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STUDY HABITS AND TECHNOLOGY EXPOSURE ON THE ACADEMIC PERFORMANCE OF STUDENTS IN MATHEMATICS

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ABSTRACT

This research investigated the effect of study habits and technology exposure on performance in mathematics in the modern world of first-year college students of IBA College of Mindanao, Inc. during School Year 2025-2026. 250 students were sampled. The study used descriptive-correlational research design, with adopted survey instruments to measure students' study habits and exposure to technology; while the official midterm grades constituted the academic performance. In the study, it was found that the students had High study habits, Moderate exposure to technology and Good academic performance. Based on the correlation analysis, study habits do not significantly correlate to academic performance (r = .000, p = .997) and study habits also do not significantly correlate to exposure to technology (r = –.041, p = .520). Nonetheless, exposure to technology showed a statistically significant but weak positive correlation to academic performance (r = .167, p = .008). In particular, the purposeful and academic use of technology improves performance in mathematics albeit marginally. The findings show that even though students have a habit of studying, it does not directly improve their mathematics performance. However, educational technology helps in the learning. The significance of applying technology meaningfully has been confirmed through the results of the study conducted on the mathematics lesson. Moreover, the study suggests further studies on school context and student characteristics for determining the achievement of students in Mathematics and Technology.

Keywords: study habits, technology exposure, academic performance, mathematics learning, college students

1. INTRODUCTION

For many countries around the world, students' performance in mathematics raises a continual concern. This is because mathematics is viewed as a basic subject that is critical not only for national development but also for individual development. It helps in developing logical reasoning, critical thinking and problem-solving skills which we often require in daily life and real-life situations. All the international assesses show underachievement in mathematics. For example, the OECD PISA 2018 report showed that Filipino students ranked very low in mathematics. In fact, they scored much lower than the worldwide average score (OECD, 2019). The underperformance observed in mathematics achievement points to the need to investigate factors related to school and learners in the Philippines.

The study habit is the main factor affecting achievement. Research has shown that effective study habits (time management, note taking, lesson revision and concentration) leads to better marks. According to Dagoc and Oco (2019), the study habits of Grade 9 students significantly contributed to their mathematics achievement. On the other hand, Cruz and Villanueva (2020) emphasized that time management and planning skills reduce procrastination and lead to better grades.

Likewise, Corpuz (2024) showed that students who possess strong 21st-century learning skills and who have "very good" study habits got very satisfactory performance in mathematics. Wu, Qi and Zhong (2022) studied of international research lend support. Self-regulation grit, and study habits motivate predict mathematics performance.

Beside study habits, the exposure by technology is becoming increasingly significant. Technology creates chances to learn interactively and independently, but the effect is dependent on how it is used. According to Al-Hariri and Al-Hattami (2017), students' purposeful use of technology improved their academic achievement. Ali (2023) focused on the integration of digital tools in mathematics teaching to enhance the engagement of students and outcomes. According to Tan (2019), in the Philippines, the use of an ICT-enabled flipped-classroom model increases involvement and mathematics skills. Using technology too much or for things other than learning can harm you. Kus (2025) did a large study of existing research and found that problematic smartphone use and online gaming harms performance. By contrast, educational technology helps performance.

Evidence from around the world shows how technology can help close learning gaps. Poddar, Rotondi, and Kashyap (2025) found that a free laptop programme in India led to improvement in mathematics proficiency by students—especially those from disadvantaged background—when technology was meaningfully integrated into learning. In the same manner, Zhao et al. (2021) illustrated that GeoGebra and Desmos eased complex mathematical concepts and improved conceptual understanding. According to these finding, technology can assist the learning of mathematics. However, this applies under certain conditions. Specifically, access, teacher preparedness and pupils' digital competence.

Summing up the literature shows two things: (1) study habits are a key factor responsible for the mathematics achievement, and (2) technology has a double-edged impact as well – it can help/educate or become a hindrance to learning. Although these domains have been investigated independently, there is scarce recent research in the Philippines on their joint impact on mathematics performance by selected junior high school students. As students now use higher digital tools after the pandemic, it is especially relevant to understand how the use of technology and study habits interact.

The research is timely as it fills the gap in Philippine education which relates to the study habits and exposure to technology of students that predict their performance in mathematics.

