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Assessing the Information and Communication Technology Proficiency of the BSOA Students, Philippines

Gateway to Employee-Ready Graduates

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ABSTRACT

This paper aimed to assess the level of Information and Communication Technology Proficiency among BSOA students, as well as the potential barriers that affected their ICT skills, including hardware operations, software processing, information management, digital communication, and data security and privacy. Additionally, it proposed an intervention program to enhance the Information and Communication Technology proficiency of BSOA students. One hundred twelve (112) 2nd to 4th-year students enrolled in the Bachelor of Science in Office Administration (BSOA) program at Camarines Sur Polytechnic Colleges - Buhi Campus were systematically chosen to serve as the respondents. The Descriptive Method was used to attain the objectives. The instrument used in this study was a research-made survey questionnaire for data collection and was interpreted using a weighted mean. The findings revealed that BSOA students' ICT proficiency demonstrates a mixed landscape and exhibits a consistent trend of moderate proficiency in ICT aspects, specifically in hardware operations, software processing, information management, digital communication, and data security and privacy.

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Introduction

In today's rapidly evolving job market, proficiency in information and communication technology (ICT) skills has become a crucial determinant of success for students pursuing a BSOA. As the digital landscape continues to shape the way businesses operate, the ability of administrative students to navigate and harness the power of ICT tools plays an important role in their readiness to step into the professional world. In the workplace, ICT proficiency is essential for enhancing job efficiency by enabling tasks such as document creation, data analysis, and digital communication. This proficiency empowers individuals to manage their responsibilities independently, reducing manual work. Collaboration is facilitated as individuals can simultaneously handle the same document in real time, fostering efficiency. Additionally, technology promotes worker mobility, allowing them to work remotely from various locations as long as there is internet access [1].

The Bachelor of Science in Office Administration program focuses on developing administrative competency through core courses aligned with the CHED Memorandum Order No. 19, Article IV, Section 7 [2]. Emphasizing computer systems and information technology software, the curriculum covers foundational topics essential for academic and practical growth. Key subjects include keyboarding, document processing, integrated software applications, and courses like Web Design and Living in the IT Era. Furthermore, these specialized courses align with industry demands, ensuring that BSOA graduates possess the skills needed to thrive in the evolving landscape of office administration. The program's commitment to staying current with industry trends enhances graduates' readiness for dynamic roles in today's technology-driven workplaces.

In line with the United Nations' Goal 4 for 2030, focusing on inclusive education, ICT skills among youth and adults play a vital role as a key indicator of progress [3]. The International Telecommunications Union (ITU), a UN agency overseeing ICT matters, monitors this indicator within its member organizations. Recognizing the importance of digital skills, the ITU includes them in its Global Digital Connectivity Goals for 2030. This highlights the global priority of ICT proficiency for broader developmental objectives. Despite high social media usage, a Philippine Institute for Development Studies (PIDS) research paper reveals alarming low levels of ICT literacy in the country, especially among the younger and older age groups [4]. The study emphasizes the urgent need for targeted efforts to improve digital literacy across diverse age groups.

The absence of ICT proficiency among Filipino students poses a challenge to their job prospects post-graduation. Interviews with recent BSOA graduates from CSPC revealed that ICT skills significantly impact personal development, professional growth, and job opportunities. Employers highly value strong ICT proficiency in the current digital era, opening

diverse career prospects. Recognizing this felt need, it is crucial to address the digital skills gap through targeted interventions and educational strategies, empowering students for success in the competitive job market. Therefore, this assessment focuses on assessing BSOA students' ICT proficiency in hardware operations, software processing, information management, digital communication, data security, and privacy, aiming to provide a comprehensive understanding of their technological readiness across various professional settings.

Methodology

This study used a descriptive method to analyze data, aiming to determine BSOA students' ICT proficiency levels. Respondents were randomly sampled from 112 BSOA students at Camarines Sur Polytechnic Colleges – Buhi Campus, specifically 2nd to 4th-year students in the first semester of the academic year 2023-2024. To ensure accuracy, a questionnaire checklist was employed as the primary tool for assessment. Responses were tallied, tabulated, and analyzed using weighted mean, percentage, and ranking systems.

