



THE MEDIATING EFFECT OF INFORMATION AND COMMUNICATION TECHNOLOGY LEARNING ON THE RELATIONSHIP BETWEEN SOCIAL MEDIA USAGE AND INFORMATION-SEEKING BEHAVIOR OF STUDENTS

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Abstract:

This study aimed to determine the mediating effect of information and communication technology learning on the relationship between social media usage and students' behavior from the Bachelor of Science and Technology program at the University of Mindanao. A stratified random sampling method was used, with 300 students serving as respondents. The results of a non-experimental quantitative mediation analysis using a validated questionnaire, mean, regression techniques, and Pearson r revealed a significant relationship between social media usage, behavior, and information and communication technology learning. Results of the study showed that students' level of social media usage was moderate. The study also revealed that students' level of information-seeking behavior was moderate. Further, there was a partial mediation on the effect of information and communication technology learning on the relationship between social media usage and information-seeking behavior. As a result, one of the reasons why social media usage can influence information-seeking behavior is information and communication technology learning. Nevertheless, it cannot wholly account for the relationship between the two variables.

Keywords: library and information science, social media usage, information-seeking behavior, information and communication technology learning, mediating effect, Philippines

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1. Introduction

The behavior is considered an act of searching for information. However, the dilemma is on what is satisfactory and best (El-Maamiry, 2017) because knowing how to access information is crucial (Pwadura et al., 2018). According to one study, students confront challenges because they cannot achieve their information needs due to bad behavior and incorrect acquisition application. Complex information needs, a lack of awareness of accessible resources, an inability to evaluate information sources, information overload, insufficient search knowledge and aptitude, bad behavior, and incorrect information application are all examples of issues. As a result, Ajayi Crowther University in Nigeria determined that information demands and poor seeking behavior are the most significant causes that require an examination (Oluwaseye, 2014).

Conversely, mechanisms of seeking information are essential (Partap & Chopra, 2013) to learn about and obtain access to the information. Students' utilization and understanding of their information needs and recognizing different information sources are essential to seek information effectively and efficiently (Nadzir & Salim, 2013). Almost every day, people seek information. It can identify specific literature gaps and discover areas that have not been explored or under-explored. Further, a study showed that respondents were aware that information-seeking helps them make decisions (Kolarić & Stričević, 2016). Thus, information is the backbone of every decision (Rejikumar & Aswathy, 2017). It is an essential factor in developing the society to make a decision that surrounds uncertainty and broadens the scope of options in problem-solving (Obi et al., 2018).

Social media can provide increased access to information, helpful to information seekers. It gives a new platform for people to seek information and is highly valuable for information-seeking purposes (Alruwaili & Ku, 2019; Maureen, 2018; Pang & Goh, 2016; Ranganath et al., 2017). Academically, social media has emerged as an essential source of information for students seeking information on academic, financial, sociocultural, and health-related matters (Hamid et al., 2016; Kim et al., 2014b). Hence, the application of Information and Communication Technology in education significantly impacted teaching, learning, and research (Kumar & Boria, 2019). The capacity to use developing technologies is a type of literacy required in the twenty-first-century workplace (Krubu et al., 2017). In addition, the use of ICT improves students' information-seeking behavior (Naqvi et al., 2020).

The researcher finds out that social media usage and information-seeking behavior have been explored within different disciplines: education, health, information technology, human development behavior, business, and library information science. However, the researcher has not discovered any research that dealt with the mediating effect of information and communication technology learning on the relationship between social media usage and students' information-seeking behavior. In this context, the researcher is interested in determining whether information and communication technology learning has a mediating effect on the relationship between social media

usage and the information-seeking behavior of students. As such, they are concerned that beneficiaries may find the study a valuable means of finding possible solutions for related problems.

2. Research Objectives

The purpose of this study is to determine the mediating effect of information and communication technology learning on the relationship between social media usage and information-seeking behavior of students: Specifically, the study sought answers to the following questions:

1. To describe the level of social media usage in terms of:
 - 1.1 Habit;
 - 1.2 Obligation; and
 - 1.3 Knowledge sharing.
2. To ascertain the level of information-seeking behavior among students in terms of:
 - 2.1 Sources;
 - 2.2 Applying search strategies;
 - 2.3 Evaluating information; and
 - 2.4 Referring to information.
3. To measure the level of information and communication technology learning.
4. To establish the level of significance of the relationship between:
 - 4.1 Social media usage and information-seeking behavior of students;
 - 4.2 Social media usage and information and communication technology learning; and
 - 4.3 Information-seeking behavior of students and information and communication technology learning.
5. To determine if the information and communication technology learning has a significant mediating effect on the relationship between social media usage and information-seeking behavior of students.

2.1 Hypothesis

The following are the hypotheses of the study:

1. There is no significant relationship between:
 - 1.1 social media usage and information-seeking behavior of students;
 - 1.2 social media usage and information and communication technology learning; and
 - 1.3 the information and communication technology learning and information-seeking behavior of students.
2. Information and communication technology learning have no mediating effect on the relationship between social media usage and information-seeking behavior among students.

2.2 Theoretical Framework

This study is anchored on Hyldegard's (2014) proposition that using social media for information-seeking is likely to develop certain types of behavior. The students needed specific strategies, tactics, and criteria to evaluate the trustworthiness and value of information. Further, social media may not replace information sources like databases and search engines. Still, Hyldegard claims social media added value and provided information seekers with more.

This study is supported by Aghili (2018), which states that behavior on social media contains influential factors that impact the users. Such as personal-related factors, workplace-related factors, information need type-related factors, surveillance-related factors, and social media-related factors. Although the elements do not remain the same as they may change over time, the level of these factors can vary from context to context, situation to situation. Consequently, the author cannot qualify the level of impacts of these factors.

Correspondingly, Kim et al. (2013) supported that college students use social media platforms for entertainment purposes or social connections and information searching in an academic environment. Since obtaining high-quality information is critical in the educational setting, it may impact students' academic achievement. Thus, actions can check and validate information collected through social media.

