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The Relationship Between Computer Access and Academic Performances of Grade 12 Information and Communication Technology Students in Meycauayan National High School

A Research Presented to

Senior High School Department

Meycauayan National High School

Bulacan

In Partial Fulfillment

of the Requirement for the Subject

Practical Research 2

Information and Communication Technology (Thompson)

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INTRODUCTION

RATIONALE

"With fast-growing technology, schools have to adapt and use technology constantly as a tool to grow." Simões et al., (2022) Technology has been a necessity for students, more specifically, Information and Communication Technology Students. Studies suggest that students without computer access tend to have lower academic performance compared to those who have regular access to computers as technology has been a key for everyone to have an easier life. This research shows the difference in academic performance of students who do and do not have computer access and the effects and impacts it brings.

In this generation, gadgets are everywhere; that's why schools and other facilities are evolving, and by that, the use of technology can lead to many advantages, according to the OECD, "Education helps overcome these challenges by developing knowledge and high skills, allowing better opportunities and faster economic progression." OECD, (2019). By having developed knowledge and high skills about computers can give a boost to Information and Communication Technology students that already have computers to use at home, which affects the students academic performance a lot. "The adoption of Information and Communication Technologies by the university sector has made it possible to modify teaching methods, improve teaching quality, and reach a new student audience interested in online training." Youssef et al., (2022). Without any computer access, students would have difficulty enhancing the skills necessary for their future careers related to Information and Communication Technology.

"while ICT use at home for school purposes had a positive relationship with achievement, ICT use for entertainment purposes and the magnitude of use at school had a negative relationship with achievement." Courtney et al., (2022). Lack of experiences of computer access can lead to disadvantages to academic performance of the student because lack of knowledge and computer skills. Struggling access to computer at home or the internet is not equal in every dwelling. Without regular practice and exposure they may struggle to grasp complex concepts and complete assignment effectively. The objective of this research is to determine the extent to which computer access impacts the Grade 12 Information and Communication Technology students academic performance.

"The acquisition of digital skills increases students' academic performance." Youssef et al., (2022). The impact of technology on students has become a great factor, especially to those who are studying Information and Communication Technology. "We propose a model on the influence of computer attitudes, computer learning environments, computer learning motivations, computer confidence, computer use, computer self-efficacy, loneliness, mothers' education, parents' marital status and family size on academic achievement (AA)." Simões et al., (2022). Access to computers enhances and gives them the skills necessary to succeed in various jobs corresponding to what they have learned. However, there can be disadvantages that might occur. According to Simões, "Nonetheless, access to computers at home or the internet is not equal in every dwelling, and some students have the disadvantage of not having parental support or engagement to learn by themselves online." Simões et al., (2022). This purpose of this study is to find whether computer access affects the students' academic performance, negatively or positively. This study will provide insights into how computer access influences the academic success of Information and Communication Technology students but also their readiness for future careers that require digital skills.

STATEMENT OF THE PROBLEM

This study aims to find the answer on the relationship between Computer Access and Academic Performance of Grade 12 Information and Communication Technology Students at Meycauayan National High School Academic Year 2024 – 2025.

This study also sought to answer the following questions:

1. Is there a difference in academic performance between Information and Communication Technology students with limited computer access and those with regular access in Meycauayan National High School?
2. Does having access to computers improve the students computer attitudes, computer learning environments, computer learning motivations, computer confidence, computer use, computer self-efficacy which significantly affects their academic performance?
3. Does the students way of learning, digital skills, and quality of informations they receive worsens when shortage of computer access occurs on Meycauayan National High School?

SIGNIFICANCE OF THE STUDY

The importance of the study is to inform the Relationship between Computer Access and Academic Performance and the advantages and disadvantages that it can provide to the students and the school. The research shows the data and the impacts of computer access to students academic performances.

