E-LEARNING: ASSESSMENT OF THE INFORMATION COMMUNICATION TECHNOLOGY LITERACY OF SENIOR HIGH SCHOOL STUDENTS ENROLLED IN MODULAR DISTANCE LEARNING MODALITY

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ABSTRACT

The evolution of technology helped people in many ways particularly the productivity and education made easier and more accessible for learners. This study aims to assess the information communication technology literacy of senior high school (SHS) students under the modular distance learning (MDL) modality in Cavite National High School-Senior High School. The study used a quantitative research approach, specifically the descriptive research design which is meant to assess the technology literacy of the respondents. Through simple random sampling and stratified random sampling, the researchers conducted the study on Grade 12 students taking Cascading Style Sheet (CSS), Electrical Installation and Maintenance (EIM), Home Economics (HE), Technical Drafting (TD), Arts and Design (AD), Accountancy, Business, and Management (ABM), Humanities and Social Sciences (HUMSS), and Science, Technology, Engineering, Mathematics (STEM. Upon determining the passing score for the questionnaire, the researchers concluded the percentage of Grade 12 students enrolled in modular distance learning modality, which is 53%, are technology literate in using Microsoft Word, 54% that are technology literate in using Microsoft Excel, and 57% are technology literate in using Microsoft PowerPoint. Moreover, The Science, Technology, and Mathematics or STEM strand have the most number of students who answered the questionnaire, with a percentage of 32%. The Technical Drafting or TD strand has the least number of students who answered the questionnaire, with a percentage of 0.4%. The researchers calculated the percentage of information and communication technology-literate students within the STEM strand. The result shows that 76% of students from the STEM strand passed the assessment. Therefore, 76% of the STEM students are technology literate.

Keywords: Technology, Literacy, Literate, Modular

1. INTRODUCTION

Learning Using Technology

Students in the modern world are mostly technically savvy which they can use in preparation to take a role and contribute information to society, according to Martinez (n.d.).Reed (2018) researched that the quality and amount of Pc programs have expanded significantly that their utilization is now inescapable in k-12 classrooms. Different survey articles taking a gander at the present status of mixed learning research across different times of understudies and settings have discovered critical beneficial outcomes. The survey conducted by the researchers showed seven investigations in optional schools that utilized a detailed exploration plan that fits for evaluating the adequacy of mixed learning.Furthermore, he defined electronic books as a reading material that needed internet and can be delivered via Pc, tablets, and computers. In accordance, the researcher confirmed that students are most often observed sitting in front of the laptop wearing headphones and listening to the audio of the book or articles being read to them. This activity does not make learners to responsible for reading. The researcher believed that the use of a digital circular program helps the teachers and students to read instruction and reading disabilities. The use of educational software and digital tools gives people improved efficiency. Nonetheless, replacing formal printed books with the digital format cannot be guaranteed to be used wisely.

2. TECHNOLOGY AND LITERACY SKILLS

As reported in the University of Texas Arlington Online (2015), students could use technology to develop their literacy skills in different educational settings. Using technology, students could mix different kinds of media that could mold a new form of education.Turner and Katic (n.d.) stated that in nonlinear environments, there are many forms of technological information and it is possible for new strategies that can more closely match naturalistic and authentic to learning. The use of technology by the students no longer seemed like a translation challenge. Rather, in,

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around, and with this nonlinear setting, writing took place. It is likely that by using this new literacy they have learned, the more students use such non-linear structures, the more their fluency will continue to increase, and the more they will look to achieve other writing tasks.

Information Communication Technology and the Students' Academic Performance

In recent decades, we have been confronted by rapid changes in ICT. The worldwide web integration into everyday life has also had new and major implications for education. In the investigation of Alkan and Meinck (2016), the association between the usage of ICTs for social communication by students and the computer and information literacy (CIL) values was examined. Based on the definition of Pratt (2019), ICT is all about all devices, applications, systems so that people can interact in the digital world. They stated that ICT affects the economic and business growth. Also the society, they said that people are now more likely to interact digitally than face to face. ICT has been an essential innovating and efficient source for numerous sectors worldwide. Informing and communication technology (ICT).