Furthermore, Bukhari et al. (2018) proposed a model of students' information-seeking behavior when using social media. The model is based on previous behavior models, with Ellis's model serving as the primary theoretical lens. The informational needs of the students were determined and the authors investigated the effect of social media in facilitating information-seeking behavior. Actions such as informal searching, deciding, interacting, following, checking, and saving are included in the suggested model. Students get information from various sources, including search engines, social media, and face-to-face platforms. In comparison to search engines and face-to-face platforms, social media, on the other hand, plays a critical role in the dissemination of information at any time and in any location.

In addition, Ranganath (2018) identifies several challenges in facilitating information-seeking in social media. First, the characteristics affecting the user's response time for a question are not comprehended, making it hard to identify prompt responders. Second, the social context in which the user has asked the question has to be determined to find personalized responders. Third, users apply rhetorical questions such as statements containing syntax questions, and systems assisting might be hindered from focusing on genuine questions. Fourth, social media advocates of political campaigns employ nuanced strategies to prevent users from obtaining balanced perspectives on issues of public importance.

2.3 Conceptual Framework

Figure 1 presents the conceptual framework showing the variables of the study. The independent variable of this research focuses on the Social Media Usage depicted by the indicators: habit, obligation, and knowledge sharing. Habit refers to the involuntary use of social media platforms; Obligation refers to the obligation of the youth to take part as vital to the whole youth socializing exercise, and knowledge sharing is a word that refers to the use of social media platforms to share gained knowledge to others.

The study's dependent variable is Information-seeking Behavior, measured in terms of sources, applying search strategies, evaluating information, and referring to information. Sources refer to the resources used by the students when seeking information; applying search strategies refers to the access of information effectively and efficiently; evaluating information refers to evaluation and verification of information; and referring to information refers to understanding the economic, legal, and social issues surrounding the use of information and accesses and usefulness of information ethically and legally.

A mediating variable exists between a causal component and an effect. It also seeks to evaluate how a variable influences X's impact on Y. A mediator is assumed to be the cause of the outcome, not the other way around.

Mediation testing aims to determine how the original variable influences the outcome. When variations in students' perceived social media usage and information-seeking behavior are attributed to variations in information and communication technology learning, information and communication technology learning may serve as a mediator. Variations in information and communication technology learning account for significant variations in information-seeking behavior, and the direct link between social media usage and information-seeking behavior is no longer significant.

Furthermore, a variable may function as a full mediator when it meets the following conditions: variations in the levels of the independent variable significantly account for the variations in the presumed mediator; variations in the mediator significantly account for the variations of the dependent variable; and when both independent variable and mediating variable appear in the model, a previously significant relationship between the independent and dependent variables is no longer essential and when the direct path is zero.

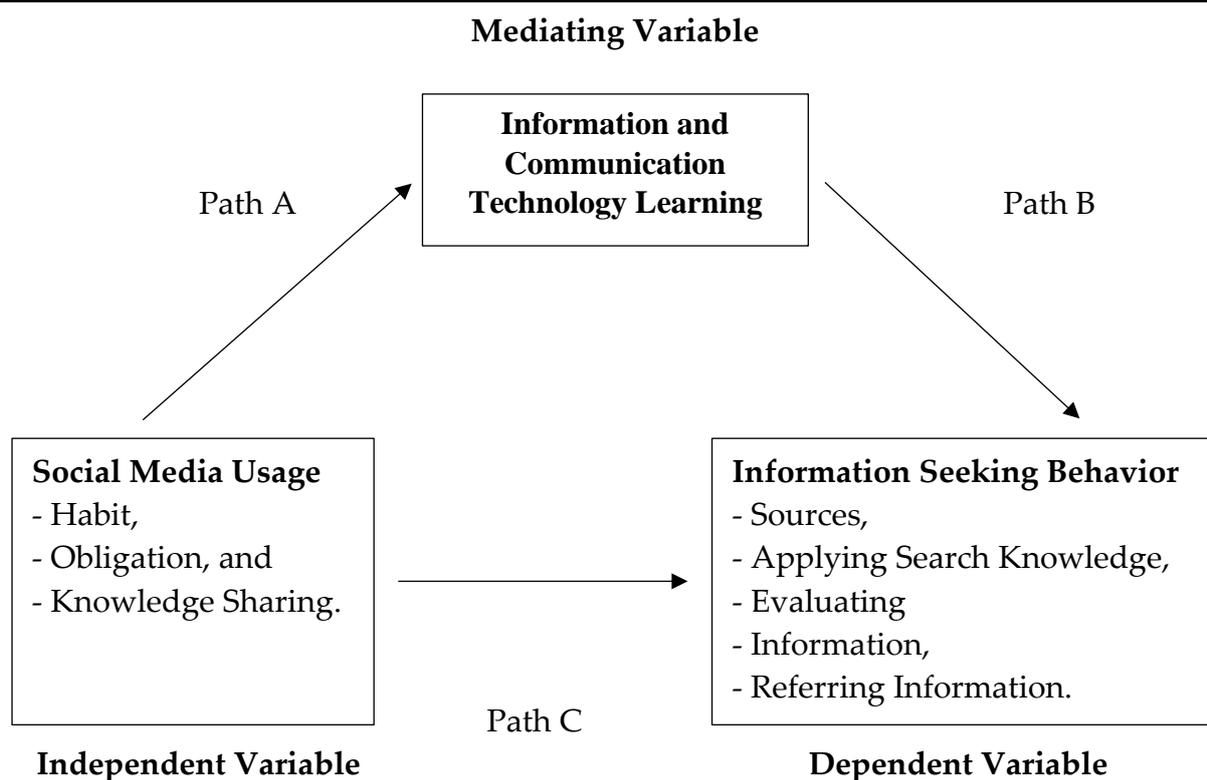


Figure 1: Conceptual Framework Showing the Variable of the Study

3. Methods

3.1 Research Design

This study used mediation testing to investigate the relationship between variables: information and communication technology learning, social media usage, and information-seeking behavior. Mediation analysis is a statistical procedure was used to determine whether the effect of an independent variable X on a dependent variable Y can be explained at least partially by the chain of effects of the independent variable on an intervening mediator variable Z and the intervening variable on the dependent variable (Klaus et al., 2011).

