International Journal of Economics, Commerce and Management
United Kingdom ISSN 2348 0386 Vol. 12, Issue 8, Aug 2024

https://ijecm.co.uk/

AN ASSESSMENT ON THE LEVEL OF DIGITAL TECHNOLOGY LITERACY SKILLS OF LOCAL COUNCIL STAFF IN SIERRA LEONE

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Abstract

Digital technology literacy skills encompass a lot more than just the ability to operate software or any digital device. It includes a larger variety of other constituents that enable someone to thrive well in the digital environment. The public sector still suffers from a deficiency in digital technology literacy skills among its staff members, which requires urgent action from policymakers as well as practitioners. As institutions largely depend on their human resources to succeed, so does the local council. This cannot be disconnected from the ever-growing need for a digitally literate workforce and the synergy between the political will-power and the administrative bureaucrats of the local councils so required to get the job done. A synergy that will work towards identifying and mitigating the existing digital technology literacy skills gaps and ensuring improved staff performance and effective service delivery is so required. This research uses a questionnaire with a sample size of 200 respondents. A descriptive analysis was done using SPSS software. The UNESCO's 2018 Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 is used as a predefined reference to measure the level of digital technology literacy skills of staff members of local councils in Sierra Leone. The findings from the study reveal the existence of digital technology literacy skills gaps among local council staff members. This, however, requires complementary efforts from both the political leadership and the administrative bureaucrats to identify these gaps and ensure effective on- and off-the-job training programs that resonate with satisfactory staff performance and effective service delivery.

Keywords: Digital technology literacy skills, local council, service delivery, staff performance

INTRODUCTION

With an estimated 10 percent of workers using virtual workplace environments by 2025 (Tsappi & Papageorgiou, 2023), so investing in the digital literacy skills of staff members becomes an important component of the 21st-century work environment. The digital literacy skills of local council staff will be assessed using the United Nations Educational, Scientific, and Cultural Organization's (UNESCO's) 2018 Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2 with a case reference of Sierra Leone local councils. The revised 2021 Local Government Act (LGA) of Sierra Leone provide a range of public services, such as approving annual budgets, fostering economic development, carrying out oversight, summoning officials of the council when necessary, managing their affairs, coordinating development activities of their localities, collaborating with agencies, and supervising chiefdom councils. As such, staff performance is essential to these governments' ability to carry out these functions.

Performance review systems evaluate an employee's effectiveness, talents, and moral character by assessing how well they meet predetermined standards. Staff performance at local government administration is influenced by several factors, including their low degree of digital technology literacy, lack of funding, ineffective staff, a shortage of qualified professionals and other skills gaps, and a poor work ethic that jeopardizes the delivery of effective service at this tier of government.

Digital technology literacy is one of the most important components of ensuring effective service delivery in the public sector. Administrative staff in these institutions need to possess some form of digital literacy skills to help them in their day-to-day functions. However, there seems to be neglected in the current literature about the digital literacy skills of administrative staff (Kabakus et al., 2023). Governance's primary goal is to enhance efficient and effective public service delivery by adopting a set of performance metrics and standards that are universally accepted (Milakovich, 2021) and the use of platforms by governments to render services to their citizens. Many governmental organizations are now executing higher-level, multi-tasking, and complicated government-to-business (G2B) or government-to-citizen (G2C) transactions remotely, even though the majority of transactions are simple data inquiries or information searches for wide-ranging navigation. However, if this is to work for public sectors like the local council, the skills of the human resources department should be sandwiched with the required digital technology skills, which will enable them to carry out their tasks efficiently and effectively. The full potential of digital governance in the public sector can be unleashed if the staff are digitally literate. As such, the effective utilization of a digitalized public sector institution can be realized once entry barriers have been removed, access opportunities have been equalized, and standardized, secure networks have been implemented for full-service interactions, minimizing duplication and removing inefficiencies and redundancies while also equipping the workforce with the digital skills required for such purposes (Durkiewicz & Janowski, 2018). Among many expectations for producing high-value policy impact, digital technology literacy is increasingly recognized as a key enabler for sustainable development. This cannot also be unconnected to knowing the use of digital technology platforms, as they play pivotal roles in people's lives and form the core of the digital ecosystem (Ha & Kim, 2023) for rendering essential services to users. This is used by the government to render essential public services. In this 21st century era, search engines like Google, Yahoo, and Science Hub, social media sites like Facebook, Whatsapp, Twitter, Instagram, and Instablog, e-commerce sites like Amazon and Alibaba, e-commerce applications like WeChat Pay and Alipay, and ride-hailing services like Uber, Didi, and Gojek are a few examples of some of the digital platforms in use. In this era of propelling technology giants, governments of nations should be able to