The study employed the rank ordering method to determine the sequence of ranks, assessing the ICT proficiency level and barriers among BSOA students across hardware operations, software processing, information management, digital communication, and data security and privacy. The researchers employed the percentage technique to meticulously analyze and interpret the personal profiles of the students, ensuring that the data were comprehensively assessed and accurately interpreted. Weighted Mean was used to determine the level of information and communication technology proficiency and the possible barriers affecting the information and communication technology proficiency of the BSOA students. The 4-point Likert-type scale questionnaire assessed the extent of Information and Communication Technology (ICT) proficiency among Bachelor of Science in Office Administration (BSOA) students. These scales serve as a structured framework for evaluating and categorizing students based on their proficiency levels in utilizing information and communication technologies. The delineated scale comprises four distinct levels, each associated with a specific range and verbal interpretation. To interpret the weighted mean in terms of the barriers affecting the technological proficiency level of the BSOA student, the following scale was used to analyze the means. See Table 1.

Table 1. Scale for the Verbal Interpretation

Scale	Range	Verbal Interpretation
4	3.50 – 4.00	Highly Proficient (HP)
3	2.50 – 3.49	Moderately Proficient (MP)
2	1.50 – 2.49	Below Proficient (BP)
1	1.00 – 1.49	Not Proficient (NP)

Results and Discussion

This chapter provides a comprehensive overview of the research findings derived from data gathered by the researchers. The data, presented in tabular form, are accompanied by concise descriptions for easier comprehension. The analysis and interpretation of the data serve as the foundation for drawing conclusions and making recommendations based on the study's objectives.

A. Personal Profile of the Respondents

Table 2 presents the demographic profile of respondents at Camarines Sur Polytechnic Colleges – Buhi Campus. Among 112 respondents, 27 are male and 85 are female. The majority (73.21%) fall within the 19-22 age range, while 25% are in the 23-26 age group. Those aged 27 and above represent 1.78% of the total. In today's digital landscape, students are considered "digital natives," accustomed to the pervasive use of ICT in their daily lives, as supported by Ref. [5]. This familiarity with technology enhances their proficiency in information and communication technology. Regarding year level, out of 112 respondents, 35.71% were in their second year (40 individuals), 33.92% were in their third year (38 students), and 30.35% were in their fourth year (34 individuals). Regarding monthly family income, 50% reported incomes of 5,000 and below (56 individuals), 38.38% fell within the range of 5,000 – 10,000 (43 respondents), 8.91% had incomes between 10,000 and 15,000 (10 participants), and 2.67% reported incomes of 15,000 and above (3 individuals). Most participants belonged to lower income categories, indicating potential economic challenges and a significant disparity in access to educational resources.

Table 2. Personal Profile of the Respondents

Variable	N	%
Age Group		
19-22 years old	82	73.21
23-26 years old	28	25
27 and above	2	1.78
Sex		
Male	27	24.10
Female	85	75.89
Year Level		
Second Year	40	35.71
Third Year	38	33.92
Fourth Year	34	30.35
Monthly Family Income		
5,000 and below	56	50
5,000 – 10,000	43	38.38
10,000 – 15,000	10	8.91
15,000 above	3	2.67
Total	112	100%

B. Access to Devices and Participation in ICT seminars and training

Table 3 presents the distribution of device access among respondents. Smartphones have the highest accessibility (110), followed by laptops (96) and computers (93). Smart TVs and projectors also show substantial accessibility (87 and 86, respectively). However, devices like scanners, tablets, and hard disks have relatively lower accessibility frequencies (42, 35, and 23). Printers, routers, cameras, and microphones fall within low accessibility frequencies (21, 20, 11, and 6). This variance underscores diverse usage patterns and reliance on modern devices.

Table 3. Access to Devices

Device	n	Rank
Computer	93	3
Laptop	96	2
Smartphone	110	1
Tablet	35	7
Printer	21	9
Projector	86	5
Scanner	42	6
Smart TV	87	4
Camera	11	11
Router	20	10
Hard Disk Drive	23	8
Microphone	6	12

Table 4 shows the distribution of respondents' participation in ICT seminars and training, providing insight into engagement levels.