A mediator variable induces mediation in both the dependent and independent variables. It explains the link between the dependent and independent variables. The entire mediation process is defined as the intervention caused by the mediator variable. As a result, the beginning variable does not affect the outcome variable. The partial mediation procedure is also known as a partial intervention. In general, the mediation model investigates the relationship between the dependent and independent variables, the link between the independent and mediator variables, and the relationship between the dependent and mediator variables (Statistics Solutions, 2019).

3.2 Research Local

This study was conducted in an academic institution, specifically at the University of Mindanao (UM). It is Mindanao's largest private, non-sectarian institution, located in Davao City on the southern Philippine Island of Mindanao. It was the first school in

Southern Mindanao to offer tertiary education, mainly to provide learning opportunities to Mindanao's indigenous inhabitants and pioneers. Furthermore, UM is one of only two universities in the Davao Region to be given autonomy by the Commission on Higher Education. It signifies that the university has a long history of integrity and unblemished reputation, commitment to excellence, and sustainable and viable activities.

Davao City, the study's location, is a modern metropolis brimming with life, vitality, and color and is hailed as the world's most bountiful in land area. This thriving city is a busy center of trade, education, tourism, arts, culture, and wellness. In the city's first legislative district, there are two administrative districts with central barangays, such as Poblacion and Talomo, where some students live. In the second legislative district, four administrative areas such as Agdao, Buhangin, Bunawan, and Paquibato, are also situated. In the third congressional district, five administrative sections consist of Baguio, Calinan, Marilog, Toril, and Tugbok.

3.3 Population and Sample

The study respondents were students of one of the universities in Davao City who were currently enrolled in the academic year 2021-2022. The sample size of 300 was computed and obtained through Slovin's formula. Slovin's procedure was appropriate because the sample is taken from a large population, and there was a need to consider confidence levels and margins of error.

Furthermore, to ensure that everyone had an equal opportunity to participate in the study, a stratified random sample process with proportional allocation was utilized to generate a sampling frame. As a result, more data can be collected more efficiently (Liu et al., 2021). The population is divided into smaller sub-groups called strata using this strategy. Strata is formed when members have similar features or characteristics (Hayes, 2021). As a result, stratification refers to categorizing people into groups. Furthermore, the strata represent the majority of the population. When a population is too huge to investigate, dividing it into groups with similar characteristics saves the researcher time and money (Nickolas, 2021).

The area covered in this study was the universities' main campus only. On the other hand, students who declined to answer the survey questionnaire were excluded from the study; hence, the review was voluntary. Meanwhile, due to the nature of this research, several limitations were observed. First, the included research respondents were first-year to fourth-year students. Second, the research respondents of the survey were from the Bachelor of Science in Information Technology program. On the other hand, students from the other programs were excluded from the study.

In the questionnaire administration, adequate and transparent copies were printed to facilitate the study's smooth conduct. Before the actual data collection schedule, the respondents were requested to sign the informed consent form provided by the researcher. This informed consent was made available as attached to the questionnaire. In addition, respondents were asked if their time availability and convenience in answering all the questions involved. Also, the respondents were given information

about their right to withdraw their participation from the study if they felt uncomfortable responding to the questionnaire. Withdrawal from the study would not cost them anything or impose a penalty. It ensures that no coercion, undue influence, or no inducement involves in selecting the respondents. Since the respondents were informed of their voluntary participation, only those who affixed their signature on the consent letter were considered as part of the study.

They were chosen as respondents because the researcher wanted to determine the mediating effect of information and communication technology learning on the relationship between social media usage and information-seeking behavior. Furthermore, the respondents understood the content of the survey questionnaire and were able to interpret it based on their experience.

3.4 Research Instrument

The researcher utilized a questionnaire in gathering the data. Three sets of questionnaires were adopted from different authors. The adopted standardized questionnaire was valid in contents, for they were already tested and proven by the author as it underwent modification to classify the questions. The first part of the questionnaire deals with social media usage with habits, obligations, and knowledge sharing indicators. The instrument will be adopted and modified from the study of Shava and Chinyamurindi (2018). This part consists of 16 items.

The second set of instruments employed was to measure information-seeking behavior. The tool was adopted and modified from the study of Timmers and Glas (2010). There are four indicators in this variable consisting of 47 items. The third set of questionnaires was adopted and modified from Mills et al. (2013) study, composed of 15 items.

The five-point Likert scale was used for the research variables. McLeod (2019) states that the Likert scale was developed to measure the attitudes of the persons being studied. It enables individuals to communicate how much they agree or disagree with a statement. Likert scales have the advantage of not expecting a simple yes or no response from the respondent but rather allowing for degrees of opinion and even no thought. Therefore, quantitative data was produced, implying that the data may be evaluated quickly.

3.5 Data Collection

The researcher took the following actions to collect the essential data: First, the researcher sent a formal written message to the validators requesting that they read and review the questionnaires utilized in the research study. The tools mentioned above were exposed to comments, ideas, and recommendations, and the pilot test was carried out following the validation and pilot testing. Second, another set of letters addressed to the SVP-Academics, requesting authorization to conduct the research and accompanied by an endorsement letter from the Dean of the Graduate School. Third, after receiving approval

from the SVP, the researcher guaranteed that the letter's specified norms and conditions were fulfilled.

Consequently, the researcher conducted the survey. The informed consent form was given first to the participants to ask to be a part of the study using an online medium through Google Forms. Conducting the survey personally was not possible due to pandemics and health restrictions. It was impossible to achieve the quota since the students opted not to participate in the study, but the researcher explained that the data were given handled with maximum confidentiality; thus, consent was granted. Nevertheless, the researcher personally administered the questionnaire to the participant to ensure proper retrieval. After the respondents answered the questionnaire, they had personally sent it back to the researcher via email. The researcher waited an ample time since the questionnaire was distributed electronically. Finally, after gathering all necessary data, it was tallied, tabulated, analyzed, and interpreted confidentially under the supervision of a statistician based on the goal of the study.

