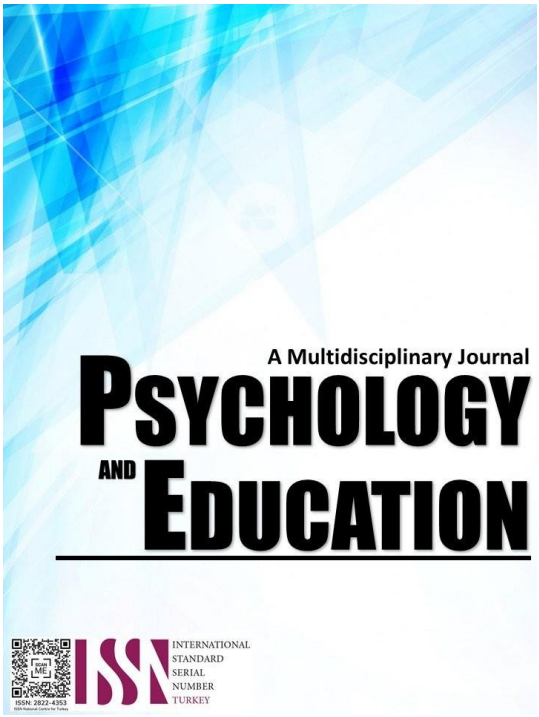
THE IMPACT OF BEHAVIORAL ENGAGEMENT AND DIGITAL LITERACY ON THE RESEARCH SKILLS OF STUDENTS UNDER RESEARCH WRITING COURSES



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Research Article

The Impact of Behavioral Engagement and Digital Literacy on the Research Skills of Students Under Research Writing Courses

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Abstract

The purpose of the study is to determine the regression analysis of the impact of behavioral engagement and digital literacy to the research skills of education students in a local college in Davao del Norte. The study is quantitative research that utilizes a descriptive-correlational approach. A sample of 188 randomly selected 3rd and 4th year education students who were identified using stratified random sampling answered the surveys on the three variables. Results showed that the level of behavioral engagement, digital literacy, and research skills were all high in level. Results also revealed that there is a significant relationship between behavioral engagement and research skills. Likewise, there is also a significant relationship between digital literacy and research skills of the education students. Moreover, results show that domains of behavioral engagement such as attentiveness, diligence, and time spent can significantly influence research skills. Finally, it was revealed that domains of digital literacy such as communication, critical thinking, and collaboration can significantly predict research skills of the respondents. Results imply that the variables are significant in improving the research skills of education students under research writing courses.

Keywords: *behavioral engagement, digital literacy, research skills, education students, research writing courses*

Introduction

Students struggle with learning research skills due to motivational issues, which they describe as an unwillingness or dislike for research. For instance, students with research skills may find research courses dull, hard to understand, or irrelevant to their daily lives. Many students still struggle to engage with research skills, leading to persistent challenges in their academic journey. In a study on teaching and learning research methods, it is stated that students may fail to grasp the importance of research methods courses, feel anxious about them, lack interest, and have negative attitudes towards learning research skills. Some research courses uninteresting or fail to see their practical application to learn the material by hindering their academic progress and future success. Thus, these difficulties from students experiences with learning research, highlight the need to focus on encouraging their motivation from education onward (Depaepe et al., 2023).

In Canada, a major problem arises from the lack of clear and consistent guidelines for defining and cultivating research skills among students. The commencement of students' research experiences is often marked by misconceptions about the nature of research, hindering not only their initial progress but also impeding their overall academic achievements. The absence of a well-articulated framework for research skills and limited explicit opportunities for skill development lead to significant disparities in outcomes across various programs, even within the same academic institution. Moreover, the absence of validated assessment tools for gauging research skill development, combined with the lack of a standardized list of these skills in the academic literature, compounds these difficulties (Campbell et al., 2022).

In the Philippines, especially in Occidental Mindoro, education students face significant challenges in developing their research skills due to limited resources and infrastructure. These constraints often hinder their ability to conduct high-quality studies, as they struggle to access essential materials, conduct experiments, and utilize databases effectively. Moreover, the scarcity of qualified research mentors and educators leaves students without the guidance and support necessary to fully engage in research activities. Additionally, the unreliable internet connectivity in the region further complicates data collection, analysis, and collaboration, compounding the difficulties students encounter when trying to hone their research abilities (Casanova, 2021).

The study holds significant social relevance as it emphasizes the imperative for every education student to master research skills, a fundamental component of research writing courses. The current lack of emphasis on socially relevant research skills within these courses for education students raises concerns about potential negative consequences. When students are not prompted to address real-world, socially significant issues in their research, it restricts their capacity to contribute meaningful solutions to educational problems. This limited perspective may result in a gap between academic knowledge and its practical application, leaving students ill-equipped to confront pressing challenges in the education sector, such as issues related to equity, inclusivity, and evolving pedagogical demands. To bridge this gap, it is crucial for educational programs to incorporate a component that focuses on social relevance within research writing courses. This integration will not only provide students with the necessary skills but also instill the motivation to effectively address the dynamic and intricate issues within the field, enabling them to contribute positively to societal progress. Immediate action is warranted to address and rectify this concern and ensure that education graduates are well-prepared to meet the diverse challenges of the evolving educational landscape.

In connection, the researcher has not come across any studies about the impact of behavioral engagement and digital literacy on research skills within the local setting. There have been studies conducted such as the studies of Depaepe et al., (2023), entitled “Fostering

students' motivation towards learning research skills: the role of autonomy, competence and relatedness support", Campbell et al., (2022), entitled "Broadening the Definition of 'Research Skills' to Enhance Students' Competence across Undergraduate and Master's Programs", and Casanova, (2021), entitled "Predictors of Graduate Students' Research Performance in the Philippine State-Run Higher Education Institution" . These studies are different from my own study given the fact that this research study does correlate the influences of behavioral engagement and digital literacy on research skills under research writing courses of education students. Moreover, the study is being conducted in the Philippines, which primarily interests the college students in the Province of Davao del Norte.

This work will be presented at educational facilities and through appropriate institutions which could be use as basis in academic conferences aligned with the topic of the study. Having plans of publishing this paper on academic websites and presented it to various conferences. It was also considering to disseminate this paper on the Kapalong College of Agriculture, Sciences, and Technology (KCAST), displaying it to its facilities where other academic researchers can study and find interest towards the topic of the study. This will also undergo on an emphasis is on creating a thoughtful distribution strategy to make sure the knowledge reaches and helps a larger audience.

Research Objectives

The purpose of this study is to determine the significant relationship of behavioral engagement and digital literacy on research skills among education students. To be specific, this study soughs to answer to the following objectives:

1. To determine the level of behavioral engagement in terms of:
    1.1. attentiveness;
    1.2. diligence; and
    1.3. time spent.
2. To determine the level of digital literacy in terms of:
    2.1. communication;
    2.2. copyright;
    2.3. critical thinking;
    2.4. character;
    2.5. citizenship;
    2.6. connectedness;
    2.7. creativity; and
    2.8. collaboration.
3. To ascertain the level of research skills in terms of:
    3.1. problem identification and conceptualization skills;
    3.2. information and evidence seeking skills;
    3.3. research methodology skills;
    3.4. statistics or quantitative analysis and evidence evaluation skills; and
    3.5. communication and language skills.
4. To determine the significant relationship between:
    4.1. behavioral engagement and research skills; and
    4.2. digital literacy and research skills.
5. To determine which domain/s of behavioral engagement and digital literacy that can considerably influence the research skills of the respondents.

