

From Newsfeeds to Numbers: Investigating The Influence of Social Media and Study Habits on Mathematics Achievement of Filipino Grade 10 Students

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Publication history:

Received: September 10, 2026

Revised: October 18, 2026

Accepted: October 21, 2026

Published: October 22, 2026

International Journal of Sustainable and Integrated Studies, Vol. 1, No. 3, pp. 729–734, October 2026.

Abstract

This study examined the relationships among social media use, study habits, and mathematics performance among Grade 10 students at Aguing National High School, President Carlos P. Garcia, Bohol, Philippines, during School Year 2025–2026. Grounded in Social Learning Theory, the Theory of Planned Behavior, and Cognitive Load Theory, the study employed a descriptive-correlational research design involving 64 students selected through total enumeration. Data were gathered using structured questionnaires measuring passive and active social media engagement and study habits, while mathematics achievement was assessed using official third-quarter grades. Descriptive statistics and Pearson product–moment correlation were employed to analyze the data. Results indicated moderate levels of passive ($M = 3.33$) and active ($M = 3.15$) social media use, good study habits ($M = 3.25$), and very satisfactory mathematics performance ($M = 86.08$). Correlation analysis revealed no statistically significant relationship between social media use and mathematics performance ($r = -0.124$, $p = 0.327$) or between study habits and mathematics performance ($r = 0.112$, $p = 0.380$). These findings indicate that neither social media engagement nor study habits demonstrated a significant association with mathematics achievement within the study population. The study recommends promoting responsible digital engagement, strengthening independent learning practices, and implementing school-based academic support initiatives. Aligned with Sustainable Development Goal 4 (Quality Education), the research contributes to understanding behavioral factors relevant to mathematics learning. Its educational and institutional sustainability implications include providing localized empirical evidence to inform school-level interventions, responsible technology use, and continuing improvements in students' academic development.

Keywords: Academic Performance; Digital Engagement; Grade 10 Students; Mathematics Achievement; Social Media Use; Study Habits; Sustainable Development Goal 4

1. Introduction

Mathematics achievement is essential to students' academic development, yet it remains a challenge in Philippine secondary education. The increasing use of social media has transformed students' learning behaviors, potentially affecting concentration, time management, and study routines. This study examines the relationships among social media use, study habits, and mathematics performance of Grade 10 students at Aguing National High School, Bohol, during School Year 2025–2026, as a basis for a proposed action plan.

Mathematics develops critical thinking, logical reasoning, and problem-solving skills, although students often experience difficulties and academic anxiety that affect achievement (OECD, 2023). Social media platforms provide opportunities for communication and learning but may also encourage excessive engagement, procrastination, and poor self-regulation (Moon & Illingworth, 2022). Unregulated use can reduce study time and academic concentration (Sun, 2023; Pang, 2021). Digital multitasking and prolonged exposure may further disrupt attention, memory, and emotional well-being (Twenge, 2021; Cao et al., 2024). Conversely, consistent study routines and independent practice support mathematical understanding and achievement (Gan et al., 2024). (OECD, 2023; Rahmawati & Suciati, 2023).

Social media facilitates information sharing and collaborative learning (Alhabash et al., 2022), but inappropriate use may interfere with academic responsibilities (Martin & Sunley, 2022). Excessive digital engagement and multitasking have been associated with reduced academic performance, particularly in cognitively demanding subjects such as mathematics (Hamzah et al., 2021). Meanwhile, effective study habits involving time management, regular review, and goal setting contribute to academic success (Khan & Memon, 2021). Self-monitoring and reflective learning further strengthen students' ability to manage distractions and sustain mathematical problem-solving (Nurhadi et al., 2023). (Tafesse, 2022; Sharma & Behl, 2022; Goet, 2022).

International assessments have highlighted persistent challenges in Filipino students' mathematics proficiency (OECD, 2023). Digital distractions and inconsistent study routines may further complicate learning (Li et al., 2023). Republic Act No. 10533 and DepEd Order No. 010, s. 2024 emphasize improving foundational competencies and educational outcomes. Within this context, Aguinig National High School in President Carlos P. Garcia, Bohol, provides a setting for examining how social media engagement and study habits relate to Grade 10 mathematics achievement.

The study is anchored in Social Learning Theory, which explains behavioral development through observation and interaction (Bandura, 1977); the Theory of Planned Behavior, which relates behavior to attitudes, subjective norms, and perceived control (Ajzen, 1991); and Cognitive Load Theory, which explains how excessive information and distractions can overwhelm working memory (Sweller, 1988). These theories support the examination of social media engagement, study habits, and mathematics achievement. The study also adopts an Input–Process–Output framework, identifying social media use and study habits as independent variables and mathematics performance as the dependent variable.