3.6 Statistical Treatment of Data

For more comprehensive interpretation and analysis of the data, the following statistical tools will be utilized.

- **Mean.** This was used to characterize the level of social media usage, level of the students' information-seeking behavior, and level of information and communication technology learning.
- **Pearson r.** This was used to determine the significance of the relationship between social media usage, information-seeking behavior of the students, and information and communication technology learning.
- **Medgraph using Sobel z-test.** This was used to determine the mediating effect of information and communication technology learning on the relationship between social media usage and students' information-seeking behavior.

3.7 Ethical Considerations

This investigation was submitted to the University of Mindanao Research and Ethics Committee (UMERC) for review to guarantee that the quality of this research project was based on the research's ability to present valid argumentation to readers while giving a fair presentation of data. The researcher ensured the proper implementation in anonymizing the respondents since the findings were confidential. After which, the researcher complied with the recommendations and requirements set by the UMERC. Also, the researcher obtained informed consent from the survey respondents specifying their awareness and purposes of the study.

4. Results

Table 1: Level of Social Media Usage

Indicators	SD	Mean	Descriptive Level
Knowledge Sharing	1.03	2.99	Moderate
Obligation	0.82	2.97	Moderate
Habit	0.80	2.79	Moderate
Overall	0.66	2.92	Moderate

The level of students' social media usage from the BSIT program is *moderate*. It is presented hereunder, and items of this variable's indicators are analyzed and interpreted as shown in the appendices. Presented in table 1 is the social media usage of students with an overall mean of 2.92, described as a *moderate level*. The data showed that the indicator with the highest mean rating of 2.99 or moderate is *knowledge sharing*, followed by an *obligation* with a mean rating of 2.97 or moderate, and the *habit* has the lowest mean rating of 2.79 or moderate. It means that social media usage is sometimes evident.

Table 2: Level of Information-seeking Behavior of Students

Indicators	SD	Mean	Descriptive Level
Sources	0.82	2.80	Moderate
Applying Search Strategies	1.06	2.75	Moderate
Evaluation Information	1.09	2.75	Moderate
Referring to Information	1.16	2.75	Moderate
Overall	0.87	2.76	Moderate

The level of the information-seeking behavior of students is presented in Table 2. The corresponding indicators are arranged as is per the item in the questionnaire. Each indicator is evaluated and interpreted in a simplified manner to offer readers a better understanding. The information-seeking behavior of students had an overall mean of 2.76 or moderate.

Data showed that the mean scores among the indicators are all in the same category at a moderate level. The indicator with the highest mean rating of 2.80 or *sources*, 2.75 or *applying search strategies*, *evaluating information*, and *referring information*. The moderate level result means that students' information-seeking behavior is sometimes manifested.

Table 3: Level of Information and Communication Technology Learning

Item	SD	Mean	Descriptive Level
I learn more when I regulate my own learning experience and seek information on things that I want to learn about	1.49	2.89	Moderate
I post information that might be interest to other people.	1.43	2.84	Moderate
I use internet communications and other technology tools for self-expression.	1.47	2.81	Moderate

The things I need to know are taught by instructors in the classroom.	1.45	2.78	Moderate
I learn many things by interacting with other internet users.	1.48	2.71	Moderate
I use internet communications technology to keep current on topics related to my field of expertise.	1.54	2.70	Moderate
I learn best in a traditional classroom setting.	1.48	2.69	Moderate
I use internet communications technology tools when I want to learn about something new.	1.55	2.66	Moderate
Internet technology helps me be successful in my college classes.	1.52	2.65	Moderate
I like to share interests and reflections online.	1.40	2.64	Moderate
More classroom learning should include interactive communication technology experiences.	1.54	2.63	Moderate
I would like to be a participating member of an online community.	1.46	2.59	Low
I use internet technology to explore topics of interest.	1.58	2.58	Low
I like to take classes from good professors.	1.49	2.58	Low
I like to enroll in classes to continue my education.	1.49	2.53	Low
Overall	1.18	2.68	Moderate

The information and communication technology learning level is shown in Table 3 with its 15 item statements. The table shows that the overall mean score is 2.68 or is described as *moderate*. It could be viewed from the findings that the item-statement with the highest mean rating is information and communication technology learning of students *regulates their own learning experience and seek information on things that they want to learn about* with a mean rating of 2.89 or moderate. In reverse, the item-statement with the lowest mean rating of 2.53 or described as low is the student's information and communication technology learning to *enroll in classes and continue education*. Other item-statements of information and communication technology learning with a mean rating between 2.84 and 2.58 from highest to lowest: *posts information that might be interesting to other people, using internet communications and other technology tools for self-expression, instructors in the classroom teach the things that are needed to know, learn many things by interacting with other internet users, use internet communications technology to keep current on topics related to the field of expertise, learn best in a traditional classroom setting, use internet communications technology tools to learn about something new, Internet technology helps to be successful in college classes, share interests and reflections online, more classroom learning should include interactive communication technology experiences, to be a member of an online community, use internet technology to explore topics of interest, to take classes from good professors.*

Table 4.1: Significance of the Relationship between Social Media Usage and Information-seeking Behavior

Social Media Usage	Information-seeking Behavior				
	Sources	Applying Search Strategies	Evaluating Information	Referring to Information	Overall
Habit	.378** .000	.259** .000	.207** .000	.199** .001	.299** .000
Obligation	.189** .001	.165** .004	.141* .014	.112 .053	.176** .002
Knowledge Sharing	.263** .000	.250** .000	.288** .000	.263** .000	.317** .000
Overall	.365** .000	.300** .000	.289** .000	.261** .000	.356** .000

Displayed in Table 4.1 are the data outputs of the significant relationship between social media usage and students' information-seeking behavior. The overall coefficient or correlation is .356 with a $p \leq 0.05$ level of significance. Thus, the null hypothesis of no significant relationship between social media usage and information-seeking behavior of students was therefore rejected. Further, the indicators of social media usage correlated with students' information-seeking behavior yielded the following results: *Social media usage* correlated with *sources*, *applying search strategies*, *evaluating information*, and *referring to information* yielded an overall r-value of .299 at $p \leq 0.05$. *Obligation* correlated with *sources*, *applying search strategies*, *evaluating information*, and *referring to information* yielded an overall r-value of .176 at a $p \leq 0.05$. *Knowledge sharing* correlated with *sources*, *applying search strategies*, *evaluating information*, and *referring to information* yielded an overall r-value of .317 at a $p \leq 0.05$.