Methodology

Research Design

In this quantitative, non-experimental study, researchers used a combination descriptive-correlation method. The major purpose was to understand how the impact of one variable is transmitted to another via intermediary variables.

These intermediary elements may include aspects relating to behavior and biology, and psychology, sometimes known as social conceptions. Regression analysis is the statistical technique employed to determine how one variable influence another (Rincon et al., 2020).

In the context of the study, it employed a quantitative descriptive-correlational technique to investigate how students' behavioral engagement toward research skills and digital literacy connect with research writing courses. Through surveys and statistical analysis, the study tried to discover links between these features, thereby giving knowledge for academics and third year to fourth year education students. The study's goal is to help inform third year to fourth year education students' pedagogical approaches and curriculum development. The study clarifies any potential constraints on generalizability by recognizing the limitations of the education students.

Moreover, a descriptive-correlation research approach was deemed appropriate when the goal was to present a picture of the current

condition of a situation during the study and to analyze the elements contributing to a certain event. Furthermore, the correlation design attempted to create linkages between two or more variables within the same group of high school students and quantify their statistical associations in private school settings (Peteros et al., 2019).

In this study, the decision selecting to use the descriptive-correlational research methodology works well in giving a picture of the current situation in the field. This methodology makes it possible to look at the variables affecting Education students' research skills in college school settings. The correlation design offers a quantitative lens to examine the linkages within this educational context by particularly attempting to create statistical links between behavioral engagement, digital literacy on research skills, and research writing courses.

Respondents

The study involved mathematics major education students enrolled in the Academic Year 2023-2024 at Kapalong College of Agriculture, Sciences and Technology located at the Municipality of Kapalong, Province of Davao del Norte. Specifically, these includes all the third year and fourth year Education students. The respondents of this study are primarily drawn using the Slovin's formula with a margin of error of 0.05. A total of 188 students out of 349 across all third- and fourth-year level of education students were the respondents of the study. Moreover, to ensure an accurate distribution of samples, the researcher utilizes stratified random sampling, specifically proportional allocation. They were chosen as the respondents because the study is all about the behavioral engagement and digital literacy on research skills, and since the study purpose involves students' perception, it would be fitting and valid to include the education students. Furthermore, stratified random sampling was chosen to ensure randomness and preserve the study's element.

The researcher employed a stratified random sampling technique to select participants for this study. Stratified random sampling is a probabilistic sampling approach that entails subdividing a larger population into smaller groups based on specific characteristics relevant to the study. In other words, it is a sampling method that involves categorizing all samples based on certain criteria and selecting samples from each of these categories rather than choosing randomly from the entire population. It enhances the representativeness of the sample by ensuring that each subgroup is proportionately represented in the study, leading to more accurate and generalizable results. This method was chosen to address the research's specific goals and to minimize potential bias in participant selection (Hayes, 2023).

Table 1. *Distribution of Respondents*

Program	*Section*	*Population*	*Sample*	*Percentage*
BEEd - Generalist	3A	65	35	9.98%
BEEd - Generalist	4A	16	9	2.46%
BSEd - English	3A	69	37	10.59%
BSEd - English	4A	29	16	4.45%
BSEd - Filipino	3A	60	32	9.21%
BSEd - Filipino	4A	34	18	5.22%
BSEd - Mathematics	3A	43	23	6.60%
BSEd - Mathematics	4A	33	18	5.07%
Total		349	188	53.58%

The stratified random sampling is especially fitting in this study because the respondents will be randomly selected based on the strata, which are, in this case, the third and fourth level of education students. To compute for the sample, the researcher will first gather the population data. After gathering the data, the researcher will relay this information to her statistician for the computation of the study sample.

The table provides data on how respondents are distributed across different academic years within the mathematics education student population. It shows that 188 out of a total of 349 students, 9.98% are in their third year in BEEd-Generalist, 2.46% are also in their fourth year in BEEd-Generalist, 10.59% are in their third year in BSEd-English, 4.45% are also in their fourth year in BSEd-English, 9.21% are in their third year in BSEd-Filipino, 5.22% are also in their fourth year in BSEd-Filipino, 6.60% are in their third year in BSEd-Mathematics, and 5.07% are in their fourth year in BSEd-Mathematics. The dataset comprises 188 respondents, including 35 third-year students in BEEd-Generalist, 9 fourth-year students as well in BEEd-Generalist, 37 third-year students in BSEd-English, 16 fourth-year students as well in BSEd-English, 32 third-year students in BSEd-Filipino, 18 fourth-year students as well in BSEd-Filipino, 23 third-year students in BSEd-Mathematics, and 18 fourth-year students as well in BSEd-Mathematics.

Instrument

Likert scale, a five-point measurement tool, enables individuals to convey their degree of agreement or disagreement with a specific statement. Typically, it offers five response options, allowing respondents to express the strength of their agreement or feelings towards the statement (McLeod, 2023). In this study, the 5-point Likert scale is utilized to assess the levels of respondents' behavioral engagement, digital literacy, and research skills.

The Likert scale was employed to assess the level of agreement or disagreement regarding statements related to the effectiveness and

advantages of behavioral engagement, as well as participants' confidence in using the internet for learning. This scale enables the study to collect data that can be easily analyzed and interpreted to determine participants' readiness for research skills, a critical aspect of education. In this scale, respondents were instructed to indicate their responses by ticking the box corresponding a number. The participants were asked to use a Five-point Likert scale, ranging from 'strongly agree' to 'strongly disagree.' Subsequently, these values were aggregated across the items to provide respondents with an overall score.

The researcher utilized adapted questionnaires from web sources to measure the variables. These adapted questionnaires that were used in this study underwent thorough expert validation before dissemination of the research questionnaires towards the students. The first set of questions assessed education students' perception of behavioral engagement with its indicators; attentiveness, diligence, and time spent (Kong et al., 2003). The second set of questions focused on the digital literacy of education students with its indicators; communication, copyright, critical thinking, character, citizenship, connectedness, creativity, and collaboration (Akkaya et al., 2021). The third set of questions focused on the research skills of education students with its indicators; problem identification and conceptualization skills, information and evidence seeking skills, research methodology skills, statistics or quantitative analysis and evidence evaluation skills, and communication and language skills (Dejos & Lacson, 2022).

Procedure

In gathering data, the researcher had observed the following steps in order to gather the data needed for study.

Questionnaire Formulation and Development. The researcher searched the questionnaires from reputable journal articles and related internet research which can be positively related to the three variables.

Revision and Validation of Questionnaires. Afterwards, it was submitted to the panel of experts to be evaluated and be contextualized towards mathematics learning. The researcher followed the advice of those revision experts until it was approved for administration.

Crafting and Validation of the Survey Questionnaires. The researcher developed a questionnaire that was tailored to the needs of the study's target respondents. Each item on the questionnaire is modified and contextualized to ensure its relevance and appropriateness. The questionnaire underwent a rigorous validation process facilitated by a panel of examiners who were experts in the field. They will review the questionnaire's content and assess its appropriateness for the study's objectives. This validation process helped ensure the questionnaire's validity and reliability, providing confidence in the results obtained through its use in the study.