Although previous studies have examined social media use and study habits separately, the manuscript identifies limited localized research investigating their relationships with mathematics performance in rural Philippine public schools. This study addresses that gap by assessing passive and active social media use, study habits, and mathematics achievement among Grade 10 students of Aguinig National High School. It also examines respondents' demographic characteristics and the significant relationships among the principal variables to develop an evidence-based action plan for improving learning practices.

The study aligns with SDG 4 (Quality Education) by examining behavioral factors associated with mathematics achievement. Its focus on responsible social media use, effective study habits, and academic performance supports efforts to strengthen numeracy, independent learning, and educational quality among Filipino secondary students.

The study contributes to educational sustainability by identifying study behaviors associated with mathematics achievement. It supports digital sustainability by promoting responsible technology use and balanced academic engagement. Institutionally, the findings may guide teachers, administrators, and parents in developing school-based strategies that strengthen study habits, reduce digital distractions, and support sustained mathematics learning.

2. Material and methods

2.1 Research Design

The study utilized a descriptive-correlational research design to assess students' social media use, study habits, and mathematics performance without manipulating the variables. Descriptive research examines the characteristics of a population, while correlational research identifies relationships among variables (Creswell, 2014). The descriptive component determined respondents' demographic profiles, passive and active social media engagement, study habits, and mathematics performance. The correlational component examined the direction, strength, and statistical significance of the relationships between social media use and mathematics performance and between study habits and mathematics performance.

2.2 Locale of the Study

The study was conducted at Aguinig National High School, Barangay Aguinig, President Carlos P. Garcia, Bohol, Philippines, during School Year 2025–2026. Established in 1993 under Republic Act No. 7871, the school

is a public secondary institution offering junior and senior high school education. It follows the Department of Education's K–12 curriculum and was selected because of its Grade 10 mathematics classes and available academic records. During the study period, the school had 448 enrolled students, comprising 276 junior high school and 176 senior high school students.

2.3 Respondents of the Study

The respondents were 64 Grade 10 students enrolled at Aguing National High School during School Year 2025–2026. They represented three sections: Lapu-Lapu, Sultan Kudarat, and Del Pilar. The respondents were selected because they were exposed to social media platforms, participated in mathematics instruction, and could provide information about their study habits and digital engagement. Their third-quarter mathematics grades served as the measure of academic performance.

2.4 Sample and Sampling Procedure

The study employed total enumeration, including all 64 Grade 10 students in the three sections. Lapu-Lapu and Sultan Kudarat each contributed 21 respondents (32.81%), while Del Pilar contributed 22 respondents (34.38%). This approach ensured complete representation of the target Grade 10 population without selecting a smaller sample.

2.5 Research Instrument

The study utilized a three-part structured questionnaire. The first part gathered respondents' demographic information, including age, gender, parents' highest educational attainment, and combined monthly family income. The second part adopted the instrument of Ozimek et al. (2022) to assess passive and active social media use through a five-point Likert scale ranging from Strongly Disagree to Strongly Agree. Passive use involved viewing online content, while active use included posting, sharing, and interacting with others. The third part adopted the questionnaire of Charles-Ogan and Alamina (2014) to evaluate study habits, including time management, study routines, and concentration, using a five-point frequency scale ranging from Never to Always. Mathematics performance was measured using respondents' official third-quarter mathematics grades, classified according to the Department of Education grading scale.

2.6 Data Gathering Procedure

The researcher requested permission from the Schools Division Superintendent and school principal before conducting the study. Upon approval, coordination was undertaken with class advisers and mathematics teachers regarding questionnaire administration. Respondents were informed of the study's objectives and assured of confidentiality. Following informed consent, questionnaires were administered and collected. With institutional permission, third-quarter mathematics grades were obtained from official school records. The collected data were subsequently organized, coded, tabulated, and prepared for statistical analysis.

2.7 Data Analysis Techniques

The collected data were analyzed using descriptive and correlational statistical techniques. Frequency counts and percentages described respondents' demographic characteristics, while weighted means and standard deviations summarized social media use and study habits. Mathematics performance was classified according to the Department of Education grading scale. Correlation analysis examined the direction, strength, and statistical significance of the relationships between social media use and mathematics performance and between study habits and mathematics performance. The null hypotheses were tested at the 0.05 significance level. The findings provided the basis for the proposed action plan.

