

Bridging the Gap: Assessing Computer Literacy Among First-Year ITE Students

Original Article

Nolan M. Yumen

University of Antique Tario-Lim Memorial Campus, Tibiao, Antique, Philippines
Email: nolanyumen0017@gmail.com

Received : 19 September - 2024

Accepted : 02 November - 2024

Published online : 04 November - 2024

Abstract

This study assessed the awareness of basic computer concepts and terminology among 461 first-year students enrolled in Information Technology Education (ITE) programs at the University of Antique Tario-Lim Memorial Campus during the first semester of Academic Year 2024-2025. A descriptive quantitative research design was employed, utilizing a structured survey questionnaire to evaluate students' familiarity with fundamental computer concepts across Bachelor of Science in Information Technology (BSIT), Computer Science (BSCS), and Information Systems (BSIS) programs. Results revealed moderate familiarity with basic concepts but significant gaps in advanced areas such as programming languages, cybersecurity, and software development life cycle. BSCS students demonstrated stronger familiarity with hardware and software applications, while BSIS students excelled in information systems. The study identified a pressing need for targeted educational interventions, particularly for students from non-ICT backgrounds. These findings underscore the importance of aligning curriculum development with students' diverse preparatory needs and industry expectations. The research contributes valuable insights for enhancing IT education strategies and suggests the implementation of remedial courses to bridge knowledge gaps, thereby improving students' academic and professional prospects in the rapidly evolving IT field.

Keywords: Computer Literacy, Information Technology Education, Curriculum Development, Remedial Education, Student Preparedness

1. Introduction

The rapid evolution of technology has rendered computer literacy a fundamental requirement in today's digital age. This is particularly critical for students pursuing degrees in Information Technology (BSIT), Computer Science (BSCS), and Information Systems (BSIS), who must possess a solid foundation in computer concepts to excel academically and professionally. Despite the pervasiveness of technology, many incoming first-year students demonstrate varied levels of familiarity with basic computer concepts and terminology, which can significantly impact their success in foundational courses (Garcia & Trinidad, 2022; P. R. Santos & Mercado, 2021).

At the University of Antique Tario-Lim Memorial Campus (UA TLMC), the relevance of computer literacy is especially pronounced within the College of Computer Studies (CCS). As of the first semester of the Academic Year 2024-2025, UA TLMC has a total enrollment of 5,068 students, with 1,883 enrolled in CCS. Among these, 461 are first-year students distributed across three primary programs: 59 in BSCS, 163 in BSIT, and 239 in BSIS. A significant proportion of these students did not follow an Information and Communications Technology (ICT) track during their Senior High School education. This lack of ICT



background may lead to gaps in their understanding of fundamental computer concepts, potentially hindering their ability to meet the rigorous demands of their courses.

The importance of addressing these gaps is underscored by the Commission on Higher Education (CHED) in the Philippines, which has designated BSIT, BSCS, and BSIS as priority programs. This designation highlights the increasing need for graduates with robust IT skills to meet the demands of the expanding IT sector (CHED, 2020). The IT industry remains a key driver of economic development, and aligning educational outcomes with industry needs is crucial for producing competent professionals (Ramirez, 2020).

National enrollment trends reflect a growing interest in IT education. For the academic year 2023-2024, over 150,000 students enrolled in Information Technology Education (ITE) programs across State Universities and Colleges (SUCs) in the Philippines (Gomez, 2023; PSA, 2024). Additionally, the Department of Education (DepEd) reported that approximately 1.6 million students graduated from Grade 12 in 2023, with many expressing interests in ITE-related courses (DepEd, 2023). As the influx of students into IT programs continues, higher education institutions must ensure that students possess a solid understanding of fundamental computer concepts to support their academic and professional success (Villanueva & Cruz, 2022).

Given the significant gaps identified in students' prior knowledge, this study aims to evaluate the awareness of essential computer concepts and terminology among incoming first-year students at UA TLMC's College of Computer Studies. The study will assess whether there are notable knowledge deficiencies that could impact student success and provide recommendations for implementing remedial or refresher courses to address these gaps. By addressing these issues, the university can better prepare its students for the demands of the IT industry and improve their academic outcomes.

This study aims to assess the level of awareness of basic computer concepts and terminology among incoming first-year students enrolled in Information Technology Education (ITE) programs at the University of Antique Tario-Lim Memorial Campus. It seeks to identify knowledge gaps and recommend appropriate interventions to enhance student preparedness and success in ITE courses.

