, ultimately impacting academic performance.

Model fit indices support the adequacy of the structural model, with CFI = 0.915 and TLI = 0.899 indicating an acceptable fit, though slightly below the ideal threshold of 0.95. RMSEA = 0.088 falls within the acceptable range, and SRMR = 0.101, though slightly above the preferred cutoff of 0.08, still suggests a generally good model fit.

Overall, the analysis underscores the importance of addressing smartphone addiction as a moderating factor when designing interventions aimed at enhancing student engagement and academic outcomes through improved social support systems. Herrero et al. (2019) in his previous studies have highlighted a positive relationship between peer support, parental support, teacher support and student engagement (Kilday & Ryan, 2019; Garcia-Reid et al., 2015). This study revealed that smartphone addiction negatively impacts engagement while social support increases the latter. Hence, aligning with some recent studies (Ma et al., 2024; Tortosa et al., 2024), it is important to note that social support was found to have increased academic engagement, consequently academic achievement, however social support does not significantly lower smartphone addiction in this study which was inconsistent with several other studies (; Wan et al., 2024; Wu et al., 2023). Interventions should focus on excessive users with maladaptive behavior and cellphone use reduction should not be dependent on improving environmental factors. It should recognize the use of more specific technology regulation techniques such as tech -balance, digital awareness workshops, and self- monitoring app guidelines. Through social support networks should be strengthen, but with the presence of smartphone addiction as a moderating variable, weakens the social support-engagement link. Therefore, cellphone excessive use should be mitigated, itself as it affects engagement negatively despite strong social support consequently affecting achievement. However, it is important to emphasize the moderating effect of cellphones partially while social support does not affect cellphone use but it affects engagement and engagement is enhanced by social support, thus the latter indirectly affects academic achievement.

CONCLUSION

The study concludes that perceived social support plays a significant role in enhancing student engagement, which is crucial for academic success. However, the presence of smartphone addiction partially negatively affects this relationship, negatively influencing student engagement. In addition, smartphone addiction directly and indirectly negatively affects academic achievement. While social support does not significantly reduce smart addiction, the latter has a significant negative impact on engagement. The indirect effect further confirms that smartphone addiction weakens the positive influence of social support. These findings highlight the importance of promoting healthy digital habits alongside fostering strong support systems to enhance student engagement and academic outcomes. In addition, gender-based and excessive users targeted interventions to specific population exhibiting maladaptive behavior identified through needs assessment is necessary in the design of program interventions. Interventions include smartphone addiction as an academic strategy not just a behavioral and psychological problem, thus involving the productive use of cellphones that characterized specific academic strands into digital literacy and positive technology adoption. Parental involvement with collaboration to education initiatives among parents, parallel programs of curricular and non-curricular opportunities offered to students and positive social support in the school, home and community setting impact academic achievement despite negative effects of the prevalence of excessive cellphone use among senior high school students.

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