

# Grade 10 Students' Online Learning Readiness and e-Learning Engagement in a Science High School during Pandemic

Merly P. Tabang<sup>1</sup>, Dennis G. Caballes<sup>2</sup>

<sup>1,2</sup>National Teachers College

<sup>1</sup>Puerto Princesa City National Science High School  
[merly.tabang@deped.gov.ph](mailto:merly.tabang@deped.gov.ph), [dg.caballes@ntc.edu.ph](mailto:dg.caballes@ntc.edu.ph)

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## Abstract

Every area of the government faced enormous hurdles as a result of the COVID-19 outbreak. For the Department of Education, this meant using a different teaching modality to continue the students' education. Online learning, where students and teachers interact virtually and use Google Classroom as the learning management system (LMS), is one of the learning modes used during the pandemic. This study examined how prepared Grade 10 students of Puerto Princesa City National Science High School were for online learning and how engaged they were in it throughout the pandemic. According to the study's findings, the majority of students are prepared for online learning in terms of expectations, preferred methods of learning, and technological aptitude. On the other side, students must develop their capacity for initiative in their own learning and be provided with the necessary hardware and software to support their studies. Additionally, the students' grades indicate proficient to advanced level of e-learning engagement. Results also showed that there is no significant relationship between students' online learning readiness and students' e-learning engagement in science subject during the pandemic. This implies that regardless of their readiness in online learning, students are capable of handling their tasks and get high grades.

**Keywords—** online learning readiness, e-learning engagement, science high school, pandemic

## I. INTRODUCTION

The pandemic's occurrence turned into one of the most difficult circumstances the globe has ever faced. The pandemic in the Philippines brought a crisis to the government's many sectors. It presented unforeseen turns and shifts that led to changes in the nation's pre-existing systems and regulations. The pandemic urged the Department of Education to cancel in-person classes as schools continuously looked for alternatives to continue the students' education. This led to their participation in a variety of learning delivery modes, including blended learning and distant learning, among others.

Many students had learning issues as a result of the dramatic changes made to Philippine education by the epidemic and getting the students to participate in active learning at home became one of the biggest obstacles the teachers faced. To provide learners with a high-quality education, both teachers and students must learn how to use new technology tools and adapt to them. With that, deliberate efforts were made to have the teachers ready to do their job.

Relevantly, the findings of Altawalbeh & Al-Ajlouni (2022) revealed that distance learning explored many challenges in teaching science. According to them, being familiar with technology was not easy- both the students and the faculty faced technical problems, internet access, and other problems, and facilitation of practical activities were influenced negatively. Also, the results explored that the faculty members highly prefer the traditional teaching method over distance learning for many reasons.

In light of the aforementioned circumstances, the researchers investigated the readiness of Grade 10 students for online learning as well as their e-learning engagement in science subject reflective in their grades during the pandemic. The researchers also looked into if there was a link between Grade 10 students' engagement in online learning in the Science subject and their readiness for it. Specifically, this study sought to answer the following research questions:

1. What is the online learning readiness level of Grade 10 students?
2. What is the e-learning engagement of Grade 10 students in science subject measured through their grades?
3. Is there a significant relationship between online learning readiness and the e-learning engagement of Grade 10 students in science subject?

Further, the null hypothesis was tested at 0.05 level of significance.

The study focused only on investigating online learning readiness level of Grade 10 students in a public science high school and significant relationship between the respective variables.

Only the most vital factors were considered, including readiness for online learning as determined by a Creative Commons Attribution-Noncommercial-Share Alike 3.0 United States License-compliant Online Readiness Questionnaire developed by Penn State University and e-learning engagement as determined through the grades of Grade 10 students in their science subject.

The findings of this study can be utilized to evaluate the newly adopted learning modality (blended distance learning) and will provide the Department of Education with some initial data that can be used to improve instructional practices in the new normal.

## II. METHOD

In this study, descriptive correlational analysis was used. This approach is suitable because it described and identified the relationship between online learning readiness and Grade 10 students' engagement in online learning as indicated by their grades in science subject in the third quarter (recent quarter).