navigate to take advantage of chances for innovation and improve institutions' performance, as a system that is known as information technology governance (ITG) (Ali et al., 2021), which has a favourable impact on both innovation and organizational performance.

According to (Aavakare & Nikou, 2020), in their conference paper, "The Effects of Digital Literacy and Information Literacy on the Intention to Use Digital Technologies for Learning: A Comparative Study in Korea and Finland", they referred to digital literacy as the skills and abilities needed to use the available digital technology (tools, devices, and software) to fulfil the information needs. These digital literacy skills are so much needed in this era of digital government (DG) as a phenomenon involving new styles of leadership, new decision-making processes, different ways of organizing and delivering services to citizens, and new concepts of the relationship between citizens and their government, which aligns with UNESCO's 2011 definition of e-governance (Gil-Garcia et al., 2018). This ensures the public sector's use of information and communications technologies (ICTs) to improve information and service delivery drives, encouraging citizen participation in the decision-making process, and making government more accountable, transparent, and effective.

Digital technology literacy, which is the ability to locate, assess, produce, and share vital information using information and communication technology, resonates and necessitates both technical and cognitive skills. It creates the awareness, attitude, and ability of individuals to appropriately use and interact with digital technological tools (applications and software) to easily and effectively access information in different formats (e.g., pictorial, text, and videos) in the digital environment (Stordy, 2015; van Deursen & van Dijk, 2011). Digital literacy transformation can give governments the best chance of making sustainable, effective, and innovative policies that work toward fulfilling the United Nations Sustainable Development Goals (SDGs) (Liebowitz, 2023). With the right digital literacy skills of the public sector staff, policymakers and regulators are empowered to digitally transform their institutions with policies that take advantage of the opportunities offered by new technologies while navigating the many risks and challenges they can bring (UNDESA - United Nations Department of Economic and Social Affairs, 2020). In such a trajectory, one of the United Nations Sustainable Development Goals (SDGs) aims to substantially increase the percentage of the global population who have achieved at least a minimum level of proficiency in digital literacy (Laanpere, 2019). So, digital technology literacy and staff performance in the public sector are becoming as relevant as they are in the private sector (Benbunan-Fich et al., 2020), especially in an era where governments of many nations continue to embark on service delivery through electronic media for efficiency and effectiveness. For instance, the application of mobile technologies by local councils in their services can help them reach a multitude of their constituents through text messages. This can

also help make payment and filing of returns very simple and easy. The world over, digital technology literacy is not a new phenomenon as the global community leaps into the use of information systems (IS) in our daily activities. In the private and profit-making sectors, information technology implementation and digital technology literacy among staff have been found to increase staff efficiency and effectiveness, which increases business profit (Mithas et al., 2012), increases customer satisfaction, reduces waste, and increases stakeholder value (Sariwulan et al., 2020). This advancement in information and communications technologies presents creative opportunities to design company plans that are centred on co-creating consumer value. This scenario is particularly noteworthy in the banking sector, where e-banking activities provide competitive advantages and increase customer satisfaction (Carranza et al., 2021), and therefore the staff's ability to navigate themselves and be digitally literate is most often an uncompromising requirement in job advertisements (Lestari & Santoso, 2019).