This study will focus on first year college students of IBA College of Mindanao, Inc. It will provide evidence that is contextualized to the setting. In other words, it will help teachers design strategies that create effective study habits and responsible use of technology. In addition, the results can help schools and parents to understand the kinds of interventions that can improve learning outcomes in maths. The paper aims to help resolve the on-going mathematics achievement problem in the Philippines.

2. STATEMENT OF THE PROBLEM

The study examines the relationship between study habits and technology exposure in connection to the academic performance in mathematics of first year college students at IBA College of Mindanao, Inc. for the school year 2025-2026.

Specifically, it aims to answer the following questions:

1. What is the level of students' study habits?
2. What is the level of students' technology exposure?
3. What is the level of students' academic performance in mathematics?
4. Is there a significant relationship between study habits, technology exposure and academic performance of students in mathematics?

3. METHODOLOGY

3.1 Research Design

The study is of a descriptive-correlational type. It sought to determine the levels of students' study habits, technology exposure, and academic performance in mathematics (APM). Further, it determined the relationship of these variables. The official midterm math weights of the students were obtained in addition to an adopted survey questionnaire on study habits and technology exposure. The responses on the questionnaires were coded and then analysed with the help of software, after checking them for completeness. The variables were summarized using descriptive statistics (mean and standard deviation). Then, the Pearson Product-Moment Correlation Coefficient was applied to determine whether the study habits, technology exposure and academic performance were significantly and strong correlated at 0.05 levels of significance. This

method gave a lucid portrayal of the students' learning behaviours and an assessment of how these factors correlate to their mathematics outcomes.

3.2 Locale of the Study

This research was conducted at IBA College of Mindanao, Inc. in T.N. Pepito St., Poblacion, Valencia City, Bukidnon, Northern Mindanao, Philippines. In 2004, the school was founded by Dr. Irene B. Antonio. Currently, it is a fully operational preschool to college with 100+ teachers and staff as well as 3052 students from pre-school to college level. The school chosen for the study was chosen because of the diversification of the students. The emphasis on academic excellence in the school makes it a good place to study the factors affecting students' performance in Mathematics.

3.3 Participants of the Study

The respondents of the study were 250 first year students from IBA College of Mindanao, Inc. for the School Year 2025 – 2026. First years were selected since they were still in transition and the subjects' foundational skills were still being developed. Moreover, they can be affected by technology use and allocation of study time amongst other things. The respondents were chosen randomly from each section.

3.4 Data Gathering Procedure

To ensure ethical compliance, the researcher sought permission from the School President of IBA College of Mindanao, Inc. and secured informed consent from all participants. Anonymity and confidentiality were strictly maintained, and all data were used solely for research purposes and reported in aggregate form. Participants were free to withhold any personal information.

3.5 Statistical Techniques

To offer exact analysis and interpretation of the gathered data, the researcher will use descriptive and inferential statistics. The mean and standard deviation will be used for a descriptive analysis of the level of students' study habits, technology exposure and performance in mathematics.

Inferential statistics will be used to find the relationship between respondents' the level of technology exposure and study habits and academic performance. Pearson Product-Moment Correlation will be specifically used to determine whether there is a significant relationship between study habits, technology exposure and academic performance of students in mathematics.

4. RESULTS AND DISCUSSION

Table 1 presents the students' study habits using descriptives, specifically the mean, standard deviation, maximum, and minimum values in the data collected.

Table 1. Descriptive Statistics on Study Habits

Variable	N	Min	Max	Mean	Std. Deviation
Study Habits	250	2.47	4.93	3.8651	.57243

The mean score of 3.87 shows that the students are often involved in good study habits. The lowest score of 2.47 indicates that certain students still display moderate levels. Meanwhile, the highest score is 4.93 indicates that other students demonstrate excellent study behavior. The standard deviation of 0.57 reveals a moderate difference in the way the students study.

Students generally have strong and consistent study habits. Students often have several behaviors such as lesson review, note-taking, concentration, and lesson preparation. The majority of first-year students are adjusting well to the requirements of university mathematics. This level of a study habit is expected to impact studying mathematics positively due to the improvement it gives to understanding, remembering, and preparedness.

The current study revealed that the study habits were at a high level. They are consistent with past studies. The past studies also highlight the significance of study habits in mathematics learning.