In the education sector, the application of ICT is very crucial for students both outside and inside. The classroom in the learning process. In Basti, Alandejani, and Almadani's study (2018), They examined the application by universities of ICT. And the effects it has on the academic performance of university students. They also explored the impact on the relationships between ICT and academic achievement of gender, GPA, and students. As per Ratheesweri K. (2018) ICT helps the students on learning 21at century skills, also ICT makes the lessons of the teachers attractive to the students and may be used to any level of education. As for the study of Ghaznavi, Keikha, and Yaghoubi (2011) they come up with a conclusion that using ICT in their studies will greatly improve the educational motivation of the students, improve research skills, and can help in raising grades. Wu (2021) stated that using ICT has made a sustainable education for the students. With the help of ICT the students became more aware and more responsible. Button, Harrington, Belan(2014) test nursing students the relationship of E-Learning and use of ICT. When it comes to getting work in the modern age, knowledge, and use of ICT has nearly become a must. The study by A Infante-Moro, J Infante-Moro, and Gallardo-Perez (n.d.) intended to research the importance of ICT skills acquired for future professional development and the field they have above. They found out that with the use of ICT, students were able to progress, and equip learning skills that are needed in giving evidence based care.

3. METHODOLOGY

This chapter presents the method used by the researchers to assess the information and communication technology literacy of Grade 12 students under the modular distance learning modality in Cavite National High School. This chapter discusses the research design, the participants of the study, the research setting, and the research instruments used in this study.

Research Design

The study used a quantitative research approach, in line with this is the descriptive research design. Descriptive was used to determine information and communication technology and its importance to education. With survey research, the researchers were able to input the necessary questions to get answers related to the study. Also, respondents were able to read precise questions related to the topic with given choices for them to choose. The descriptive research design was used to assess the technology literacy of senior high school students under the modular distance learning modality.

Research Setting

Students of Cavite National High School - Senior High School are instructed to do online or modular distance learning where both modalities were done inside the house because of the pandemic. Hence, this research study will be conducted inside the house, whether it is located inside or outside Cavite City.

Sample and Sampling Techniques

The researchers used Simple Random Sampling to allow for members of the population to have an equal chance of being selected as a member of the sample. Hence, the researchers assigned a number to all members of the sample, and researchers selected a predetermined number by using a table. The researchers also used Stratified Random Sampling to ensure the diversity of the sample. The students in Cavite National High School - Senior High School were divided into strata or subgroups. These subgroups are the different strands the students are currently taking. These strands are Cascading Style Sheet (CSS), Electrical Installation Maintenance (EIM), Home Economics (HE), Technical Drafting (TD), Arts and Design (AD), Accountancy, Business, and Management (ABM), Humanities and Social Sciences (HUMSS), and Science, Technology, Engineering, Mathematics (STEM). From these subgroups, all students from grade 12 students will be randomly sampled.

Data Collection Procedure

Before the researchers distribute the link of the survey questionnaire in Google Forms, a letter of approval was sent to the subject advisor. Once it was approved, the researchers asked the class advisors of Cavite National High School for their approval to conduct the survey. The researchers sent the link to the survey questionnaire to the class advisors after. The class advisors will forward the link to their class group chat in the Messenger application with senior high students enrolled in modular distance learning. The survey questionnaire was open for five working days.

The questionnaire consists of two parts. The first part is about the profile of the respondent. It includes the student's name, strand, and the device they use for learning. The second part of the questionnaire contains questions that will assess the literacy of the students. It is divided into three levels of difficulty which are easy, medium, and hard. The questions are about the use of Microsoft Word, Microsoft Excel, and Microsoft PowerPoint.