The descriptive method was used to describe the online learning readiness level of Grade 10 Students and the e-learning engagement in science subject reflective in their grades.

The correlational method was used to determine if there is a significant relationship between online learning readiness and the e-learning engagement of Grade 10 students in science subject.

The study's respondents were 30 students from Puerto Princesa City National Science High School in the City Schools Division of Puerto Princesa for the SY 2021-2022 who chose online or virtual learning as their preferred mode of instruction.

Data on online learning readiness were gathered through a survey. Expectations, self-direction, learning preferences, self-study habits, technological skills, and software/hardware requirements are among the six question clusters that make up the questionnaire. The survey used a 3-point Likert scale for scoring the respondents' answers. On the other hand, e-learning engagement in science was measured through the grades of the students.

A communication letter was submitted to the school principal. Following the letter's clearance, the researchers sent the students the survey questionnaire and obtained their most recent Science grades from their teacher. Prior to the data collection, consent letters explaining the study and the value of the respondents' participation were sent to each student. This is done to confirm their consent and willing involvement.

Furthermore, the participants' identities in the study were kept anonymous. The completed questionnaires were checked for plausibility, integrity, and completeness. In addition, all the respondents' responses were treated with utmost confidentiality.

For statistical analysis, the collected data were compiled and tabulated. The following statistical analyses were applied to the data. The students' readiness for online learning was described using frequency counts and percentages. The e-learning engagement was described using frequency counts, percentages, and mean. Further, Pearson correlation was used to determine if there is a significant relationship between the students' online learning readiness and e-learning engagement in science subject.

## III. RESULTS AND DISCUSSION

This research titled "Grade 10 students' Online Learning Readiness and e-learning Engagement in a Science High school during Pandemic" presents the results arranged in order as stated in the research questions.

Table 1. Online Readiness of Grade 10 Students (n=30)

Indicators of Online Learning Readiness	Description	Frequency of Response (n=30)	Percentage of Response
<b>Expectations</b>	Have a solid understanding of what is expected as an online 2 student	22	73%
	Needs to reexamine expectations of what it means to be a student in an online class.	8	27%
<b>Self- direction</b>	Have a good sense of self-direction	11	37%
	Needs to improve time management skills and study habits	19	63%
<b>Learning Preferences</b>	Can use different types of media in online courses, solve minor problems, and work in online groups	20	67%
	Need to experiment using different types of media	10	33%
<b>Self-study Habits</b>	Have good study habits	15	50%
	Must carefully choose a place to study	15	50%
<b>Technology Skills</b>	Have good technology skills	28	93%
	Needs technological support	2	7%
<b>Hardware/Software Requirements</b>	Adequate computer capabilities	14	47%
	Needs some upgrades or additional software	16	53%

In their study, Widodo et al. (2020) discovered that the following factors can be used to gauge a student's online learning readiness: equipment capability, technical abilities, self-directed learning, motivation, and perceived usefulness. The standardized questionnaire employed in this study, however, revealed the following as markers of readiness for online learning: expectations, self-direction, learning preferences, self-study habits, technology skills, and hardware/software requirements.

According to the data acquired, the majority of students (22 out of 30) have a clear understanding of what is expected of them. The table also shows that 11 out of 30 students have a strong sense of self-direction, whereas 19 out of 30 students need to develop their time management techniques and habits. The table also demonstrates that more than half of the class (20 out of 30) is able to use a variety of media in online courses, collaborate in online groups, and solve simple problems. On the other hand, half

of the respondents (15 out of 30) have effective study habits when it comes to self-study, while the other half must carefully select a study location that is conducive for them. The respondents' technological aptitudes are also shown in the table. According to the data, 28 out of 30 respondents have strong technological aptitudes, while 2 require technical assistance. Finally, data on hardware/software requirements showed that 14 out of 30 respondents have available hardware/software that they can use in their online class, whereas 16 out of 30 respondents needed to provide and/or upgrade their gadgets to support their learning.

