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## Accessibility and ICT Competencies of Grade 10 Students in Mindanao State University at Naawan

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### Abstract

Information and communication technology (ICT) has become an essential part of our lives, transforming the way we learn, work, and play. This study examined how technology, or ICT accessibility, correlates to competencies of Grade 10 students at Mindanao State University's Naawan. Researchers used the National ICT Competency Standard – Basic (NICS – Basic) to assess students' tech skills, access to devices, how they spend their screen time, and how they use technology for learning. The study found unequal access to devices. While most students had smartphones, laptops, computers, and tablets were less common. This "digital divide" could create bigger differences in student learning. There was, however, a positive finding. Many students (spending 41-50 hours a week) use their smartphones for communication and learning apps. This shows that smartphones can be useful for education, even if students cannot access traditional computers. The study also showed that students are good at using different technology applications. They were skilled in using word processing programs, communicating online, researching, creating presentations, and working on multimedia projects. This demonstrates their ability to use technology to improve their learning experiences. The study highlights the significant role technology plays in education. Even though access to devices is not equal, students are still actively using the technology they have to learn. Findings showed a need for programs that ensure all students have access to technology so they can all benefit from its educational advantages.

**Keywords:** ICT Accessibility, Digital Divide, Student ICT Competency, Mobile Learning, Technology and Education

### 1. Introduction

Information and Communication Technology (ICT) is changing quickly, transforming how we live, work, and connect. This rapid change affects all areas of life, including education. It is important to assess students' skills in using technology. It improves teaching, makes sharing information easier, boosts student involvement, and helps with communication. This creates a more inclusive and lively learning environment (García-Valcárcel et al., 2014). For teachers, knowing students' technology skills is very valuable. It helps them understand students' strengths and weaknesses. This knowledge allows teachers to improve their lessons and provide extra help where needed. By measuring students' skills, teachers can see how well their courses are working and make improvements. This study assessed the grade 10 students at Mindanao State University at Naawan Integrated Developmental School in terms of their ability to access devices and how well they use them. The study checked the students' skills and looked at the link between having access to devices and these skills. In conclusion, this study helps students see the importance of technology in their future jobs and gives teachers the information they need to improve their teaching. This way, students can be better prepared for a digital world.

## 2. Literature Review

Information and Communication Technologies (ICT), encompassing devices like radios, televisions, cellphones, computers, and internet networks, have fundamentally transformed communication and information access (Kareem, 2017). These technologies encompass not just the hardware, but also the services and applications that utilize them, such as video conferencing and online learning platforms (Kareem, 2017). Within specific contexts, such as education, healthcare, and libraries, ICT plays a crucial role in facilitating the creation, collection, processing, transmission, and storage of information (Ratheeswari, 2018; Khattak, 2019; Margaret, 2023). Modern ICT includes computing devices like servers, laptops, and software applications, alongside wired and wireless communication technologies that support telephones, the Internet of Things (IoT), and even the emerging metaverse (Mir & Shakeel, 2019). Students today are surrounded by ICT, particularly smartphones and laptops (Ghavifekr & Rosdy, 2015). Research has investigated how students utilize these devices in classrooms, exploring their motivations and attitudes toward in-class ICT use. Studies have shown that students are more likely to use ICT for non-academic purposes when feeling bored or disengaged from classroom activities (Timotheou et al., 2022). While acknowledging the potential for distraction, students generally express a dislike for restrictions on device use in class.

Interestingly, they appear receptive to the integration of ICT for educational purposes, suggesting that strategically incorporating ICT into lessons could be a key strategy to enhance student engagement and potentially reduce disruptions caused by non-academic phone or computer use (Timotheou et al., 2022). However, research also reveals a significant disparity in student access to ICT devices (Gastelú et al., 2014). While smartphone ownership is often nearly universal, access to essential devices like laptops, computers, tablets, and printers remains considerably lower. This highlights the presence of a "digital divide" within the student population (Gastelú et al., 2014). The analysis of this disparity further reveals a positive correlation between ICT device accessibility and overall ICT competency. This suggests that students with greater access to devices tend to demonstrate higher skill levels in using them (Gastelú et al., 2014). Interestingly, the correlation is not absolute, indicating that even students with limited access can develop basic ICT skills. These findings underscore the critical role of integrating ICT education into the curriculum, regardless of individual student access levels. Equipping students with fundamental ICT skills is crucial for academic success in today's technology-driven world (Pineida, 2011). Furthermore, the research underscores the need for targeted initiatives to bridge the digital divide within schools. By improving access to essential ICT equipment, such initiatives can foster a more equitable learning environment and empower all students to develop the ICT competencies necessary for success.