Furthermore, the correlation test between indicators of social media usage and students' information-seeking behavior yielded the following: *Sources* linked with *habit*, *obligation*, and *knowledge sharing* yielded an overall r-value of .365 at a $p \leq 0.05$. *Applying search strategies* linked with *habit*, *obligation*, and *knowledge sharing* yielded an overall r-value of .300 at a $p \leq 0.05$. *Evaluating information* linked with *habit*, *obligation*, and *knowledge sharing* yielded an overall r-value of .289 at a $p \leq 0.05$. *Evaluating information* linked with *habit*, *obligation*, and *knowledge sharing* yielded an overall r-value of .289 at a $p \leq 0.05$. *Referring to information* linked with *habit*, *obligation*, and *knowledge sharing* yielded an overall r-value of .261 at a $p \leq 0.05$.

To sum it up, social media usage and students' information-seeking behavior showed a low relationship; this implies that social media usage has something to do with information-seeking behavior. So, if the social media usage skill declines, the students become less skilled in information-seeking.

Table 4.2: Significance on the Relationship between Social Media Usage and Information and Communication Technology Learning

Social Media Usage	Information and Communication Technology Learning
Habit	.175** .002
Obligation	.204** .000
Knowledge Sharing	.320** .000
Overall	.319** .000

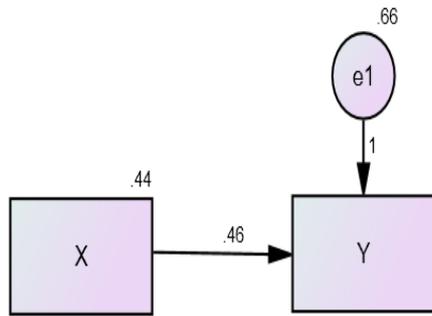
Table 4.2 bares the results of the significant relationship between social media usage and information and communication technology learning. When correlated with information and communication technology learning, social media usage yielded an overall r-value of .319 $p \leq 0.05$. Therefore, the two variables are significantly related to each other. Thus, the null hypothesis of no significant relationship between social media usage and information and communication technology learning from the BSIT students was therefore rejected.

Table 4.3: Significance of the Relationship between Information and Communication Technology Learning and Information-seeking Behavior

Information and Communication Technology Learning	Information-seeking Behavior				
	Sources	Applying Search Strategies	Evaluating Information	Referring to Information	Overall
	.282** .000	.340** .000	.360** .000	.333** .000	.394** .000

Table 4.3 reflects the significant relationship between information and communication technology learning and students' information-seeking behavior. Results yielded an overall r-value of .394 with a $p \leq 0.05$; therefore, information and communication technology learning are significantly related to students' information-seeking behavior. Thus, the null hypothesis of no significant relationship between information and communication technology learning and information-seeking behavior of students from the BSIT was therefore rejected.

Table 5: Mediation Analysis of the Three Variables



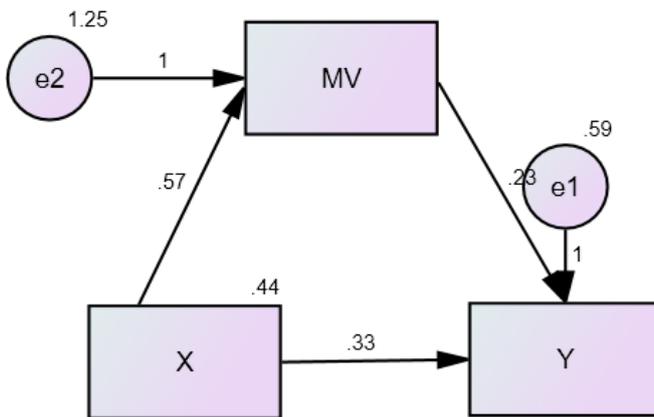
Regression Weights: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
Y <--- X	.464	.071	6.578	***	

Regression Weights: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
MV <--- X	.567	.097	5.820	***	
Y <--- X	.334	.071	4.731	***	
Y <--- MV	.229	.040	5.774	***	

Since all are significant, therefore, it is Partial Mediation.



C = .464
C' = .334

Legend:
X=Social Media Usage
Y=Information Seeking Behavior
MV= Information and Communication Technology Learning

Figure 2: Path Diagram for the Regression

There are multiple perspectives and discussions regarding mediation. The mediator in this study, information and communication technology learning, explains how or why there is a relationship between the predictor, social media usage, and the dependent variable, information-seeking behavior.

The first step's goal is to establish an effect to mediate. If the effect is not statistically significant, the investigation is terminated using the casual step method. Full mediation will be accomplished if the effect of the IV on the DV becomes non-significant at the end of the analysis. It signifies that the mediating variable mediates all of the effects. Only partial mediation is obtained if the regression coefficient is significantly lowered but still significant in the last step. It means that MV mediates a portion of the IV, but the rest is either direct or mediated by variables that are not concluded in the model. After

adjusting for MV, the effect of IV on DV is dramatically reduced. As a result, only partial mediation occurred because the effect is still strong.

Table 5 shows the mediation analysis of social media usage, information-seeking behavior, and information and communication technology learning. Figure 3 depicts the effect size computation in the mediation test performed among the three variables. Three stages were completed for the third variable (information and communication technology learning) to operate as a mediator. These are labeled Steps 1–4 in the table. At the 0.05 level of significance, social media usage was found to significantly predict information and communication technology learning, the mediator, in step 1. In step 2, information and communication technology learning predicts information-seeking behavior with a 0.05 level of significance. In step 3, social media usage was likewise found to significantly predict information-seeking behavior at the 0.05 level of significance.