Table 4. ICT Seminars and Training Attended

ICT Training/Seminar	n	%
Webinar on Digital Productivity	25	28
No response	87	75
Total	**112**	**100**

The focus was on the "Webinar on Digital Productivity," attended by 28 respondents (25% of the total). Remarkably, only 3rd-year students reported attending ICT webinars during their 2nd year. However, 75% of participants did not respond regarding their attendance.

This aligns with studies indicating a gap in ICT training for office administration students in the Philippines, impacting their future workforce readiness (Adeyemo & Sehoole, 2016). The findings stress the need for effective regulation in higher education to provide essential skills for economic development and emphasize the importance of addressing ICT training gaps to meet evolving needs.

C. Level of Information and Communication Technology Proficiency of BSOA Students

In this section, the levels of information and communication technology (ICT) proficiency of BSOA students are assessed. Tables 5 to 8 provide the weighted mean and verbal interpretation of respondents' responses, categorizing their ICT proficiency into four key areas: hardware operations, software processing, information management, digital communication, and data security and privacy. As outlined in Table 4, The respondents exhibit a moderate level of proficiency in information and communication technology (ICT), particularly in hardware operations, with an overall weighted mean of 2.95. This numeric representation signifies a classification of "Moderately Proficient," indicating a reasonably adept competence level within this specific domain. This classification emphasizes a balanced and competent level of expertise among the surveyed individuals in navigating and executing tasks related to hardware operations within the ICT domain.

Among the assessed indicators, "Transfer files using flash drives or other storage devices" ranked highest with a weighted mean of 3.38, interpreted as "Moderately Proficient." "Effectively navigate and use Microsoft Office and Google Docs" followed closely with a weighted mean of 2.95, also interpreted as "Moderately Proficient." The indicator "Power on and shut down a computer, troubleshooting basic hardware issues" achieved a weighted mean of 3.28, while "Set up a projection system for meetings and presentations" obtained a weighted mean of 3.08, both interpreted as "Moderately Proficient." However, "Configure and maintain computer networks" received a weighted mean of 2.78, and "Operate a printer and scanner without assistance" scored lowest at 2.24, interpreted as "Below Proficient."

Table 5. Proficiency Level in Hardware Operations

Indicators	Weighted Mean	Verbal Interpretation	Rank
Power on and shut down a computer, including knowledge of troubleshooting basic hardware issues and ensuring efficient system start-up and shutdown procedures.	3.28	Moderately Proficient	2
Operate a printer and scanner without assistance, including loading paper, changing ink or toner cartridges, and handling routine maintenance tasks.	2.24	Below Proficient	5
Transfer files using flash drives or other storage devices, demonstrating the ability to save, copy, and move files between devices securely.	3.38	Moderately Proficient	1
Set up a projection system (projector) for meetings and presentations.	3.08	Moderately Proficient	3
Capability to configure and maintain computer networks, including setting up routers and switches and troubleshooting basic network connectivity issues.	2.78	Moderately Proficient	4
Average Weighted Mean	**2.95**	**Moderately Proficient**	

The data gathered highlights the proficient hardware skills of BSOA students, notably in secure file transfer and basic computer operation, echoing findings from Ref. [6] and Ref. [7]

emphasizing the importance of these skills for future administrative professionals. However, there's a notable opportunity for improvement in operating printers and scanners independently, suggesting the need for enhanced proficiency in this area. Studies by Ref. [8] underscore the challenges students face in mastering these devices, emphasizing the necessity of additional support to enhance proficiency. Overall, effective hardware skills are crucial for administrative professionals to streamline workflows, improve efficiency, and boost productivity.

Table 6 summarizes BSOA students' ICT proficiency in software processing, with an average weighted mean of 2.54, indicating a moderate proficiency level. The top-ranking indicator, "Effective use of Microsoft Office and Google Docs," scored 2.95, followed by "Creating visually appealing presentations in PowerPoint" at 2.83. Using Microsoft Excel for data analysis ranked third at 2.79. Proficiency in digital calendars ranked fourth (2.17), while Adobe Creative Suite proficiency ranked lowest (2.00).

