

# Assessing Tertiary Students' Level Of Information-Communication Technology (ICT) Competence: Basis For Maritime Education Management

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## ABSTRACT

In this increasingly connected and worldwide civilization, the world has been pushed to adjust in the next period like never before. Maritime education's future is certainly going to look substantially different from what it did in the past. This study's main objective is to gauge the maritime students' degree of Information-Communications Technology (ICT) proficiency at one of the Philippines' higher education institutions in Zamboanga City. The study used a quantitative-descriptive design and a five-point Likert scale adapted from Infante-Moro's (2019) research to address the research topics. With representation from every year level, 94 respondents were chosen using stratified random sampling. According to this survey, the ICT proficiency of maritime students is very high. The use of ICT for communication produced the highest mean among the ICT components assessed, indicating that maritime students are proficient in it. With these conclusions, the study suggests that the College of Maritime Education may continue to teach the current curriculum, which focuses on developing the ICT abilities of upcoming seafarers because these skills are already essential.

**Keywords:** Information-Communications Technology, ICT Competence, Maritime Education Management, curriculum, seafarers.

## INTRODUCTION

Numerous social, economic, and cultural shifts have taken place in society over the past decade. Because of technological breakthroughs, information, and communication technologies (ICTs) are now employed in every area of human existence. As the digitization process has advanced, so has the demand for digital-related capabilities. University students are expected to have the necessary digital abilities to meet the demands of a changing educational approach as well as the challenges of the future employment environment. Education, and consequently the students who will make up that society's future workforce, must reflect the significant role of ICT in today's society and labor market. In order to determine the information that students already possess and the training

that they require, it is essential to conduct an assessment to learn about the ICT aptitude that they have been trained in as well as the importance that they place on each of these abilities.

After the World Health Organization (WHO) proclaimed the new coronavirus (COVID-19) upsurge a global pandemic in 2020, challenges of digital competence became more relevant. Since then, traditional education has been disrupted in response to COVID-19 which led to an adoption of an online educational model (Schleicher, 2021). Moreover, the expansion of the pandemic has hastened the incorporation of technology into education, and crisis e-current learning's shape is the product of new digital skills, knowledge, and attitudes. Current events have brought to light the flaws in the global education system, as well as the implications of the digital divide on education. The relevance of digital proficiency at all school attainment has gained considerable awareness in the previous year. (Portillo et. al 2020, Sanchez-Caballe et. al (2020) & Zhao et. al (2021).

The country's oldest educational curriculum is maritime education, according to a 1992 news article, which was supported by the country's geographical characteristics. The Philippines has a coastline that is 235,973 square kilometers longer than the United States with 7,107 tide-dependent islands and islets. Given this information, it may be assumed that our predecessors utilized boats and other types of water transportation to travel between islands. As a result, marine navigation is ingrained in Filipino culture and history especially to the young generations.

Maritime Education is one of the higher education programs that suffered the most. The maritime program in the Philippines is one of the most well-known college degrees for male students who desire to go overseas for greater salaries, as stated by Laguador (2019). According to enrollment statistics from the Commission on Higher Education for the 2018–2019 academic year, the Maritime program has 87,960 students enrolled as of June 30, 2019, or 2.7%, of the 3,212,542 students who were enrolled across all levels and programs of all HEIs in the Philippines. These students ranged from pre-baccalaureate to PhD degrees. Given the amount of students enrolled, it has placed as the seventh discipline group overall. In 2018, 17, 634 graduates from the maritime field, or 2.35 percent of all graduates, graduated.

The nation's maritime education passed through phases of transformation, from its difficult beginnings to its current position of affluence. Universities and training centers have therefore been compelled to accept and address this issue. Therefore, in addition to seeing this technology incorporated into management processes, it also needs to be integrated into the teaching processes, both through the integration of learning, instructional strategies' instruments, and utilization of information and communications technology tools, which, in addition to their academic programs, will be employed in the labor market (Dave, 2019 et. al). A maritime student must acquire ICT knowledge and proficiency in order to achieve this skill. Information and communication technology (ICT) is a crucial component of the global maritime industries as well as maritime educational

institutions that presents new opportunities as well as difficulties (Hersham, 2003; 2003 Constantinescu).

