Digital Literacy Ability and Academic Performance among College Students

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ABSTRACT

Academic performance referred to how well a student did in school. It was usually shown through grades, test scores, assignments, and how well they understood what they were learning. This study investigated the relationship between digital literacy ability and academic performance of college students. Data was collected from 138 third-year education students in Santo Tomas, Province of Davao del Norte. Through the use of stratified universal sampling technique. This study utilized quantitative and non-experimental research through a descriptive correlational design. An adapted questionnaire assessed digital literacy ability, while academic performance was evaluated based on grades provided by instructors, which were adjusted for accuracy and relevance. An adapted questionnaire was used to assess digital literacy ability, while academic performance was evaluated based on grades provided by instructors, which were adjusted for accuracy and relevance. A very high level of digital literacy ability improved academic performance by enabling students to comprehend complex text, critically analyze information, and apply knowledge effectively across subjects. Results showed that both digital literacy ability and academic performance had a descriptive level of strong positive correlation. The statistical tools used in the study were the mean and Pearson r. The relationship between digital literacy ability and academic performance suggested that students who were more digitally literate tended to perform better academically, as they were able to efficiently access, evaluate, and use digital information for learning, which helped improve and enhance their academic achievement.

Keywords - Digital Literacy Ability, Academic Performance, Correlational Research Design, Philippines.

INTRODUCTION

In the pursuit of academic excellence, understanding the multitude of factors that impact students' performance has become imperative concern for educators, researchers, policymakers, and parents alike (Howard, et al, 2019).

Academic performance is established through cumulative grade point average or continuous assessment and serves as an indicator of the degree to which an organization, instructor, or student has fulfilled their short- or long-term learning goals (Tadese, et al., 2022). However, several issues have highlighted the undesirable state of student academic performance. A lack of self-motivation, inadequate reading habits, and poor time management abilities are significant barriers to students' academic success (Yaya et al., 2024). Poor attendance and a bad attitude towards learning might lead to lower academic performance (Selvarajoo & Baharudin, 2023).

In Bangladesh, academic performance is challenging especially in (ICT)-based universities. For instance, according to Shahjahan et al., (2021) the Daffodil International University (DIU) student's academic performance This issue has garnered attention due to the fact that over 5,000 students have a CGPA (cumulative grade point average) below 2.5 after completing all of their coursework. As a result, the graduation process has been impeded, and students might be allowed to retake one or two of the classes in which they had the lowest grades in order to enhance their CGPA. In Ghana, the study of Nkansah and Oldac, (2024) undergraduate students face challenges, particularly concerning digital literacy. There is a large gap in the digital knowledge and competencies of these students due to a complicated interaction of individual factors, such as personal motivation and previous experience; parental factors, such as parental digital literacy levels and support.

In the Philippines, most students experience challenges in working with, evaluating, and using digital information to their best capacity, and this affects their academic performance negatively. Barrot et al., (2021). Moreover, according to Mangarin and Climaco., (2024) major players of this challenge are limited technology access, inadequate initial digital skills education, and inadequate support from institutions and instructors. Furthermore, in Davao Del Sur, Bachelor of Science in Information Technology (BSIT), student's poor academic performance is primarily impacted by elements like inadequate strategies for online information retrieval and a lack of digital literacy (Graciano & Benablo., 2023).

Although previous researchers studied the connection between digital literacy ability and academic performance, our understanding of how this process operates among students is significantly lacking. Specifically, previous studies have not explored well enough the specific challenges that confront students as a result of restricted access to digital resources and how such constraints affect their academic achievement. Our research aimed to fill the gap in the body of current literature. By exploring this relationship among college students, the findings contributed to improving educational strategies and making sure that students are equipped with the necessary digital skills for success.

Statement Of the Problem

This study aimed to determine the significant relationship between Digital Literacy Ability and Academic Performance among College Students in Santo Tomas, Province of Davao del Norte.