This study will benefit the following:

1. Information and Communication Technology Students – Information and Communication Technology students need the information of the relationship between the access of computer and getting better academic performance . They might need this knowledge now or their future.
2. Teachers- Teachers can help the student understand how computer availability affects to learning, which is another benefit. This information can help them successfully integrate technology into their lesson, which will increase student achievement.
3. Parents- the parents of student benefit as well since they can learn how crucial computer access is to their kids academic achievement. With this information, they may make informed decisions about giving their kids the support and resources they needing for their schooling.
4. Information and Communication Technology Department - this benefits the connection between computer access and academic performance will help the department and the school's ICT.
5. Government- the government is in charge of monitoring the standard of instruction in schools, including the availability of technology. Determining how computer access affects academic learning might help policymakers make judgments about learning student digital infrastructure and advancing technology in the classroom.
6. Future Researchers - These benefits of this study can serve as a basic for future investigations into the connection between academic achievement and computer access by education and technology researchers.

HYPOTHESIS

There is no relationship between computer access and academic performance in Grade 12 Information and Communication Technology students at Meycauayan National High School.

There is a relationship between computer access and academic performance in Grade 12 Information and Communication Technology Students at Meycauayan National High School.

SCOPE AND DELIMITATION

This study covers The Relationship Between Computer Access and Academic Performance of Grade 12 Information and Communication Technology Students at Meycauayan National High School for the academic year 2024-2025. The study targets the school, and at least 66 of the students with/without computer access at home with 16 in two sections and 17 in the other two summing up to 66 students, to show the relationship and impacts between computer access and the academic performances of the students.

METHODOLOGY

RESEARCH DESIGN

The researchers used the descriptive quantitative research design to identify the differences between the two groups. As McCombes (2019) said, “Descriptive research is an appropriate choice to identify characteristics, frequencies, trends, and categories.” The researchers have concluded that using this design would highlight the problem that is yet to be discovered and it is appropriate to use it to compare the two groups being those with computer access and those without computer access. According To McCombes (2019) “It is useful when not much is known yet about the topic or problem. Before you can research why something happens, you need to understand now, when, and where it happens.” With the design used, the researchers may be able to deal with and give the right solutions for the possible problems and information that might appear.

POPULATION AND SAMPLE

The researchers applied the simple random sampling method because it is efficient and is the most basic way of gathering respondents, it will also make the answers much more truthful. As Thomas (2023) said, “A simple random sample is a randomly selected subset of a population.” a simple sampling method is to make everyone’s likelihood of answering the survey equal for a much fair selection of participants and to increase the odds of the survey getting answered. The population used for this study includes a total of 139 students in the four sections of Grade 12 Information and Communication Technology Students in Meycauayan National High School

Academic Year 2024-2025. Using the slovin's formula with 10% margin of error sample is 66 students from the Grade 12 Information and Communication Technology Strand have at least 17 respondents in 2 sections and the other 2 sections having 16 respondents.

RESEARCH INSTRUMENT

The instruments used in this study are designed to effectively gather quantitative data on the relationship between computer access and academic performance. The two main instruments used are the **Dichotomous Questions** and the **Ordinal Scale**.

The Dichotomous Questions used in this study are made to provide straightforward, responses **Yes** or **No**. "Yes or no surveys, also known as dichotomous survey scales, allow respondents to provide quick and straightforward answers by choosing between two options: yes or no." Said by Sharma (2023), These questions are designed to assess the basic pieces of information to get from the respondents, such as whether the respondent has access to a computer, or whether they believe computer access impacts their academic performance. According to Sharma (2023), "With only two possible answers, collecting feedback using Yes or No surveys is one of the most effective ways to maximize response and capture actionable insights." Dichotomous questions are an efficient and effective tool for gathering clear, easily analyzable data. The simplicity of yes/no responses minimizes confusion and reduces the potential for bias and error. This is particularly beneficial in a study focused on understanding the presence or absence of computer access and its impacts on academic performance. The clear answers enable the researcher to quickly identify trends or patterns without complex data processing, which is ideal for quantitative analysis in this study.