Seeking the Permission to Conduct the Study. The researcher obtained permission from the research panel to distribute the questionnaires to the target respondents. Once approval was granted, the researcher was given permission to conduct the study. This step was important to ensure that ethical considerations were met, and that the study was conducted in accordance with the appropriate guidelines and regulations.

Collection and Tabulation of the Data. Once the respondents were complete the test questionnaires, the researcher collect the questionnaires and transfer the data into a Microsoft Excel spreadsheet for encoding. The data will be endorsing to a statistician for computation, tabulation, and analysis with the highest level of confidentiality. This step was taken to ensure the accuracy and validity of the data, and to maintain the privacy and confidentiality of the respondents.

Data Analysis

The data collected from the questionnaires were processed and analyzed using various statistical tools. These tools were applied to the data to help identify patterns and relationships that clarify on the study's objectives. The results of this analysis were then used to draw conclusions and make recommendations based on the findings.

Mean. This was used to determine the level of quality of behavioral engagement, digital literacy, and research skills among the respondents.

Pearson-r. This was used to determine the significant relationship between quality of behavioral engagement and research skills as well as between digital literacy and research skills of the respondents

Regression. This was used to determine the significant influence of behavioral engagement and digital literacy on the research skills of the respondents.

Ethical Considerations

The study's participants were education students of the local college of Kapalong Davao del Norte. The researcher made sure to address and consider ethical considerations to ensure the study's soundness and integrity. This included obtaining informed consent from the participants, maintaining confidentiality, and avoiding any harm or discomfort to them. Furthermore, when conducting research with humans as respondents, researcher must adhere to the highest ethical standards. The primary goal of this quantitative investigation was to ensure that the study will be ethically sound in order to protect the human respondent's comfort. The researcher discussed how the study would be able to adhere to the following Denzin and Lincoln (2011) guidelines, which focused on three key principles: informed consent; risk of harm; anonymity and confidentiality; and conflict of interest.

Informed Consent. It was the first essential ethical principle to take into account. The obligations, the intended used of the data, and any potential consequences must be adequately disclosed to the respondents. The respondents must provide their explicit, active, and written consent in order to participate in the study. They must also state that they are aware of their right to access their information and that they are free to change their minds at any time. An agreement between the researcher and the respondents may be taken into account during the process of obtaining informed permission (Denzin & Lincoln, 2011).

In this case, the researcher included an informed consent question in the questionnaire asking the respondents of the study if they are still willing to participate despite the risks. When the respondents were unsure about the agreement, they may choose to decline. Making informed decisions and participating in the study voluntarily are strongly encouraged. The researcher ensures that all the respondents in the study are enthusiastic about it and eager to participate. It is critical to base their responses on the available surveys while gathering data.

During the informed consent process, the respondent will also be oriented on the following rights that they have. The respondents shall be informed that they have the right to terminate participant without any need of explanation. They also have the right to refuse to answer sensitive questions. Another right that they have is the entitlement to ask questions about the study. Lastly, they also have the rights to be informed of the study results after this research is accomplish.

Risk of Harm, Anonymity and Confidentiality. The respondent's information must always be kept confidential or hidden, and promises have to go further than just keeping their names private to include refraining from using identity remarks and material. Anonymity and secrecy are important steps in safeguarding people from possible harm. There is possible risk of harm in terms of social liabilities when the data is carefully disclosed to others (Denzin & Lincoln, 2011).

As such, data of the study shall be maintained private and secured to avoid this incident from happening. The researcher made sure to emphasize to the respondents that their safety, identity, and personal information would be protected and that their participation in the study would be important to them. For the purpose of creating an error-free collection, the researcher removes identities from the data. A clean data collection does not contain any data that could be used to identify the respondents, such as names or addresses (such identifying data could be stored in separate, secure files elsewhere). Data shall be stored and destroyed three years after the study is accomplished.

Conflict of Interest. Present connections or prior actions of the researcher may result in a conflict of interest, which needs to be reported transparently in an ethical committee application so that the committee may give advice on how to address the conflict. However, the study's researcher asserts that the research will be carried out in the absence of any business or financial ties that may be interpreted as a possible conflict of interest (Fleming & Zegwaard, 2018).

This viewpoint holds that the research activity's findings were unaffected by outside factors because the respondents were also students, and the researcher had no competing interests with the study. Conflict of interest only arises when the researcher has the power to use coercive methods to force respondents to participate, such as threats of termination of benefits, blackmail, or other forms of punishment (e.g., principals threatening to fire teachers or teachers threatening to fail their students if they do not respond to the survey).

Results and Discussion

Level of Behavioral Engagement in Terms of Attentiveness

The level of behavioral engagement of research writing courses under education students was measured through the survey questionnaire with the indicator, attentiveness. The responses of education students on each indicator were presented and analyzed below.

Presented in Table 2 is the level of behavioral engagement of education students in terms of attentiveness. The data revealed that the level of behavioral engagement in terms of attentiveness had a total mean of 4.21 with means high. This indicates that the level of behavioral engagement of education students in terms of attentiveness is oftentimes manifested.

The highest mean is 4.30 which descriptively means very high. This indicates that the item is always manifested by the respondents. This is from item number 1 – Improving my attentiveness in academic lessons.

In contrast, the lowest mean is 4.14 with a descriptively equivalent of high. This indicates that the item is oftentimes manifested by the respondents. This is from item no. 4 - Internalizing information shared about new concepts.

Table 2. *Level of Behavioral Engagement in Terms of Attentiveness*

	Attentiveness	*Mean*	*Description*
1.	Improving my attentiveness in academic lessons	4.30	Very High
2.	Absorbing the teacher's guidance on academic skills	4.23	High
3.	Utilizing diverse approaches to understand concepts easily	4.19	High
4.	Internalizing information shared about new concepts	4.14	High
5.	Initiating valuable ideas during our academic conversations	4.19	High
	Overall	4.21	High

Level of Behavioral Engagement in Terms of Diligence

The level of behavioral engagement among education students was assessed using a survey questionnaire, focusing on the indicator diligence. It was collected following specific guidelines and processes attaining the essential instrument for gathering the data. The response of the respondents on each indicator were presented and analyzed below.

Presented in Table 3 is the level of behavioral engagement of education students in terms of diligence. The data revealed that the behavioral engagement of the education students in terms of diligence had a total mean of 4.15 with a descriptively equivalent of high. This indicates that the level of behavioral engagement in education students in terms of diligence is oftentimes manifested.

Table 3. *Level of Behavioral Engagement in Terms of Diligence*

	Diligence	*Mean*	*Description*
1.	Reviewing and rectifying flaws in my academic methods	4.06	High
2.	Working towards finding accurate solutions in learning abilities	4.08	High
3.	Showing dedication in acquiring proficiency in academic skills	4.26	Very High
4.	Reviewing challenging coursework to enhance my academic performance	4.18	High
5.	Verifying data across online platforms for precise topic	4.18	High
	Overall	4.15	High

The highest mean is 4.26 which descriptively means very high. This indicates that the item is always manifested by the respondents of the study. This is from item number 4 – Showing dedication in acquiring proficiency in academic skills.