Specifically, this sought to answer the following questions:

1. What is the level of digital literacy ability in terms of :

1.1 hardware and software basics;

1.2 information and data literacy;

1.3 communication and collaboration;

1.4 digital content creation;

1.5 security;

1.6 problem solving; and

1.7 career related competencies?

2. What is the level of academic performance in terms of grades;

2.1 rating in Educ 104: Technology for Teaching and Learning 1; and

2.2 rating in Educ 109: Technology for Teaching and Learning 2?

3. Is there a significant relationship between digital literacy ability and academic performance?

Hypothesis

The hypothesis was tested at using a 0.05 level of significance describing that there was no significant

relationship between digital literacy ability and academic performance of college students.

Theoretical Framework

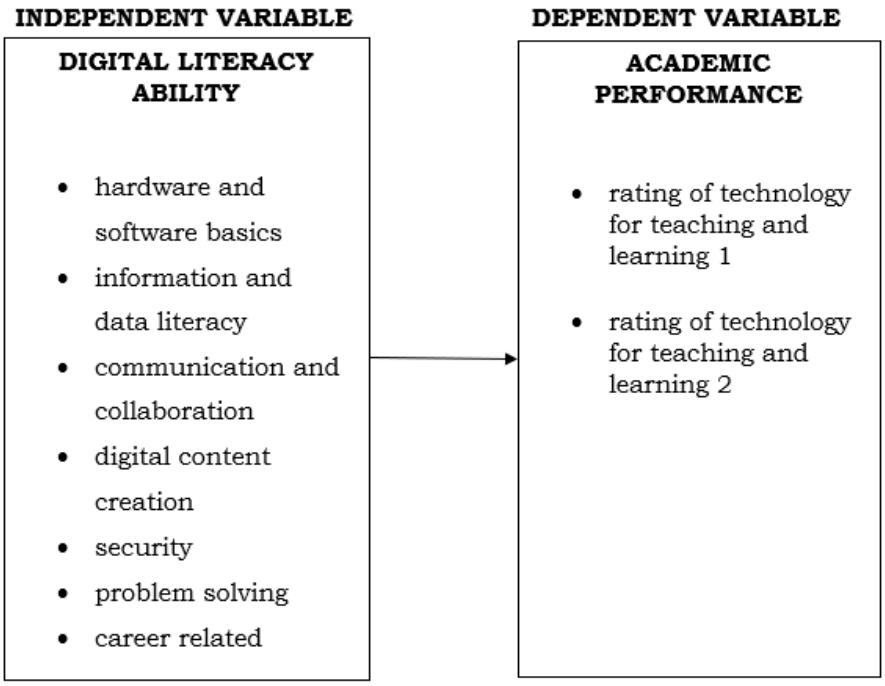
This study was anchored in Constructivist Learning Theory proposed by Piaget and Vygotsky (1978) was a learning theory that students construct their knowledge and comprehension of the world actively through experience and interactions. However, the proposition of Suryansyah and Hasanah, (2024) digital literacy ability

was an important driver of improving learning capabilities, enabling students to use technology confidently and effectively in academic endeavors and everyday life.

Moreover, this study was supported by Miswar et al., (2024) developing that digital literacy ability empowers students navigating the digital world and improve their academic performance, thus increasing their ability to work with online content responsibly and independently. Dewi et al., (2024) was exposed for his statement that digital literacy enhances students academic performance by improving their interaction with information and technology, fostering research skills, critical thinking, and information synthesis, crucial for academic success.

Conceptual Framework

The conceptual framework as shown in Figure 1, outlines the study's variables. The independent variable of the study was digital literacy ability. The variable consists of (7) indicators which were: hardware and software basics, information and data literacy, communication and collaboration, digital contents creation, security, problem solving and career related competencies (Afandi, et al, 2024). The dependent variable was the rating for the subject for technology for teaching and learning 1 and the rating for technology for teaching and learning 2.