Since the three paths (A, B, and C) are significant, further mediation analysis using MedGraph is warranted. Furthermore, this suggests that a part of the independent variable (social media usage) is mediated by the mediator (, information and communication technology learning). Still, the remainder is either direct or mediated by factors not included in the model. Because the effect was shown to be significant at the 0.05 level, partial mediation occurred.

In addition, Figure 3 shows that the impact size reflects how much of the effect of information and communication technology learning on information-seeking behavior may be attributed to the indirect path. As indicated in the figure, the total impact size is 0.46, which is calculated by adding the direct effect size (0.33) and the indirect effect size (the product of A and B), which is 0.13. Meanwhile, the ratio index, which is calculated by dividing the direct effect by the total effect, yielded a value of 0.28, indicating that approximately 28% of the total effect of the independent variable on the dependent variable is mediated by the mediator variable, and approximately 46% of the total effect is either direct or mediated by other variables not included in the model.

To summarize, since it is just a partial mediation, it is not possible to claim that information and communication technology learning is the main reason why social media usage influences information-seeking behavior. It suggests that learning about information and communication technology is only one of the factors that can influence information-seeking behavior when using social media.

5. Discussion

5.1 Social Media Usage

The students' moderate level of social media usage is due to the respondent's moderate rating on habit, obligation, and knowledge sharing. These indicators resulted in an overall moderate rating which was the product of the moderate scores rated by the students. Of all the indicators, the highest mean is knowledge sharing. This high level is consistent with Sharabati's (2018) study, which found that students enjoyed sharing knowledge because they enjoyed helping other colleagues without expecting anything in

return and believed in their abilities to share helpful knowledge to have a stronger motivation to contribute others.

The item obligation resulted in a moderate rating second to the knowledge sharing. It agrees with the study of several authors (Hutter et al., 2013; Kaplan & Haenlein 2010; Kwahk & Kim, 2017) that social media is a commitment. A user's obligations show that they frequently participate in social media interactions since it can be a valuable source of information. When making a decision, a user committed to social media is more likely to gather material that might be deemed evidence or knowledge. In other words, committing to social media increases the number of opportunities to gain information or knowledge likely to have a social influence.

Finally, habit ranked last, garnering a moderate level rating. Correspondingly, several authors (Hossain, 2019; Limayem et al., 2007) indicated that habit could push users to continue using social media. The more frequent an individual's behavior, the more likely it becomes habitual. In like manner, Griffiths (2018) mentioned that habitual social media uses often have many psychological hooks. Some examples are unpredictable incentives, social affirmation and validation, the fear of missing out, smartphone noises and vibrations, social connection, reciprocal liking, social competition, and psychological involvement.

Using social media has become an educational tool (Griffin, 2014; Manan et al., 2012; Saini & Abraham, 2018; Tess, 2013; Wiid et al., 2013). When utilized wisely and with caution, social media can be a powerful and transforming tool, as well as a helpful tool for collaborative learning (Kim et al., 2014a; Moran et al., 2011).

5.2 Information Seeking Behavior

The level of the information-seeking behavior of students is moderate. This finding was due to the indicators described as moderate in sources, applying search strategies, evaluating information, and referring to information. Each indicator is analyzed and interpreted in a simplified manner to understand the readers better. Sources got the highest mean score among the indicators, indicating a moderate-level rating. Tsai and Kim (2013) discovered that students had diverse source preferences in different academic environments. It can be course-related, program-related, or moral-support circumstances. While some materials appeared in various academic contexts, others appeared just in one. In educational settings, peers were the most chosen source in multiple situations. And professionals (e.g., professors and TAs) tended to recommend students to various sources, particularly official sources.

Applying search strategies, next in the rank indicator, which also resulted in a moderate-level rating, is described as preparing for implementing search tasks involving several search stratagems and tactics (Kriewel & Fuhr, 2010). Furthermore, the design of a search strategy always begins with analyzing the primary concepts and selecting terms to employ for each thought. Incorrect mistakes can have an impact on search success. Furthermore, strategies direct information searching by advising on what information is vital and how to obtain the information that is deemed essential or desirable. It suggests

that searching methods are essential elements in determining how people plan their search procedures, select or exclude information sources, and end the search process (Salvador-Olivan et al., 2019; Hjørland, 2011; Savolainen, 2016).

Evaluating information also showed a moderate rating level from students ranked third among indicators. Conforming to Richar Kraut's (2007) ideas that evaluating information emphasizes trustworthiness, CRAAP (currency, relevance, authority, accuracy, and purpose), and CARS (credibility, accuracy, reasonableness, and support). In connection, students are aware that they should look for and select credible sources and use specific criteria to determine validity or relevance. Despite that they have understood the importance of truth or scholarly information, it was concluded that the students were not skilled in evaluating information (Currie et al., 2010).

Lastly, referring to information ranked last yet still garnering a moderate-level rating. In line with the idea of several authors (Kier, 2014; Kinsey & Comerchero, 2011; Price, 2014), referring to information is a necessary skill for students to develop to avoid plagiarism. Especially now with the advent of technology, acceptable citing makes it more difficult and conjures up much anxiety. Accordingly, to minimize the risk of plagiarism, there should be careful preparation, ethical, and proper organization. One must be skilled at taking notes, file sources and notes together, and understand the difference between primary and secondary sources of information.

The initial results parallel Oluwaseye's (2014) idea that information-seeking behavior results from the user's awareness of specific needs. The identified needs will lead to behavioral changes, which may take several forms like consulting information systems.

5.3 Information and Communication Technology Learning

The level of information and communication technology obtained a moderate level. The majority of the items in this variable reflect a moderate descriptive level. This result shows that the emerging technologies appear to offer the opportunity to gain access to knowledge that could provide a new strategy for education. Thus, it enables the learners to compete and survive in the competitive world of education, per Gunjan (2014). More importantly, it contributes to students' knowledge, skills, and competencies formation and develops the personality, enhancing motivation for learning (Kruchinina et al., 2016). Moreover, Bas (2017) believes that ICT plays a vital role in today's educational systems. Many countries have made substantial use of technology in schools' teaching and learning processes. ICT has the potential to transform the education industry. It has benefited both teachers and students.