3. Results and Discussion

3.1 Demographic Profile of Grade 10 Students

3.1.1 Age and Gender Distribution

The findings revealed that 54.69% ($n = 35$) of respondents were 15 years old, 34.38% ($n = 22$) were 16 years old, and 10.94% ($n = 7$) were 17 years old or older. Gender distribution was equal, with 32 males (50.00%) and 32 females (50.00%), indicating balanced representation. The respondents were predominantly within the expected age range for Grade 10. The balanced gender distribution provides a context for understanding students' digital and academic behaviors. Previous studies emphasized the relevance of peer interactions, gender distribution, and digital susceptibility in adolescent learning (Santos & Buhat, 2023; Valdez, 2022; Del Rosario, 2024).

3.1.2 Parents' Highest Educational Attainment

The results showed that high school was the most common educational attainment among mothers (50.00%) and fathers (48.44%). College graduates accounted for 4.69% of mothers and 7.81% of fathers, while 3.13% of mothers had completed a master's degree. No fathers were reported in the latter category.

These findings indicate that most respondents came from households with moderate parental educational backgrounds. Parental education may influence academic guidance and support at home, particularly in

mathematics. However, structured learning routines and school-based assistance remain important in supporting learners whose parents have limited opportunities to provide academic instruction (Del Rosario, 2024; Aquino (2023); Flores, 2023).

3.1.3 Combined Family Monthly Income

The findings indicated that 73.44% of respondents belonged to households earning ₱10,000 or below monthly. Only a small proportion came from higher-income households, with very few reporting monthly family incomes exceeding ₱30,000. This distribution highlights the socioeconomic circumstances of most respondents. Financial limitations may affect access to internet connectivity, learning devices, reference materials, and appropriate study environments. These concerns are consistent with studies emphasizing the effects of socioeconomic conditions on digital access and independent learning among students in rural communities (Magpantay, 2024; Flores, 2023; Santos & Buhat, 2023).

3.2 Social Media Engagement Among Grade 10 Students

3.2.1 Passive Social Media Use

Passive social media use was classified as Moderate, with an overall weighted mean of 3.33 and a standard deviation of 1.00. Reading comments on personal pictures received the highest weighted mean (3.81), interpreted as High, while reading entries on others' pages obtained a lower mean of 2.84. These findings indicate occasional engagement in browsing, viewing, and reading online content. The moderate level suggests that passive social media activities form part of students' regular digital routines. Nevertheless, prolonged browsing may contribute to distraction and procrastination. Previous studies associated passive digital consumption with self-regulation difficulties, reduced academic engagement, and fragmented study schedules (Sun, 2023; Pang (2021); Muzaffar et al., 2020; Cao et al., 2024).

3.2.2 Active Social Media Use

Active social media use was also Moderate, with an overall weighted mean of 3.15 and a standard deviation of 1.08. Posting pictures with family obtained the highest weighted mean (3.52), interpreted as High. Activities involving event creation and other more demanding online interactions were less common, indicating that students primarily engaged in personal sharing and social communication. These findings suggest that active engagement was generally directed toward maintaining social connections rather than extensive content creation. Such activities may support communication but can also compete with academic responsibilities. Research indicates that active social media use may facilitate collaborative learning when academically directed, although excessive engagement may interfere with study time (Escobar-Viera et al., 2021; Chen & Xiao, 2022).

3.2.3 Overall Social Media Engagement

The combined level of social media use was Moderate, with a grand mean of 3.24 and a standard deviation of 1.05. Passive engagement (WM = 3.33) was slightly higher than active engagement (WM = 3.15), indicating that respondents were more inclined toward viewing content than actively participating in online activities. This pattern suggests that social media was a regular component of students' daily routines without consistently reaching high engagement levels. Existing literature emphasizes that academic outcomes associated with social media depend partly on self-regulation, time management, and the educational context in which digital platforms are used (Cao et al., 2024; Sun, 2023).

3.3 Study Habits and Mathematics Achievement

3.3.1 Level of Study Habits

The respondents demonstrated Good study habits, with an overall weighted mean of 3.25 and a standard deviation of 0.98. Paying attention to details received the highest weighted mean (3.47), followed by satisfaction in independently solving problems (3.41). However, studying without effective time management (WM = 3.11) and moderate concentration ratings indicated areas requiring improvement. The findings suggest that respondents practiced positive learning behaviors but did not consistently demonstrate structured time management and sustained concentration. Previous research highlighted the importance of regular study routines, self-directed learning, and minimizing digital distractions to support mathematical understanding (Gan et al., 2024; Nurhadi et al., 2023). (Solano, 2023; Tarigan & Purba, 2023).