Framework Figure 1. The Conceptual of the Study

METHODOLOGY

Research Design

This study used quantitative, non-experimental, descriptive correlational research with a component that evaluated the aforementioned two variables regarding digital literacy ability and academic performance. It entails the controlled gathering and study, using statistical evaluation by way of a specified model or theory to verify the hypothesis, acquire knowledge of the variables' relations, and make conclusions (Mweshi & Muhyila, 2024).

According to Alford and Teater, (2025) quantitative refers to the measurement or expression to something in terms of quantity or amount. It involved using numerical data to describe or analyze the phenomenon, often in mathematical or statistical context. Moreover, descriptives were applied to explain the data through words (Deckert & Wilson, 2023). In addition, correlation would be used to determine if there is a relationship between two variables which is digital literacy ability and academic performance (Gravetter, et al., 2021).

Research Subject

The respondents of this study were 138 students out of a total population of 138 3rd-year students taking education courses in Santo Tomas, Province of Davao del Norte. The respective sampling technique comprised universal sampling used in statistical research methodology to select a specific population in the larger data.According to Sarker and Al-Muaalemi, (2022) universal sampling methods allowed researchers to process larger sets of data so that they may make more generalized conclusions regarding the entire population in a time-saving and cost-saving manner.

They were very useful for testing hypotheses and estimating confidence intervals when faced with more intricate statistical models that cannot easily be managed through standard methods (Wasserman et al., 2020).

Research Instrument

Range of Means	Descriptive Level	Interpretation
4.20 - 5.00	Very High	Digital Literacy Ability was always manifested
3.40 - 4.19	High	Digital Literacy Ability was oftentimes manifested
2.60 – 3.39	Moderate	Digital Literacy Ability was sometimes manifested
1.80 - 2.59	Low	Digital Literacy Ability was rarely manifested
1.0 -1.79	Very Low	Digital Literacy Ability was least manifested

The researchers used one (1) adapted survey questionnaire for independent variables. For the dependent variable, the final grade was used. The questionnaires were validated by the panelist and an external validator to test its validity.

Digital Literacy Ability. The survey questionnaire for the independent variable, digital literacy ability was from the research study titled Digital Literacy Ability Questionnaire Instrument Based on the Integration of Elementary School Students' Characteristics by Afandi et al., (2024).

It consisted of 21 items and would be composed of seven (7) indicators namely: Hardware and Software Basics (4), Information and Data Literacy (3), Communication and Collaboration (3), Digital Content Creation (3), Security (3), Problem Solving (3), and Career Related Competencies (3). The survey used a 5-point Likert scale, ranging from 5 for “strongly agree”, 4 for “Agree”, 3 for “Neutral”, 2 for “Disagree”, and 1 for “Strongly disagree”.

Academic Performance. In determining the level of academic performance was assessed using grades provided by the subject instructor. These grades reflect student achievement on various outcomes outlined in the Commission on Higher Education's syllabus.

Academic Performance was categorized into five levels using the following parameter. The parameter and scaling were used for the interpretation of the digital literacy ability of the college students studying in a local higher education institution in Santo Tomas, Davao del Norte were the following.

Score Interval	Descriptive Equivalent	Interpretation
90 – 100	Very high	Academic performance was outstanding.
85 – 89	High	Academic performance was very satisfactory.
80 – 84	Moderate	Academic performance was satisfactory.
75 – 79	Low	Academic performance was fairly satisfactory.
Below 75	Very Low	Academic performance did not meet the expectation.

Statistical Treatment of Data

Mean. The mean was a statistical metric that shows a dataset's average value. It was computed by adding up all of the values and calculating the ratio of the total number of values (Luís et al, 2023). It was used to determine the level of digital literacy ability and academic performance.

Pearson R. Pearson's r, a standardized linear correlation coefficient, which gauges how strongly and in which direction two interval or ratio-level variables (David et al, 2020). It was used to determine the relationship between digital literacy ability and academic performance.