According to Dagoc and Oco (2019), students who continuously review lessons, take down notes and implement single-minded study strategies perform better and show more engagement in mathematics. This pattern was likewise echoed in the study of Cruz and Villanueva (2020) who pointed out that learners who practice time management, planning, and lesson review develop more positive learning behaviors. This means that there are indeed those who have high levels of

study habits according to this current study's respondents. Similarly, Corpuz (2024) revealed that the very satisfactory performance in grade seven mathematics of students with a "very good" study habit was highly correlated, which students in the current study showed as well.

Table 2 shows the mean and standard deviation of the students' technology exposure including the minimum and maximum values in the data.

Table 2. Descriptive Statistics on Technology Exposure

Variable	N	Min	Max	Mean	Std. Deviation
Technology Exposure	250	1.67	3.87	2.9112	.45195

A mean of 2.91 indicates that students have access to technology most of the time, particularly to access materials online, tools for solving math problems, and communicating with teachers. The findings suggest that there is neither very high nor very low exposure but an optimal and functional use of technology.

Students moderately employ the technology, indicating that they often use technology for their studies. The respondents often use the internet to help them out with their academics. The respondents are comfortable with the digital platform and their exposure level is adequate but not extensive enough to be categorized as "well exposed." This is something we would expect from first-year students who have just moved from S-H-S where they were comfortable with a technology-supported learning environment.

The result finds that students are moderately exposed to technology. This is in line with studies which show that Filipino learners use technology frequently but with varying intensity. Tan (2019) with reference to students use ICT tools and digital platforms to understand mathematics, however, their use is moderate rather extensive. This was also the case in the present study. According to Ali (2023), the respondents obtain maximum academic technology exposure, but the frequency and depth of use differ based on needs, availability, and preference, resulting in a relatively balanced exposure to technology among respondents. Al-Hariri and Al-Hattami (2017) revealed in their findings that students often use technology for academic purposes even though level of exposure depends on availability and the school context as well.

Table 3 presents the descriptive statistics of the respondents on their academic performance using mean and standard deviation. Minimum and maximum values are presented as well.

Table 3. Descriptive Statistics on Academic Performance

Variable	N	Min	Max	Mean	Std. Deviation
Academic Performance	250	69	99	86.7320	6.59044

The average midterm score of 86.73% suggests that the students have the required mastery in Mathematics in the Modern World. Scores ranging from 69 to 99 demonstrated student proficiency levels. My dear, the standard deviation of 6.59 shows moderate variability in performance.

Most students usually study maths perfectly and understand adequately but have scope for improvement. The study habits of the participants was high while their exposure to technology was moderate.

The students' performance level of "Good" was consistent with the findings of other studies that reported the same achievement of Filipino learners. Salimaco (2020) said that the performance of senior high school students in mathematics is generally satisfactory when they have good study habits and study environments that can be managed. This is the same performance level of this sample. Similarly, according to Capuno et al. (2019), Filipino junior high school students usually show adequate mastery of mathematical concepts which obtain performance ratings that range from good to satisfactory. The result of the analysis suggests that the performance of the students in the present study in Mathematics is consistent with the national position.

Using Pearsons r correlation test, Table 4 presents the correlation matrix across variables using the correlation coefficient and the p-value.

Table 4. Correlation Between Study Habits, Technology Exposure, and Academic Performance.

Variables	Study Habits	Technology Exposure	Academic Performance
Study Habits	1	-.041	.000
Technology Exposure	-.041	1	.167 (p = .008)
Academic Performance	.000	.167 (p = .008)	1

The study looked at how study habits, exposure to technology and first-year college students taking Mathematics in the Modern World are related to each other. According to the results, study habits and their academic performance had a "relationship" having Correlation Coefficient of r = .000 with significant value of p = .997. Therefore, study habits and academic performance are not related. Whether the score of study habits of students was good or bad, their grades in mathematics did not differ. Likewise, the study habits' technology correlation was negative and non-significant (r = –.041, p = .520), implying they are not influencers and operate independently from one another in the students' learning behaviours.

On the other hand, technology exposure and academic performance was significant (r = .167, p = .008) but weakly associated. This means that students who use technology in their study like online videos, digital tools, math apps tend to get slightly higher mathematics grades. Though its strength is weak, the P-value is significant. Thus, exposure to technology has a positive influence on students' mathematics performance.

