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Assessing the ICT competencies of out-of-school youth in a village in Naga city: A basis for developing a training program

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Abstract: This study aimed to assess the Information and Communication Technology (ICT) competencies of out-of-school youth (OSY) in Naga City, Cebu, as a basis for developing a targeted training program. Using a descriptive-evaluative research design, 50 OSY participants aged 16–24 were evaluated through structured questionnaires and practical exercises that covered hardware assembly, operating system installation, networking, office productivity software, Google Suite, and the utilization of online tools. Findings revealed significant deficiencies in networking (mean = 1.85), operating system installation (mean = 2.10), and online tools utilization (mean = 1.93), while moderate proficiency was observed in office productivity software (mean = 2.35) and Google Suite (mean = 2.58). These results informed the design of a hands-on training program tailored to address specific skill gaps. Post-training assessments showed marked improvements in digital collaboration and productivity tools, though advanced technical skills still required further development. The study concludes that targeted ICT training has a significant impact on enhancing digital literacy and employability among marginalized youth. Practical implications include the need for sustained, skill-specific interventions to bridge the digital divide and prepare OSY for meaningful participation in the digital economy.

Keywords: *Digital literacy, Employability, ICT competencies, Out-of-school youth, Vocational training.*

1. Introduction

Out-of-school youth (OSY) face significant challenges in terms of employability and social integration, especially in underserved regions with limited access to quality education and vocational training. In today's increasingly digital world, Information and Communication Technology (ICT) skills are essential for workforce participation and social inclusion. Many industries now require digital proficiency even for entry-level positions. However, marginalized groups, including OSY from rural areas, often lack the resources and opportunities to develop these competencies, leaving them at a greater risk of unemployment and social exclusion [1]. The digital divide, particularly in rural and low-income areas, further exacerbates these challenges, as access to digital technologies does not necessarily translate into proficiency [2].

Recent literature underscores the growing importance of digital literacy in enhancing employability and fostering innovative work behavior, particularly among marginalized populations. Caroline et al. [3] conducted a systematic literature review and bibliometric analysis exploring the interplay between digital literacy, employability, and innovative work behavior. Their findings reveal that while digital literacy is increasingly recognized as a critical skill in Industry 5.0 and Knowledge Society 5.0, there remains no universally accepted framework linking digital literacy directly to employability outcomes in business contexts. The review emphasizes that digital literacy not only supports workforce adaptability but also stimulates innovation and performance in digitally driven environments. Moreover, the study calls for more contextualized approaches in human resource management and education, advocating for

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diverse methodologies and cross-cultural perspectives to better understand how digital competencies influence employability across different sectors and regions [3].

Despite national efforts such as the Philippine Digital Literacy Framework and the Department of Information and Communications Technology (DICT)'s Tech4ED program, research on the ICT competency levels of OSY, particularly in rural areas, remains limited. Most studies tend to focus on urban settings or formal educational institutions, overlooking the specific challenges faced by marginalized youth in rural regions like Naga City, Cebu. Existing literature has highlighted the importance of bridging the digital divide, but gaps remain in understanding how rural OSY can effectively develop practical ICT skills [4]. Without targeted training, these youths will continue to face barriers to meaningful employment.

This study seeks to address these gaps by evaluating the ICT competencies of OSY in Naga City, Cebu, particularly in critical areas such as hardware assembly, operating system installation, networking, and office productivity tools. These competencies are vital for employability in today's labor market, especially in ICT-related fields. Through this assessment, the study aims to provide evidence-based insights that can inform the development of targeted ICT training programs designed to meet the needs of marginalized OSY populations in rural areas. Practical skills development in these areas is crucial for enhancing their employability and enabling them to participate in the digital economy.

This research focuses on basic and advanced ICT skills, recognizing that foundational competencies like office productivity software and more technical skills, such as networking and system installation, are equally important for the modern workforce. The study's use of a structured questionnaire, based on established frameworks like the Philippine Digital Literacy Framework and the DICT's Tech4ED initiative, ensures that the assessment is both relevant and aligned with national standards. Additionally, the study explores the relationship between ICT proficiency and employability, emphasizing the importance of hands-on, practical training in fostering real-world skills.