RESULTS AND DISCUSSIONS

Level of Digital Literacy Ability

Table 1 presented a summary of the level of digital literacy ability. As shown, the equivalent overall mean was 4.29 with a standard deviation of 0.72, which was qualitatively described as very high. This means that digital literacy Ability was always manifested. The highest mean of 4.41, described as very high, was for indicator 1, Hardware and Software Basics. While, the lowest mean of 4.21 was for indicator 2, Information and data literacy, and indicator 6, Problem-Solving described as very high. The overall findings on the level of digital literacy ability imply that high levels of digital literacy ability enhance students' ability to be able to understand, use, and analyze information and data easily, while also using technology to solve problems and make smart decisions.

Table 1
Summary on the Level of Digital Literacy Ability

Indicators	Mean	SD	Descriptive Equivalent
1. Hardware And Software Basics	4.41	0.74	Very High
2. Information And Data Literacy	4.21	0.74	Very High
3. Communication And Collaboration	4.26	0.69	Very High
4. Digital Content Creation	4.25	0.71	Very High
5. Security	4.39	0.72	Very High
6. Problem Solving	4.21	0.75	Very High
7. Career Related Competencies	4.33	0.69	Very High
Overall	**4.29**	**0.72**	**Very High**

The data collected was aligned in the study of Murtadho, et al., (2023) high levels of digital literacy skills. Determinants of these skills were the availability of computers or tablets at home, internet connection, parents' education levels, and the use of the internet. In addition, according to Murtadho, et al., (2023) students with high digital literacy ability display stronger learning outcomes, as they could successfully discover, analyze, and utilize information through digital tools and platforms.

Level of Academic Performance

Table 2 presented the level of academic performance, with an overall mean of 91.66 and a standard deviation of 3.69, corresponding to a very high descriptive level. This was described as very high which means outstanding. Moreover, the data with the highest mean of 92.64, the subject of Technology for Teaching and Learning 2 was also described as very high. The lowest mean of 90.67 was the subject of Technology for Teaching and Learning 1, which is also described as very high.

This performance was categorized as very high, indicating that students demonstrated strong academic abilities in this subject. The overall findings suggest that students' proficiency in Technology for Teaching and Learning 1 and 2 helps students understand and share ideas clearly, which is important for academic success. These skills include using technology, finding reliable information, and thinking critically while studying and completing school tasks.

Table 2

Summary on the Level of Academic Performance

Indicators	Mean	SD	Descriptive Equivalent
1. Rating In Technology for Teaching and Learning 1	90.67	3.65	Very High
2. Rating In Technology for Teaching and Learning 2	92.64	3.74	Very high
Overall	**91.66**	**3.69**	**Very High**

The data collected aligned with the study of Kamara et al., (2024) academic performance was influenced by various factors like grades, time management, study hours, critical thinking, absences, and psychological factors like self-efficacy, and self-esteem. Moreover, in the study of Briones et al., (2022) academic performance among students was attributed to effective parenting styles, positive student characteristics, internet effectiveness, teacher effectiveness, motivation, and alignment with career choices.

Correlation between digital literacy ability and academic performance

Table 3 showed the findings about the significance of the association between digital literacy ability among college students with an overall calculated r-value of .637 and p-value of .000, which was lower than the .05 level of significance. This implied that the relationship of the variable has a positive, strong, and significant correlation. Also, this shows digital literacy ability and academic performance among college students. Thus, the null hypothesis was rejected. This indicates that strong digital literacy ability contributes to better academic achievement. Additionally, challenges such as limited access to technology or difficulty in using digital tools may affect its effectiveness. Developing digital skills enhanced learning experiences and support students' success in their academic growth.The result conformed to the Constructivist Learning Theory of Piaget and Vygotsky (1978) that students know how to construct their knowledge and comprehension of the world actively through experiences. As supported by Dewi, et al., (2024) that digital literacy ability enhances students' academic performance by improving their interaction with information and technology, fostering research skills, critical thinking, and information synthesis, crucial for academic success.