The results show that study habits do not directly influence the performance of the students in Mathematics despite high levels of study habits of the students. This means that although the students study through reading, jotting down notes, and revisiting the lessons, yet they do not score higher in tests. The frequency with which the pupils engage in study activities to prepare for a mathematics assessment may not be as important as the quality of study strategies and test-taking skills. The absence of a relationship between study habits and technology exposure means that students' study habits and technology usage evolve independently. Some students may not be influenced by technology as they prefer studying traditionally, while some depend more on technology.

Conversely, the strong positive correlation between exposure to technology and academic achievement suggests technology has a functional role in supporting the mathematics learning of students. Despite the relationship being weak, the results indicate that students who use educational technologies more often – whether it's online tutorials, learning platforms, graphing tools or maths-related apps – tend to get slightly better grades. This means technology has the potential to make math concepts clearer, offer instant feedback, and engage students, resulting in better performance. The relevance of use of technologies for purpose specific learning of mathematics is growing. Moreover, use of the same may have more influence over performance on study habits alone.

Recent studies show strong evidence of the positive relationship between academic performance and exposure to technology. Zhao et al. (2021) demonstrated that the use of interactive digital tools such as Desmos and GeoGebra enhances students conceptual understanding and problem-solving skills which resulted in better performance in mathematics. Similarly, in this study, students with increased exposure to technology had higher grade in mathematics. A comparable finding by Poddar et al. (2025), whereby greater access to digital learning tools and conducive conditions enhanced students' foundational mathematics skills, affirms the current outcomes.

On the contrary, the insignificant relationship between study habits and academic performance is similar to what many studies have concluded that having good study habits is not equal to achieving high achievements. Manalo (2021) claimed that although students maintain good study habit, their performance would not reach the best levels due to other factors such as motivation, strategies or difficulty of assessment. Likewise, melom et al. in 2024 said that only a few study strategy - for example, self-test and time management -strongly predict academic outcome, while a few had grossly irrelevance effect. Likewise, the present study showed no significant relationship.

Also, the lack of significant relationship of study habits and exposure to technology is consistent with past findings that these two variables proved to develop independently. Based on Berondo and Dela Fuente (2021), some students learn the traditional way while others depend on digital devices. This means that students can either use one or both of the two variables, and of course, this may not affect the other. This aligns with the current study, as study habits and technology exposure demonstrated no significant link between the two.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the findings, several conclusions can be drawn. Even if a student has great studying habits, that does not necessarily mean they will do better at math. This means that the kinds of study strategies may be more important than how often they are used, this is similar to what Manalo (2021) has pointed out- not all study habits are the same. Moreover, the use of technologies for academic related tasks experienced moderate exposure among the students. This is in agreement with literature as it explains how technology use is growing in Philippine classrooms but there are varied uses (Ali, 2023; Al-Hariri & Al-Hattami, 2017). Third, students' Good academic performance aligns with previous reports of satisfactory levels of mathematics mastery among Filipino youth (Capuno et al., 2019). The lack of influence of study habits on academic performance indicates that other 3 include. Also, the same had greater influence on the outcomes in mathematics. They are motivation, comprehension, learning environment and instructional methods. Finally, a significant positive relationship was established with technology exposure with academic performance. This means that technology is a supportive tool that aid understanding and engagement. These findings comply with Zhao et al., (2021) and Poddar et al., (2025) that better performance can be achieved with technology when used properly.

5.2 Recommendations

In view of the conclusions, various recommendations are provided for students, teachers, administrators, parents, and the future researchers. It has been noted that students would benefit from being taught how to improve the effectiveness of their studying rather than simply being informed of the importance of studying. Evidence-based techniques include self-testing, spaced practice, and active recall, which all positively impact learning (Melon et al., 2024). They should also use technology more purposefully and academically to improve their understanding, such as connecting with reliable online learning platforms and mathematics applications. Teachers are advised to use technology-supported instructional strategies in mathematics such as simulations, interactive tools, and online problem-solving environments as they can enhance engagement and understanding of mathematics (Zhao et al. 2021). In order to maximize the benefit of technology for instruction, administrators should provide adequate ICT facilitation and stable internet access and train teachers on digital pedagogy. Parents should help students use technology in a responsible and learning-oriented manner and create a positive study environment at home. In the future, researchers may use more variables or different methods to obtain a deeper understanding of the students' learning in the digital age. The variables may include motivation, digital literacy, learning styles, teaching strategies, and others variables like this one.

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