Digital technology literacy can be of different types, and (Ha & Kim, 2023) categorized these into 12 groups: ICT literacy, information literacy, media literacy, computer literacy, critical literacy, visual literacy, health literacy, financial literacy, digital literacy, transliteracy, human behaviour literacy, and others. However, this paper will use the phrase “digital technology literacy” skills, which is synonymous in this context with digital literacy and is frequently used by most authors. In the digital age, it is the foundational knowledge that underpins development in all fields and serves as a stepping stone for a person to place the ladder to leap forward in their journey to success. In public sector organizations, there has been an increase in global awareness of the use of electronic government (E-government) systems for efficient and effective service delivery, increased accountability and transparency, and increased citizens’ participation in governance (Hai-Jew, 2013; Harris & Sun, 2008). So, the “digital literacy” of the public sector staff in this global era of revolving digitalization has a great impact on their performance. For instance, the Republic of Korea intends to enhance the digital literacy of public officials to increase the efficiency, transparency, and delivery of services to citizens through public administration (Young, 2016).

Governments around the world are significantly making use of social media platforms as a supplementary tool to convey messages to citizens and engage them on governance matters. This will increase citizens’ perceptions of the government’s transparency and citizens’ trust in the governance process(Song & Lee, 2016). The use of government social media platforms, they asserted, has been significantly associated with government transparency, which in turn is significantly related to trust in government. Social media has, however, been an ad hoc pillar through which citizens view the openness of state functions, which subsequently increases trust in government operations (Van Dijk, 2017). However, one of the existing gaps in the digital

literature is the divide that separates the availability of digital technology from end users. The concept referred to as the digital divide usually connotes the gap that exists between people who do have access to forms of information and communication technology and those who do not have access to any (the haves and have-nots) (Gil-Garcia et al., 2018). These forms are primarily computers and the Internet, and sometimes cell phones, particularly smartphones and other digital hardware and software that become inclusive (van Deursen & van Dijk, 2011). This concept of digital inequality is also seen between the private sector utilization of digital services for profit motives, customer satisfaction, and an increase in shareholders' wealth, and the public sector use of digital tools for effective and efficient service delivery. These skills are relevant to and should be used for living, working, studying, and entertaining oneself in the information society that we all live in today.

Even though there are still several barriers to realize the digital modernization of public administration, the benefits of a digitally modernized public sector institution with the right calibre of staff in this digital era far outweigh the underlying constraints (Khan et al., 2022). Businesses, both large and small—as well as many governments, profit, and non-profit organizations of all purposes and sizes—are adopting advanced technologies, revising job descriptions, and developing new accountability and performance management strategies to adapt to the new era of digital technology (Milakovich, 2021). This has increased sales revenue through financial technology (Fin-tech or payment gateways) in the private sector (Parianom et al., 2022) while the operational competence of e-businesses has also influenced their corporate performance (Girindratama, 2018). This digital advancement of the public administration system and getting the right staff members to effectively operate the system implies the expansion of methods for analyzing and evaluating the implementation of government programs, projects, and policies, including the audit of the effectiveness and efficiency of their implementation process and also helping in the review process of public policies (Ziyadin et al., 2020). This has a great impact on foreign diplomatic arrangements (Jan, 2017), which further provides a platform to understand the interplay between continuity and change in international politics (Hedling & Bremberg, 2021). The availability of digital skills by public sector staff, the construction and upkeep of an online catalogue database, improved virtual reference services, and improved internet search activities for users have all contributed to improve job performance among staff members of 21st-century libraries (Eliezer & Enuma, 2019). The staff learning of new technological skills is essential for digital transformation and a route for leaping forward in this digital era, as it will create in them a digital mindset and be able to use their skills to create new opportunities and learnings that are useful in the environment (Somerville et al., 2008) and increase employability (Khan et al., 2022). A digital mindset is needed as a set of

attitudes and behaviours that enable people and organizations to see how data, algorithms, and AI open up new possibilities and to chart a path for success in an increasingly technology-intensive global community (Leonardi & Neeley, 2022), which will also help employees in public sector organizations modify their work and create the needed impact in service delivery to their constituents.