It is also important to take note of the findings of the study of Herguner et al. (2020), which show that learners' attitudes toward online learning have a beneficial effect on their online learning readiness. As a result, it's important to foster a positive online learning attitude among students in order to give learners a good online learning experience.

Table 2. e-learning Engagement of Students measured through Grades (n=32)

Grades Range	Frequency	Percent	Mean
Advanced (90 and above)	22	73.3	
Proficient (85- 90)	8	26.7	
Approaching Proficiency (80-84)	0	0	
Developing (75-79)	0	0	1.27
Beginning (74 and below)	0	0	
Total	30	100	

Mean Legend: 1-Advanced; 2- Proficient; 3- Approaching Proficiency; 4- Developing; 5- Beginning

DepEd Order No. 73, s. 2012 gives the guidelines on the assessment and rating of learning outcomes under the K to 12 basic education curricula. The performance of the students shall be described in the report card, based on the following levels of proficiency:

- a. **beginning**, if the student struggles with his or her understanding and prerequisite and fundamental knowledge and/or skills have not been acquired or developed adequately to aid understanding;
- b. **developing**, if the student at this level possesses the minimum knowledge and skills and core understandings but needs help throughout the performance of authentic tasks;
- c. **approaching proficiency**, if the student has developed fundamental knowledge and skills and core understandings and, with a little guidance from the teacher and/or with some assistance of peers, can transfer these understandings through authentic performance tasks;
- d. **proficient**, if the student has developed fundamental knowledge and skills and core understandings and can transfer them independently through authentic performance tasks; and
- e. **advanced**, if the student exceeds the core requirements in terms of knowledge, skills and understandings and can transfer them automatically and flexibly through performance tasks.

Table 2 presents the grades in Science of Grade 10 students in the recent quarter. It can be inferred that most (22 out of 30) respondents are advanced with grades of 90 and above, while the rest of the respondents (8 out of 30) are proficient, with grades 85-90. No students got grades under approaching proficiency (80-84), developing (75-79), and beginning (74 and below). The mean suggests that generally, the students' grades fall within the scale of proficient and advanced category.

Table 3. Relationship between Online Readiness and Grades (n=30)

Variables	Pearson r	Sig. value	Interpretation	Decision to Ho
Online Readiness*Grades	0.011	0.953	Not Significant	Accept

$\alpha = 0.05$  Level of Significance

Based on the correlation test result, the value of r is equal to 0.011 with a probability value (0.953) greater than the alpha (0.05). This suggests that there is no positive association between the online learning readiness of the students and their e-learning engagement measured through their grades. This implies that students can cope with their

lessons and get high grades independent from their readiness to online learning.

Nevertheless, it is helpful to note what Rodgers (2008) has found out in his study. He concluded that to improve teaching effectiveness and academic achievement, developing e-learning teaching strategies that encourage greater engagement should be considered.

Remarkably, the study of Narca & Caballes (2021) revealed that several strategic activities such as report enhancement, online debates, virtual experiments, discussion and updating of recent findings, and the creation of infomercials can increase students' engagement in online learning.

#### IV. CONCLUSION

The goal of this study is to determine how prepared and engaged Grade 10 students were for online learning during the pandemic at a science high school. According to the findings, the majority of students are prepared for online learning. Expectations, learning preferences, and technological proficiency are some of these. On the other hand, it's important to improve students' abilities to take initiative in their own learning and be provided of the necessary hardware and software to support their learning. Additionally, the students' engagement in online learning, as indicated by their grades, is at the proficient and advanced level. Finally, there is no significant relationship between the respondents' online learning readiness and e-learning engagement. This implies that regardless of their readiness in online learning, students are capable of handling their tasks and get high grades.

In this light, the researchers recommend the following:

1. The Department of Education could organize or start discussions/talks on how to improve students' self-direction in learning. The students online learning readiness can be improved by doing this.
2. The government should look into ways to support online teaching and learning, such as by providing students with the tools they need to succeed in the new form of instruction.
3. Future studies can be conducted in parallel with students in regular high schools to determine whether the results from different respondents differ significantly.

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