By identifying specific ICT skill gaps and evaluating the current competency levels of OSY, this study provides a foundation for future interventions that can better equip these youth for success in the workforce. The findings from this research are intended to guide the development of a comprehensive, skill-specific training program that addresses the identified gaps, offering a pathway to improved employability and social inclusion. This study contributes to the broader efforts to bridge the digital divide and create opportunities for marginalized youth to participate fully in the digital economy.

2. Materials and Methods

This study employed a descriptive-evaluative research design to assess out-of-school youth's Information and Communication Technology (ICT) competencies (OSY) in Naga City, Cebu. The descriptive component aimed to provide a detailed account of the current level of ICT skills among the participants, while the evaluative aspect focused on determining the specific areas of weakness that could be addressed through targeted training programs. Combining these two approaches allowed for a comprehensive understanding of the participants' digital competencies, making it easier to design a training program that directly addressed their skill gaps.

The study involved 50 out-of-school youth (OSY) aged 16 to 24 residing in Naga City, Cebu. Participants were selected based on their availability and willingness to participate in the study. The OSY group was chosen as they represent a segment of the population with limited access to formal education and training, making it vital to assess and improve their skills in ICT to enhance their employability. The inclusion criteria required respondents to have minimal formal ICT training, ensuring that the study would assess a group with little prior exposure to structured digital education.

A structured questionnaire was used as the primary data collection instrument. The questionnaire was developed based on established ICT competency frameworks, such as the Philippine Digital Literacy Framework and relevant literature on ICT skills assessment. It included several sections to evaluate the respondents' competencies in key areas: hardware assembly, operating system installation,

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networking, office productivity software, Google Suite, and online tools utilization. Each section contained questions designed to measure the participants' level of proficiency on a five-point Likert scale, where 1 indicated no competency, and 5 indicated advanced competency. This format allowed for quantitative data analysis, providing clear insights into the participants' strengths and weaknesses.

The data collection process was conducted in two phases. In the first phase, participants completed the structured questionnaire under the supervision of the research team. The questionnaire was administered in a controlled environment to ensure that all participants received the same instructions and had ample time to complete each section. Any clarifications needed during the completion of the questionnaire were addressed by the research team to prevent misunderstandings that could lead to inaccurate responses.

The second phase involved practical, hands-on exercises that were closely observed by the research team. Participants were tasked with completing specific ICT-related activities aligned with the assessment areas, such as assembling computer hardware, installing operating systems, configuring a network, and using online tools. These practical activities provided a more in-depth understanding of the participants' competencies, ensuring that the data collected did not rely solely on self-reported measures. Observational data were recorded using detailed checklists that captured the participants' performance on each task.

Data from the questionnaires and observations were analyzed using descriptive statistics, including calculating means, standard deviations, and frequency distributions. The mean scores for each competency area were calculated to determine the overall proficiency levels of the participants. These means were then compared to identify which areas had the most significant skill gaps and thus required the most attention in the training program.

The quantitative data from the questionnaires were supplemented with qualitative observations from the practical exercises, ensuring that the findings were grounded in both self-reported data and observed behavior. Using qualitative and quantitative data provided a comprehensive picture of the participants' ICT competencies, enabling the research team to make informed decisions when designing the subsequent training program.

Ethical approval for the study was obtained from the Institutional Ethics Review Board. Participants were informed about the purpose of the study, and consent was obtained before their participation. The study adhered to principles of confidentiality and anonymity, ensuring that the participants' identities were protected throughout the research process. Participants were also informed of their right to withdraw from the study at any time without penalty, ensuring voluntary participation.

Table 1.
Assessing the ICT Competencies of Out-of-School Youth.

Competency Area	Mean Score	Proficiency Level	Interpretation
Hardware Assembly	2.52	Low Extent	Basic competence; limited hands-on experience
Operating System Installation	2.10	Low Extent	Minimal exposure to formal training
Networking	1.85	Low Extent	Most deficient; foundational skills lacking
Office Productivity Software	2.35	Low Extent	Moderate proficiency; informal learning
Google Suite	2.58	Low Extent	Basic competence; gaps in advanced collaboration
Online Tools Utilization	1.93	Low Extent	Limited skills in cloud-based tools

3. Results and Discussion

The results of this study revealed significant deficiencies in the ICT competencies of out-of-school youth (OSY) in Naga City, Cebu. The focus was on assessing key ICT skills such as hardware assembly, operating system installation, networking, and the use of office productivity tools, including Google Suite. Each skill area was evaluated using a structured questionnaire, and data were analyzed using frequency counts, percentages, and mean distributions. As shown in Table 1.