Based on the aforementioned, ICT has evolved into a tool for reformation education. It is commonly acknowledged that ICT can be viewed as a catalyst in teaching and learning for increasing teacher productivity and student achievement (Achimugu et al., 2010). In like manner, it was also found out in the study of Egbedokun and Oyewusi (2014) students perceived that ICT

will help them develop communication and language skills. Facilitating communication and feedback between them and lecturers encourages them to build a learning community. Express individual creativity, pose questions in the learning community, remove physical classroom walls between them and lecturers, become a content producer and not just a receiver, connect content, people and ideas, provide collaborative learning opportunities and knowledge sharing.

5.4 Correlation between Social Media Usage and Information Seeking Behavior

The test of the study's relationship revealed a significant relationship between the levels of social media usage and behavior. Further, all indicators of social media usage are significantly related to all the indicators of information-seeking behavior. The findings support the proposition of Aghili (2018) that behavior on social media contains influential factors. Impact the users such as personal-related factors, workplace-related factors, information need type-related factors, surveillance-related factors, and social media-related factors.

The result is parallel with the study Hyldegard (2014), which states that social media for information-seeking is likely to develop certain types of behavior. The use of specific strategies, tactics, and criteria was needed to evaluate the trustworthiness and value of information. Further, social media may not replace information sources like databases and search engines. Still, Hyldegard claims that social media adds value and provides information seekers more.

Moreover, most of the students' behaviors involve using the Internet and some form of social media. Using search engines and social networks for information-seeking help the users get new ideas about how they express what they are looking for (Morris et al., 2010). Hence, social media are evolving into important sources of information (Hamid et al., 2016; Khoo, 2014; Moore, 2016).

In like manner, social media is quickly becoming the new primary source of information. That is why the use of social media for information-seeking is increasing, and it is becoming a common practice across all domains. Because of the high connection between users and the trustworthy sharing aspect of social media, the reliance on information is increasing. Furthermore, students' support on social media platforms such as Wikipedia became their primary sources of information, particularly for research. It has emerged as the primary source of knowledge for pupils in the twenty-first century (Fardou et al., 2019; Frederick & Run, 2018; Nwangwa et al., 2014; Osauyi, 2012).

In this study of mediation, the first step of Baron and Kenny's (1986) procedure was established since there is a correlation between the independent variable, social media usage to the dependent variable, information-seeking behavior.

5.5 Correlation between Social Media Usage and Information and Communication Technology Learning

The study's findings revealed a significant relationship between social media usage and information and communication technology learning. This finding is supported by the

notion of Wade (2016) that information and communication technology in social media enables interaction of different social aspects, including the growth of personal relations, development of career, and building friendship. However, the most exciting part of information and communication technology in social media relates to learning.

To add, Elham et al. (2013) asserted that Facebook has a high potential for educational use, particularly in higher education, and that it can be viewed as a large classroom with many facilities and equipment that allow users to publish notes, share information, communicate, and, of course, learn. It is consistent with Laronde et al. (2017)'s assertion that ICT learning is critical to educational performance.

In parallel with Biasini's (2018) study, ICT competency is only one of the factors required to fully prepare higher education students to engage in today's digital world. This study supports the findings of various authors (Desta et al., 2021; Kaarakainen et al., 2017) that ICT skills can be gained by using social media as a tool for exchanging ideas in everyday communications.

In this study, the Baron and Kenny (1986) process for mediation in the second step was constructed since there is a significant relationship between the independent variable, social media usage, and the mediator, information and communication technology learning.

5.6 Correlation between Information Seeking Behavior and Information and Communication Technology Learning

The study's findings revealed a significant relationship between information and communication technology learning and information-seeking behavior. This finding supports the idea of Naqvi et al. (2020), which states that the information and communication technology foundation plays a vital role in facilitating the adoption and sustainability of users' information-seeking behavior. It helps students to access the quality of information sources available online.

This finding is also inconsistent with the idea of Ilgaz et al. (2015) that ICT tools are primarily used for information retrieval, not for information sharing. Conjointly, students' information-seeking behavior will be beneficial as long as they use ICT tools in their study (Eftekhar et al., 2019). Thus, a study conducted by Nwobasi et al. (2013) suggested that the use of ICT facilities must be effectively implemented to promote satisfaction to information-seeking behavior of the students.

Additionally, technology is helpful when choosing information sources since it is convenient and easy to access. It is asserted that information-seeking success involves understanding the technical system's topic domain (Cordes, 2012). Therefore, the advancement of ICT influences the student's information-seeking behavior (du Toit et al., 2018). This development has created new tools for acquiring knowledge and insight from information (Jebaraj & Muthukumar, 2016).

The Baron and Kenny (1986) method for testing the hypothesis in this study was established due to the mediator's variable's significance, information and communication technology learning to the dependent variable, information-seeking behavior.

5.7 The Mediating Effect of Information and Communication Learning on the Relationship between Social Media Usage and Information-seeking Behavior

The Barron and Kenny (1986) procedure was fully established, a regression analysis was employed to test the mediating effect using the casual steps approach for further analysis.

According to Baron and Kenny's mediation guidelines (1986), the first step in the mediation study was to demonstrate a correlation between the independent variable, social media usage, and the dependent variable, information-seeking behavior. Furthermore, the second step was formed in this study since there is a significant relationship between the independent variable, social media usage, and the mediating variable, information and communication technology learning. Finally, due to the significance of the mediating variable, information and communication technology learning, to the dependent variable, information-seeking behavior, testing the hypothesis in this study was established once again. Since three steps were significant, only partial mediation occurred. However, this is a positive result because the mediating variable influences the relationship between the independent and dependent variables.

Previous studies have examined the relationship between social media usage and information-seeking behavior. However, the lack of enough research studying the relationship between these two factors where information and communication technology learning acts as a mediator was the reason for this research.

