

Digital Literacy Assessment of Undergraduates in using Computer Hardware and Software for Export Client Servicing: A Mixed-Method Comparative Case Using Digital Literacy Global Framework 4.4.2

Joshua T. Isaguirre^{1,2} and Michelle Renee D. Ching^{2 +}

¹ College of Engineering, Architecture and Technology, De La Salle University–Dasmariñas, Philippines

² Center for ICT for Development (CITe4D), College of Computer Studies, De La Salle University–Manila, Philippines

Abstract. This study addresses the gap in understanding the digital literacy competencies of undergraduates in the context of employment through digital content creation in the Home Office set up thru export client servicing. Despite the growing importance of digital skills in today's workforce, limited research explores how these competencies can be effectively developed among marginalized youth. Guided by the Digital Literacy Global Framework (DLGF) 4.4.2, which aligns with the United Nations' Sustainable Development Goal (SDG) 4.4 on improving youth digital proficiency, this study aims to assess initial skill levels, prioritize competency areas, and identify effective training strategies. Using a mixed-methods approach, the study examined four Home Office cases through surveys and interviews. This research is significant as it bridges between theoretical frameworks and practical implementation, offering insights into how digital literacy can be leveraged to enhance youth employability. By aligning with global sustainable development goals, it underscores the relevance of targeted training interventions in addressing skill deficits and empowering marginalized youth for workforce integration.

Keywords: Digital Literacy, DLGF 4.4.2, Export Client Servicing

1. Introduction

With the shift to remote work, the Home Office (HO) emerged in the Christian community during the COVID-19 pandemic to empower undergraduates through export client services. Unlike typical remote jobs, HO provides a pathway from intern to business owner by equipping participants with essential digital and business skills for international clients. Digital literacy is crucial in this model, as it involves using technology to create digital content. Research highlights the importance of digital literacy in job opportunities today, emphasizing the need for government and non-government collaboration to create policies and programs for skill development among those not in education, employment, or training [1]. A study supports this idea by introducing the work-based training which is a process of acquiring knowledge and competencies often delivered in the workplace to meet specific employment needs [2]. Similarly, training and development initiatives for these competencies are needed to be prioritized so that it can adjust to quickly changing of demands [3]. Furthermore, the level of digital literacy significantly influence the behavioural intention of the employees to remain engage in digital workspace [4]. Providing digital skills opens job opportunities and supports long-term career growth in the digital economy. This study assesses undergraduates' digital literacy using DLGF 4.4.2, aligning with SDG 4-Quality Education and 8-Decent Work and Economic Growth to identify key training needs and effective programs to prepare them for employment specifically in export client servicing.

⁺ Corresponding author.
E-mail address: michelle.ching@dlsu.edu.ph.

2. Review of Related Literature

2.1. Digital Literacy of the Youth

Paul Gilster introduced digital literacy in 1997, defining it as the ability to understand and use information from digital sources effectively across academics, careers, and daily life [5]. Research [4] demonstrated that digital literacy has a direct positive effect on both effort expectancy and performance expectancy, with the latter significantly influencing continued use intentions and individual performance. Study of [6] proposed five digital literacy in the framework of Internet skills aiming to take into account the broader meanings of digital skills and their role in digital inclusion. Using the framework, a study of 1,220 Malaysian youth found strong digital skills but weaknesses in information navigation and creativity [7]. Similarly, research on 15 Indonesian youth organization members, using digital literacy within the framework of community empowerment, showed proficiency in computer and internet use but gaps in digital content creation and technology for self-development [8]. In a global perspective, a review of related literature [9] examines digital literacy from three perspectives – general youth, students from low income and among young immigrants. Digital literacy programs for low-income families have proven to be highly beneficial, particularly in enhancing computer skills and providing avenues for creativity and self-expression. The success of export client services in Home Offices relies on workers' skills, making it essential to identify and prioritize digital competencies for effective training and development of undergraduate trainees.