Table 6. Proficiency Level in Software Processing

Indicator	Weighted Mean	Verbal Interpretation	Rank
Effectively navigate and use Microsoft Office and Google Docs to create and edit documents, spreadsheets, and presentations, enabling me to efficiently manage and produce high-quality work.	2.95	Moderately Proficient	1
Capable of using Microsoft Excel to perform data analysis and create spreadsheets.	2.79	Moderately Proficient	3
Capable of creating visually appealing and informative documents and presentations using advanced design techniques in Microsoft PowerPoint.	2.83	Moderately Proficient	2
Possess a strong knowledge of Adobe Creative Suite, including Photoshop and Illustrator, for graphic design and image editing tasks.	2.00	Below Proficient	5
Proficiency in using digital calendars and scheduling software.	2.17	Below Proficient	4
Average Weighted Mean	**2.54**	**Moderately Proficient**	

The assessment highlights BSOA students' proficiency in Microsoft Office and Google Docs for document-related tasks, as well as their adeptness in creating visually engaging presentations using advanced design techniques in Microsoft PowerPoint. Ref. [9] supports the practical significance of these competencies for office professionals. Ref. [10] emphasizes the importance of proficiency in digital calendars and scheduling software. However, there's room for improvement in Adobe Creative Suite proficiency, including Photoshop and Illustrator, for graphic design tasks, as noted by Ref. [11] and Ref. [12]. Addressing this skill gap will better equip BSOA students for graphic design responsibilities in real-world scenarios.

Table 7 presents the ICT proficiency level of BSOA students regarding information management, with an overall weighted mean of 3.17, indicating a "Moderately Proficient" level. Notably, the indicator "Understanding the principles of file naming, version control, and folder

organization" scored 3.88, ranking as "Highly Proficient" and topping the list. Following closely is "Familiarity with practices to safeguard confidential and sensitive information," scoring 3.07 and ranking second. The third indicator, "Demonstrating skills in creating and maintaining well-organized digital files and documents," scored 3.02, also falling within the "Moderately Proficient" range.

Table 7. Proficiency Level in Information Management

Indicator	Weighted Mean	Verbal Interpretation	Rank
Ability to organize and categorize various types of information in a structured manner.	3.00	Moderately Proficient	4
Demonstrate skills in creating and maintaining well-organized digital files and documents.	3.02	Moderately Proficient	3
Understand the principles of file naming, version control, and folder organization.	3.88	Highly Proficient	1
Capable of retrieving and categorizing information when needed for tasks.	2.87	Moderately Proficient	5
Familiar with practices to safeguard confidential and sensitive information.	3.07	Moderately Proficient	2
Average Weighted Mean	**3.17**	**Moderately Proficient**	

On the other hand, "Ability to organize and categorize various types of information in a structured manner" secured a rating of 3.00, positioning it as fourth among the five indicators. Conversely, "Capable of retrieving and categorizing information when needed for tasks" garnered a rating of 2.87, placing it at the bottom of the list.

The findings revealed that the respondents exhibit a high level of proficiency in understanding the principles of file naming, version control, and folder organization, as reflected by the top-ranking indicator. This implies that students are well-versed in the complexities of managing digital files systematically, showcasing their adeptness in principles crucial for efficient information organization. This result finds support in the literature, specifically in the insights provided by Ref. 13], emphasizing the efficiency of well-organized file structures in facilitating document retrieval. The relevance of this skill aligns with the evolving responsibilities of administrative professionals in the digital era, underlining the importance of organized information for effective service delivery.

As shown in Table 7, the level of ICT proficiency of BSOA students in terms of digital communication has an overall weighted mean of 3.24, interpreted as Moderately Proficient. The indicator "Confident in using email for professional communication" ranked highest with an average weighted mean of 3.49, followed by "Ability to navigate and utilize meeting platforms" with a weighted mean of 3.40. "Proficiency in using social media for business communication" scored 3.22, while "Knowledge of digital etiquette" rated 3.08. "Familiarity with online collaboration tools" ranked lowest with a weighted mean of 2.99.