3.3.2 Level of Mathematics Performance

The respondents obtained an average mathematics grade of 86.08, classified as Very Satisfactory. Among the students, 37.50% achieved Outstanding performance, while 29.69% were classified as Very Satisfactory. Only a small proportion belonged to the Fairly Satisfactory category, and no respondents received failing grades. These findings indicate generally favorable mathematics achievement despite moderate social media engagement. Nevertheless, continued academic support and structured learning activities remain important. This is consistent with literature emphasizing the need to strengthen mathematics proficiency through sustained instruction, independent practice, and effective study routines (OECD, 2023; Khan & Memon, 2021).

3.4 Relationships Between Social Media Use, Study Habits, and Mathematics Performance

3.4.1 Relationship Between Social Media Use and Mathematics Performance

Pearson correlation analysis revealed a very weak negative relationship between social media use and mathematics performance ($r = -0.124$, $p = 0.327$). Since the p-value exceeded the 0.05 significance level, the relationship was not statistically significant, and the null hypothesis was not rejected. The findings indicate insufficient evidence of a significant association between social media use and mathematics achievement among the respondents. Although the correlation was negative, its magnitude was negligible. Previous studies similarly emphasized that academic outcomes may depend on the nature, purpose, and intensity of social media engagement rather than usage alone.

3.4.2 Relationship Between Study Habits and Mathematics Performance

The correlation between study habits and mathematics performance was very weak and positive ($r = 0.112$, $p = 0.380$). Since the p-value was greater than 0.05, the relationship was not statistically significant, resulting in failure to reject the null hypothesis. These findings suggest that study habits alone were not significantly associated with mathematics achievement in the sample. Other factors, including motivation, cognitive ability, self-efficacy, learning strategies, and emotional regulation, may also contribute to academic performance. This interpretation is consistent with studies emphasizing the multidimensional nature of academic achievement (Richardson et al., 2021; Panadero, 2021).

3.5 Implications for Mathematics Learning and Digital Engagement

The overall findings revealed moderate passive and active social media use, good study habits, and very satisfactory mathematics performance. Neither social media use nor study habits demonstrated a statistically significant relationship with mathematics achievement. These results indicate that the measured behavioral variables were not strongly associated with students' mathematics grades within the investigated population. The findings support the importance of considering multiple factors when developing academic interventions. Responsible digital engagement, structured study routines, instructional support, and student self-regulation remain relevant considerations for school-level planning. Rather than relying exclusively on restrictions on social media use or improvements in study habits, the proposed action plan may incorporate broader strategies addressing students' learning needs and academic development. (Shankleman et al., 2021).

4. Conclusion & Recommendations

The study revealed that Grade 10 students of Aguining National High School demonstrated moderate passive and active social media use, good study habits, and very satisfactory mathematics performance. Most respondents belonged to low-income households, with parents predominantly having high school educational backgrounds. Statistical analysis showed no significant relationship between social media use and mathematics performance ($r = -0.124$, $p = 0.327$) or between study habits and mathematics performance ($r = 0.112$, $p = 0.380$). These findings indicate that neither variable was significantly associated with mathematics achievement among the respondents, suggesting that other academic and contextual factors may also contribute to their performance.

Students are encouraged to maintain responsible social media use and strengthen time management, concentration, and independent study practices. Teachers should reinforce effective learning strategies through enrichment activities and engaging mathematics instruction, while school administrators and guidance counselors may implement programs promoting digital responsibility, academic discipline, and student support. Parents are encouraged to monitor online activities and support productive study routines at home. Future researchers may examine additional factors, including motivation, parental involvement, learning styles, and teaching strategies. The proposed action plan should also be implemented and evaluated to determine its effectiveness in supporting students' study habits, responsible social media engagement, and mathematics performance.

The study was limited to 64 Grade 10 students of Aguining National High School, President Carlos P. Garcia, Bohol, during School Year 2025–2026. It focused on passive and active social media use, study habits, and mathematics performance measured through third-quarter grades. Its descriptive-correlational design identified statistical relationships but could not establish causality. Since the investigation involved one school and a specific grade level, the findings may not be generalizable to other student populations or educational settings. Other potentially relevant factors, including motivation, prior knowledge, parental involvement, and instructional strategies, were not directly examined.

5. Compliance with ethical standards

The author acknowledges the participation of Grade 10 students of Aguining National High School, President Carlos P. Garcia, Bohol, and the cooperation of the school authorities. Participation was voluntary, and informed consent was obtained before data collection through non-invasive survey questionnaires and authorized access to mathematics academic records. Confidentiality was maintained through the secure handling of research data and

reporting of findings without disclosing personally identifiable information. Statements confirming the absence of conflicts of interest and external funding status require verification by the author before publication.

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