

## PERCEIVED BARRIERS IN THE SUDDEN TRANSITION TO ASYNCHRONOUS AND SYNCHRONOUS ONLINE DISTANCE LEARNING OF RADIOLOGIC TECHNOLOGY STUDENT

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### ABSTRACT

*This study identified the effect of the perceived barriers in the sudden transition to online distance learning on the academic performance of radiologic technology students. Four barriers were identified and used: digital literacy, support barriers, institutional barriers, and educational impact. A causal-comparative study was utilized to determine the effect of the perceived barriers on students' academic performance. Results revealed that support and institutional barriers significantly impact students' academic performance. On the other hand, digital literacy and educational impact have no significant effect. This finding of the study indicates that students must have easy access to the available support. This is critical not only for technical assistance but also for institutional support.*

*Keywords: online distance learning, digital literacy, support barriers, institutional barriers, educational impact, academic performance, radiologic technology*

### INTRODUCTION

COVID-19, like numerous other facets of daily life, has had a profound effect on students, instructors, and educational institutions worldwide. The WHO declared COVID-19 a global public health emergency on January 30, 2020, and a pandemic on March 11, 2020 (WHO, 2020). On March 15, 2020, Metro Manila was placed under enhanced community quarantine (*Proclamation No. 922, 2020*). On March 18, 2020, less than a week after the global pandemic was declared, UNESCO reported that 107 countries had closed all schools due to the pandemic (UNESCO, 2020). The pandemic's impact on most Filipinos is unprecedented as the Philippine government battles COVID-19 and more than a third of the world's population is currently quarantined.

Many universities and medical schools had to suspend face-to-face classes,

forcing students and teachers to use distance learning (Baticulon et al., 2020; Hayat et al., 2021). In this extraordinary time, academic activities using E-Learning have increased, with a rapid shift from traditional classrooms to virtual online learning systems (Abbasi et al., 2020). Unplanned change occurs in response to unexpected events or crises (Knowles & Saxberg, 1988). When abrupt transitions occur in response to a crisis, coordinated measures will take far too long to implement, significantly when bureaucracy's rigidity limits the ability to change by establishing rigid rules (Haveman, 1992). As a result, instructors must quickly select multiple digital tools with varying capabilities to support teaching while balancing their workload (Iglesias-Pradas et al., 2021). While the Covid-19 pandemic is unlikely to affect current anatomy students, previous crises have taught us valuable lessons about adapting

and educating. Nonetheless, a smooth transition from traditional education to distance and virtual learning is not possible overnight. Due to the uncertainty of eradicating the pandemic, educational institutions have developed online learning materials for students from all academic disciplines. Because all instruction is delivered online, software and hardware issues can completely disrupt sessions and the learning process. To facilitate effective teaching and learning, teachers and students alike must be trained and knowledgeable about the technology used in E-learning. Otherwise, the advantages of E-learning will be limited to the technologically savvy. Otherwise, the advantages of E-learning will be limited to the technologically savvy (Ngampornchai & Adams, 2016; Wood, 2010).

Comparing Online Distance Learning to face-to-face, laboratory-based learning is critical for health faculty. Students in medical, radiologic, and other allied departments learn on the wards, clinics, and laboratories. Since the sudden implementation of online distance learning during this pandemic is not available, studies on perceived barriers among allied health students, especially radiologic technology students, are lacking. These barriers may cause students to perform poorly in online distance learning and laboratory training during the pandemic. Understanding the perceived barriers radiologic technology students face may also help school administrators develop an efficient online distance learning implementation. Thus, the current study seeks to assess students' perceptions of asynchronous and synchronous online distance education barriers

## OBJECTIVES OF THE STUDY

As online education develops, new questions arise about creating efficient teaching and learning strategies. The student's perception of the online learning experience is a critical factor in the success of online education. This study explored the effects of the perceived barriers in distance learning using internet-based environments in a radiologic technology course during COVID19 pandemic. This determined the performance of radiologic technology students

during synchronous and asynchronous classes. Lastly, it ascertained the perceived barriers in the sudden transition to online distance learning in terms of : Digital literacy barriers, Support barrier, Institutional barriers and Educational impact.

## METHODOLOGY

This quantitative survey was conducted following the academic year 2021-22's implementation of online distance learning. The effect of perceived barriers to online distance learning on the academic performance of radiologic technology students during the COVID-19 pandemic was examined using a causal-comparative study.