Table 8. Proficiency Level in Digital Communication

Indicator	Weighted Mean	Verbal Interpretation	Rank
Confident in using email for professional communication, including composing, sending, and managing messages.	3.49	Moderately Proficient	1
Ability to navigate and utilize meeting platforms using features like screen sharing and chat.	3.40	Moderately Proficient	2
Proficiency in using social media platforms for business communication.	3.22	Moderately Proficient	3
Familiar with online collaboration tools for team projects.	2.99	Moderately Proficient	5
Knowledge of digital etiquette and online professionalism.	3.08	Moderately Proficient	4
Average Weighted Mean	**3.24**	**Moderately Proficient**	

The study indicates that respondents show commendable proficiency in using email for professional communication, in line with contemporary workplace demands emphasized by Ref. [14]. There's an expectation for higher education to equip graduates with digital communication skills. Additionally, proficiency in navigating meeting platforms like Zoom and Microsoft Teams is highlighted, reflecting the evolving dynamics of modern workplaces, as noted by Ref. [15]. Familiarity with online collaboration tools for team projects, emphasized by Ref. [16], is crucial for fostering innovation within organizations, aligning with contemporary workforce demands. This underscores the importance of students being well-versed in such tools for seamless knowledge exchange and collaboration, preparing them for the challenges of the modern workplace.

Table 8 reveals BSOA students' ICT proficiency in data security and privacy, with an overall weighted mean of 2.96, indicating Moderate Proficiency. Specifically, the highest-rated indicator, "Capable of password management and know how to create and manage strong, secure passwords," scored 3.29, while "Proficiency in secure file handling" scored 3.20. "Awareness of data backups and know-how" received a rating of 3.16, followed by "Ability to identify potential data security threats" at 3.00. However, "Capable of encrypting data to protect from unauthorized access" scored lowest at 2.16, interpreted as Below Proficient. The findings highlight students' moderate proficiency in password management but suggest a need for improvement in data encryption.

The study's findings resonate with insights from Ref. [17], stressing the importance of proficient password management amid increasing data breaches. Likewise, the emphasis on secure file handling, supported by Ref. [18], underscores the role of data backups in preventing data loss. However, the need for improvement lies in encrypting data for unauthorized access prevention, as highlighted by Ref. [19]. The study emphasizes the importance of secure file sharing for undergraduates, suggesting a need to enhance encryption skills for better data protection and alignment with evolving information security standards.

Table 9. Proficiency Level in Data Security and Privacy

Indicator	Weighted Mean	Verbal Interpretation	Rank
Ability to identify potential data security threats.	3.00	Moderately Proficient	4
Capable of encrypting data to protect it from unauthorized access.	2.16	Below Proficient	5
Capable of password management and know how to create and manage strong, secure passwords.	3.29	Moderately Proficient	1
Aware of the importance of data backups and know how to perform them.	3.16	Moderately Proficient	3
Proficiency in secure file handling.	3.20	Moderately Proficient	2
Average Weighted Mean	**2.96**	**Moderately Proficient**	

Table 10 summarizes the level of ICT proficiency among BSOA students, with "Digital Communication" ranking first, achieving an average weighted mean of 3.23, classified as "Moderately Proficient." Following closely is "Information Management," securing the second position with an average weighted mean of 3.17, also interpreted as "Moderately Proficient." In third place is "Data Security and Privacy" with an average weighted mean of 2.96, similarly categorized as "Moderately Proficient." The fourth spot is held by "Hardware Operation," registering an average weighted mean of 2.95 and described as "Moderately Proficient." Lastly, "Software Processing" occupies the fifth position, attaining an average weighted mean of 2.94 and classified as "Moderately Proficient" as well.

Table 10. Summary Table of the Level of ICT Proficiency of BSOA Students

Indicator	Weighted Mean	Verbal Interpretation	Rank
Hardware Operations	2.95	Moderately Proficient	4
Software Processing	2.54	Moderately Proficient	5
Information Management	3.17	Moderately Proficient	2
Digital Communication	3.24	Moderately Proficient	1
Data Security and Privacy	2.96	Moderately Proficient	3

The assessment results show that "Digital Communication" ranked highest, indicating a moderate proficiency level among BSOA students. This suggests a commendable understanding of digital communication skills, aligning with the contemporary workforce's demand for effective online collaboration. Ref. [16] supports this, emphasizing knowledge sharing's significance in fostering innovation within organizations.