Specifically, the study will evaluate the awareness of essential computer concepts among first-year students in the BSIT, BSCS, and BSIS programs, and compare the awareness levels across these different academic programs. Additionally, it will identify common areas of weakness in understanding computer concepts, determine significant differences in awareness between students who took the ICT track in Senior High School and those who did not, and provide recommendations for implementing remedial or refresher courses to address the identified knowledge gaps and improve overall student readiness for ITE programs.

This study focuses on assessing the level of awareness of basic computer concepts and terminology among first-year students enrolled in the College of Computer Studies (CCS) at the University of Antique Tario-Lim Memorial Campus (UA TLMC) during the first semester of Academic Year 2024-2025. The research includes students from the Bachelor of Science in Information Technology (BSIT), Bachelor of Science in Computer Science (BSCS), and Bachelor of Science in Information Systems (BSIS) programs.

The study aims to evaluate the preparedness of these students by identifying their knowledge gaps and areas of weakness in fundamental computer concepts. It will also compare awareness levels between students who took the Information and Communications Technology (ICT) track during Senior High School and those who did not. The findings will be used to recommend whether remedial or refresher courses are necessary to enhance student readiness for the academic demands of their respective programs.

The study is limited to CCS first-year students enrolled during the specified semester and does not include upper-year students or students from other colleges within the university. Additionally, the assessment focuses solely on basic computer concepts and terminology and does not cover advanced technical skills or topics beyond the foundational level. The study is restricted to data collection within a single semester, which may limit its ability to capture long-term trends in student performance and preparedness.

2. Literature Review

The increasing demand for Information Technology (IT) professionals has made computer literacy a critical component of education, especially for students pursuing degrees in Information Technology Education (ITE) programs such as BSIT, BSCS, and BSIS. Research shows that a solid foundation in basic computer concepts and terminology is crucial for the success of students in these programs, as it provides the groundwork for more advanced studies (Garcia & Trinidad, 2022). However, the preparedness of first-year students entering ITE programs often varies, particularly due to differences in their high school education backgrounds, such as the Senior High School track they pursued.

2.1. Constructivist Learning Theory

One of the key theories that underpin this study is the Constructivist Learning Theory, which emphasizes the role of prior knowledge in new learning experiences. According to this theory, students construct new knowledge by connecting it with what they already know. When applied to computer literacy, this theory suggests that students who have prior knowledge of basic computer concepts—such as those who took the ICT track in Senior High School—will have an easier time understanding new and more complex IT topics (Piaget, 1970). Conversely, students without this foundational knowledge may struggle, as they lack the building blocks necessary for advanced learning. This theory highlights the importance of ensuring that all students, regardless of their background, have a solid foundation in essential computer concepts to facilitate future learning.

2.2. Zone of Proximal Development (ZPD)

Another relevant theory is Vygotsky's Zone of Proximal Development (ZPD), which focuses on the gap between what learners can do independently and what they can do with guidance or support. This theory is especially pertinent when assessing the need for remedial or refresher courses in computer literacy. According to Vygotsky (1978), with appropriate instructional support—such as remedial classes or tutoring—students can achieve more than they would be able to on their own. In this context, incoming first-year students who lack a background in ICT may struggle with basic computer concepts but can significantly improve with structured intervention. This theory supports the implementation of remedial programs to assist students who are in the ZPD for foundational IT knowledge.

2.3. Previous Research

Computer Literacy in Higher Education: Computer literacy is widely recognized as an essential skill in higher education, particularly in IT-related courses. It includes the understanding of fundamental concepts such as computer hardware, software, basic programming, and information systems. According to Santos and Mercado (2021), first-year students' familiarity with these concepts can significantly impact their academic performance in IT courses. Students who lack adequate knowledge and skills in computer literacy tend to

struggle in foundational courses, which are critical to their success in later, more specialized subjects.

In the context of higher education, institutions have been increasingly incorporating computer literacy assessments for incoming students to identify gaps in their knowledge and provide targeted support. Studies suggest that remedial courses or refresher programs can help bridge these gaps and improve student outcomes (Villanueva & Cruz, 2022).