The objective of this research is to look at how important students think learning ICT skills will be for their professional success in the future and the authority they will hold over them. Because of this, this study is mainly concentrated on universities and their programs for developing technical proficiency and competency in their students. It is in this light that the researcher was motivated to pursue this study as a basis for the Maritime Education Management. As a school administrator, the researcher believed that the study's result could serve as a baseline on future revisions and enhancement of the Maritime Education curriculum.

## **RELATED LITERATURE AND STUDIES**

### **Information-Communication Technology**

In the present state of information technology (IT) based education, there are numerous major contrasts between various forms of remote learning, including e-Learning, web-based, digital or Internet-based learning, Cloud-based, and hybrid learning. According to Zhao, Gómez, Llorente, and Liping Zhao's study from 2021 on students' opinions of digital competence, students had good perceptions of their ability to use technology safely, communicate and collaborate effectively, and read and understand information and data. Furthermore, utilizing the DigComp framework-based assessment, substantial disparities in learners' self-perceptions of digital competency were discovered in terms of gender, grade level, residence area, and prior relevant training.

According to Sharma & Nazir (2021), the technological advancements of the twenty-first century are causing global shifts in the educational dynamics and its implementation. Technology advancements in information and communication has led to the creation of educational solutions that permit the widespread distribution of material and provide distinctive opportunities for discussion and collaboration when consuming that content (ICTs). The marine sector has incorporated current ICTs and learning sciences innovations using e-learning, simulator-based learning, distant learning, and other efforts. (Kitada et. al ; 2017 & Boulougoris et. al; 2019). Virtual and augmented reality as well as artificial intelligence are two more recent breakthroughs that hold great potential for marine training and education (Mallam et. al ; 2019 & Sharma et. al, 2021).

However, teachers and instructors, who frequently are accountable for achieving the learning objectives outlined in educational programs, are responsible to some extent for the use of any technology or its incorporation into classrooms (Bitner, 2002). Even though the use of dispersed learning solutions has significantly increased in recent years, traditional hierarchical learning

solutions, in which education and training are facilitated in an institution and refined by instructors, remain relevant for the vast majority of marine operations.

Therefore, it is important to keep in mind that information technologies should only be employed when they can speed up students' learning of abstract course material and that excessive use of these tools might harm a person's capacity for conceptual thought. Information technology specifically make it easier to study difficult subjects, however not all students find education to their liking (Li et al (2012)). Considering everything said above, it is important to worry about the issue of educating teaching personnel (in maritime educational institutions in particular) for thoughtful ICT usage when teaching various courses.

### **Maritime Education**

The International Maritime Organization has identified maritime education and training as one of the industry's six foundations (2015). The maritime industry plays an important role in the global economy because it makes it easier to trade and move goods and services between continents. Due to the presence of significant maritime clusters in the region, which have traditionally aided in the exchange of information, collaboration, research, and the advancement of marine technology, the European region has long been recognized as having a substantial impact on the maritime sector.

Over the last few decades, the Philippines has set the standard, with Filipinos accounting for 25% of all marine posts worldwide in the maritime business, making maritime curriculum one of the most popular courses in the country (Tinig ng Marino, 2000). Maritime Education is reportedly among the finest in the Asia-Pacific area and even the entire globe, according to a 2006 article. This is a profitable area that attracts workers from other Asian countries. This is clear from a research conducted in 2001 under the auspices of the Philippine APEC Study Center Network that compared the marine and nursing curricula of the nation, paying particular attention to best practices.

Modern marine education is equipped with a number of changes and advances, as well as technical breakthroughs. Global marine institutions must enhance their facilities and teaching to meet the needs of the internationalization and globalization processes. It is clear that today's maritime schools are producing seafarers who uphold the highest standards of professionalism and competence in their work at sea. According to Section 36 of CHED Memorandum #51 from 1997 (Article 13, Quality Standard System), "recognizing that Filipino seafarers shall be globally competitive in compliance with the 1995 Amendments to STCW'78 and other international laws and conventions," they must produce graduates with sufficient language proficiency and communication skills. To meet the quality standards, the school's facilities, equipment, and teaching skills will be upgraded using high-quality instructional materials (Navarro et al.)