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3.1. Hardware Assembly

Proficiency in hardware assembly was low, with a mean score of 2.52, indicating that only 50.4% of respondents demonstrated basic competence. Hardware assembly involves handling physical components of computer systems, such as assembling and troubleshooting hardware. This skill is essential for technical support roles, IT maintenance, and repair jobs.

Although some respondents demonstrated basic proficiency, the results suggest that nearly half of the OSY lack hands-on experience in hardware assembly, limiting their ability to troubleshoot and maintain IT systems effectively [4]. This gap is significant, as hardware-related tasks are fundamental for many technical roles in the ICT sector.

The limited proficiency in hardware assembly reflects a lack of access to practical, structured training programs that focus on developing these essential skills. Training initiatives should incorporate hands-on workshops in hardware assembly, troubleshooting, and repair to better prepare the OSY for IT maintenance and technical support roles. By enhancing these skills, OSY can improve their employability and readiness for IT-related job opportunities.

3.2. Operating System Installation

Proficiency in operating system installation was also low, with a mean score of 2.10, indicating that only 42% of respondents demonstrated basic competence. OS installation is a critical skill for system administrators, technical support staff, and IT professionals responsible for setting up and maintaining computer systems.

The low proficiency in OS installation suggests that the OSY has had minimal exposure to formal training in this area. Installing, configuring, and maintaining operating systems are foundational tasks in ICT roles, and a lack of skills in this area significantly limits job opportunities [5].

The low competence in OS installation highlights the urgent need for structured training programs focusing on basic and advanced OS installation techniques. Such training should cover various operating systems, including Windows, Linux, and macOS, to ensure the OSY are well-equipped for diverse technical roles. Improving OS installation skills would significantly enhance the employability of OSY in the ICT sector, particularly in system administration and IT support positions.

3.3. Networking

Networking proficiency was the most deficient area, with a mean score of 1.85, indicating that only 37% of the respondents demonstrated basic competence in this skill. Networking involves tasks related to system integration, IT support, and troubleshooting. In today's digital economy, networking is essential for ensuring that computer systems and devices can communicate efficiently.

The low proficiency in networking is concerning, as it suggests that OSY lack the foundational skills necessary for jobs that require the setup and maintenance of networks [6]. Without these skills, the youth will face difficulties in securing jobs in ICT-related fields, further exacerbating their vulnerability to unemployment and social exclusion.

Addressing the gap in networking skills is critical for improving the employability of OSY. Training programs should prioritize practical, hands-on networking courses that cover essential topics such as network configuration, troubleshooting, and security. By focusing on these areas, the training initiatives could help bridge the digital divide and better prepare OSY for jobs in the digital economy.

3.4. Office Productivity Software

Proficiency in office productivity software (e.g., word processors, spreadsheets, and presentation tools) was relatively higher compared to other competencies, with a mean score of 2.35, indicating that 51.6% of respondents demonstrated basic competence. This proficiency is important for office-based roles and professional environments that require documentation, data management, and presentations.

The moderate proficiency suggests that the OSY may have acquired some skills informally, possibly through personal or ad-hoc use of digital tools [6]. However, this basic competence does not meet the

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higher standards required in professional settings, where advanced proficiency is often needed to perform tasks such as data analysis and complex reporting.

To enhance employability, training programs should focus on developing advanced skills in office productivity software, including the ability to perform higher-order tasks. Modules should cover advanced word processing functions, spreadsheet management, and presentation creation, allowing OSY to excel in office-based roles and administrative positions.

3.5. Google Suite

Proficiency in Google Suite tools (e.g., Google Docs, Sheets, Drive) was also moderate, with a mean score of 2.58, indicating that 52.58% of respondents demonstrated basic competence. Google Suite is widely used for collaborative work in both academic and professional environments, and proficiency in these tools is essential for teamwork and productivity.

While the respondents demonstrated competence in using Google Suite for basic tasks, there may be gaps in their ability to utilize these tools for more advanced collaborative projects, such as real-time document editing and cloud-based project management [4].

The moderate proficiency in Google Suite indicates that while OSY have some familiarity with these tools, there is a need for more structured training that focuses on collaborative, cloud-based tasks. Training should include advanced applications of Google Suite, such as file sharing, real-time collaboration, and cloud-based storage management, which are increasingly in demand in modern workplaces.