Conversely, the last-ranked indicator, "Software Processing," although moderately proficient, remains important for administrative professionals. Ref. [9] study on secretary competencies underscores the significance of software processing skills, identifying crucial software competencies like MS Word, PowerPoint, Outlook, Excel, and Access. The need for focused attention, particularly in MS PowerPoint, MS Excel, and MS Access, aligns with the relevance of software processing skills for BSOA students.

D. Barriers Affecting the Information and Communication Technology Proficiency of the BSOA Students

This section evaluates barriers to BSOA students' ICT proficiency using Tables 10 to 14, categorizing them into hardware operations, software processing, information management, digital communication, and data security and privacy. The analysis, featuring weighted means and verbal interpretations, provides valuable insights for academic discussions and educational enhancement.

Table 11 outlines obstacles in hardware operations affecting ICT proficiency, with an overall weighted mean of 2.55, indicating "Often Encountered" challenges. The top barrier, "Lack of Familiarity with Hardware Features," ranks first with a weighted mean of 2.67, followed by "Downtime Due to Hardware Malfunctions" at 2.64. "Lack of Expertise in Network Configuration and Maintenance" ranks third with a weighted mean of 2.60. "Struggles with Projection System Configuration" and "Limited Access to Up-to-Date Hardware" occupy the fourth and fifth ranks with weighted means of 2.54 and 2.30, respectively.

Table 11. Barriers Affecting the ICT Proficiency in Hardware Operations

Indicator	Weighted Mean	Verbal Interpretation	Rank
Limited Access to Up-to-Date Hardware	2.30	Seldom Encountered	5
Lack of Familiarity with Hardware Features	2.67	Often Encountered	1
Downtime Due to Hardware Malfunctions	2.64	Often Encountered	2
Struggles with Projection System Configuration	2.54	Often Encountered	4
Lack of Expertise in Network Configuration and Maintenance	2.60	Often Encountered	3
Average Weighted Mean	**2.55**	**Often Encountered**	

The primary challenge in ICT proficiency relates to a lack of familiarity with hardware features, frequently encountered by respondents. This issue, which includes incomplete hardware features, resistance to change, and a lack of technical readiness and resources, aligns with the findings by Ref. [20]. Their study similarly highlights the difficulties students face in navigating and utilizing hardware features, hindering overall ICT proficiency.

Table 12 reveals the challenges in software processing affecting ICT proficiency, with an overall weighted mean of 2.55. This number shows how often these barriers are faced, interpreted as Often Encountered. The foremost barrier to ICT proficiency is the "Inability to Utilize Adobe Creative Suite for Graphic Designing," ranked first with a weighted mean of 2.83. Following closely is "Unfamiliarity with Digital Calendars and Scheduling Software," ranked second with a weighted mean of 2.66. "Lack of Familiarity with Microsoft Office Suite" holds the third position with a weighted mean of 2.61. "Limited Access to Updated Software" is ranked fourth with a mean of 2.53, while "Challenges in Utilizing Advanced Design Techniques in PowerPoint" is fifth with a mean of 2.36.

The results imply that the primary challenge hindering ICT proficiency among BSOA students is the "Inability to Utilize Adobe Creative Suite for Graphic design," with a significant occurrence. This indicates a critical barrier that students often encounter, suggesting a potential gap in their skills.

Table 12. Barriers Affecting the ICT Proficiency in Software Processing

Indicator	Weighted Mean	Verbal Interpretation	Rank
Limited Access to Updated Software	2.53	Often Encountered	4
Lack of Familiarity with Microsoft Office Suite	2.61	Often Encountered	3
Challenges in Utilizing Advanced Design Techniques in PowerPoint	2.36	Seldom Encountered	5
Inability to Utilize Adobe Creative Suite for Graphic Designing	2.83	Often Encountered	1
Unfamiliarity with Digital Calendars and Scheduling Software	2.66	Often Encountered	2
Average Weighted Mean	**2.59**	**Often Encountered**	

These findings, supported by Ref. [21], highlight the importance of graphic design proficiency for employability. Proficiency in Adobe Creative Suite aligns with job market demands. "Unfamiliarity with Digital Calendars and Scheduling Software" underscores the need for digital literacy skills, as emphasized by Ref. [22]. Conversely, "Challenges in Utilizing Advanced Design Techniques in PowerPoint" are seldom encountered, aligning with Ref. [23] and Ref. [24], who stress the importance of technological competencies for employability

Table 13 highlights ICT proficiency challenges in information management, with an overall weighted mean of 2.33, indicating "Seldom Encountered." Top challenges include "Inconsistent Data Entry and Updating" and "Unawareness of Confidentiality Practices," both "Often Encountered." "Difficulty in Utilizing Information Management Software" is third, with "Insufficient Knowledge in Information Organization" and "Resistance to Adopting New Information Management Technologies" following, all "Seldom Encountered."