The Ordinal Scale used in this study is a Likert-type scale, ranging from **1 (Strongly Disagree)** to **5 (Strongly Agree)**, designed to assess the degree of agreement or frequency with various statements regarding the importance of computer access in completing academic tasks. Respondents show their level of agreement with statements related to the importance of computers in their academic performance. The Ordinal Scale fits well for this study as it allows respondents to express varying degrees of agreement. "an ordinal scale is used as a comparison parameter to understand whether the variables are greater or lesser than one another using sorting." Bhat (2023), This level of measurement provides more verified data. The scale allows the researcher to quantify perceptions and attitudes towards computer access and academic performance in a manner that is both reliable and understandable. It also enables a deeper analysis of trends within the collected data.

DATA COLLECTION

The researchers followed the following steps in this study:

Conceptualizations Phase. For the topic given, the researchers noticed that not every ICT student would have computer access in their home and that is based on their experience. However, there are still ICT students who excel in their academic performances even without proper computer access, and the researchers have decided to find if there is a relationship between computer access to the academic performance of ICT students and what are the impacts it can have in it.

Design Phase. The researchers made a Google survey form for an efficient way of gathering information. When the form was created, it was checked by the Practical Research Adviser. Once approved, the researchers started gathering 66 random students from each Grade 12 ICT section. The researchers decided to pick the sections, Babbage and Hollerith to get at least 17 random students while having at least 16 random students in sections Thompson and Pascal. This is to prevent error and bias. The researchers have decided to go to each of the respondents' rooms and ask the president or the available teacher currently present for their room's approval before handing out their phone along with the Google survey form rather than sending it to the online group chat, this is to get the data much more efficiently and to prevent any kinds of misinformation and bias.

Empirical Phase. In this phase, the researchers ask for the class president's or teacher present's approval before conducting the survey. The researchers used voluntary method where anyone can participate.

Analytical Phase. The researchers found that most ICT students have limited access to computers outside of school, which affected their ability to complete assignments and projects. Those with better access to computers generally performed better academically, while students with less access struggled with deadlines and task completion. These findings highlight the importance of computer access in supporting ICT students' academic success.

Dissemination Phase. The researchers will publish this study to contribute to the future researchers.

DATA ANALYSIS

The research used various tools to determine the information of senior high school students and the relationship between computer access and academic performance. The data that will be gathered from the Google survey form was systematically analyzed to address the research questions. The analysis was divided into three parts, corresponding to each research objective:

Research Objective	Research Question	Instrument	Data Analysis
RO1. Determine the difference in academic performance between ICT students with limited and regular computer access.	RQ1. Is there a difference in academic performance between ICT students with limited computer access and those with regular access in Meycauayan National High School?	Google Survey	Comparative Analysis
RO2. Assess how computer access influences students' attitudes, learning environment, motivation, confidence, and self-efficacy.	RQ2. Does having access to computers improve students' computer attitudes, learning environments, learning motivations, confidence, and self-efficacy, significantly affecting their academic performance?	Google Survey	Trend and Correlation Analysis
RO3. Identify how computer shortages affect students' learning methods, digital skills, and the quality of information received.	RQ3. Does the students' way of learning, digital skills, and quality of information they receive worsen when a computer shortage occurs at Meycauayan National High School?	Google Survey	Descriptive Statistics and Trends

RESULTS AND DISCUSSION

To understand the relationship between computer access and academic performance, the study utilized a questionnaire composed of seven yes-or-no questions.

Questions	Frequency (YES)	Percentage	Frequency (No)	Percentage
1. **Do you have a personal computer at home?**	26	60.61%	40	39.39%
2. Are you able to use a computer whenever you need it for school assignments?	43	34.85	23	65.15%
3. **Do you use a smartphone to complete school-related tasks when a computer is unavailable?**	62	6.61	4	93.94%
4. **Do you believe that having regular computer access has a positive impact on your academic performance?**	54	18.18	12	81.82%
5. **Have you ever missed a deadline because you couldn't access a computer?**	35	46.97	31	53.03%
6. **Have you ever received a lower grade on an assignment due to**	28	57.58	38	42.42%

limited computer access?				
7. **Do you think your grades would improve if you had more frequent access to a computer?**	51	22.73	15	77.27%