Statistical Treatment

The collected answers of the respondents were compiled in google forms. To know the reliability of the questionnaire, it underwent item analysis. The researchers did an item analysis on 250 Grade 12 students enrolled in modular distance learning. Their scores were input in a Google spreadsheet. 27% of 250 MDL students who got higher and lower scores were chosen by the researchers. Their answers were analyzed to determine which question they found hard or easy. With this, the researchers were able to identify which questions should be rejected, retained, and revised.

The data gathered from the Grade 12 students enrolled in modular distance learning modality were shown and summarized in the google forms. The summary of scores and the answers in every number was interpreted in graphs. To get the passing score of the students, the raw score was divided by the total score and the quotient was multiplied by 100.

4. RESULTS AND DISCUSSION

This chapter presents the data gathered by the researchers from the respondents that will determine the information and communication literacy of Grade 12 students under modular distance learning modality. This chapter discusses the figures and tables showing the result of the assessment and item analysis.

**Item Analysis**

Table 1. Results of the Item Analysis

Item No.	Upper 27%		Lower 27%		Difficulty Index	Discrimination Index	REMARKS * Rejected **Retained ***Revised
1	64	0.65	33	0.33	0.49	0.31	**
2	68	0.69	47	0.47	0.58	0.21	**
3	67	0.68	46	0.46	0.57	0.21	**
4	65	0.66	36	0.36	0.51	0.29	**
5	68	0.69	39	0.39	0.54	0.29	**
6	62	0.63	26	0.26	0.44	0.36	**
7	48	0.48	26	0.26	0.37	0.22	**
8	66	0.67	39	0.39	0.53	0.27	**
9	68	0.69	62	0.63	0.66	0.06	*
10	68	0.69	64	0.65	0.67	0.04	*
11	65	0.66	30	0.30	0.48	0.35	**
12	67	0.68	35	0.35	0.52	0.32	**
13	62	0.63	39	0.39	0.51	0.23	**
14	58	0.59	39	0.39	0.49	0.19	*
15	47	0.47	17	0.17	0.32	0.30	**
16	42	0.42	22	0.22	0.32	0.20	**

17	66	0.67	41	0.41	0.54	0.25	**
18	54	0.55	29	0.29	0.42	0.25	**
19	64	0.65	43	0.43	0.54	0.21	**
20	68	0.69	45	0.45	0.57	0.23	**
21	68	0.69	28	0.28	0.48	0.40	**
22	52	0.53	29	0.29	0.41	0.23	**
23	22	0.22	15	0.15	0.19	0.07	*
24	52	0.53	30	0.30	0.41	0.22	**
25	20	0.20	29	0.29	0.25	-0.09	*
26	65	0.66	35	0.35	0.51	0.30	**
27	68	0.69	41	0.41	0.55	0.27	**
28	50	0.51	34	0.34	0.42	0.16	*
29	63	0.64	28	0.28	0.46	0.35	**
30	61	0.62	43	0.43	0.53	0.18	*
31	54	0.55	35	0.35	0.45	0.19	*
32	65	0.66	34	0.34	0.50	0.31	**
33	65	0.66	25	0.25	0.45	0.40	**
34	40	0.40	14	0.14	0.27	0.26	**
35	66	0.67	35	0.35	0.51	0.31	**
36	56	0.57	35	0.35	0.46	0.21	**
37	61	0.62	38	0.38	0.50	0.23	**
38	65	0.66	24	0.24	0.45	0.41	**
39	37	0.37	12	0.12	0.25	0.25	**
40	68	0.69	35	0.35	0.52	0.33	**
41	66	0.67	38	0.38	0.53	0.28	**
42	66	0.67	44	0.44	0.56	0.22	**
43	38	0.38	34	0.34	0.36	0.04	*
44	58	0.59	20	0.20	0.39	0.38	**
45	60	0.61	23	0.23	0.42	0.37	**
46	66	0.67	42	0.42	0.55	0.24	**
47	36	0.36	26	0.26	0.31	0.10	*
48	67	0.68	30	0.30	0.49	0.37	**
49	62	0.63	31	0.31	0.47	0.31	**
50	66	0.67	40	0.40	0.54	0.26	**
51	60	0.61	42	0.42	0.52	0.18	*
52	27	0.27	37	0.37	0.32	-0.10	*
53	65	0.66	19	0.19	0.42	0.46	**
54	44	0.44	39	0.39	0.42	0.05	*
55	37	0.37	18	0.18	0.28	0.19	*
56	52	0.53	20	0.20	0.36	0.32	**