Table 13. Barriers Affecting the ICT Proficiency in Information Management

Indicator	Weighted Mean	Verbal Interpretation	Rank
Insufficient Knowledge in Information Organization	2.09	Seldom Encountered	5
Difficulty in Utilizing Information Management Software	2.33	Seldom Encountered	3
Inconsistent Data Entry and Updating Practices	2.58	Often Encountered	1
Resistance to Adopting New Information Management Technologies	2.16	Seldom Encountered	4
Unawareness of Confidentiality Practices	2.52	Often Encountered	2
Average Weighted Mean	**2.33**	**Seldom encountered**	

Based on the findings, "Inconsistent Data Entry and Updating Practices" emerged as the most prevalent challenge, resonating with insights from Ref. [25] and Ref. [26]. This highlights the need for targeted interventions to enhance students' data management proficiency. "Unawareness of Confidentiality Practices" is another commonly encountered barrier. The

fifth-ranked indicator, "Resistance to Adopting New Information Management Technologies," indicates a notable challenge, despite the broader trend of increasing automation.

Table 14 shows challenges in ICT proficiency in digital communication, with an overall weighted mean of 2.25, indicating the "Seldom Encountered." "Difficulty in Using Collaborative Platform" ranks highest at 2.60, signifying it as often encountered. "Challenges in Virtual Meeting Participation" follows closely at 2.33. "Unfamiliarity with Digital Etiquette and Online Professionalism" secures the third rank at 2.27. "Limited Familiarity with Professional Email Use" and "Inconsistent Use of Digital Communication Tools" hold the fourth and fifth ranks at 2.00 and 2.05, respectively.

Based on the findings, respondents often encounter challenges with collaborative platforms, supported by Ref. [27] highlighting the importance of collaboration for work-ready graduates. However, there's a notable gap in collaborative skills, prompting the need for enhanced training methods aligned with digital workplace demands.

Table 14. Barriers Affecting the ICT Proficiency in Digital Communication

Indicator	Weighted Mean	Verbal Interpretation	Rank
Limited Familiarity with Professional Email Use	2.00	Seldom Encountered	5
Challenges in Virtual Meeting Participation	2.33	Seldom Encountered	2
Inconsistent Use of Digital Communication Tools	2.05	Seldom Encountered	4
Difficulty in Using Collaborative Platforms.	2.60	Often Encountered	1
Unfamiliarity with Digital Etiquette and Online Professionalism	2.27	Seldom Encountered	3
Average Weighted Mean	**2.25**	**Seldom Encountered**	

Seldom-encountered challenges include virtual meeting participation, digital etiquette unfamiliarity, limited professional email use familiarity, and inconsistent digital communication tool usage. Ref. [28] stresses digital communication skills' importance in the fourth industrial revolution, yet respondents demonstrate comfort in navigating digital communication tools, aligning with literature on social media platforms' positive impact on learning and academic performance [29].

Table 15 presents barriers affecting ICT proficiency in Data Security and Privacy, with an overall weighted mean of 2.39, indicating they are "Seldom Encountered." "Limited Knowledge of Data Encryption Techniques" ranks highest at 2.50, often encountered. "Ineffective Password Management Practices" follows at 2.41, also seldom encountered. "Lack of Awareness of Data Security Threats" secures the second position at 2.49, indicating infrequent encounters.

Meanwhile, "Inadequate Data Backup Practices" and "Unfamiliarity with Secure File Handling Practices" are ranked fourth and fifth, respectively, both categorized as "Seldom Encountered" with weighted means of 2.28 and 2.27. Based on the findings, it was revealed

that respondents often encounter challenges associated with limited knowledge of data encryption techniques. The study's identification of limited knowledge in data encryption techniques aligns with the call for enhanced educational curricula to integrate practical training in data security and privacy, preparing students for the workforce's demands where data security is paramount.