In contrast, the lowest mean is 4.06 but with a descriptively equivalent of high. This indicates that the item is oftentimes manifested by the respondents. This is from item number 1 - Reviewing and rectifying flaws in my academic methods.

The level of behavioral engagement among education students was assessed using a survey questionnaire, focusing on the indicator of time spent. The responses of the participants for each indicator were subsequently presented and analyzed. It was collected following specific guidelines and processes attaining the essential instrument for gathering the data. The response of the respondents on each indicator were presented and analyzed below.

Presented in Table 4 is the level of behavioral engagement of education students in terms of content. The data revealed that the level of behavioral engagement in terms of content had a total mean of 4.13 with a descriptively equivalent of high. This indicated that the level of behavioral engagement of education students in terms of time spent is oftentimes manifested.

Table 4. *Level of Behavioral Engagement in Terms of Time Spent*

	Time Spent	*Mean*	*Description*
1.	Allocating an appropriate amount of time to my studies to stay engaged in class	4.17	High
2.	Investing time outside of class to complete assignments and study	4.07	High
3.	Managing my time effectively to balance academic work and other commitments	4.09	High
4.	Finding it easy to stay focused and engaged during lectures and class activities	4.10	High
5.	Making an effort to participate actively discussions and group work	4.20	High
	Overall	4.13	High

The highest mean is 4.20 which descriptively means high. This indicates that the item is oftentimes manifested by the respondents. This is from item number 5 – Making an effort to participate actively discussions and group work.

In contrast, the lowest mean is 4.07 but with a descriptively equivalent of high. This indicates that the item is oftentimes manifested by the respondents. This is from item number 2 – Investing time outside of class to complete assignments and study.

Summary of the Level of Behavioral Engagement

Presented in Table 5 is the overall level of behavioral engagement of education students in KCAST in terms of attentiveness, diligence, and time spent. The data revealed that the level of behavioral engagement of education students has a total mean of 4.16 with the descriptively equivalent of high. This indicates that behavioral engagement is oftentimes manifested as perceived by the respondents.

Table 5. *Summary of the Level of Behavioral Engagement*

Indicators	*Mean*	*Description*
Attentiveness	4.21	High
Diligence	4.15	High
Time Spent	4.13	High
Overall	4.16	High

Further, the highest mean is 4.21 with the descriptively equivalent of high. This indicates that the level of behavioral engagement in terms of attentiveness is oftentimes manifested.

In contrast, the lowest indicator is time spent which obtained a mean of 4.13 with a descriptively equivalent of high. This indicates that the level of behavioral engagement in terms of time spent is oftentimes manifested.

Lastly, diligence obtained a mean of 4.15 which descriptively means high. This indicates that the level of behavioral engagement in terms of diligence is oftentimes manifested.

Level of Digital Literacy in Terms of Communication

The level of digital literacy of education students was measured through the survey questionnaire with the indicator, communication. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 6 is the level of digital literacy of education students in terms of communication. The data revealed that the level of digital literacy in terms of communication has a total mean of 4.22 with a descriptively equivalent of high. This means that the level of digital literacy of education students in terms of communication is oftentimes manifested.

Table 6. *Level of Digital Literacy in Terms of Communication*

	Communication	*Mean*	*Description*
1.	Reading online contents from screen	4.34	Very High
2.	Preferring to take prints of online reading materials for better reading	4.40	Very High
3.	Typing quickly using both hands	4.14	High
4.	Knowing how to write formal emails	4.03	High
5.	Informing about email sending and formatting options	4.18	High
	Overall	4.22	High

The highest mean is 4.40 which descriptively means very high. This means that the item is always manifested by the respondents. This is from item number 1 – Preferring to take prints of online reading materials for better reading.

In contrast, the lowest mean is 4.03 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 4 – Knowing how to write formal emails.

Level of Digital Literacy in Terms of Copyright

The level of digital literacy of education students was measured through the survey questionnaire with the indicator, copyright. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 7 is the level of digital literacy of education students in terms of copyright. The data revealed that the level of digital literacy in terms of copyright has a total mean of 4.45 with a descriptively equivalent of very high. This means that the level of digital literacy of education students in terms of copyright is always manifested.

Table 7. *Level of Digital Literacy in Terms of Copyright*

	Copyright	*Mean*	*Description*
1.	Knowing online plagiarism policy of my college	4.53	Very High
2.	Knowing the consequences of using copyright work online without permission	4.58	Very High
3.	Giving acknowledgement/reference in my online work while using collusion	4.52	Very High
4.	Using Turnitin or other similar software to check and avoid unintentional plagiarism	4.18	High
5.	Seeking to educate myself about copyright issues in the context of digital media	4.44	Very High
	Overall	4.45	Very High

The highest mean is 4.58 which descriptively means very high. This means that the item is always manifested by the respondents. This is from item number 2 - Knowing the consequences of using copyright work online without permission.

In contrast, the lowest mean is 4.18 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 4 – Using Turnitin or other similar software to check and avoid unintentional plagiarism.

In contrast, the lowest mean is 4.44 but with a descriptively equivalent of very high. This means that the item is always manifested by the respondents. This highlights the intriguing paradox between the numerical representation. This is from item number 5 – Seeking to educate myself about copyright issues in the context of digital media.

Level of Digital Literacy in Terms of Critical Thinking

The level of digital literacy of education students was measured through the survey questionnaire with the indicator, critical thinking. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 8 is the level of digital literacy of education students in terms of critical thinking. The data revealed that the level of digital literacy in terms of critical thinking has a total mean of 4.14 with a descriptively equivalent of high. This means that the level of digital literacy of education students in terms of critical thinking is oftentimes manifested.

The highest mean is 4.22 which descriptively means high. This means the item is oftentimes manifested by the respondents. These are from item number 1 and 2 - Relating to real life problems when my university assigns me online activities and Finding different pieces of information online, and put them together to solve a problem. This is from item number 3 – Having an online reflective journal to

write.

In contrast, the lowest mean is 4.01 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 3 – Using Having an online reflective journal to write.

Table 8. *Level of Digital Literacy in Terms of Critical Thinking*

	Critical Thinking	*Mean*	*Description*
1.	Relating to real life problems when my university assigns me online activities	4.22	High
2.	Finding different pieces of information online, and put them together to solve a problem	4.22	High
3.	Having an online reflective journal to write	4.01	High
4.	Navigating and evaluating digital information and resources	4.13	High
5.	Feeling confident in my ability to analyze and discern the credibility of online content before considering it as a reliable source of information	4.11	High
	Overall	4.14	High

Level of Digital Literacy in Terms of Citizenship

The level of digital literacy of education students was measured through the survey questionnaire with the indicator, citizenship. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 9 is the level of digital literacy of education students in terms of citizenship. The data revealed that the level of digital literacy in terms of citizenship has a total mean of 4.51 with a descriptively equivalent of very high. This means that the level of digital literacy of education students in terms of citizenship is always manifested.

Table 9. *Level of Digital Literacy in Terms of Citizenship*

	Citizenship	*Mean*	*Description*
1.	Communicating with others in a respectable way while using technology	4.51	Very High
2.	Knowing the consequences for violating cyber laws in digital world	4.55	Very High
3.	Accepting and follow the terms and conditions for accessing any information	4.53	Very High
4.	Respecting the cultural differences in online world, and respond accordingly	4.59	Very High
5.	Engaging in promoting positive online behavior and digital etiquette	4.39	Very High
	Overall	4.51	Very High

The highest mean is 4.59 which descriptively means very high. This means that the item is always manifested by the respondents. This is from item number 4 - Respecting the cultural differences in online world, and respond accordingly.