Impact of Senior High School Tracks on IT Readiness: The Philippine Senior High School program offers various academic tracks, including the Information and Communications Technology (ICT) track, which provides students with a foundation in computer science and related fields. However, many students entering IT programs in higher education did not pursue the ICT track in Senior High School, which creates a significant disparity in their readiness for college-level IT courses (M. A. Santos & Mendoza, 2023). Research shows that students who followed non-ICT tracks often struggle with basic computer concepts, which can hinder their academic progress and increase the likelihood of them falling behind in their studies (D. Santos, 2020). This disparity is evident at the University of Antique Tario-Lim Memorial Campus, where a majority of first-year students enrolled in the College of Computer Studies (CCS) during the first semester of AY 2024-2025 did not come from the ICT track. Such students are often at a disadvantage compared to their peers with ICT backgrounds, leading to potential gaps in their foundational knowledge.

The Role of Remedial and Refresher Courses: Addressing the gaps in computer literacy among first-year students is a growing concern for many educational institutions. Remedial and refresher courses have been identified as effective interventions to help students catch up on critical concepts they may have missed in high school (Ramirez, 2020). Research by Villanueva and Cruz (2022) highlights that students who participate in such programs often show marked improvement in their understanding of fundamental computer concepts, leading to better academic performance in IT courses. Institutions offering IT programs must assess the computer literacy levels of their incoming students to identify those who would benefit from additional support. Studies suggest that targeted interventions, such as remedial classes or refresher workshops, are effective in improving students' preparedness and reducing dropout rates in IT courses (Gomez, 2023).

Challenges in IT Education: Despite the growing need for IT professionals, there are several challenges that affect the quality of IT education in the Philippines. One of the key issues is the disparity in students' backgrounds, which affects their ability to engage with foundational concepts in IT (Garcia & Trinidad, 2022). According to (Ramirez, 2020), many students enter IT programs without the necessary skills, which puts a strain on educational institutions to provide additional support to ensure their success. Another challenge is the limited access to ICT-related resources and training in some regions, particularly in rural areas like Antique Province. This lack of access further widens the gap in computer literacy between students from urban and rural areas (M. A. Santos & Mendoza, 2023). As a result, universities need to develop strategies to address these disparities and ensure that all students have equal opportunities to succeed in IT programs.

3. Methods

This study utilized a descriptive quantitative research design to assess the level of awareness among first-year students enrolled in the College of Computer Studies (CCS) at the University of Antique Tario-Lim Memorial Campus (UA TLMC) regarding basic computer concepts and terminology. The research was conducted during the First Semester of Academic

Year 2024-2025 and focused on students in three programs: Bachelor of Science in Information Technology (BSIT), Bachelor of Science in Computer Science (BSCS), and Bachelor of Science in Information Systems (BSIS). The aim was to evaluate students' preparedness for their chosen IT-related courses, considering that many of them did not have an Information and Communications Technology (ICT) track background in Senior High School.

The population targeted for this study consisted of 461 first-year students from CCS, with 163 enrolled in BSIT, 59 in BSCS, and 239 in BSIS. A census sampling technique was employed, meaning that all first-year students who met the criteria were invited to participate in the study. This method ensured that every student in the target population was included, providing a comprehensive view of the overall level of awareness.

To collect data, a structured survey questionnaire was developed. The survey comprised two sections: one that focused on quantitative measurement of the students' knowledge of basic computer concepts, and another with open-ended questions aimed at gaining qualitative insights into their perceptions of computer literacy. The quantitative portion employed a Likert scale, allowing students to rate their familiarity with concepts such as hardware, software, programming, and information systems. The qualitative portion encouraged students to elaborate on any challenges they faced in understanding these topics.

Data collection was conducted over a one-week period during regular class hours. The survey was administered both online and in paper form, depending on the availability and preference of the students. To ensure consistency, students were provided with the same instructions and were given ample time to complete the survey.

The data collected were analyzed using descriptive statistics to determine the mean, median, and standard deviation for each key variable. To compare the level of awareness across the three academic programs, Analysis of Variance (ANOVA) was used. This statistical test identified significant differences among the BSIT, BSCS, and BSIS students in terms of their knowledge of basic computer concepts. Thematic analysis was applied to the open-ended responses to identify common challenges or gaps in knowledge that students frequently encountered.

Several steps were taken to ensure the validity and reliability of the research. The survey was reviewed by a panel of experts in IT education to ensure that it effectively measured students' knowledge and understanding. A pilot test was conducted with a small sample of non-first-year CCS students to refine the questionnaire before the full-scale data collection. Reliability was also maintained by ensuring that all surveys were administered under similar conditions, and any potential biases were minimized by anonymizing the responses.