57	67	0.68	34	0.34	0.51	0.33	**
58	62	0.63	33	0.33	0.48	0.29	**
59	50	0.51	16	0.16	0.33	0.34	**
60	64	0.65	35	0.35	0.50	0.29	**
61	68	0.69	22	0.22	0.45	0.46	**
62	15	0.15	32	0.32	0.24	-0.17	*
63	65	0.66	23	0.23	0.44	0.42	**
64	30	0.30	9	0.09	0.20	0.21	**
65	57	0.58	28	0.28	0.43	0.29	**
66	68	0.69	43	0.43	0.56	0.25	**
67	60	0.61	15	0.15	0.38	0.45	**
68	37	0.37	31	0.31	0.34	0.06	*
69	53	0.54	27	0.27	0.40	0.26	**
70	57	0.58	35	0.35	0.46	0.22	**
71	49	0.49	23	0.23	0.36	0.26	**
72	50	0.51	15	0.15	0.33	0.35	**
73	52	0.53	34	0.34	0.43	0.18	*
74	47	0.47	32	0.32	0.40	0.15	*
75	41	0.41	26	0.26	0.34	0.15	*
76	55	0.56	30	0.30	0.43	0.25	**
77	44	0.44	11	0.11	0.28	0.33	**
78	62	0.63	12	0.12	0.37	0.51	**

The table above shows the results of the item analysis. There were a total of 78 questions before conducting the item analysis. The results showed that 59 questions from the questionnaire must be retained while 19 questions must be removed from the questionnaire. The final total number of the questionnaire is 59. The total scores of the respondents in the final screening were computed.

Respondents' Profile
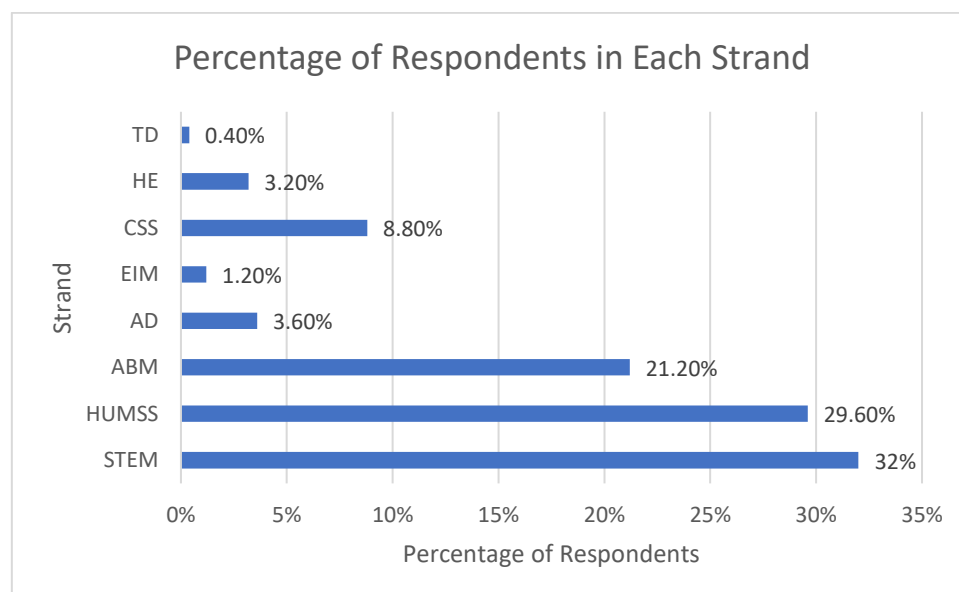
Figure 1. Percentage of Respondents in Each Strand