Table 3

Significance of the Relationship Between Digital Literacy Ability and Academic Performance

Variables Correlated	r-value	p-value	Decision on H_o	Decision on Relationship
Digital Literacy Ability and Academic Performance	0.637	0.000	Rejected	Significant

Summary of Findings, Conclusions, and Recommendations Summary of Findings

The major findings of the study were the following:

1. The level of digital literacy ability had an overall mean of 4.29 with a standard deviation of 0.72, with a descriptive equivalent of very high. The highest indicator was Hardware and Software Basics with a mean of 4.41, while the lowest indicator was Information and Data Literacy and Problem Solving with a mean of 4.21.

2. The level of academic performance had an overall data that showed that students obtained an average grade of 91.66 in Technology for Teaching and Learning 1 and Technology for Teaching and Learning 2, with a standard deviation of 3.69. This performance was categorized as very high.

3. The relationship of digital literacy ability and academic performance showed a strong positive correlation with an r- value 0.637 and a p- value of <0.000. These results lead to the rejection of the null hypothesis.

CONCLUSION

1. The level of digital literacy ability of the students revealed a very high level, which was always manifested. The overall findings on the level of digital literacy ability imply that students were able to understand, use, and analyze information and data easily, while also using technology to solve problems and make smart decisions.

2. The Level of academic performance was very high, considered as outstanding. The overall findings suggest that students' proficiency in Technology for Teaching and Learning 1 and 2 helps students understand and share ideas clearly, which is important for academic success. These skills include using technology, finding reliable information, and thinking critically while studying and completing school tasks.

3. The results show the significance of the relationship between digital literacy ability and academic performance, indicating a positive, strong and significant correlation. This indicates that strong digital literacy ability contributes to better academic performance. In addition, challenges such as limited access to technology, lack of proficiency and difficulty in using digital tools may affect its effectiveness. Developing digital skills enhanced learning experiences and support students' success in their academic growth.

RECOMMENDATION

Based on the findings, analysis, and conclusion drawn in this study, the following recommendations were summarized:

1. The Commission on Higher Education (CHED) may maintain specialized digital literacy training and seminars that focus on helping instructors and students use digital tools, locate and evaluate information, and utilize digital content ethically. These seminars may also teach participants how to apply logical thinking to solve complex problems. By incorporating these skills into real-world assignments and multidisciplinary

projects, instructors and students can be empowered to become more self-reliant, make informed decisions, and thrive in both academic and professional digital environments.

2. The school administrators may enhance organizational support, including digital skills benchmarking, seminars, workshops, and online resources. By using step-by-step learning to enhance the capabilities of students and instructor's education can create a more inclusive learning environment that may improve academic performance and adapt to the demands of digital education.

3. Instructors may enhance their digital literacy capabilities through workshops and collaborative learning environments, institutions may provide continuous training in digital literacy, boosting instructor's confidence and enhancing the caliber of their teaching. These kinds of settings, which encourage educators to support one another and keep enhancing, by providing the framework for successfully incorporating digital tools into instructional strategies, which raises student performance and engagement. In addition to fostering instructor's professional development, also increasing their digital literacy helps create inclusive and productive learning environments for students.

4. Students may periodically visit reliable internet sources, learn safe, ethical internet usage, and interact with various learning tools in the digital world. Taking online courses, learning the latest trends in technology, and acquiring critical thinking skills to assess digital information will also enhance their digital capabilities and equip them for meeting the challenges in the digital world.

5. Future researchers may examine the relationship between student's academic performance and particular digital literacy skills, like communicating using digital tools, locating and comprehending information online, thinking critically, and using digital content responsively. This covers test scores, retention of information, and involvement in the classroom. Researchers may also look at things like family income, technology access, internet connectivity, and school support that affect student's capacity to acquire and use these digital skills. Studying diverse student cohorts from a range of geographic locations, educational levels, and learning environments could yield insightful information. The results could also be used to develop fair and efficient teaching methods and school regulations that assist every student in learning digital skills and succeeding academically.

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