According to the results, the majority of students (81.82%) understand how important regular computer use is to raising academic performance. Due to a lack of resources, many students struggle, 46.97% of students have missed deadlines due to the lack of computer access, while 57.58% have received lower grades because of limited computer availability, which emphasizes the importance of fair access. This means that lack of computer access at home or at school can limit their ability effectively. The results show that 93.94% of the students rely heavily on smartphones as substitute for computers which is not ideal for completing ICT or computer-related tasks that require specific softwares, or even larger screens.
The need for computer resources is vital for ICT students as it helps improve their academic performance more, specially on practical and computer tasks, that could lead them on getting better grades for the future. As 77.27% of respondents believe that their grades would improve with more frequent access to a computer, further highlighting the significant role computers play in their academic success. The challenges the students may face due to limited sources may hindrance the improvements of their skills and overall performance.

To further understand the importance of computer access and usage, participants rated their skills, attitudes, and motivations on a Likert scale. The results are summarized in the table below, along with the verbal interpretation and weighted mean for each category:

Part 1. Computer access improving a specific academic field.

Digital Skills (Editing, Photography, Troubleshooting etc.)	Highly agree - 38 Agree - 25 Neutral - 3 Disagree - 0 Highly disagree – 0 ---------- 66 Weighted mean - 1.515

	Verbal Interpretation - Agree
Critical Thinking	Highly agree - 20 Agree - 31 Neutral - 13 Disagree - 2 Highly disagree – 0 ---------- 66 Weighted Mean -1.955 Verbal Interpretation - Agree
Researching	Highly agree - 32 Agree - 28 Neutral - 5 Disagree – 1 Highly disagree – 0 ---------- 66 Weighted Mean - 1.621 Verbal Interpretation - Agree
Time Management	Highly agree – 15 Agree - 34 Neutral - 15 Disagree - 2 Highly disagree – 0 ---------- 66 Weighted Mean - 2.061 Verbal Interpretation - Agree
Computer Literacy	Highly agree – 15 Agree - 34

	Neutral - 15 Disagree - 2 Highly disagree – 0 ---------- 66 Weighted Mean - 2.061 Verbal Interpretation - Agree

Part 1. Computer access improving a specific personal quality.

Computer Attitude (The way you behave online)	Highly agree - 13 Agree - 38 Neutral - 12 Disagree - 3 Highly disagree – 0 ---------- 66 Weighted Mean - 2.076 Verbal Interpretation - Agree
Computer Learning Motivation	Highly agree - 19 Agree - 31 Neutral - 15 Disagree - 1 Highly disagree – 0 ---------- 66 Weighted Mean - 1.970 Verbal Interpretation - Agree
Computer Confidence	Highly agree - 29 Agree - 26

	Neutral - 11 Disagree – 0 Highly disagree – 0 --- 66 Weighted Mean -1.727 Verbal Interpretation - Agree
Computer Use	Highly agree – 27 Agree - 31 Neutral - 6 Disagree - 2 Highly disagree – 0 --- 66 Weighted Mean - 1.742 Verbal Interpretation - Agree
Computer Self-Efficacy	Highly agree – 27 Agree - 33 Neutral – 6 Disagree - 0 Highly disagree – 0 --- 66 Weighted Mean - 1.682 Verbal Interpretation - Agree

Scale	Range	Interpretation
5	4.5 - 5	Highly Disagree
4	3.5 - 4.49	Disagree
3	2.5 - 3.49	Neutral
2	1.5 - 2.49	Agree

1	1.0 - 1.49	Highly Agree

The first part of the ordinal scale assessed how students believe computer access impacts their academic skills. The responses for digital skills, such as editing, photography, and troubleshooting, were overwhelmingly positive, with the majority of students either agreeing or highly agreeing that computer access helps improve these skills. The weighted means still staying within the "Agree" range indicates that students acknowledge the positive influence of computer access on these skills, and that there is room for further development in these areas. The weighted mean for digital skills was 1.515, which corresponds to a general agreement. And having 1.955 for critical thinking and 1.621 for researching while time management and computer literacy, the weighted means for both were slightly higher at 2.061. The ability to manage time effectively and improve computer literacy skills are critical thinking for academic success, and more consistent access to technology could further support this development.