In contrast, the lowest mean is 4.39 but with a descriptively equivalent of very high. This means that item is always manifested by the respondents. This is from item number 5 – Engaging in promoting positive online behavior and digital etiquette.

Level of Digital Literacy in Terms of Character

The level of digital literacy of education students was measured through the survey questionnaire with the indicator, character. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 10 is the level of digital literacy of education students in terms of character. The data revealed that the level of digital literacy in terms of character has a total mean of 4.53 with a descriptive equivalent of very high. This means that the level of digital literacy of education students in terms of character is always manifested.

The highest mean is 4.62 which descriptively means very high. This means that the item is always manifested by the respondents. This is from item number 5 -

Table 10. *Level of Digital Literacy in Terms of Character*

	Character	*Mean*	*Description*
1.	Evading the use and share others' personal information, pictures, conversations, etc. without their consent in the online world	4.55	Very High
2.	Avoiding posting negative online comments and poking in others' discussion and chatting	4.49	Very High
3.	Remaining neutral and tolerant during online discussions	4.43	Very High
4.	Taking ownership of my actions.	4.54	Very High
5.	Respecting towards others, regardless of their background or opinions	4.62	Very High
	Overall	4.53	Very High

Respecting towards others, regardless of their background or opinions. Underscores the unwavering commitment and universal adherence among respondents.

In contrast, the lowest mean is 4.43 but with a descriptively equivalent of very high. This means that the item is always manifested by

the respondents. This is from item number 3 – Remaining neutral and tolerant during online discussions. Highlighting a commendable and widespread adherence to this aspect of online communication.

Level of Digital Literacy in Terms of Connectedness

The level of digital literacy of education students was measured through the survey questionnaire with the indicator, connectedness. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 11 is the level of digital literacy of education students in terms of connectedness. The data revealed that the level of digital literacy in terms of connectedness has a total mean of 3.93 with a descriptively equivalent of high. This means that the level of digital literacy of education students in terms of connectedness is oftentimes manifested

The highest mean is 4.10 which descriptively means high. This means that the item is oftentimes manifested by the respondents. This is from item number 4 - Participating in online polls/surveys.

Table 11. *Level of Digital Literacy in Terms of Connectedness*

	Connectedness	*Mean*	*Description*
1.	Involving in different online communities for volunteer work	3.89	High
2.	Taking participate in different online projects at national level	3.86	High
3.	Taking interest in different online campaigns for community development	3.92	High
4.	Participating in online polls/surveys	4.10	High
5.	Encouraging and helping my community to post their problems and issues on social media for getting attention	3.88	High
	Overall	3.93	High

In contrast, the lowest mean is 3.86 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 2 – Taking participate in different online projects at national level.

Level of Digital Literacy in Terms of Creativity

The level of digital literacy of education students was measured through the survey questionnaire with the indicator, creativity. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 12 is the level of digital literacy of education students in terms of creativity. The data revealed that the level of digital literacy in terms of creativity has a total mean of 3.99 with a descriptively equivalent of high. This means that the level of digital literacy of education students in terms of creativity is oftentimes manifested.

The highest mean is 4.37 which descriptively means very high. This means that the item is always manifested by the respondents. This is from item number 5 – Believing that creativity can be developed and improved over time.

In contrast, the lowest mean is 3.79 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 1 – Writing online blogs giving new ideas and perspectives.

Table 12. *Level of Digital Literacy of Creativity*

	Creativity	*Mean*	*Description*
1.	Writing online blogs giving new ideas and perspectives	3.79	High
2.	Enjoying to post new information on my social media account(s)	3.93	High
3.	Developing my own videos and post them online	3.88	High
4.	Having creative ideas but do not know how to use them online	3.99	High
5.	Believing that creativity can be developed and improved over time	4.37	Very High
	Overall	3.99	High

Level of Digital Literacy in Terms of Collaboration

The level of digital literacy of education students was measured through the survey questionnaire with the indicator, collaboration. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 13 is the level of digital literacy of education students in terms of collaboration. The data revealed that the level of digital literacy in terms of collaboration has a total mean of 4.20 with a descriptively equivalent of high. This means that the level of digital literacy of education students in terms of collaboration is oftentimes manifested.

The highest mean is 4.22 which descriptively means high. This means that the item is oftentimes manifested by the respondents. These are from item number 2, 4, and 5 - Learning from others, which helps me work in online groups, Feeling comfortable asking for help or guidance from fellow students when learning about digital resources, and Finding it easy to communicate and share ideas with classmates when working on digital projects.

In contrast, the lowest mean is 4.15 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 3 – Working online with my peers to find solutions to the problems.

Table 13. *Level of Digital Literacy of Collaboration*

	Collaboration	*Mean*	*Description*
1.	Working with others in groups in the online world	4.18	High
2.	Learning from others, which helps me work in online groups	4.22	High
3.	Working online with my peers to find solutions to the problems	4.15	High
4.	Feeling comfortable asking for help or guidance from fellow students when learning about digital resources	4.22	High
5.	Finding it easy to communicate and share ideas with classmates when working on digital projects	4.22	High
	Overall	4.20	High

Summary of the Level of Digital Literacy

Presented in Table 14 is the overall level of digital literacy of education students in terms of communication, copyright, critical thinking, citizenship, character, connectedness, creativity, and collaboration. The data revealed that the level of digital literacy of education students has a total mean of 4.25 with the descriptively equivalent of high. This means that digital literacy is oftentimes manifested by the respondents.

Further, the highest mean is 4.53 with the descriptively equivalent of very high. This means that the level of digital literacy in terms of character is always manifested.

In contrast, the lowest indicator is connectedness which obtained a mean of 3.93 with a descriptively equivalent of high. This means that the level of digital literacy in terms of connectedness is oftentimes manifested.

Moreover, citizenship obtained a mean of 4.51 which descriptively means very high. This means that the level of digital literacy in terms of citizenship is always manifested.

In addition, copyright obtained a mean of 4.45 which descriptively means very high. This means that the level of digital literacy in terms of copyright is always manifested.

Consequently, communication earned a mean of 4.22 which means high. This means that the level of digital literacy in terms of copyright is oftentimes manifested

Besides, collaboration obtained a mean of 4.20 which descriptively means high. This means that the level of digital literacy in terms of collaboration is oftentimes manifested.

Table 14. *Summary of the Level of Digital Literacy*

Indicators	*Mean*	*Description*
Communication	4.22	High
Copyright	4.45	Very High
Critical Thinking	4.14	High
Citizenship	4.51	Very High
Character	4.53	Very High
Connectedness	3.93	High
Creativity	3.99	High
Collaboration	4.20	High
Overall	4.25	High

Moreover, critical thinking obtained a mean of 4.14 which descriptively means high. This means that the manifestation of digital literacy in terms of critical thinking is oftentimes manifested.

Lastly, creativity obtained a mean of 3.99 which descriptively means high. This means manifestation of digital literacy in terms of creativity is oftentimes manifested.

