Assessing the ICT Skills of Senior High School Students: Basis for Instructional Intervention

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ABSTRACT

This study focused on determining the level of Information and Communication Technology (ICT) skills of Grade 11 Senior High School students at Lorenzo S. Sarmiento Sr. National High School. The main purpose of the study was to assess respondents' levels of ICT skills in maintenance, word processing, spreadsheet, presentation, database, browser, and e-communication, as well as their demographic profile in terms of sex, age, and strand. A descriptive quantitative research design was used in this study, involving the 199 Grade 11 students as respondents. Data were gathered through a structured questionnaire and analyzed using statistical tools such as frequency, percentage, and mean. The findings show that the majority of the respondents were female, mostly aged 15–16 years, and from the HUMSS strand. Results further indicated that the overall level of ICT skills among the respondents was high, with e-communication obtaining the highest mean score, followed by maintenance, browser, presentation, word processing, spreadsheet, and database skills. These findings suggest that the students have the required ICT skills for academic tasks and digital communication. The study recommends continuing to enhance ICT-related programs to further develop students' technological skills.

Keywords: Computer System Servicing, Information and Communication Technology Skills, Instructional Intervention, Philippines

INTRODUCTION

In today's digital age, Information and Communication Technology (ICT) skills are becoming more important in education (Magtoltol and Oropa, 2025). However, globally, students in Africa still struggle due to limited computer resources and insufficient ICT skills (Aruleba & Jere, 2022). This issue is particularly evident in Eritrea, a country in the Horn of Africa, where students lack basic digital technology skills and have limited proficiency in using internet applications to access, share, and communicate information (Elias et al., 2023). Moreover, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 2021 found that about 24% of Albanian adults have at least basic digital skills. This means that the majority of adults (76%) lack even the most basic digital skills, due to the inadequate infrastructure and digital skills in schools.

Information and Communication Technology (ICT) skills in the Philippines, as stated by Limpangog and Caliba (2024), have become an effective instrument for shaping the school environment, growth, and development, and fostering creativity in the quest for academic success. According to the Philippine News Agency (2023), State of the Nation Address (SONA), President Ferdinand Marcos Jr. emphasized that digitalization is crucial to keep the Philippines apace with progress in the world. Furthermore, a study conducted by Magallanes et al. (2024) in Mexico, Pampanga, reveals that learning, teaching, and professional advancement all greatly benefit from the use of ICT applications, highlighting the importance of integrating technological tools and resources into educational settings and professional development.

In Davao Occidental, a study revealed that 80% of senior high school students have limited hands-on experience

with modern ICT applications beyond basic computer use, resulting in low ICT skills (Arrellano & Lumogdang, 2025). Similarly, in Davao del Sur, TESDA Davao Region (2023) reported that students have poor ICT skills due to a lack of hands-on experience with computers and digital tools, which limits their ability to develop these skills. In addition, Davao de Oro, the Department of Science and Technology (DOST) has introduced the STARBOOKS project to provide students and educators with offline access to science and technology, highlighting that many schools are still in the early stages of digital integration (Philippine News Agency, 2025).

Several studies have also highlighted the related issue of ICT skills. For instance, a systematic review of higher education institutions in Sub-Saharan Africa identified that the development of 21st-century skills is restricted by gaps in digital literacy (Ndibalema, 2025). Likewise, in Delta State, Nigeria, a study of senior secondary school students found that although some ICT facilities are available, many students still have low levels of ICT skills, particularly where access to devices and stable internet is limited (Onohwakpor, 2023). However, none of these studies have focused specifically on Lorenzo S. Sarmiento Sr. National High School, leaving a gap in understanding how these ICT skills affect the students there. Therefore, this study is socially relevant because many students struggle to use computers, which they need for school and future jobs. To help solve this problem, this study will implement an ICT intervention to teach students computer skills. This can help students become better prepared for school and their future careers. This study also aims to assess the ICT skills of grade 11 senior high school students here in Lorenzo S. Sarmiento Sr. National High School.

Research Objectives

This research aims to assess the ICT skills of senior high school students as a basis for instructional intervention. This study specifically seeks to address the following objectives:

1. To determine the demographic profile of the senior high school students in Lorenzo S. Sarmiento Sr. National High School in terms of:
   1.1. age;
   1.2. sex; and
   1.3. strand.
2. To identify the level of ICT skills of senior high school students in Lorenzo S. Sarmiento Sr. National High School in terms of:
   2.1. maintenance;
   2.2. word;
   2.3. spreadsheet;
   2.4. presentations;
   2.5. database;
   2.6. browser; and
   2.7. e-communication
3. To propose an instructional intervention based on the findings of the study.