The second part of the ordinal scale shows the assessment of students personal qualities getting positively affected by computer access. Responses related to computer attitude, learning motivation, and confidence were all positive, with weighted means of 2.076, 1.970, and 1.727, respectively. The results shows that students agree that computer access helps with ones behaviours and characteristics. Furthermore, computer use and self-efficacy, both crucial factors in students' ability to utilize computers for learning, also received positive responses, with weighted means of 1.742 and 1.682. Overall, the ordinal scale demonstrated a strong response among students that having computer access positively impacts not only their academic fields but also their personal development. These findings highlight the importance of consistent access to computers in fostering both academic and personal growth.

CONCLUSION

Based on the findings of the study, this research concludes that:

1. **The Relationship Between Computer Access and Academic Performance.** In ICT courses, students who have regular and enough access to computers typically perform better academically. Their capacity to effectively do practical activities, have ICT skills and do well on tests are all examples of this. Students who have little access to computers, on the other hand, deal with difficulties that have a negative effect on their academic achievement.

2**. Practical implications for ICT Education.** Having a solution for the lack of computer access is important for improvements in learning outcomes, especially in ICT, where practical experience is important and requires closing the gap in computer access. Students' engagement, skill development, and general academic success can all be improved by ensuring equal access.

RECOMMENDATIONS

Based on the findings of the study, the following are recommended:

- **Increase Computer Availability:** Provide additional computers in the ICT laboratories to ensure sufficient access for all students during practical activities and performance tasks.
- **Introduce Proper Time Management Schedule:** Implement rotational schedules or time-sharing strategies to maximize the use of available resources.
- **Promote Partnerships:** Collaborate with local government units or private sectors to secure funding for ICT equipment.
- **Offer Digital Resource Access:** Supplement limited computer access with online learning platforms or mobile-friendly resources to support self-study and practice.
- **Future Research:** Expand this study to other schools or educational levels to validate findings and investigate other variables influencing academic performance in ICT.

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APPENDICES

A.

CONSENT FORM

The researchers from **Grade 12 Information and Communication Technology, Section - Thompson** seeks for your consent to participate in answering a survey for their research entitled "**The Relationship Between Computer Access and Academic Performance on Grade 12 Information and Communication Technology Students on Meycauayan National High School**". The researchers seek to understand the difference between the academic performance of those with computer access and those without computer access. The researchers would be grateful for your participation which will have a significant positive impact on the research. Participating in this survey, the researchers will keep your identity private as stated in the privacy.

Will you participate? ☐**Yes** ☐**No (Kindly put a check on one of the boxes)**

NAME (Optional)**:**
SECTION (Optional)**:**
ADDRESS (Optional)**:**

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B.

SURVEY FORM

1. **Do you have a personal computer at home?**

   ☐**Yes** ☐**No**

2. **Are you able to use a computer whenever you need it for school assignments?**

   ☐**Yes** ☐**No**

3. **Do you use a smartphone to complete school-related tasks when a computer is unavailable?**

   ☐**Yes** ☐**No**

4. **Do you believe that having regular computer access has a positive impact on your academic performance?**

   ☐**Yes** ☐**No**

5. **Have you ever missed a deadline because you couldn't access a computer?**

   ☐**Yes** ☐**No**

6. **Have you ever received a lower grade on an assignment due to limited computer access?**

   ☐**Yes** ☐**No**

7. **Do you think your grades would improve if you had more frequent access to a computer?**

   ☐**Yes** ☐**No**

8. **I believe that having computer access able to help you improve in this specific academic field:**

Digital Skills (Editing, Photography, Troubleshooting etc.)	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**
Critical Thinking	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**
Researching	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**
Time Management	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**
Computer Literacy	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**

9. **I believe that having computer access is able to help me improve the following qualities:**

Computer Attitude (The way you behave online)	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**
Computer Learning Motivation	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**
Computer Confidence	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**
Computer Use	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**
Computer Self-Efficacy	☐ **Highly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Highly Disagree**