2.2. Digital Literacy Global Framework 4.4.2

One of the 17 Sustainable Development Goals (SDG) specifically under 4.4 theme is the “Percentage of youth/adults who have achieved at least minimum level of proficiency in digital literacy skills”. Thus the development of Digital Literacy Global Framework (DLGF) whose objective is to develop a methodology was created [10]. Initiated by United Nations Educational, Scientific and Cultural Organization (UNESCO), DLGF is based on the European Commission’s Digital Competence Framework for Citizens (DigComp 2.0) which is intended to serve for monitoring, assessment and further development of digital literacy. With five areas of competence from DigComp 2.0 which are information and data literacy, communication and collaboration, digital content creation, safety and problem solving; DLGF added two more competencies which are devices and software operations and career-related competencies. The resulting framework can be utilized accordingly in context.

The study of [10] provided an example on how to utilize DLGF 4.4.2 in the context of agriculture and government. Recent studies like [11] used this framework as a tool to categorize and assess the various social media skills identified in the 54 publication reviews. Another used the framework to make a questionnaire that effectively evaluates the digital literacy skills of students in an entrepreneurship course in Universitas Negeri Padang, Indonesia [5]. Study of [12] conducted a convenience sampling strategy in Hong Kong using the framework to identify what digital skills that students demonstrate during online exams and how consistent these skills are being applied. Lastly, [13] measures and improves the digital literacy skills of the Bekasi City community in Indonesia in dealing with hoax news and to analyze the extent of digital literacy competence through the DLGF framework. The DLGF 4.4.2 framework was developed to assist developing countries like the Philippines, in which the study explores how the DLGF 4.4.2 framework is applied to better understand the role of digital literacy in empowering employment opportunities.

3. Theoretical Foundation

Experts agree on the Global Framework for Digital Literacy, but emphasize that digital competence assessments must be tailored to specific contexts and purposes to be effective [10]. Table 1 describes how each skill competencies in the DLGF 4.4.2 was used in digital content creation for export client servicing.

Table 1: DLGF 4.4.2 in Home Office Context

Competency Area		Description
0. Device and Software Operations	0.1 Physical operations of digital devices	Use computer hardware and peripherals for digital content.
	0.2 Software operations in digital devices	Operate software like Canva, Adobe, Illustrator,

		WordPress, and web builders.
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content	Find online resources using the internet.
	1.2 Evaluating data, information and digital content	Assess the truthfulness and validity of online information.
	1.3 Managing data, information and digital content	Store, share, and transfer files like images, documents, and media.
2. Communication and collaboration	2.1 Interacting through digital technologies	Communicate via messaging and conferencing apps.
	2.2 Sharing through digital technologies	Share content safely and responsibly.
	2.3 Engaging in citizenship through digital technologies	Follow ethical principles in online communities.
	2.4 Collaborating through digital technologies	Collaborate using project management tools.
	2.5 Netiquette	Practice proper online etiquette.
	2.6 Managing digital identity	Manage online profiles and accounts professionally.
3. Digital content creation	3.1 Integrating and re-elaborating digital content	Edit and enhance graphics, web designs, and videos.
	3.2 Copyright and licenses	Understand copyright and licensing in digital content.
	3.3 Programming	Plan and execute tasks step by step.
4. Safety	4.1 Protecting devices	Protect digital devices from viruses and malware.
	4.2 Protecting personal data and privacy	Safeguard personal data and privacy.
	4.3 Protecting health and well-being	Maintain physical and mental well-being while using digital devices.
	4.4 Protecting the environment	Recognize the environmental impact of digital technology.
5. Problem-solving	5.1 Solving technical problems	Troubleshoot technical issues
	5.2 Identifying needs and technological responses	Identify needs and find technical solutions.
	5.3 Creatively using digital technologies	Solve problems and simplify solutions with technology.
	5.4 Identifying digital competence gaps	Conduct self-assessments for improvement.
	5.5 Computational thinking	Apply logical thinking and problem-solving strategies.
6. Career-related competences	6.1 Operating specialized digital technologies for a particular field	Develop and maintain digital skills and tools.
	6.2 Interpreting and manipulating data, information and digital content for a particular field	Analyze, interpret, and act on digital content.

4. Research Method

This mixed-method comparative case study explored four Home Offices specializing in digital content creation for export client servicing. A structured questionnaire based on the DLGF 4.4.2 framework assessed the digital literacy confidence of 40 undergraduate workers before joining the Home Office. Additionally, interviews with 12 CEOs examined the HO operations, skill requirements, challenges, and training strategies. These Home Offices have been operating for over three years, generating nearly half a million in monthly revenue while actively training and hiring undergraduates.