Table 15. Barriers Affecting the ICT Proficiency in Data Security and Privacy

Indicator	Weighted Mean	Verbal Interpretation	Rank
Lack of Awareness of Data Security Threats	2.49	Seldom Encountered	2
Inadequate Data Backup Practices	2.28	Seldom Encountered	4
Ineffective Password Management Practices	2.41	Seldom Encountered	3
Limited Knowledge of Data Encryption Techniques	2.50	Often Encountered	1
Unfamiliarity with Secure File Handling Practices	2.27	Seldom Encountered	5
Average Weighted Mean	**2.39**	**Seldom encountered**	

In contrast, the study indicates that "Ineffective Password Management Practices" are seldom encountered by respondents. This finding aligns with the broader perspective of digital literacy, emphasizing the importance of creating awareness of privacy and security risks [30]. Ref. [31] supports this viewpoint, emphasizing that understanding cybersecurity risks and protective measures is fundamental in the 21st century. Moreover, the research highlights a growing need for comprehensive education on secure password practices, given the increasing prevalence of cyber threats in today's interconnected world.

Moreover, the indicators "Lack of Awareness of Data Security Threats," "Inadequate Data Backup Practices," and "Unfamiliarity with Secure File Handling Practices" all fall under the category of seldom encountered challenges. This resonates with the need highlighted in the literature for improved information security awareness and privacy education in higher education settings [32]. The emphasis on integrating practical training in data security measures aligns with the study's indication that these specific challenges are seldom encountered by respondents.

Conclusion

A comprehensive profile of the BSOA students reveals a predominant representation within the 19-22-year-old, females, in the second-year level, and widespread smartphone accessibility. The level of ICT proficiency demonstrates a mixed landscape. Hardware operations exhibit a consistent trend of moderate proficiency, with challenges noted in tasks like operating printers and scanners. Software processing indicates moderate proficiency overall, with specific indicators falling below the proficient threshold. Information management displays moderate proficiency, with one notable indicator ranked as highly proficient. Digital communication and data security and privacy present generally moderate

proficiency, except for one indicator rated below proficient. As the data presented on the barriers affecting the ICT proficiency of the BSOA students, even born and considered as digital natives the BSOA students highlight different barriers affecting their ICT proficiency. In hardware operations, issues such as a lack of familiarity with hardware features and downtime due to malfunctions are frequently encountered. Challenges in software processing, particularly in the utilization of specific tools, are noted. Barriers in information management are often encountered, particularly in data entry and updating practices. Digital communication and data security and privacy barriers are predominantly seldom encountered, with isolated challenges in using collaborative platforms and awareness of data security threats.

The main conclusions of the study can be presented in a short section, which should present the results achieved in the study, which science gap was able to contribute, the limitations of the research, the expected findings, and unexpected findings, if any, and suggestions for future studies.

Suggestions

Based on the conclusions of the study, the researchers came up with the following recommendations. The researchers recommend tailoring educational programs to meet the distinct needs of diverse age groups among respondents. Designing initiatives that align with the majority's preferences while ensuring inclusivity for older participants is crucial. This approach aims to enhance the acceptance of educational offerings across age brackets. The researchers recommend implementing targeted training programs to fortify ICT proficiency among BSOA students. Efforts should concentrate on improving operational skills related to hardware and software, emphasizing areas where proficiency currently requires enhancement. Incorporating interactive learning methods and facilitating access to relevant technologies is suggested to contribute to a more proficient and technologically adept student body. The researchers recommend implementing interventions that target commonly encountered challenges, especially in areas such as information management, educational institutions can create a supportive environment for students. Initiatives may include awareness campaigns, workshops, and mentorship programs, fostering an atmosphere conducive to overcoming hurdles and enhancing overall ICT proficiency. The Intervention Program designed by the researchers may be adopted by the school to ensure that graduates are proficient in Information and Communication Technology (ICT) and ready for employment. This program is tailored to equip students with the necessary skills and knowledge, enhancing their preparedness for the workforce in the field of Information Technology.

Conflict of Interest

The authors declare that there is no conflict of interest.

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