METHODOLOGY

This study used a quantitative, descriptive research design. This type of design is suitable because it does not change or control conditions; instead, it focuses on describing a population, situation, or phenomenon. It helped the researchers determine the actual level of ICT skills among grade 11 senior high school students and how these skills could be improved through appropriate instructional intervention.

This research was quantitative, as it involved collecting and analyzing numerical data using a standardized questionnaire (Sino Cruz et al., 2023). The study employed this design using structured questionnaires to gather measurable data from grade 11 senior high school students. The variable was measured using a standardized

instrument administered using a Likert scale. The collected data were analyzed using statistical tools and were interpreted accordingly.

Moreover, descriptive research is a method used to identify and describe the characteristics of a specific population or phenomenon (Shinija, 2024). Descriptive research provides a snapshot of a particular situation at a given point in time, systematically gathering information without manipulating variables or establishing cause-and-effect relationships (Creswell & Creswell, 2018).

In this study, descriptive research was used to distribute structured questionnaires adapted from a standardized survey developed by Heerwegh et al. (2016). This instrument collected numerical data on ICT skills from grade 11 students across seven domains: maintenance, word processing, spreadsheet, presentation, database, browser, and e-communication. The original instrument had previously undergone content validation and reliability testing. Since the instrument had been validated in prior research, it was deemed appropriate for use in the present study.

Population and Sample

A stratified sampling technique was employed to select the study's respondents. According to Creswell (2014), stratified sampling is a probability sampling technique in which the population is divided into distinct strata based on specific characteristics. The study subjects were 408 grade 11 students from the General Academic Strand (GAS), Science, Technology, Engineering, and Mathematics (STEM), and Technical-Vocational-Livelihood (TVL) strands. Grade 11, senior high school students were chosen as the population because they are at a crucial stage where ICT skills are highly necessary for both academic performance and future career. Among grade 11 senior high students, a total of 408 individuals were selected, and a sample of 199 respondents was selected. The sample size was computed using the Raosoft sample size calculator.

Statistical tools

The statistical tools used for data analysis and interpretation were the following:

Mean. This statistical tool was used to find the average response of ICT skills using a Likert scale.

Frequency and Percentage. This statistical tool was used to describe the respondents' demographic profile and to show how many students had specific ICT skill levels.

RESULT

Demographic Profile of the Respondents

Shown in Table 1 are the results of the demographic profile in terms of sex, age, and strand among grade 11 senior high school students in Lorenzo S. Sarmiento Sr. National High School.

Table 1. Demographic Profile of the Respondents

Demographic Profile	Frequency (n=199)	Percentage (%)
Sex*		
Male	85	42.71
Female	**114**	**57.29**
Total	199	100
Age*		
15-16	**153**	**76.88**
17-18	44	22.11
19-20	2	1.01
Total	199	100
Strand*		
GAS-ABM	23	11.56

GAS-HUMSS	**55**	**27.64**
STEM	14	7.03
CAREGIVING	51	25.63
CSS	28	14.07
AGRICULTURE	28	14.07
Total	199	100

Level of ICT Skills

Shown in Table 2 are the mean scores for the indicators of ICT Skills among grade 11 senior high school students at Lorenzo S. Sarmiento Senior National High School, with an overall mean of 3.68 and a standard deviation of 0.49, indicating a high level. The high level could be attributed to respondents' high ratings across all indicators. This indicates that the respondent's responses to the level of ICT skills are highly positive across maintenance, word processing, spreadsheets, presentations, databases, browsers, and e-communication.

The cited overall mean score was the result obtained from the following computed mean scores from highest to lowest 3.90 or high for e-communication with a standard deviation of 0.75; 3.71 or high for maintenance with a standard deviation of 0.56; 3.70 or high for browser with a standard deviation of 0.69; 3.68 or high for presentation with a standard deviation of 0.63; 3.61 or high for word with standard deviation of 0.62; 3.61 or high for spreadsheet with the standard deviation of 0.58; and 3.58 or high for database with the standard deviation of 0.66.