### 3.1 Materials and Methods

#### 3.1 Research Design

This study utilizes a quantitative descriptive approach, leveraging surveys to delve into student behavior and thought processes surrounding a particular ICT topic. By

employing this method, the researchers aim to illuminate current trends in student ICT competencies, rather than venturing into predictions about future developments (Lambert V. A., Lambert C. E. 2012). While this approach may not provide an exhaustive examination of the topic (Bradshaw et al., 2017), it offers valuable insights that can contribute significantly to the field of educational technology.

#### 3.2 Participants

The study involved all 122 Grade 10 students at Mindanao State University at Naawan Integrated Developmental School.

#### 3.3 Research Instrument

This study used a survey adapted from a national standard (National ICT Competency Standard - Basic) to measure the students' ICT skills in different areas. This standard helps ensure everyone involved in education and work understands the expected skills. The survey had six sections; (1) Skill Set A: ICT Basics, (2) Skill Set B: Word Processing (3) Skill Set C: SpreadSheet, (4) Skill Set D: Presentation, (5) Skill Set E: Information and Communication, (6) Skill Set F: Computer Security. Each section had 10 questions with answer choices like "Very Skilled" or "Not at All Skilled." Based on their total score, students were categorized into levels like "High Competency" or "Low Competency." Securing approval from the school principal and obtaining informed consent from participants, the study collected data through a survey adapted from the NICS - Basic. The three-part survey assessed student access to ICT devices, obtained consent, and measured ICT competencies using a Likert scale.