Level of Research Skills in Terms of Problem Identification and Conceptualization Skills

The level of research skills of education students was measured through the survey questionnaire with the indicator, problem identification and conceptualization skills. The responses of the respondents on each indicator were presented and analyzed below. Additionally, the findings shed light on the strengths and areas for improvement in students' problem identification and conceptualization skills.

Presented in Table 15 is the level of research skills of education students in terms of problem identification and conceptualization skills. The data revealed that the level of research skills in terms of problem identification and conceptualization skills has a total mean of 4.18 with a descriptively equivalent of high. This indicates that the level of research skills of education students in terms of problem identification and conceptualization skills is oftentimes manifested.

The highest mean is 4.29 which descriptively means very high. This means that the item is oftentimes manifested by the respondents.

This is from item number 1 - Seeing it as an opportunity to do research if confronted by a question/problem.

Table 15. *Level of Research Skills in Terms of Problem Identification and Conceptualization Skills*

	Problem Identification and Conceptualization Skills	*Mean*	*Description*
1.	Seeing it as an opportunity to do research if confronted by a question/problem	4.29	Very High
2.	Linking research to the real-world affairs	4.23	High
3.	Identifying and ask useful, challenging questions; always curious	4.20	High
4.	Formulating my research topic/problem based on related literatures and other sources	4.16	High
5.	Formulating and writing an acceptable research title	4.00	High
	Overall	4.18	High

In contrast, the lowest mean is 4.00 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 5 – Formulating and writing an acceptable research title.

The highest mean is 4.29 which descriptively means very high. This means that the item is oftentimes manifested by the respondents. This is from item number 1 - Seeing it as an opportunity to do research if confronted by a question/problem.

In contrast, the lowest mean is 4.00 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 5 – Formulating and writing an acceptable research title.

Level of Research Skills in Terms of Information and Evidence Seeking Skills

The level of research skills of education students was measured through the survey questionnaire with the indicator, information and evidence seeking skills. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 16 is the level of research skills of education students in terms of information and evidence seeking skills. The data revealed that the level of research skills in terms of information and evidence seeking skills has a total mean of 4.21 with a descriptively equivalent of high. This indicates that the level of research skills of education students in terms of information and evidence seeking skills is oftentimes manifested.

Table 16. *Level of Research Skills in Terms of Information and Evidence Seeking Skills*

	Information and Evidence Seeking Skills	*Mean*	*Description*
1.	Gathering information about my research topic through various means (e.g., electronic media images, audio and video)	4.26	Very High
2.	Identifying and access appropriate bibliographical resources, archives and other sources of relevant information (including web-based resources, primary sources and repositories	4.23	High
3.	Assessing the reliability, reputation, currency, authority and relevance of sources	4.28	Very High
4.	Evaluating the accurateness of the content by reading other sources mentioned by the writer	4.20	High
5.	Arranging each item systematically when searching for information	4.11	High
	Overall	4.21	High

The highest mean is 4.28 which descriptively means very high. This means that the item is always manifested by the respondents. This is from item number 3 - Can assess the reliability, reputation, currency, authority and relevance of sources.

In contrast, the lowest mean is 4.11 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 5 – Can arrange each item systematically when searching for information.

The highest mean is 4.28 which descriptively means very high. This means that the item is always manifested by the respondents. This is from item number 3 - Can assess the reliability, reputation, currency, authority and relevance of sources.

In contrast, the lowest mean is 4.11 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. This is from item number 5 – Can arrange each item systematically when searching for information.

Level of Research Skills in Terms of Research Methodology Skills

The level of research skills of education students was measured through the survey questionnaire with the indicator, research methodology skills. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 17 is the level of research skills of education students in terms of research methodology skills. The data revealed that the level of research skills in terms of research methodology skills has a total mean of 4.10 with a descriptively equivalent of high. This indicates that the level of research skills of education students in terms of research methodology skills is oftentimes manifested.

The highest mean is 4.16 which descriptively means high. This means that the item is oftentimes manifested by the respondents. This is from item number 4 - Understanding relevant research methodologies and techniques and their appropriate application within own research area.

In contrast, the lowest mean is 4.07 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. These are from item number 1 and 2 – Formulating a conceptual framework of my research and Planning and designing

the research process of a research topic.

Table 17. *Level of Research Skills in Terms of Research Methodology Skills*

	Research Methodology Skills	*Mean*	*Description*
1.	Formulating a conceptual framework of my research	4.07	High
2.	Planning and designing the research process of a research topic	4.07	High
3.	Determining the appropriate research design or method of my research	4.11	High
4.	Understanding relevant research methodologies and techniques and their appropriate application within own research area	4.16	High
5.	Justifying the principles and experimental techniques used in own research	4.11	High
	Overall	4.10	High

Level of Research Skills In Terms of Statistics/Quantitative Analysis and Evidence Evaluation Skills

The level of research skills of education students was measured through the survey questionnaire with the indicator, statistics/quantitative analysis and evidence evaluation skills. The responses of the respondents on each indicator were presented and analyzed below. Additionally, the findings shed light on specific areas where students may benefit from targeted interventions or further training to enhance their overall research proficiency.

Presented in Table 18 is the level of research skills of education students in terms of statistics/quantitative analysis and evidence evaluation skills. The data revealed that the level of research skills in terms of statistics or quantitative analysis and evidence evaluation skills has a total mean of 4.15 with a descriptively equivalent of high. This indicates that the level of research skills of education students in terms of statistics/quantitative analysis and evidence evaluation skills is oftentimes manifested.

Table 18. *Level of Research Skills in terms of statistics or quantitative analysis and evidence evaluation skills*

	Statistics or Quantitative Analysis and Evidence Evaluation Skills	*Mean*	*Description*
1.	Observing and collecting necessary data	4.23	High
2.	Evaluating and systematically organize the data I gathered	4.18	High
3.	Determining which statistical tool or method of to use for my research	4.21	High
4.	Performing common statistical tools in any statistical application like MS Excel, SPSS, Minitab, or others application	4.06	High
5.	Analyzing and interpreting the results of my statistical treatment or method of analysis	4.06	High
	Overall	4.15	High

The highest mean is 4.23 which descriptively means high. This means that the item is oftentimes manifested by the respondents. This is from item number 1 - Observing and collecting necessary data.

In contrast, the lowest mean is 4.06 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. These are from item number 4 and 5 – Performing common statistical tools in any statistical application like MS Excel, SPSS, Minitab, or others application and Analyzing and interpreting the results of my statistical treatment or method of analysis.

Level of Research Skills in Terms of Communication and Language Skills

The level of research skills of education students was measured through the survey questionnaire with the indicator, communication and language skills. The responses of the respondents on each indicator were presented and analyzed below.

Presented in Table 19 is the level of research skills of education students in terms of communication and language skills. The data revealed that the level of research skills in terms of communication and language skills has a total mean of 4.07 with a descriptively equivalent of high. This indicates that the level of research skills of education students in terms of communication and language skills is oftentimes manifested.

Table 19. *Level of Research Skills in Terms of Communication and Language Skills*

	Communication and Language Skills	*Mean*	*Description*
1.	Having an excellent knowledge of language(s) appropriate for research, including technical language	4.06	High
2.	Understanding, interpreting, creating, and communicating appropriately within an academic context	4.14	High
3.	Preparing grammatically and syntactically correct content for presentations	4.05	High
4.	Communicating research results clearly	4.02	High
5.	Constructing my thesis statement clearly	4.06	High
	Overall	4.07	High

The highest mean is 4.14 which descriptively means high. This means that the item is oftentimes manifested by the respondents. This is from item number 2 – Understanding, interpreting, creating, and communicating appropriately within an academic context.