Table 2. Level of ICT Skills

Indicators	**Mean**	**SD**	**Descriptive Equivalent**
Maintenance	3.71	0.56	High
Word	3.61	0.62	High
Spreadsheet	3.61	0.58	High
Presentation	3.68	0.63	High
Database	3.58	0.66	High
Browser	3.70	0.69	High
E-communication	3.90	0.75	High
Overall	**3.68**	**0.49**	**High**

DISCUSSION

Demographic Profile of the Respondents

Regarding sex, the results indicate that female students comprised the majority of respondents. This distribution may reflect the current enrollment trend in senior high school programs, where female participation is often higher. In terms of age, most respondents were between 15 and 16 years old, which is consistent with the typical age range of Grade 11 senior high school students in the Philippine educational system.

Regarding the academic strand, the majority of respondents were enrolled in the Humanities and Social Sciences (HUMSS) strand. This may suggest that students from this strand were more represented in the selected sample during data collection. The demographic distribution of the respondents provides an important context for understanding the ICT skill levels reported in the study, as students' exposure to technology and academic requirements may vary across strands.

Level of ICT Skills

The overall level of ICT skills of the respondents was described as high. This shows that the students are skilled in using the different tools and programs needed for schoolwork. The widespread use of technology by students, online learning, and the integration of technology into classroom settings may all contribute to the high level of ICT proficiency.

This result aligns with Rasheed et al. (2025), who found that students demonstrated a high level of ICT skills, particularly in communication, information, and collaborative learning. This is also consistent with the result of Burgos et al.'s (2023) descriptive study on students' digital literacy and technology use, which found that learners were capable of essential ICT tasks using communication tools, accessing information online, working with spreadsheets, and creating presentations, all of which were described at a high level. Furthermore, research on digital competences among university students found a positive relationship between years of exposure to technology and performance in digital skills (Pais et al., 2024).

Although the results indicate a high level of ICT skills, schools should continue strengthening students' digital competencies through enrichment activities and advanced ICT training programs. Continuous exposure to technology and structured ICT learning opportunities can further enhance students' ability to apply these skills effectively in academic and real-world contexts.

CONCLUSION

Conclusions are drawn based on the results of the study. This study concludes that the demographic profile of the senior high school grade 11 students of Lorenzo S. Sarmiento Sr. National High School shows that the majority of the respondents were female, mostly aged 15–16 years old, and enrolled HUMSS strand

Furthermore, the study concludes that the overall level of Information and Communication Technology (ICT) skills of the respondents was high, as reflected in all its indicators, namely maintenance, word, spreadsheet, presentation, database, browser, and e-communication skills.

This study is socially relevant as it addresses students' ICT skills. Since the results show that students already have high skills, these findings will be used to create an instructional intervention called "ICT Skills Enhancement and Application Program" that will enhance their ICT skills.

Proposed Enrichment Program

Since the results are already high, the researcher aims to make an enrichment program to help improve the areas that still need to be worked on.

REPUBLIC OF THE PHILIPPINES

REGION XI, DAVAO REGION

LORENZO S. SARMIENTO SR. NATIONAL HIGH SCHOOL

POBLACION, DAVAO DE ORO

"ICT Skills Enrichment and Application Program"

Proposed Enrichment Program

April 2026– June 2026

Activities	Objectives	Beneficiaries	Responsible	Time Frame	Budget
Real-World ICT Project-Based Learning	Apply ICT skills in real-life scenarios (e.g., creating websites, digital portfolios, basic system troubleshooting. Develop teamwork and	Grade 11 Senior High School Students	Researchers, ICT Teachers, and School Administrators	Once a week, every Friday (1:00 pm to 4:00 pm)	1000 pesos per session

	collaboration using digital platforms. Encourage innovation and creativity through technology integration.				
Advanced Digital Productivity Workshop	Enrich students' efficiency in using advanced features of productivity tools (Excel, PowerPoint, and collaborative tools). Strengthen problem-solving Skills using ICT tools. Promote digital organization and workflow management.	Grade 11 Senior High School Students	Researchers, ICT Teachers, and School Administrators	4 times a Month, every Monday	1500 pesos per session
Cybersecurity and Digital Ethics Seminar	Deepen students' understanding of online safety, cybersecurity awareness, and data privacy. Promote responsible and ethical use of ICT.	Grade 11 Senior High School Students	Researchers, ICT Teachers, and School Administrators	Once a Month	5000 pesos (Honorarium for guest speaker)
ICT Skills Competition	Showcase students' high ICT skills through competitions. Motivate learners to further improve.	Grade 11 Senior High School Students	Researchers, ICT Teachers, and School Administrators	Last day of the intervention	7000 pesos (prizes, certificate, and materials)

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