

Digital Readiness for Online Learning and Academic Achievement of Teacher Education Students during the COVID-19 Pandemic

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Abstract:- In relation to the recent pandemic and the shift to a full online learning mode of instruction, this study attempted to examine the digital readiness and its possible relationship with the academic achievement of teacher education students. This quantitative study utilized a descriptive-correlational research design. A total of two hundred twelve (212) participants who were enrolled in the first semester of the academic year 2021-2022 were selected through random sampling to answer the questionnaire for this study. The study was conducted from April 2022 to May 2022. Results revealed that most of the respondents were highly ready digitally, especially in terms of communicational action which includes the following: text messaging, audio calling, video chatting, using emails, and using social networks. The findings revealed that digital readiness has no effect on the students' academic achievement, implying that the availability of equipment and the student's ability to use technology have no significant contribution in achieving better academic results.

Keywords:- Digital Readiness, Academic Achievement.

I. INTRODUCTION

The COVID-19 pandemic significantly impacted the world's economy and the people's psychology. It has sown fear among people, young and old, rich and poor, from different walks of life. It also has reshaped the landscape of the educational sector. As Handel et al. (2020) put it, COVID-19 pandemic is more of a stress test for the higher education system, the professors, and instructors, but most importantly, the students themselves. The virus, which initially appeared in December 2019, quickly caused a worldwide pandemic, forcing school closures and, finally, the migration of all educational institutions to remote learning. Due to the threats of the pandemic, the Philippine president, Rodrigo Roa Duterte, mandated for a "no vaccination, no face-to-face classes" and the country's Commission on Higher Education (CHED) issued directives to colleges and universities to prepare for online learning. These circumstances led to the emergence of numerous difficulties in online learning which

include: unstable internet connectivity; inadequate learning resources; electric power interruptions; vague learning contents; overloaded lesson activities; limited teacher scaffolds; poor peer communication; conflict with home responsibilities; poor learning environment; related financial problems; physical health compromises; and mental health struggles (Rotas & Cahapay, 2020). In addition, there are some obstacles that students must overcome to attain good academic achievement, especially during online learning. These include long response times, poor internet access, uninteresting online learning content, and materials. Furthermore, internet accessibility, technological devices, and software were also hurdles in the online learning process. In addition, other factors that led to the failure of online learning, include a lack of time management, motivation, and effort (Khairuddin & Khairuddin, 2020).

Moreover, Alvarez (2020) expressed that not everyone can provide and adapt to the rapid advances of technology in today's digital age and it complicated the matter even more. Given that students have access to educational technology, the question on their digital readiness remains unaddressed to a large extent. These are just few of the factors that influence the academic achievement of students worldwide including those who are enrolled in San Agustin Institute of Technology, Valencia City, Bukidnon.

Digital readiness refers to the students' technological knowledge, abilities, attitudes, and competencies in using digital technologies to achieve educational goals. Accordingly, adopting digital technology by the students, who are often technologically savvy due to their exposure to a technologically rich environment, tends to boost their academic engagement in higher education institutions (Kim, Hong, & Song, 2019). Furthermore, Parkes, Stein, and Reading (2015) stated that to achieve a high rate of student academic success, online learning in higher education must be maximized using digital technologies to create educational materials for teaching and learning, to teach learners, and to regulate courses. Being digitally ready as Abbas, Hussain, and Rasool (2019) asserted can improve students' learning quality especially if they have access to technologies and are given

the opportunity to facilitate interactions with their instructors and fellow students.

Meanwhile, Bashir and Mattoo (2012) expressed that academic achievement is one measure of the academic success of college students. Basically, academic achievement measures how much knowledge and skills the students have learned from the academe. To define it operationally, academic achievement in this study was measured through the teacher education students' grade point average for the first semester of the school year 2021-2022.

At present, the researchers found several studies conducted that are related to digital readiness and academic achievement of students at the international and national levels. However, the researchers found that there are no studies conducted yet, especially during post-pandemic, in private higher education institutions in Valencia City, Bukidnon, pertaining to the digital readiness of teacher education students. Thus, the researchers are motivated to conduct this study.

A. Research Objectives:

Generally, the main purpose of this study is to find out the level of digital readiness of the teacher education students of San Agustin Institute of Technology and its association to their academic achievement.

Specifically, this study aimed to:

- Determine the level of digital readiness of the respondents in terms of the following:
 - Availability of digital equipment;
 - Technical action;
 - Communicational action;
 - Informational action; and
 - Computational actions
- Identify the level of academic achievement of the respondents in terms of their Grade Point Average (GPA).
- Examine whether digital readiness has a significant relationship with the academic achievement of the respondents.