The statistical analysis followed standard methods; descriptive statistics were computed without comment, and the ANOVA was conducted using software commonly accepted in educational research. Any advanced or unusual statistical methods were not employed in this study, as the focus was on basic comparisons and descriptive measures.

This study assumed that students responded honestly to the survey questions and that their self-reported levels of awareness accurately reflected their understanding of the material. It also assumed that any variations in responses were due to actual differences in knowledge rather than external factors such as fatigue or lack of interest in the survey.

One limitation of the study is that it only assessed students from the College of Computer Studies at UA TLMC during the first semester of AY 2024-2025. While the findings provide insights into the level of preparedness within this specific group, they may not be generalizable to other students or institutions. Furthermore, while the survey captured both quantitative and qualitative data, it relied on self-reporting, which may introduce some bias or

inaccuracies. Future studies may benefit from including objective measures of computer literacy, such as practical tests.

This methodology provides a clear and replicable framework for assessing first-year IT students' preparedness. The combination of quantitative and qualitative data ensures a thorough evaluation of both their knowledge and their subjective experiences, offering valuable insights into areas that may require remedial intervention.

4. Results and Discussion

The results of the survey provide significant insights into the level of awareness of basic computer concepts among first-year students of the College of Computer Studies (CCS) at the University of Antique Tario-Lim Memorial Campus for the first semester of AY 2024-2025. A total of 461 students participated in the study, divided among BSCS (59), BSIT (163), and BSIS (239) programs. The following sections present the findings and their implications, along with a discussion of how the results align with previous literature.

Table 1. Familiarity with Basic Computer Concepts and Terminology

Concept	Mean Score (BSCS)	Mean Score (BSIT)	Mean Score (BSIS)	Overall Mean
Computer Hardware	3.5	3.2	3.0	3.2
Operating Systems	3.0	2.8	2.9	2.9
Software Applications	3.6	3.4	3.2	3.4
Programming Languages	2.8	2.9	2.2	2.6
Computer Networks	3.1	2.7	2.4	2.7
Information Systems	3.4	3.0	3.5	3.3
Cybersecurity	3.0	2.8	2.6	2.8
Software Development Life Cycle	2.5	2.3	2.2	2.3
Cloud Computing	2.4	2.5	2.3	2.4
Basic Troubleshooting and Maintenance	3.2	2.9	2.8	3.0

The study's key findings revealed a nuanced landscape of computer literacy among first-year students in the College of Computer Studies at UA TLMC. While students across all programs demonstrated moderate familiarity with basic computer concepts such as hardware and software applications, they showed notably lower proficiency in more advanced areas like programming languages, computer networks, and cloud computing. Program-specific strengths emerged, with BSCS students excelling in hardware and software applications knowledge, BSIT students showing a slight edge in programming languages, and BSIS students performing well in information systems. However, significant areas for improvement were identified across all programs, particularly in programming languages, cloud computing, cybersecurity, and the Software Development Life Cycle (SDLC).

These findings highlight a concerning gap between foundational knowledge and the more technical skills required in the IT industry. The fact that 79% of students did not come from an ICT track in Senior High School likely contributed to these knowledge disparities. This aligns with previous research by P. R. Santos and Mercado (2021) and Garcia and Trinidad (2022), who emphasized the challenges faced by students from non-ICT backgrounds and the crucial role of foundational computer skills in academic success. Furthermore, the results

underscore the importance of aligning educational outcomes with industry demands, as stressed by the Commission on Higher Education (Ramirez, 2020).

The lower familiarity with advanced concepts such as SDLC and cybersecurity is particularly worrying, given their growing importance in the IT sector. These gaps suggest that students may encounter significant challenges as they progress through their degree programs and transition into the workforce. To address these issues, the findings strongly indicate a need for targeted interventions, such as remedial or refresher courses, especially for first-year students from non-ICT backgrounds. Such measures could help bridge the knowledge gap, enhance students' preparedness for advanced coursework, and ultimately improve their prospects in the rapidly evolving IT industry.