Purposive sampling ensured respondents had relevant experience, and ethical guidelines were followed by securing written consent from the Church Pastor of the selected HO. Group interviews with available CEOs were conducted and recorded during HO scheduled visit. Afterwards, the Likert-scale survey

questionnaire (5-Strongly Agree to 1-Strongly Disagree) was administered, with questions translated into Tagalog for better understanding. Survey responses were analyzed using Google Sheets, calculating mean scores for a descriptive statistical analysis of digital literacy competencies. The recorded interviews were transcribed, reviewed, and analyzed using a deductive thematic approach guided by DLGF 4.4.2. The process was reviewed three times to ensure clarity and accuracy, providing insights into undergraduates' digital competencies, priority areas, and training strategies for effective digital content creation.

5. Results and Discussions

5.1. Digital Literacy Assessment

Result as reflected in Table 2 shows that the respondents are well knowledgeable about utilizing digital technology for interaction, sharing, engaging and collaborating with other users engaged in the same digital space. As social media technology becomes popular and accessible by everyone, using digital tools for communication and collaboration is a no brainer to everyone. In the same manner, the results support that people nowadays use digital space as a source of information. As internet technology is rapidly revolutionizing our day to day lives, it can be realized that it influences how we acquire knowledge by browsing, searching, managing and evaluating available information. On the contrary, the results show the importance of training and education as this affects how people utilize digital technology to be relevant in Career Related Competencies. As the team members and partners of the Home Office are undergraduate, their lack of training in using digital tools to provide services narrows down the opportunities they can engage in their career in this digital age. Similarly, this kind of norm also causes how these individuals approach problem solving with digital tools and technology.

Table 2: Digital Literacy Assessment and Priority Level

DLGF 4.4.2 Competencies	Assessment		Priority level
	Accumulated Mean	Confidence Level	
0. Devices and Software	4.1625	Agree	High
1. Information and Data Literacy	4.3333	Strongly Agree	Medium
2. Communication and Collaboration	4.3458	Strongly Agree	Medium
3. Digital Content Creation	3.6	Agree	High
4. Safety	3.868	Agree	Low
5. Problem Solving	3.38	Neutral	Medium
6. Career Related Competencies	3.35	Neutral	High

5.2. Digital Literacy Priority

Table 2 presents the prioritization (High, Medium and Low) of the seven DLGF 4.4.2 digital literacy competencies for training and deployment. The first is Devices and Software, which covers the ability to operate system units, software, and applications used from training to actual work. It is utilizing hardware and software components for digital content creation skills. Devices and Software competency is critical, with interview results emphasizing that initial training should focus on mastering tools. Since trainees already have an agreeable confidence and understanding of the hardware and software applications, survey results indicate that training can be completed quickly. Digital Content Creation follows, requiring proficiency in Devices and Software to develop designs and web layouts which includes incorporating principles like typography, color theory, and UI/UX. Career-Related competencies come last, as they focus on client services and work-specific skills. Both fall within a neutral confidence level among trainees compared to technical tool proficiency. Since these competencies are directly tied to job performance, the survey suggests allocating more time and using effective training methods. A well-structured plan for skill and task training is essential to meet the high demand for specialized skills despite their limited availability.

Three DLGF 4.4.2 competencies fall under medium priority, as trainees can develop them naturally from training to actual work without structured teaching methods. Information and Data Literacy involves finding, using, and managing digital resources. The survey's strong confidence results suggest trainees are already familiar with browsing techniques, search tools, and resource management for storage and retrieval. This

skill aligns with Problem Solving, as trainees are encouraged to be self-reliant in finding solutions. While their confidence in this area is neutral due to a lack of real work experience, it improves over time through hands-on challenges. Communication and Collaboration, on the other hand, received high confidence ratings, as trainees are already experienced in using digital tools for collaboration, and information sharing.

Safety competency in DLGF 4.4.2 holds low priority in Home Offices, as environmental concerns, data privacy, and security are limited to NDAs and client contracts. Since all deliverables and information are given and belongs to the client upon submission, protecting personal data is less relevant.

5.3. Digital Literacy Training Model

Training procedures, strategies, and methodologies vary across Home Offices due to differences in expertise, resources, and client requirements [14]. Based on the study's findings and the DLGF 4.4.2 framework, a model as shown in Figure 1 presents effective training strategies [14-15] to bridge the digital literacy gap among undergraduates in export client servicing.