Ramirez (2009) discussed the distinctive features of maritime curriculum in the country, concentrating on a marine bachelor's degree's general education, specialized courses, and one-year apprenticeship components; English as the instructional language; and the necessity of emphasizing on character and morals for students who serve in both domestic and international settings. Discipline, diligence, and collaboration are essential characteristics of Filipino soldiers, and the culture of the Philippines upholds these values.

In the press release, PIDS used this research study to show how well-known the country's maritime education system is. According to the findings of the Seafarers International Research Centre (SIRC) study conducted in 2003 and 2005, there are a large number of Filipino seafarers working on different ships all over the world. For the record, just 8.5% of the officers were senior, 21.5% were junior, and 70% were ratings. In the same study, it was reported that the proportion of junior officers had decreased significantly from 24% to 11% from the poll conducted in 2000. However, its considerable market share has unquestionably remained a crucial factor in the marine labor supply-demand equation.

The marine labor force and industry are now dealing with a number of difficulties. In February 2006, a comprehensive marine labor convention was agreed by the International Labour Conference's Maritime Session. In many aspects, this technology represents a huge advancement. In terms of form, content, and amendment processes, it is quite innovative compared to earlier international labor standards. It also includes a comprehensive maritime labor legislation that is meant to safeguard more than 1.2 million seafarers worldwide. Many prior standards have had to be revised as a consequence of the marine industry's significant structural changes over the past 25 years, particularly as a result of the globalization of its operations and workforce. In the field of maritime education, there is no exception to the awareness of the effects of change on international maritime education.

## **RESEARCH QUESTIONS**

1. What is the over-all level of Information-Communication Technology (ICT) competence of the Maritime Students of Zamboanga Peninsula Polytechnic State University?
2. What is the level of Information-Communication Technology (ICT) competence of the tertiary students in terms of the following components:
  - a. using mobile devices and operating systems
  - b. using ICT for getting and organizing information
  - c. using ICT for communication

- d. ICT and digital responsibility
  - e. using ICT for creative and original works?
3. Does students' year level significantly influence their ICT competence?

## METHODOLOGY

The purpose of this case study was to determine the level of information-communication technology competence of the Maritime students as basis for maritime education management. The study specifically seeks to identify as well the level of Information-Communication Technology (ICT) competence of the tertiary students in terms of using mobile devices and operating systems, using ICT for getting and organizing information, using ICT for communication, ICT and digital responsibility and using ICT for creative and original works. This study also look into the correlation between the students' year level and their ICT competence. This quantitative-descriptive study utilized a five-point likert scale adopted from the study of Infante-Moro (2019) was used to answer the research questions. The 94 respondents were chosen using the stratified random sampling with representation from the every year level. Table 1. below was also used to describe the level of ICT competence of the respondents based on the tabulated mean.

Table 1. Matrix for the interpretation of the respondents' Level of ICT Competence

Mean	Description	Interpretation
0 – 1.0	Strongly Disagree	Very Low
1.01 – 2.0	Disagree	Low
2.01 – 3.0	Undecided	Average
3.01– 4.0	Agree	High
4.01 – 5.0	Strongly Agree	Very High

## RESULTS AND DISCUSSION

### THE DEMOGRAPHIC PROFILE OF RESPONDENTS

The total number of maritime students surveyed is ninety five (94). Majority or 36.18% of the students are First Year and 31.91% each are from Second Year and Third Year.