In contrast, the lowest mean is 4.02 but with a descriptively equivalent of high. This means that the item is oftentimes manifested by the respondents. These are from item number 4 – Communicating research results clearly.

Summary on the Level of Research Skills

Presented in Table 20 is the overall level of digital literacy of education students in terms of problem identification and conceptualization skills, information and evidence seeking skills, research methodology skills, statistics/quantitative analysis and evidence evaluation skills, and communication and language skills. The data revealed that the level of research skills of education students has a total mean of 4.14 with the descriptively equivalent of high. This indicates that research skills is oftentimes manifested as perceived by the respondents.

Table 20. *Summary of the Level of Research Skills*

Indicators	*Mean*	*Description*
Problem Identification And Conceptualization Skills	4.18	High
Information And Evidence Seeking Skills	4.21	High
Research Methodology Skills	4.10	High
Statistics Or Quantitative Analysis And Evidence Evaluation Skills	4.15	High
Communication And Language Skills	4.07	High
Overall	4.14	High

Further, the highest mean is 4.21 with the descriptively equivalent of high. This indicates that the level of research skills in terms of information and evidence seeking skills is oftentimes manifested.

In contrast, the lowest indicator is communication and language skills which obtained a mean of 4.07 with a descriptively equivalent of high. This indicates that the level of research skills in terms of communication and language skills is oftentimes manifested.

Moreover, problem identification and conceptualization skills obtained a mean of 4.18 which descriptively means high. This indicates that the level of research skills in terms of problem identification and conceptualization skills is oftentimes manifested.

In addition, statistics or quantitative analysis and evidence evaluation skills obtained a mean of 4.15 which descriptively means high. This indicates that the level of research skills in terms of statistics or quantitative analysis and evidence evaluation skills is oftentimes manifested.

Lastly, research methodology skills obtained a mean of 4.10 which descriptively means high. This indicates that the level of research skills in terms of research methodology skills is oftentimes manifested.

Significant Relationship Between Behavioral Engagement and Research Skills

Presented in Table 21 is the result of the significant relationship between behavioral engagement and research skills, r (186) = .700, p<.001. Since the probability value (p<.001) is less than the level of significance (α=0.05), the null hypothesis is rejected. This means that there is a positive and significant relationship between behavioral engagement and research skills.

Table 21. *Significant Relationship between Behavioral Engagement and Research Skills*

Variable	*Mean*	*R-Value*	*P-Value*	*Decision α=0.05*
Behavioral Engagement	4.16			
Research Skills	4.14	.700	<.001	Ho Rejected

Significant Relationship Between Digital Literacy and Research Skills

Presented in Table 22 is the result of the significant relationship between digital literacy and research skills, r (186) = .741, p<.001. Since the probability value (p<.001) is less than the level of significance (α=0.05), the null hypothesis is rejected. This means that there is a positive and significant relationship between digital literacy and research skills.

Table 22. *Significant Relationship between Digital Literacy and Research Skills*

Variable	*Mean*	*R-Value*	*P-Value*	*Decision α=0.05*
Digital Literacy	4.24			
Research Skills	4.14	.741	<.001	Ho Rejected

Domain/s of Behavioral Engagement That Can Considerably Influence the Research Skills of the Respondents

Presented in Table 23 are the domains of behavioral engagement that can considerably influence the level of research skills of education students. The results showed that attentiveness (β=.358, p< .001), diligence (β=.169, p=.017), and time spent (β=.139, p=.031) are the domain of behavioral engagement that appears to be statistically significant predictors of research skills. At 0.05 level of significance,

the null hypothesis is rejected. Thus, there is a domain of behavioral engagement significantly influence the research skills of the 3rd year to 4th year education students. The beta value indicates that for every one unit increase of attentiveness, the level of research skills increase by .358, for every one unit increase of diligence, the level of research skills also increase by .169, and for every one unit increase of time spent, the level of research skills will also increase by .139.

Table 23. *Domain/s of Behavioral Engagement That Can Considerably Influence the Research Skills of the Respondents*

Independent Variables	*Unstandardized Coefficients*		*Standardized Coefficients*	P-Value	*Decision @=0.05*
	Beta	*Std. Error*	*Beta*		
(Constant)	4.142	0.032			
Attentiveness	0.358	0.068	0.415	< .001	Ho Rejected
Diligence	0.169	0.07	0.208	.017	Ho Rejected
Time Spent	0.139	0.064	0.163	.031	Ho Rejected

Dependent Variable: Research Skills
Note: R= 0.710, R2=0.503, F-ratio= 62.191 P-value= < .001

Domain/s of Digital Literacy That Can Considerably Influence the Research Skills of the Respondents

Presented in Table 24 are the domains of digital literacy that can considerably influence the level of research skills of education students. The results showed that communication (β=.132, p=.012), critical thinking (β=.331, p<.001), and collaboration (β=.194, p<.001) are the domain of digital literacy that appears to be statistically significant predictors of research skills. At 0.05 level of significance, the null hypothesis is rejected. Thus, there is a domain of digital literacy significantly influence the research skills of the 3rd year to 4th year education students. The beta value indicates that for every one unit increase of communication, the level of research skills increase by .132, for every one unit increase of critical thinking, the level of research skills also increase by .331, and for every one unit increase of collaboration, the level of research skills will also increase by .194.

Table 24. *Domain/s of Digital Literacy That Can Considerably Influence the Research Skills of the Respondents*

Independent Variables	*Unstandardized Coefficients*		*Standardized Coefficients*	*P-Value*	*Decision @=0.05*
	Beta	*Std. Error*	*Beta*		
(Constant)	4.142	0.032			
Communication	0.132	0.052	0.15	.012	Ho Rejected
Copyright	0.026	0.058	0.028	.656	Ho Accepted
Critical Thinking	0.331	0.052	0.421	< .001	Ho Rejected
Citizenship	0.038	0.057	0.041	.511	Ho Accepted
Character	0.016	0.063	0.017	.798	Ho Accepted
Connectedness	0.022	0.042	0.036	.596	Ho Accepted
Creativity	0.065	0.053	0.085	.223	Ho Accepted
Collaboration	0.194	0.046	0.247	< .001	Ho Rejected

Dependent Variable: Research Skills
Note: R= 0.788, R2=0.622, F-ratio= 36.748 P-value= < .001

Moreover, digital literacy explained a significant amount proportion of variance in research skills, R2= 0.622, F= 36.748, p< .001. The R2 of 0.622 shows that the model predicts 62.2% of the statistical variation observed in the level of student's research skills among the respondents. The coefficient of alienation which is 37.8 points to the extent at which other indicators or domains not included in the study may explain the variance observed in the level of research skills among the education students.

Furthermore, the p-values for the remaining domains, copyright (β=.026, p=.656), citizenship (β=.038, p=.511), character (β=.016, p=.798), connectedness (β=.022, p=.596), and creativity (β=.065, p=.223) appeared to be not statistically significant predictors of research skills of 3rd year to 4th year education students. At 0.05 level of significance, the p-values of copyright, citizenship, character, connectedness, and creativity exceeded 0.05. This means that the domains are not likely to have any effect on the research skills of education students.