B. Research Hypothesis:

The following hypothesis was tested at 0.05 level of significance:

H₀₁. There is no significant relationship between digital readiness and the academic achievement of the respondents.

II. METHODS

Discussed concisely below are the research design, research locale, population and sample, research instrument, data collection, statistical treatment, and ethical consideration.

A. Research Design

This study used a quantitative approach using descriptive-correlational research design. Through this design, the researchers will be able to quantitatively describe the data at hand and execute test of correlation between or among variables under investigation using correlational statistical

tools (Creswell, 2012). The researchers used this design since this study attempted to describe the level of digital readiness and academic achievement of the teacher education students. Moreover, the researchers examined the possible link between digital readiness and academic achievement of the respondents.

B. Research Locale

This study was conducted at San Agustin Institute of Technology (SAIT), Fr. Caroselli St., Valencia City, Bukidnon. This school is a private Catholic institution founded by an Italian missionary priest, Fr. Manlio Caroselli S.J., in 1960. The school has elementary, high school, and college departments. The college department offers programs in teacher education, business administration, office administration, social work, midwifery, and technical-vocational programs. This research was conducted in this institution since just like the rest of educational institutions in the world, SAIT shifted from the traditional face-to-face classes to synchronous and asynchronous online learning mode due to the COVID-19 pandemic. Hence, students were forced to use gadgets like cellphones and personal computers to attend their classes through the school's learning management system.

C. Population and Sample

The respondents were the teacher education students of San Agustin Institute of Technology. The researchers intended to select them as respondents because they wanted to know the level of digital readiness and academic achievement of these students who have been trained to become teachers in the future. Probability sampling procedure was used to determine the sample size. Using Raosoft, an online sample size calculator, the researchers selected 212 respondents from a total of 467 populations.

D. Research Instrument

The instrument used in this study was an adapted questionnaire from the study of Blayone et al. (2018) entitled "Profiling the Digital Readiness of Higher Education Students for Transformative Online Learning in the Post-Soviet Nations of Georgia and Ukraine" and the study of Cueno et al. (2021) entitled "Digital Readiness and Academic Performance". The researchers slightly modified the items in digital readiness (computational, informational, communicational, and technical) to be more suitable for this study. The researchers had this questionnaire validated and tested for its reliability with a Cronbach's alpha of .884 described as reliable.

E. Data Collection

The researchers requested permission from the Dean of the College of Education by writing a letter at the start of the study. After given permission, the researchers immediately sought the consent of the respondents. After retrieving the questionnaire, the researchers immediately tabulated the responses of the respondents. The data were then sent to a statistician for the statistical analysis. Interpretation and discussion of the results were made as soon as the researchers received the results of the statistical analysis.

F. Statistical Treatment

The following descriptive and correlational statistics were used to answer the research objectives of this study. Mean and standard deviation were utilized to assess the level of the digital readiness of the students as well as their academic achievement. Meanwhile, Pearson product-moment correlation analysis was utilized to examine the association between the respondents' digital readiness and their academic achievement.

G. Ethical Consideration

The researchers ensured that all ethical protocols were followed during the conduct of the research. Before conducting the research, permission from the Dean of the College of Education and consent of the respondents were obtained. Respondents were fully informed about the purpose of the study and the possible risks associated in conducting the study. Respondents were encouraged to participate in the study but were not forced to do so. In other words, the researchers ensured that all respondents who answered the questionnaire voluntarily participated in the study. The researchers ensured that the privacy and confidentiality of respondents' personal information was properly upheld. To ensure the originality of the manuscript, the researchers run the manuscript through a plagiarism test software.

III. RESULTS AND DISCUSSION

Below are the results of the study presented concisely in tabular and textual forms.

A. Digital Readiness in terms of Availability of Digital Equipment

Table 1 presents the level of digital readiness of the teacher education students in terms of availability of digital equipment. The table further shows that the respondents are highly ready digitally since most of them have mobile phones with access to internet and or Wi-Fi connections. Meanwhile, other respondents are highly ready because they have desktop computers, printers, and scanners.