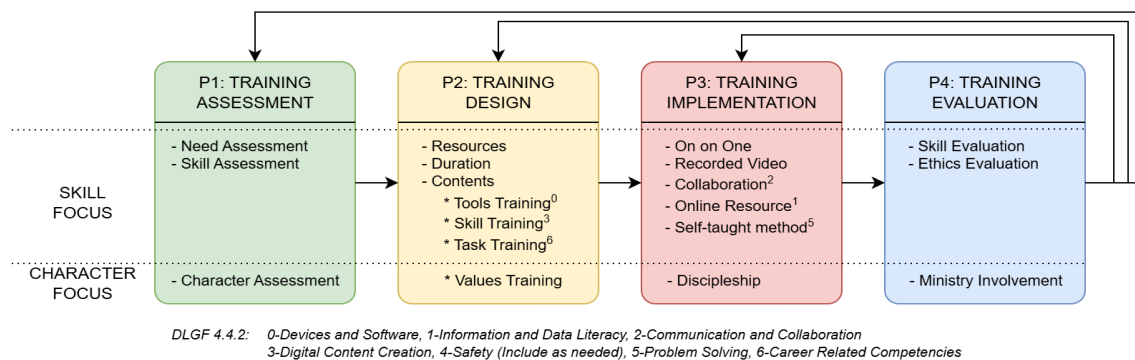


Fig. 1: Proposed Training Structure

The proposed training program consists of four phases, with two core focus areas. The first, Skill Focus, addresses the technical skills needed in the workplace. The second, Character Focus, integrates Christian values, emphasizing character development, discipleship, and ministry involvement alongside professional growth. The strong influence of faith in the HO workplace highlights how religious beliefs shape training, inviting future research on their impact on professional development and work culture across industries.

The first phase, Training Assessment, focuses on identifying necessary skills and evaluating workers' competency levels. This helps determine whether to develop workers' digital skills or meet specific client requirements while also guiding the next phase on how training should be conducted. The second phase, Training Design, outlines the necessary resources, including equipment, tools, instructional materials, and a training duration based on trainees' skill levels. The training contents highlight the three top skill priority competencies in DLGF 4.4.2 ensuring participants gain hands-on experience before deployment. Tool training develops the Software and Hardware competency as it focus utilizing hardware and software components. Skill training develops the Digital Content Creation competency as it applies the use of these tools and applications to create digital contents. Task training develops the Career Related competency as trainees experience either an actual client task or a replicate of finished task.

The third phase, Training Implementation, is where actual skill training takes place. Its approach varies based on the design established in the previous phase. Training methods include One-on-One, which allows trainers to closely monitor trainees and provide immediate feedback, and Team Collaboration, where trainees work with others to develop Communication and Collaboration skills from DLGF 4.4.2. In addition, HO also utilize online and recorded tutorials, leveraging free resources like YouTube or paid platforms like Udemy and Coursera, while some create customized training materials to address specific skill requirements. Trainees can engage in self-taught training and problem-solving, developing their Problem-Solving competency in DLGF 4.4.2. As they research and assess information, they also enhance their Information and Data Literacy skills. Finally, Training Evaluation assesses the training's effectiveness and areas for improvement. It evaluates whether trainees' skills have improved and if they are ready for deployment. Feedback helps refine the program and address trainee concerns, emphasizing continuous skill development.

6. Conclusion

This study underscores the importance of equipping the youth with comprehensive digital literacy to thrive in emerging work in digital content creation. Guided by the DLGF 4.4.2, findings show that undergraduates excelled in Communication and Collaboration as well as Information and Data Literacy. However, they need high priority training on areas specifically Career Related Competencies with Devices and Software and Digital Content Creation. While they were confident in using digital tools for information retrieval, communication, entertainment and self-expression, they require further training in utilizing these digital skills effectively in employment and real work setting. As guided instruction can support the development in these areas, competencies such as Safety and Problem Solving however may grow more naturally, as they build awareness and confidence over time. The research highlighted the importance of structured training focused on these key areas, aligning with the DLGF 4.4.2. By integrating ethical and Christian-based principles, the HO aims to go beyond financial success, fostering both professional and personal growth while creating sustainable career opportunities for undergraduates in the Philippines.

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8. References

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