Figure 1 shows the percentage of respondents in every strand who answered the questionnaire

Device I use for online learning (Check all that applies)
250 responses
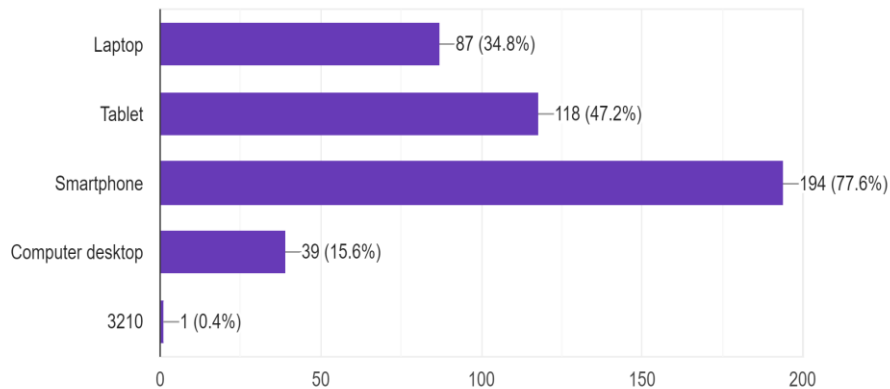
Figure 2. Devices Used by the Respondents

Figure 2 shows the percentage of devices that students use for their learning in this time of pandemic. The device with the most number of users is Smartphone. Next is Tablet with 47.2% then the Laptop device with 34.8%. The device with the least number of users in the options is the Computer desktop with 15.6%. One of the respondents input the device that is not in the options. It is a 3210, a Nokia cellular phone.

Summary of Findings
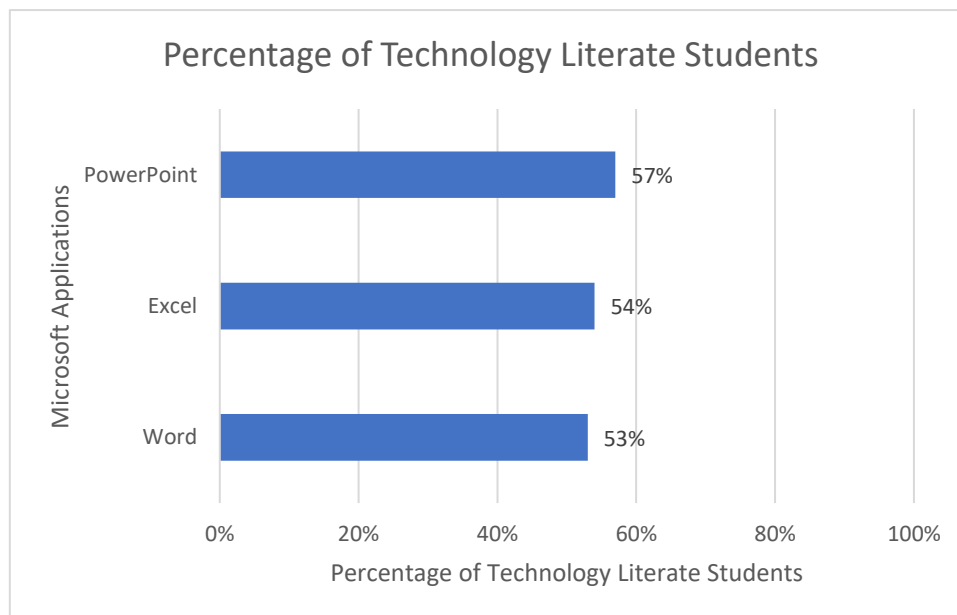
Figure 3. Percentage of Technology Literate Students

Figure 3 shows the percentage of students that are literate in using Microsoft Word, Microsoft Excel, and Microsoft PowerPoint.