Conclusions

Drawing upon the results, conclusions were formulated in response to the questions posed in the preceding chapter. The respondents consistently reported a significant prevalence of behavioral engagement, indicating that this variable is oftentimes observed by students.

Based on the result of behavioral engagement as perceived by students, it was determined to be high. This means that the students often observe the presence of the variable. Moreover, based on the result of the digital literacy of the students, it can be also drawn that the level of digital literacy among education students was high. This means that the students often manifest the variable. In addition, the students were assessed the preparedness level for research skills, and it was determined as high.

This means that the research skills of education students are oftentimes manifested. Furthermore, the correlation between the behavioral engagement and research skills revealed a significant relationship between the two variables. The study shows that behavioral engagement has a significant relationship with the research skills among education students. This means that the null hypothesis proposed in the study are rejected.

In addition, the correlation between the digital literacy and research skills also revealed a significant relationship between the two variables. The study also shows that digital literacy has a positive and significant relationship with the research skills among education students. This means that the first null hypothesis proposed in the study is rejected.

Based on the result of regression analysis, in behavioral engagement three domains have shown significant influence to research skills. This means that the domains -- attentiveness, diligence and time spent -- are significant predictors of research skills of education students. This also indicates the rejection of the second null hypothesis proposed in the study. Accordingly, the model describes 50.3% of the statistical variation in the level of research skills of the respondents, while the remaining 49.7% refers to other variables that have not been included in the study that may also affect the research skills of the respondents.

Lastly, the regression analysis of digital literacy has three domains that significantly influence the research skills of the respondents. This means that the domains -- communication, critical thinking and collaboration– are significant predictors of research skills. This also indicates the rejection of the second null hypothesis proposed in the study. Accordingly, the model describes 62.2% of the statistical variation in the level of research skills of the respondents, while the remaining 37.8% refers to other variables that have not been included in the study that may also affect the research skills of the respondents.

Also, the findings from this study indicate that behavioral engagement plays a crucial role in enhancing students' research skills in writing courses, supported by the principles of Vygotsky's Zone of Proximal Development. Furthermore, Maslow and Roger's humanistic learning theory emphasizes the importance of fostering students' intrinsic motivation and self-directed learning, which can further boost their engagement and skill development. Roger's Media ecology theory highlights how various media influences the learning environment, suggesting that digital literacy is essential for students to navigate information effectively. Lastly, Mishra and Koehler's TPACK Theory emphasizes the need for teachers to integrate technology into their pedagogy, ensuring that students develop both digital literacy and research skills in a cohesive learning experience. Based on the results, the study firmly anchors the theories Vygotsky, Maslow and Roger, Rogers, and Mishra and Koehler, in the context of learning, reinforcing the importance of behavioral engagement and digital literacy on the research skills of students under research writing courses.

Based from the results, every variable attained various level, as well as drawn different kind strengths of relationship between the correlations. Recommendation will be discussed to suggest what actions should be taken either to imply on the negative and positive results. This is to address the relationships of behavioral engagement and digital literacy on the research skills of students under research writing courses.

The result of behavioral engagement in terms of time spent is lowest among all indicators, teachers should encourage students to allocate sufficient time to their studies to remain engaged in class. Additionally, students should be guided to manage their time effectively, balancing academic work with other commitments, and consistently invest time outside of class to complete assignments and study. Teachers can also promote active participation in discussions and group work to help students stay focused and engaged during lectures and activities.

In addition, the result of the digital literacy in terms of connectedness is lowest among all indicators, it is hereby recommended that students should engage more actively in online discussions and collaborative projects. Also take interest in different online campaigns for the community environment. Joining forums, study groups, or social media platforms focused on academic topics can enhance their sense of community and facilitate knowledge sharing.

Moreover, the result of research skills in terms of communication and language skills is lowest among all indicators, it is hereby recommended that the teacher should encourage students to participate in group discussions and collaborative projects to strengthen their communication and language skills. Providing opportunities for presentations and peer feedback will help students articulate their ideas more effectively. Additionally, integrating digital communication tools can enhance their ability to engage with diverse audiences and refine their research capabilities.

However, it is shown that there is significant relationship of the behavioral engagement and digital literacy on the research skills of the third year to fourth year education students. It is requested to take consideration on the behavioral engagement and digital literacy when aiming on improving the research skills of the students as well as considering all the domains that has influence on the research skills.

Since the result of the behavioral engagement is high, it is hereby recommended that incorporate interactive activities that capture students' attention and encourage active participation. Foster a culture by setting clear expectations and providing constructive feedback, which motivates students to stay committed to their learning tasks. Optimizing time management in lessons by structuring activities to maximize engagement will help students utilize their time effectively, ultimately leading to improved learning outcomes.

Since the result of the digital literacy is high, it is hereby recommended that the teacher may incorporate project-based learning to engage students and apply their digital skills in real-world scenarios. Utilize diverse digital tools and platforms to enhance interactivity

and collaboration in the classroom. Encourage peer teaching to foster communication skills and deepen understanding of digital concepts.

Since the result of research skills is high, it is hereby recommended that the institution may promote interdisciplinary collaboration among departments to enhance research initiatives and share best practices. Implement workshops that focus on research methodologies and data analysis techniques for faculty and students. Establish a mentorship program that connects experienced researchers with newcomers to foster skill development and innovative projects.

Overall, it can be seen that there is a correlation between behavioral engagement and research skills of education students. it is hereby recommended that the school institution and teachers may prioritize active learning strategies that foster student involvement. Also, incorporate collaborative projects and hands-on activities to enhance engagement and develop research competencies. Professional development opportunities focused on innovative teaching methods can further equip educators to support these skills. Additionally, integrating research-based assignments into the curriculum will help students apply their learning in practical contexts. Creating a dynamic learning environment will benefit both student engagement and research proficiency.

Moreover, it can be seen that there is a correlation between digital literacy and research skills of third year to fourth year education students. it is hereby recommended that the school institution and teachers develop a comprehensive training programs focused on enhancing students' digital skills and encouraged to incorporate a variety of digital tools and resources into their lessons, fostering an environment where students can practice effective research techniques. Additionally, organizing workshops that emphasize the application of technology in research can further empower students. Collaboration among faculty to share best practices in teaching digital literacy is also recommended. By prioritizing these initiatives, schools can significantly enhance students' preparedness for future academic and professional challenges. Ultimately, strengthening digital literacy will lead to improved research skills, benefiting students throughout their educational journey.

In addition, future researchers may consider various confounding variables can impact the association between behavioral engagement and research skills which is only having significant domain despite having a strong relationship. These include prior student motivation, prior writing experience, access to instructional support academic achievement, personality traits, environmental factors like socioeconomic status and school culture, and peer influences which could be factor in terms of learning research writing courses. These factors can affect self-efficacy, resilience, and access to resources, time management skills, personal interests in the subject matter, and feedback from instructors making it challenging to isolate the specific contributions of behavioral engagement and skills to research success. It is recommended for future researchers to explore the same topic using various methodologies, such as mixed methods, qualitative approaches, or case studies, in order to provide a more comprehensive understanding of the importance of the relationships between the variables.

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