The study aimed to contribute to the body of knowledge regarding potential indirect, mediating variables in the relationship between social media usage and information-seeking behavior. Specifically, information and communication technology learning were explored as a possible mediating construct to explain how social media usage affects information-seeking behavior. While full mediation was not revealed in this study, significant and important direct effects were found in accordance with the study of Aghili (2018) that may help enhance the existing research in social media usage and behavior.

Furthermore, as shown by the results, information and communication technology learning could be used as a mediator to improve social media usage, which formed a crucial component for the successful result in an excellent performance.

Specifically, the current study has found that information and communication technology learning is a positive mediator for social media usage and information-seeking behavior and met Baron and Kenny's (1986) mediation guidelines. There are three steps to be completed for a third variable acting as a mediator. The mediator information and communication technology learning explained the relationship between the predictor, social media usage, and the dependent variable, information-seeking behavior. Though the first step aims to establish an effect to mediate, if the effect is not statistically significant on the first step, the study is terminated in the casual step approach. Furthermore, full mediation will be accomplished if the effect of the IV on the DV becomes non-significant at the final step in the study.

As a result, the regression coefficient is much reduced in the last step and remains significant, with signs unaltered; hence, only partial mediation was obtained. It suggests

that the MV mediated some of the IV, while other variables not included in the model either directly influence or are mediated by them. Since the effect was still significant at the final step, only partial mediation was used in this situation.

Subsequently, findings revealed that social media usage is a significant predictor of information-seeking behavior and information and communication technology learning, information and communication technology learning has a significant effect on the information-seeking behavior of students. Lastly, information and communication technology learning have a mediating effect on social media usage and information-seeking behavior. It implies that information and communication technology learning will promote good social media usage and result in significant behavior in consonance with the studies of (Naqvi et al., 2020; Quadri & Oluwasina, 2017; Eftekhar et al., 2019).

6. Conclusion

With the study's findings, conclusions are drawn in this chapter. The findings provide evidence that social media usage is relevant for research on students' behavior, social media usage was relevant to information and communication technology learning, and information and communication technology learning was relevant to behavior. In effect, the respondents exhibit a moderate level of social media usage, a moderate level of information-seeking behavior, and a moderate level of information and communication technology learning.

In general, this means there was a significant relationship between social media usage and information-seeking behavior. There was also a significant relationship between social media usage and information and communication technology learning. And there was a significant relationship between information and communication technology learning and information-seeking behavior. Further, there was a partial mediation on the effect of information and communication technology learning on the relationship between social media usage and information-seeking behavior on the mediation analysis.

In addition, the mediating effect casual steps approach in this study showed the significant relationship of the information and communication technology learning and information-seeking behavior, indicating its partial mediating effect on the variables. The outcome is consistent with the hypothesis of Baron et al. (1986), which claims that a mediator causes the outcome rather than the other way around. It has been shown that the impact of social media usage and information-seeking behavior is mediated by information and communication technology learning but does not reverse the trend.

Consequently, the findings are interpreted as a general acceptance of Naqvi et al. (2020) that information and communication technology foundation play a vital role in facilitating the adoption and sustainability of users' information-seeking behavior, thus helping students access the quality of information sources available online. Furthermore, this confirms Asiyai's (2014) idea that information and communication technology learning in higher education institutions could help. It improves instructional delivery

efficiency, increases students' interest in learning, makes teaching student-centered, and improves collaborative networking, thereby improving students' performance.

7. Recommendation

In the light of the preceding outcomes and conclusions, the succeeding commendations are presented. Given that students in UM's BSIT programs use social media at a moderate level, exhibit moderate information-seeking behavior, and possess moderate information and communication technology learning, it is suggested that students can enhance their skills through some procedure that increases moderate social media usage and effective information and communication technology learning for efficient information-seeking behavior.

To enhance students' moderate social media usage level, teachers can modify new strategies by shifting to assist with projects or discussions on social media sites teach the habit of using different social media sites for academic work. Also, since the habit got the lowest rating among the indicators of social media usage, this may be improved to ensure proper usage of social media. Further, conducting social media training is an effective program to enhance students' collaborative learning and have a significant impact on interactivity with peers, professors, and online knowledge sharing behavior.

Consequently, students with a moderate level of behavior may appear unfamiliar with information retrieval activities or information source evaluation approaches. As a result, students should participate in library information literacy programs that primarily focus on information retrieval strategies to improve their information retrieval skills.

On the other hand, the moderate level of information and communication technology learning means sharing interest and reflections online, using internet communications and other technology tools for self-expressions, learning many things with other internet users by interaction, using internet communications technology tools when want to learn about something new, learning best in a traditional classroom setting, internet technology helps to succeed in college classes, more classroom should include interactive communication technology experiences, instructors in the classroom teach the things that needed to know, learning more when regulating own learning experience and seek information in things that wanted to learn about, using internet technology to keep current on topics related to the field of expertise, posting information that might be interesting to other people. These can still be improved and may be carried out for the rest of their learning to attain adequate information and communication technology learning skills.

However, since to be a participating member of an online community, to use technology to explore topics of interest, to enroll in classes to continue education, and to take classes from good professors got the lowest rating among the items of information and communication technology learning. This may be strengthened, especially to enroll in classes to continue education, to ensure the right way to develop new skills and knowledge. Furthermore, the university should offer an ICT integration training

program for faculty and students to promote professional development and develop more confidence in using ICT as the necessary equipment to explore more effective teaching and learning methods.

Additionally, the partial mediation of information and communication technology learning on the relationship between social media usage and behavior suggests that students need to develop and strengthen their skills to assess the accuracy of information and knowledge. Thus, it emphasizes information retrieval, student development, and competence.

Furthermore, it may also be worth focusing on behavior that leads to positive outcomes. It can be beneficial in attaining students' advanced skills and being an essential part of a decision-making process that is part of making decisions in everyday life context.

Finally, future studies toward examining other variables not included in the survey that can be feasible to mediate the relationship between variables will be of utmost importance to the research community.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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