There were 27 questions under Microsoft Word. With 250 respondents for each question, there are a total of 6750. The number of students who got correct answers to the questions is 3554. The percentage of Grade 12 students enrolled in the modular distance learning modality that is technology literate in using Microsoft Word is 53%.

There were 16 questions under Microsoft Excel. With 250 respondents for each question, there are a total of 4000. The number of students who got correct answers to the questions is 2175. The percentage of Grade 12 students enrolled in the modular distance learning modality that is technology literate in using Microsoft Excel is 54%.

There were 16 questions under Microsoft PowerPoint. With 250 respondents for each question, there are a total of 4000. The number of students who got correct answers to the questions is 2299. The percentage of Grade 12 students enrolled in the modular distance learning modality that is technology literate in using Microsoft PowerPoint is 57%.

5. SUMMARY

This research study was conducted in order to assess the Information Communication Technology Literacy of Senior High School Students enrolled in Modular Distance Learning Modality. Researchers used Quantitative research approach and descriptive research design to identify how technology literate the respondents. The survey questionnaire used in this research study was self-made and was given to 250 respondents who are in modular distance learning in assessment form. This research study aimed to assess the technology literate of the students specifically in Application Interface under Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. The result of the survey states that the Grade 12 students enrolled in modular distance learning are 53% literate in terms of Microsoft Word, 54% are literate in Microsoft Excel, and lastly, 57% of the students are literate on using Microsoft PowerPoint. On the other hand, the highest percentage which is 32% of the students answered the questionnaire was from the STEM strand, while TD has the lowest percentage of students who answered the questionnaire, with a result of 0.4% which identified what strands show the highest and lowest percentage of technology-literate students enrolled in modular distance learning modality.

6. CONCLUSION

This study generally aims to assess the information and communication technology literacy of Grade 12 students enrolled in the modular distance learning modality. After they answered the questionnaire, the researchers conducted item analysis and computed the students' total scores. After determining the passing score for the questionnaire, the researchers concluded that:

The percentage of Grade 12 students enrolled in modular distance learning modality is:

a. 53% are technology literate in using Microsoft Word.

b. 54% that are technology literate in using Microsoft Excel, and;

c. 57% are technology literate in using Microsoft PowerPoint.

These results indicate that students are more technology literate in using Microsoft PowerPoint. Students are least literate in using Microsoft Word. Therefore, their literacy in using Microsoft Word should be improved.

The Science, Technology, and Mathematics or STEM strand have the most number of students who answered the questionnaire, with a percentage of 32%. The Technical Drafting or TD strand has the least number of students who answered the questionnaire, with a percentage of 0.4%. The researchers calculated the percentage of information and communication technology-literate students within the STEM strand. The result shows that 76% of students from the STEM strand passed the assessment. Therefore, 76% of the STEM students are technology literate.

7. RECOMMENDATIONS

After conducting the study E-learning: Assessment of the Information and Communication Technology Literacy of Senior High School Students enrolled in Modular Distance Learning Modality, the researchers would like to recommend:

- To use this study as a reference for teachers to determine what teaching styles are the best for their students based on their information and communication literacy.
- To test out other grade levels in order to determine the Information and Communication Technology literacy of the students who have not yet taken the subject Empowerment Technologies.
- To test out other modalities other than Modular Distance Learning. Future researchers may test out students enrolled under Online Distance Learning and Blended Learning.
- To conduct a similar study to improve the literacy skills of the students who are information and communication technology illiterate. Future researchers may conduct studies with different methods such as virtual testing of the three software (Microsoft Word, Excel, PowerPoint) or other online applications.

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