Table 1

Level of Digital Readiness in terms of Availability of Digital Equipment

Item	Statements	Mean	SD	Interpretation
1.	Mobile Phones	4.64	0.66	Very High
2.	Internet / Wi-Fi Connections	3.98	1.05	High
3.	Desktop Computer	3.87	0.99	High
2.	Printers	3.58	1.12	High
3.	Scanners	3.42	1.12	High
Overall Mean		3.90	0.75	High

Legend

- 5.00 - 4.21 - Very High Readiness
- 4.20 - 4.41 - High Readiness
- 3.40 - 2.61 - Moderate Readiness
- 2.50 - 1.81 - Low Readiness
- 1.80 - 1.00 - Very Low Readiness

B. Digital Readiness in terms of Technical Action

Presented in table 2 is the level of digital readiness of the teacher education students in terms of technical action. The table further shows that the respondents are highly ready in terms of creating or editing documents, managing software or apps, creating or editing multimedia materials, managing their learning management system accounts, and creating or editing audio recordings.

Table 2

Level of Digital Readiness in terms of Technical Action

Item	Statements	Mean	SD	Interpretation
1.	Creating/Editing Documents (Microsoft word; work sheet, presentation files)	3.80	0.81	High
2.	Managing software or apps from a computer or mobile devices.	3.77	0.78	High
3.	Creating/Editing Multimedia (combining text, art, videos, info graphs, pictures in a presentation)	3.76	0.79	High
4.	Managing Accounts for Learning Platforms and Files (Learning Management Systems; G-mail etc.)	3.74	0.79	High
5.	Creating/editing audio recordings	3.66	0.83	High
Overall Mean		3.75	0.65	High

Legend

- 5.00 - 4.21 - Very High Readiness
- 4.20 - 4.41 - High Readiness
- 3.40 - 2.61 - Moderate Readiness
- 2.50 - 1.81 - Low Readiness
- 1.80 - 1.00 - Very Low Readiness

C. Digital Readiness in terms of Communicational Action

Table 3 presents the level of digital readiness of the teacher education students in terms of communicational action. Communicational action refers to the ability of the teacher education students to communicate using different digital platforms. The table further shows that the respondents are highly ready in terms of communicational action using text or chat messaging apps, audio and video conferencing platforms, social media sites, and email messaging.

Table 3

Level of Digital Readiness in terms of Communicational Action

Item Statements	Mean	SD	Interpretation
1. Communicating with others using text chat or text messaging (SMS, messenger, wechat etc.)	4.19	0.71	High
2. Communicating using audio (Skype, Phone, Messenger etc.)	4.17	0.72	High
3. Using social networks to explore educational information	4.07	0.83	High
4. Communicating with other using video (Facetime, Skype, Zoom, Google Meet, etc.)	4.06	0.75	High
5. Sharing works and ideas online	3.77	0.85	High
6. Communicating using email	3.84	0.96	High
Overall Mean	4.19	0.60	High

Legend

- 5.00 - 4.21 - Very High Readiness
- 4.20 - 4.41 - High Readiness
- 3.40 - 2.61 - Moderate Readiness
- 2.50 - 1.81 - Low Readiness
- 1.80 - 1.00 - Very Low Readiness

D. Digital Readiness in terms of Informational Action

Presented in table 4 is the level of digital readiness of the teacher education students in terms of informational action. The table further shows that respondents are highly ready digitally in terms of searching for informative and educational materials online like videos, movies, journals articles, and digital books.

Table 4

Level of Digital Readiness in terms of Informational Action

Item Statements	Mean	SD	Interpretation
1. Searching for any sorts of educational videos	4.19	0.71	High
2. Searching and exploring various internet sites to browse educational information	4.17	0.72	High
3. Searching or downloading movies	4.07	0.83	High
4. Searching for journal articles on the web	4.06	0.75	High
5. Reading or downloading digital books	3.77	0.85	High
Overall Mean	4.05	0.61	High

Legend

- 5.00 - 4.21 - Very High Readiness
- 4.20 - 4.41 - High Readiness
- 3.40 - 2.61 - Moderate Readiness
- 2.50 - 1.81 - Low Readiness
- 1.80 - 1.00 - Very Low Readiness

E. Digital Readiness in terms of Computational Action

Table 5 presents the level of digital readiness of the teacher education students in terms of computational action. The table further shows that the respondents are highly ready digitally in terms of creating concept maps or flow charts, creating and or modifying figures and diagrams, sorting large amounts of data, and generating graphs from numbers.