The questionnaire includes the study's objective, and all participants consented to voluntary statement participation and declarations of anonymity and confidentiality in accordance with the data privacy act prior to participation. Two sections were included in the questionnaire. The first section discussed the participants' demographic characteristics, including their age, gender, year of enrollment during the online distance learning program's implementation, and their grade point average (GPA) for the academic year 2021-22. The second section was created to elicit information about perceived barriers to abruptly transitioning to online distance education. Following a review of the literature on perceived barriers, a 20-item questionnaire was developed to assess the following: digital barriers (Semerci & Semerc, 2021), support barriers (Lee et al., 2011), institutional barriers (Baticulon et al., 2020), and educational impact (Abbasi et al., 2020). Internal consistency (Cronbach's reliability) values ranged from .783 to .939, indicating that the scale items assess the same construct. The items are rated on a five-point likert scale (1 equals "strongly disagree," 2 equals "disagree," 3 equals "neutral," 4 equals "agree," and 5 equals "strongly agree.")

In the study, participants were officially enrolled during the first year of the COVID-19 pandemic. The questionnaire was encoded and uploaded to Google Forms, and the link to the survey was distributed via emails and group chats.



The collected data was tabulated using statistical packages for social science (SPSS, IBM version 27) for statistical analysis. Demographics and responses to study variables were calculated in terms of frequency and percentage. The regression analysis was used to determine the statistically significant effect of the study's independent variables on the dependent variable (Angelini, 2019). The level of significance was set to p-value .05.

## RESULTS AND DISCUSSION

### 1. Respondents Demographic Profile

**Table1**  
*Frequency Distribution of Respondents Demographic Profile*

	Frequency	Percent
Age		
18-19 years old	10	12.5
20-21 years old	50	62.5
22-23 years old	14	17.5
24-25 years old	1	1.3
28-29 years old	2	2.5
30-31 years old	3	3.8
Gender		
Female	45	56.3
Male	35	43.8
Year Level		
1st Year	21	26.3
2nd Year	31	38.8
3rd Year	22	27.5
4th Year	6	7.5

N=80

The composition of the respondents represents 80 out of 97 of the total population of enrolled radiologic technology students during the implementation of online distance learning. As presented in Table 1, 26.3 percent are first-year students, 38.8 percent are second-year students, 27.5 percent are third-year students, and 7.5 percent are fourth-year students.

It can also be gleaned from Table 1 that six class intervals have been taken with the class difference of 2 years each. The range starts from the age of 18, where education at the tertiary level starts from this age, and the upper limit of the range is 31 years old. It can be seen from Table 1 that 62.5 percent or a majority of the respondents are 20-21 years old. In addition, the majority of the

respondents, or 56.3 percent, are female, and 43.8 percent are male. The data were analyzed using the means and standard deviations of the overall point average and each of the four perceived barrier scales.

### 2. Respondents General Point Average (GPA)

**Table2**  
*Frequency Distribution of the Respondents GPA and its Equivalent Description*

		Frequency	Percent
1.00≤gpa<1.25	Outstanding	2	2.5
1.25≤gpa≤1.50	Exceed expectations	2	2.5
1.50<gpa≤2.25	Acceptable	50	62.5
2.25<gpa<3.00	Fair	23	28.8
3.00	Poor	3	3.8
<b>Total</b>		<b>80</b>	<b>100.0</b>
<b>Mean</b>	<b>Fair</b>	<b>2.32</b>	
<b>SD</b>		<b>.44</b>	

In this study, the General Point Average (GPA) was established by determining the academic performance of the radiologic technology student during the implementation of online distance learning. Table 2 reveals that there are only 2.5 percent of outstanding students and 2.5 percent exceed expectations. The majority, or 62.5 percent, of the students, are acceptable in terms of their academic performance. 28.8 percent are fair and 3.8 percent are poor. In addition, the overall academic performance of the radiologic technology students is 'fair' (M=2.32, SD=.44).

**Table 3**  
*Summary of the means of computed items according to variables*

	N	Mean	Std. Deviation	Interpretation of the Mean
Digital Literacy	80	2.49	0.77	Disagree
Support Barriers	80	2.48	0.81	Disagree
Institutional Barriers	80	2.42	0.83	Disagree
Educational Impact	80	2.40	0.72	Disagree

Table 3 provides a summary of the computed means of all items according to the



variables used in the computation. The overall score for each variable was calculated by taking the average of the responses to the relevant indicators for that variable. The mean of all of the computed items is less than 3.00 points. This result reveals that the respondents are divided on all of the barriers listed above that are related to the abrupt transition from on-campus distance learning to online distance learning.