3.6. Online Tools Utilization

The proficiency in online tools utilization scored low, with a mean of 1.93, highlighting that respondents lacked the necessary skills to effectively use online tools for communication, collaboration, and productivity. This deficiency is a significant barrier, as online tools such as cloud-based services (e.g., Google Drive, Dropbox), project management platforms (e.g., Asana, Trello), and communication apps (e.g., Zoom, Microsoft Teams) are essential for modern work and educational settings. The limited exposure of the respondents to these tools restricts their ability to engage in digital workflows and collaborative projects, which are becoming increasingly important in today's professional landscape.

The low proficiency in online tool utilization indicates that the respondents have not yet embraced or fully understood the importance of these tools, potentially due to a lack of structured training or exposure. Online tools streamline workflows and enhance productivity, particularly in remote work settings, making them critical in both academic and workplace environments.

According to Oloyede and Ogunwale [7], digital productivity tools are indispensable for education, research, and career advancement in the 21st century. These tools enable users to efficiently manage, present, and collaborate on information, thereby fostering higher levels of productivity and innovation. The authors stress that integrating these tools into learning environments not only improves student engagement but also equips them with the skills necessary for modern workplaces. Furthermore, the study underscores that structured training is critical in ensuring that individuals can effectively adopt and utilize online tools, as improper use or over-reliance can lead to reduced efficiency and productivity.

In addition, Garcia [8] points out that the successful adoption of productivity software, including online collaboration tools, is largely influenced by perceived usefulness and the availability of training. This is consistent with the Technology Acceptance Model (TAM) by Davis [9], which highlights that perceived ease of use and usefulness are key predictors of technology adoption.

The low proficiency in online tools utilization highlights the need for focused training programs that teach the practical use of these tools. Training should cover cloud-based collaboration, communication, and project management platforms, enabling OSY to enhance its digital literacy and productivity. Such skills are essential for thriving in today's remote and hybrid work environments, and improving these competencies will significantly boost OSY's employability in the digital economy.

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4. Conclusion

The findings of this study provided critical insights into the Information and Communication Technology (ICT) competencies of out-of-school youth (OSY) in Naga City, Cebu. Key deficiencies were identified in crucial areas, including networking, hardware assembly, operating system installation, and online tools utilization, which are essential for employability in today's digital and professional environments. These gaps represent significant barriers to the OSY's ability to engage with modern digital tools and limit their prospects in the job market.

The training program developed in response to these findings addressed these gaps through a comprehensive, hands-on approach, prioritizing foundational ICT skills and practical applications. Specifically, participants demonstrated marked improvement in areas where moderate proficiency was initially observed, such as office productivity software and Google Suite tools. These tools are critical for administrative roles and basic digital tasks, and the increase in competence among the OSY participants reflects the effectiveness of the training program in equipping them with essential skills for the workplace.

A particularly significant result of the study was the low proficiency in online tools utilization, which emerged as one of the most deficient areas. The limited competence in using cloud-based platforms, project management tools, and communication applications presents a substantial challenge, given the widespread use of these tools in both educational and professional settings. The deficiency in this area highlights the need for focused, practical training to ensure that OSY can engage with digital workflows and collaborate effectively in remote and in-person team environments.

The training program successfully addressed many of the skill gaps identified, demonstrating the value of targeted interventions that align with the specific needs of marginalized youth. By incorporating hands-on instruction and real-world applications, the program provided participants with not only the theoretical knowledge but also the practical experience necessary to navigate modern ICT tasks confidently. This approach proved particularly effective in improving proficiency in digital literacy, which is essential for today's workforce.

However, the study also underscored the need for ongoing efforts to expand the training program to cover more advanced ICT skills, particularly in areas such as networking and operating system installation, where deficiencies persisted. These skills are essential for higher-level technical roles, and addressing these gaps would further enhance the employability of OSY, providing them with a broader range of opportunities in the ICT sector.

In conclusion, the results of this study highlight the critical role that targeted ICT training programs play in addressing the digital literacy needs of out-of-school youth. By focusing on the specific skill gaps identified, such as online tools utilization and technical competencies, the program successfully improved the digital capabilities of participants, enhancing their confidence and employability. Moving forward, the continued expansion of training programs to include advanced ICT skills will be crucial in ensuring that OSY can fully participate in the digital economy and overcome the barriers posed by the digital divide.

Transparency:

The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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