Table 5

Level of Digital Readiness in terms of Computational Action

Item Statements	Mean	SD	Interpretation
1. Creating concept maps or flow charts	3.67	0.79	High
2. Creating/modifying figures and diagrams	3.66	0.78	High
3. Sorting large amounts of data	3.63	0.71	High
4. Generating graphs from numbers	3.53	0.74	High
Overall Mean	3.62	0.64	High

Legend

- 5.00 - 4.21 - Very High Readiness
- 4.20 - 4.41 - High Readiness
- 3.40 - 2.61 - Moderate Readiness
- 2.50 - 1.81 - Low Readiness
- 1.80 - 1.00 - Very Low Readiness

F. Academic Achievement of the Teacher Education Students

Presented in table 6 is the level of academic achievement of the teacher education students. The table further shows that the respondents in general have good academic achievement (mean = 1.57, SD = 1.09). It must be noted that majority of the respondents got a grade of 1.1-1.5 described and interpreted as very good. Meanwhile, there are seventy respondents who got 1.6-2.0 and eight who got 2.1-2.5 described and interpreted as good and satisfactory.

Table 6

Academic Achievement of the Teacher Education Students

Grade Range	F	%	Description	Interpretation
1.0	0	0	Excellent	Excellent
1.1-1.5	134	63	Very Good	Very Good
1.6-2.0	70	33	Good	Good
2.1-2.5	8	4	Satisfactory	Satisfactory
2.6-3.0	0	0	Passing	Passing
3.1-3.5	0	0	Failure	Failure
Total	32	100		
Mean=1.57	SD=1.09		Good	Good

G. Correlation Analysis between Digital Readiness and Academic Achievement

Table 7 presents the correlation analysis between the teacher education students' digital readiness and their academic achievement. Digital readiness in this study is measured through the following indicators: communicational action, informational action, availability of digital equipment, technical action, and computational action. While the academic achievement of the respondents is measured

through their grade point average for the 1st semester of the school year 2021–2022. Both of these variables were initially analyzed using mean and standard deviation. When the test of relationship was done using Pearson product-moment correlation analysis, it was revealed that teacher education students' digital readiness, in all of its indicators, is not in any way associated with their academic achievement as indicated on the p-values of the indicators that are more than the 0.05 level of significance. This implied that the teacher education students' academic achievement is not in any way attributed to their digital readiness, although their level of digital readiness is high. There must be other variables that could possibly affect the academic achievement of the students – something that could be explored by future researchers.

Table 7

Correlation Analysis between Digital Readiness and Academic Achievement

Independent Variable: Digital Readiness	Dependent Variable: Academic Achievement		
	Correlation Coefficient	p-value	Interpretation
Communication Action	0.086	0.211	Not Significant
Information Action	0.038	0.581	Not Significant
Availability of Digital Equipment	0.051	0.465	Not Significant
Technical Action	0.016	0.817	Not Significant
Computational Action	0.086	0.214	Not Significant

*Correlation is significant at the 0.05 level (2-tailed)

There are studies that examined correlations of similar variables and revealed similar results. For example, in a study conducted by Ilic (2021) among pre-service teachers, it was found that online learning readiness, which can be subsumed to digital readiness in this study, was not correlated with the respondents' academic achievement. Moreover, Hunley et al. (2005) conducted a study on computer use and academic achievement among 101 tenth-grade students in southwestern Ohio, USA. The result revealed that adolescents' computer use was not found to be associated with their academic achievement. This implies that the level of computer use of the tenth-grade students whether they are literate and ready or not, has nothing to do with their academic achievement.

However, a study conducted by Althubaiti et al. (2022) among 272 medical students enrolled in a medicine program revealed a different result. The study found out that digital readiness, together with computer anxiety, can significantly affect the students' perception on their academic performance in e-learning. Moreover, Cueno et al. (2021) in their study among student nurses in a private higher education institution in Davao City, Philippines found out that digital readiness is positively related to students' academic performance.

IV. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions are drawn based on the result of the present study. The study ascertained that the level of digital readiness of the teacher education students of San Agustin Institute of Technology is high. In other words, these students were highly ready digitally to participate in an online learning mode of delivery of instruction. In terms of academic

achievement, the respondents in general have good academic achievement. When digital readiness and academic achievement were correlated, the test of relationship revealed that digital readiness has no significant relationship on the academic achievement of the students. Therefore, the null hypothesis was accepted.

Based on the abovementioned premise, digital readiness does not in any way contribute to the academic achievement of the students. Other factors could possibly affect their academic achievement but not digital readiness.

ACKNOWLEDGMENT

The researchers would like to acknowledge the help of the Dean of the College of Education of San Agustin Institute of Technology, Dr. Virginia S. Arcallana and the 212 teacher education respondents who willingly answered the questionnaire for this study.

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