**Table 1. Respondents Classification based on Year Level**

Year Level	Frequency	%
<b>First Year</b>	34	36.18%
<b>Second Year</b>	30	31.91%
<b>Third Year</b>	30	31.91%
<b>Total</b>	<b>94</b>	<b>100%</b>

### On the Information-Communication Technology (ICT) Competence Level

Table 2 shows the overall competence level in ICT. The result reveals that the weighted mean of the Over-all Competence Level in ICT of maritime students is **3.92**. This means that they possess high level of ICT competence. (supporting)

**Table 2. Overall Competence Level in ICT**

	Mean	Adjectival Interpretation
<b>Overall competence level in Information-Communication Technology (ICT)</b>	<b>3.92</b>	<b>High</b>

Table 3. shows the competence level in ICT in terms of Using Mobile Devices and Operating Systems, Using ICT for Getting and Organizing Information, Using ICT for Communication, ICT and Digital Responsibility, and Using ICT for Creative and Original Works. When the weighted mean was computed for each competence level, the result reveals that the competence level in using ICT for Information attained the highest mean of 4.02 with an adjectival interpretation of Very High. While the competence level in Using Mobile Devices and Operating Systems, ICT and Digital Responsibility, Using ICT for Getting and Organizing Information and Using ICT for Creative and Original Works acquired an adjectival interpretation of High with a weighted mean of 3.98, 3.94, 3.88, and 3.77 respectively. It can be gleaned from the table that using ICT for communication manifested the highest mean which explain that the Maritime Students made use of ICT to express their thoughts and communicate with their teachers and peers.

**Table 3. Competence Level in ICT in terms of Using Mobile Devices and Operating Systems, Using ICT for Getting and Organizing Information, Using ICT for Communication, ICT and Digital Responsibility, and Using ICT for Creative and Original Works**

	Mean	Level of Competence
<b>Using Mobile Devices and Operating Systems</b>	3.98	High
<b>Using ICT for Getting and Organizing Information</b>	3.88	High
<b>Using ICT for Communication</b>	4.02	Very High

<b>ICT and Digital Responsibility</b>	3.94	High
<b>Using ICT for Creative and Original Works</b>	3.77	High

Table 4 presents the students' year-level influence on ICT competence level. When data were analyzed using one-way Analysis of Variance (ANOVA), the result reveals that there is a significant difference between the ICT Competence Level and Students' Year Level showing a probability value of 0.001. Furthermore, post-hoc analysis using Scheffe was also done for the multiple comparisons. Its shows that First Year, Second Year and Third Year Students are significantly different from one another. This implies that the student's year level significantly influences the ICT competency of the maritime students.

**Table 4.** Students' Year-Level Influence on ICT Competence Level

	Students Year Level	p-value	Interpretation
<b>ICT Competence Level</b>	First Year	.001	Significant
	Second Year		
	Third Year		

\*significant at 0.05 alpha level

### Multiple Comparisons

Dependent Variable: Competency Level

Scheffe

(I) Year Level	(J) Year Level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1st year	2nd year	-.75176*	.11699	.000	-1.0429	-.4606
	3rd year	-.34776*	.11699	.015	-.6389	-.0566
2nd year	1st year	.75176*	.11699	.000	.4606	1.0429
	3rd year	.40400*	.12059	.005	.1039	.7041
3rd year	1st year	.34776*	.11699	.015	.0566	.6389
	2nd year	-.40400*	.12059	.005	-.7041	-.1039

\*. The mean difference is significant at the 0.05 level.

### CONCLUSION AND RECOMMENDATION

This study found out that the Maritime students' level of ICT competence is high. Among the ICT components being tested using ICT for communication yielded the highest mean which manifested that the Maritime students have a very high competence on it. The result also reveals that there is



a significant difference between the ICT Competence Level and Students' Year Level. Its shows that First Year, Second Year and Third Year Students are significantly different from one another. This implies that the student's year level significantly influences the ICT competency of the maritime students. The world has been forced to adapt together in the following period like never before in this highly interconnected and globalized society. The future of Maritime Education will likely look very different than it did before. There are important benefits to this change but there are significant challenges that need to be addressed if the future and continuing use of technology in maritime education is to be effective, resilient and have a positive impact on students, educators and the maritime domain as a whole. With these findings, this study recommends that the College of Maritime Education continuously implement the present curriculum which is also focus on harnessing the ICT skills of the future seafarers as this skill is already a must.

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