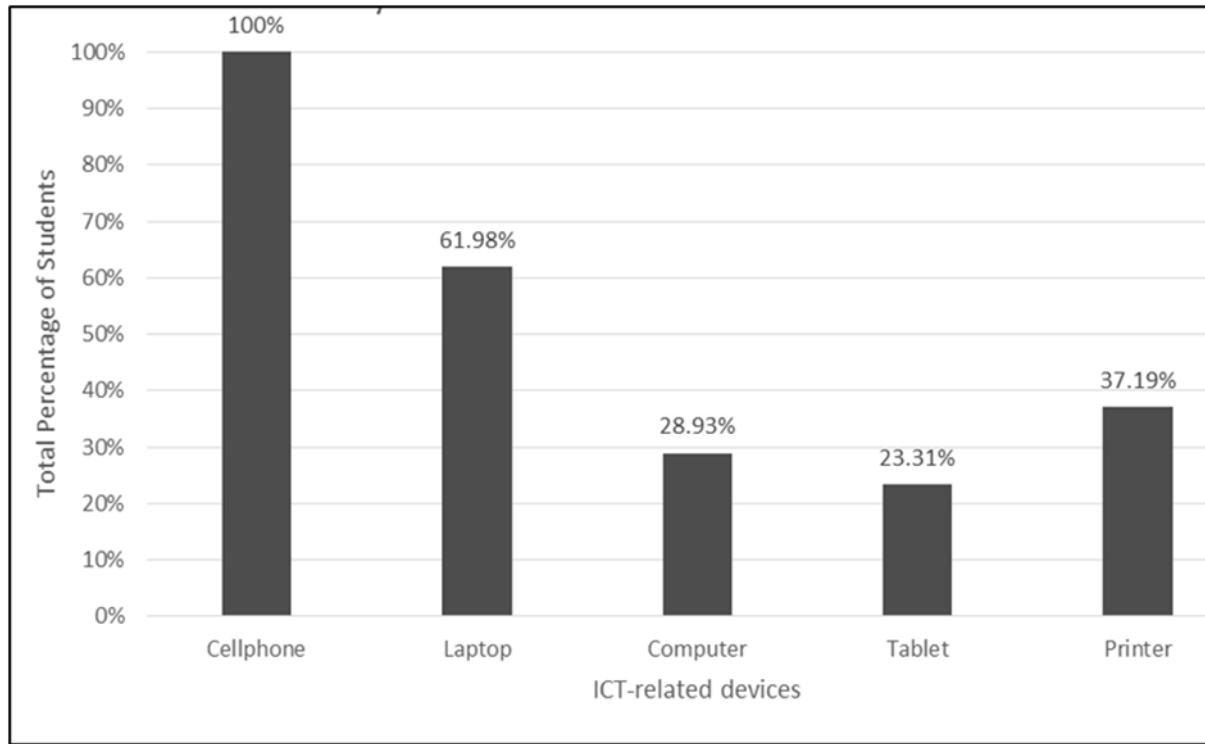
#### 3.4 Data Analysis

Investigated the student survey answers using numbers. For each ICT skill, calculated average scores (typical answer), middle scores (half scored higher, half scored lower), and how spread out the answers were. Likert scale answers were turned into competency levels (Very Low, Low, Average, High, Very High) based on set ranges. The same treatment was done for overall ICT competency by averaging the mean scores for each skill. Finally, checked to see if there was a connection between how much access students had to devices and their overall ICT competency level.

## 4 Results & Discussion

### 4.1 Accessibility of Grade 10 Students on ICT – related Devices

Figure 1 depicts the distribution of Information and Communication Technology (ICT) device access among the Grade 10 student participants. Notably, smartphone ownership stands out as the most prevalent, with a 100% access rate. In stark contrast, access to other devices such as laptops (61.98%), computers (28.93%), tablets (23.31%), and printers (37.19%) is considerably lower. This significant disparity in device access highlights a potential need for targeted initiatives to address the digital divide within the student population. Such initiatives could aim to improve access to essential ICT equipment, fostering a more equitable learning environment.



**Fig. 1:** Percentage Distribution of Accessibility of Grade 10 Students on ICT-Related Devices.

**4.2 ICT Competencies of Grade 10 Students of MSUN - IDS, S.Y 2023 -2024**

**Table 1:** Average Scores of G10 Students in ICT Competency.

Skill Sets	Average Scores	Remarks
ICT Basics	3.4	Average Competency
Word Processing	4.2	High Competency
Spreadsheet	3.4	Average Competency
Presentation	3.9	High Competency
Information and Communication	4.0	High Competency
Computer Ethics and Security	3.6	High Competency

The table includes the average scores of Grades 10 students across various ICT competencies. Based on the collected data, there are several skills set and corresponding values for each skill. The values represent averages and highs for each. To further analyze the data, we can compare the averages and highs for each skill set. ICT Basics has an average of 3.4, Word Processing has an average of 4.2, Spreadsheet has an average of 3.4, Presentation has an average of 3.4, Information and Communication has an average of 4.0, and Computer Ethics and Security has an average of 3.6. We can compare the highs across different sets of skills. For instance, word processing and information and communication scored the highest. This suggests a strong ability among students to handle tasks related to document creation and management, as well as effective communication using ICT tools. The findings also indicated no significant correlation (correlation coefficient of 0.220) between the accessibility of ICT-related devices and ICT competencies among the Grade 10 students (population size of 121). The findings suggest that while there is a relationship between the students’ accessibility of ICT-related devices and ICT competencies, factors such as how students utilize ICT devices and the quality of access may affect the sufficiency to enhance students ICT competency. The findings also emphasize the importance of factors such as digital literacy programs and school

related ICT subjects which improves students ICT competencies.

**5. Conclusions**

This study examined the ICT competency of 122 Grade 10 students at MSUN-IDS and its potential influence on learning. The results hold no significance in the association between ICT competency and learning outcomes, with students having easier access to devices demonstrating higher competency. However, the results also revealed that students developed basic skills even with limited access. These findings underscore the importance of integrating ICT education into the curriculum and highlight the need for initiatives to bridge the digital divide. Future research could delve into specific instructional strategies to enhance ICT education and ensure equitable access to technology for all students.

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