A multiple regression analysis was performed to determine the significant effect of the perceived barriers in the sudden transition to online distance learning. The result of the multiple regression are presented in Table 4. The significance value (p-value) of ANOVA was found to be less than .05,  $F(4,75)=3.055$ ,  $p\text{-value}=.022$ , which suggested that from the model equation was significantly fitted on the data. Additionally, the adjusted R-square value was (.117), which indicated the model's predictors explained 11.7 percent variation in the perceived barriers.

**Table 4**  
*Regression coefficients and significance of the perceived barriers*

	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	B	t	Sig.
Regression (ANOVA)	.402 <sup>a</sup>	.162	.117			.009
(Constant)				1.363	2.959	.004
Digital Literacy (DI)				.153	1.538	.128
Support Barriers (SB)				-.289	-2.280	.025
Institutional Barriers (IB)				.265	2.646	.010
Educational Impact (EI)				.210	1.714	.091

a. Dependent Variable: GPA

b. Predictors: (Constant), Educational Impact, Institutional Barriers, Digital Literacy, Support Barriers

Furthermore, the presence of the significant effect of the four variables on the perceived variables was identified based on their sig. value or its t-statistics, as shown in Table 4. It was found that the variable support barriers have a significant negative effect,  $t=-2.280$ ,  $p\text{-value}<.05$ , and institutional barriers have a significant positive effect,  $t=2.646$ ,  $p\text{-value}<.05$ . Digital literacy and educational impact are insignificant, with p-values .128 and .91, respectively.

Asynchronous and synchronous online distance learning are considered newly adopted approaches. (Hrastinski, 2008; Perveen, 2016). It emerges as a new method to maintain education continuity (Jin et al., 2021; Kimenyi et al., 2020) by the radiologic technology student during the COVID-19 pandemic. This explored the students perceived barriers and their effect on the academic performance during the sudden transition to online distance learning.

Online distance learning may impact the academic performance (Allam et al., 2020; Alstete & Beutell, 2004) of radiologic technology students. Students' performance in face-to-face, blended, and online classes has been studied extensively for decades (Adam et al., 2009; Auster, 2016; Bartolic-Zlomisljic & Bates, 1999; Fischer et al., 2020; Kemp & Grieve, 2014). Studies comparing student achievement between face-to-face, blended, and online learning is still relevant today (Iglesias-Pradas et al., 2021). These analyses vary depending on the type of analysis and the sample used. Examine the results of the single-course analysis. The results appear to confirm that students receive higher grades in online learning than in face-to-face instruction (Cavanaugh & Jacquemin, 2015; Ladyshevsky, 2004). (although the difference is negligible). For example, Urtel (2008) found that students perform better when taught face-to-face.

The sudden implementation of online distance learning (ODL) in allied health education is challenging (Khalil et al., 2020; Ramos-Morcillo et al., 2020). The lack of infrastructure (Hussein et al., 2020; Nimavat et al., 2021), technology, internet access (Joaquin et al., 2020; Supriyanto et al., 2020), poor quality of services (Scott & Aquino, 2020) and support (Baticulon et al., 2020; McQuirter, 2020) are an example of barriers (Bediang et al., 2013; Lakbala, 2015). In this study, barriers against adopting ODL are divided into four main levels: (1) digital literacy (2) support barriers (3) support barriers and (4) educational impact.

## CONCLUSIONS

The study's findings established that students' views of perceived assistance and

institutional constraints had an effect on their overall performance. Additionally, perceived support obstacles were shown to be negatively connected to students' academic performance, whilst perceived institutional barriers were found to be directly associated with students' academic performance. Improved communication routes are important. Students expressed disappointment that their thoughts were not being heard and that no relevant action had been done in response to their criticism. Students expressed concern about not acquiring necessary skills or receiving adequate patient exposure, a feeling common by students worldwide. Additionally, kids require interaction with peers with whom they may share information, resources, and perspectives.

Finally, the survey showed that students did not view digital literacy as the primary impediment. This indicates that radiologic technology students were able to overcome these obstacles despite the pandemic's fast deployment of online distance learning.

## RECOMMENDATION

Students must be able to access the resources that have been made available to them in a timely and convenient manner. Technical support and peer and institutional support, among other things, are critical. Elements should be in place that explicitly inform the student of the available resources, how they can access those resources, and how to obtain access to them. Tolls must also be in place if the availability of the provided support is compromised to compensate for the compromised availability of the provided support. Making constant communication between the instructor, facilitators, and administrators as readily available and immediate as possible for the learner as it is another critical component of ensuring that students feel supported while participating in an online learning course. Students must be aware on positive perception of the institution and administration, increasing the likelihood that they will participate in an online learning course for a more positive attitude among the students as well as a high level of academic achievement when they complete the course.

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