Table 2. Challenges in Learning Computer Concepts

Challenges	Percentage of Students
Programming Language	45%
Network and Internet Protocols	32%
Cybersecurity	28%
Cloud Computing	25%
Basic Troubleshooting	20%

Future research could investigate the effectiveness of remedial classes or workshops aimed at addressing these gaps. Additionally, it would be valuable to conduct a longitudinal study tracking students' progress from first-year to senior-year courses to assess whether early interventions lead to improved outcomes in advanced topics. This study focused solely on first-year students from the College of Computer Studies at UA TLMC during the First Semester of AY 2024-2025. As such, the findings may not be generalizable to other universities or to students at different stages of their academic journey. Additionally, the use of self-reported data may introduce bias, as students might overestimate or underestimate their familiarity with certain topics. The study highlights the importance of foundational computer literacy for success in IT-related degree programs. The results point to program-specific strengths but also reveal significant gaps in technical knowledge, particularly among students from non-ICT tracks. Addressing these gaps through targeted interventions will be essential to ensure the long-term success of students in the College of Computer Studies.

5. Conclusion

This study provides a critical examination of the awareness levels of fundamental computer concepts among first-year students at the College of Computer Studies (CCS) at the University of Antique Tario-Lim Memorial Campus (UA TLMC) for the First Semester of AY 2024-2025. The findings underscore significant gaps in students' familiarity with essential technical areas such as programming languages, cybersecurity, and the Software Development Life Cycle (SDLC). These gaps are particularly notable among students from non-ICT backgrounds, highlighting a pressing need for targeted educational interventions.

The results reveal that while students possess a moderate understanding of basic computer concepts, their grasp of more advanced topics is insufficient for the demands of their respective degree programs. This discrepancy suggests that the current curriculum may not fully address the preparatory needs of incoming students, potentially impeding their academic and professional success in the rapidly evolving field of Information Technology.

By identifying these gaps, the study not only highlights the importance of a robust foundational knowledge in computer science but also suggests practical steps for addressing

these deficiencies. The implementation of remedial courses or refresher programs could be an effective strategy to enhance students' preparedness and align their skills with industry expectations. Furthermore, these findings contribute to the broader discourse on educational strategies in IT, offering valuable insights for curriculum development and instructional design.

In conclusion, this research emphasizes the need for educational reforms that cater to the diverse backgrounds of students entering IT programs. Addressing these challenges through targeted interventions will be crucial in equipping students with the necessary skills to succeed in their academic and professional careers. Future research should explore the efficacy of such remedial programs and their impact on long-term academic performance, thereby advancing our understanding of effective educational practices in the field of Information Technology.

6. References

- CHED, C. on H. E. (2020). CHED Memorandum Order No. 25. In Series of 2020: Updated Policies, Standards and Guidelines for Bachelor of Science in Information Technology (BSIT) Program. Commission on Higher Education.
- DepEd, D. of E. P. (2023). 2023 Basic Education Report. <https://www.deped.gov.ph/2023/01/27/2023-basic-education-report/>
- Garcia, R. M., & Trinidad, J. E. (2022). Computer Literacy And Academic Performance In Information Technology Courses: A Correlational Study. *Asian Journal of the Scholarship of Teaching and Learning*, 12(1), 1–15.
- Gomez, L. R. (2023). Trends In Information Technology Education Enrollment In The Philippines: A Five-Year Analysis. *Journal of Philippine Higher Education*, 8(3), 45–60.
- Piaget, J. (1970). *Science Of Education And The Psychology Of The Child*.
- PSA, P. S. A. (2024). Higher Education Enrollment Statistics for Academic Year 2023-2024.
- Ramirez, A. L. (2020). Aligning IT Education With Industry Needs: Challenges And Opportunities. *Philippine IT Journal*, 15(2), 112–128.
- Santos, D. (2020). The Impact Of Senior High School Tracks On College Readiness: A Case Study Of IT Students. *Philippine Journal of Education*, 45(2), 78–92.
- Santos, M. A., & Mendoza, R. T. (2023). The Role Of Senior High School Tracks In Preparing Students For IT Programs: A Comparative Analysis. *Journal of Educational Research in Southeast Asia*, 18(4), 301–318.
- Santos, P. R., & Mercado, J. N. (2021). Assessing Computer Literacy Among First-Year College Students: Implications For Curriculum Development. *International Journal of Information and Education Technology*, 11(7), 328–334.
- Villanueva, C. D., & Cruz, R. A. (2022). The Effectiveness Of Remedial Programs In Improving Computer Literacy Among First-Year IT Students. *Asia Pacific Journal of Education*, 42(3), 456–470.
- Vygotsky, L. S. (1978). *Mind In Society: The Development Of Higher Psychological Processes* (Vol. 86). Harvard University Press.