In recent perspectives, the real challenge of digital literacy is not merely technology, as introducing new technology into the workplace is not only about hardware or software; it also encompasses having a workforce that needs to adapt to change, know how to use new technologies, and their post-adoptive behaviours in this new era of global technology dominance (Colbert et al., 2016; Muhammad Irfan Nasution et al., 2020). Global insurgences and other emergency issues such as the COVID-19 pandemic do not only keep reminding us of the growing relevance of digital technology and user literacy but also the widespread agreement amongst policymakers that the existing workforce's literacies are inadequate to meet the literacy demands of the future workplace needs (Farrell et al., 2021).

If you are unable to use digital technology, there are many things you just cannot do or access in the workplace of the 21st century. You may increase your productivity, access to resources, fulfillment, and pleasure in life by having digital literacy skills.

This article will detail a synopsis of the necessary Digital Technology Literacy skills according to UNECSO'S DLGF and the gaps that are found in a public sector organization of a sub-Saharan developing nation. It's set to identify the digital literacy skills gaps existing in the local council that continue to affect such public sector staff performance as well as identifying the available skills gap in the available workforce. The paper's research questions will look at:

1. How far has the country's local councils gone on the super highway to the information communication Technology society in terms of Digital Technology Literacy as a measure of the 2018 UNESCO's DLGF?
2. What are the challenges the local councils face in implementing a digitalized work environment?
3. What can be done to engender the process to facilitate the achievement of the government's Digital Technology Literacy Skills for all local council staff for the development vision of the country?

LITERATURE REVIEW

Digital Technology Literacy Narratives

In 2002, the International Information Communication Panel (Educational Testing Service (ETS), 2002) defined information communication technology (ICT) literacy, a

component of digital technology literacy, as the process of using digital technology, communications tools, and/or networks to access, manage, integrate, evaluate, and create information to function in a knowledge society. According to the UNESCO concept, digital literacy becomes the building block for understanding ICT devices. They expound further that the difference between technology and digital literacy is that "technology literacy is an appropriate skill and competence with using technology, while digital literacy requires fluency in digital communication, understanding, filtering, and manipulation to become successful in the future."

Aoun, (2017) however, explains the differences as follows: "Digital literacy is directed at the goal of enhancing abilities to read, analyze, and use information in big data, but technology literacy is directed at providing an understanding of how technology applications and engines work in their environments. This compact system of abilities and tactics employed by users and learners in digital settings is what (Eshet-Alkalai, 2004) termed "the survival skills in the digital era. Digital literacy has over the past decades involved more than just the mere ability to use information technology software programs or operate some other related digital devices, but has also now includes a multitude of complex cognitive, motor, sociological, and emotional skills that users need to effectively interface within the complex digital environments of the 21st-century.

Even though national digital literacy frameworks have been developed and are in use in most countries of the world, in addition to which enterprise frameworks have been added, the objective of the digital literacy global framework (DLGF) is to develop a methodology to measure the Sustainable Development Goal 4 indicator 4.4.2 (percentage of youth and adults who have achieved at least a minimum level of proficiency in digital literacy skills). Several countries from the European Union, Latin America, the Middle East, Sub-Saharan Africa, Asia, and several others, totalling 47, make up the framework's membership. These frameworks at DLGF come in two varieties: those created at the national or subnational level and those that are adapted from the training programs and assessment frameworks used by commercial businesses (Law et al., 2018). It should be highlighted, nonetheless, that the enterprise frameworks lack official recognition as a national framework. These are frequently used by national organizations (like the Colombian police force) to establish employment qualifications and human resource development.

The worldwide panel consisting of experts from the fields of education, labour, non-governmental institutions, politics, and business czars on information communication and technology was assembled in January 2001 by the Educational Testing Service (ETS) to investigate the growing significance of both established and new information and communications technologies (ICT) and how they relate to literacy. This worldwide panel also

includes countries like Australia, Brazil, France, the USA, and Canada as representatives. Five meetings of the International ICT Literacy Panel and its committees were held that year to discuss two main themes. Firstly, the ETS, along with the panel members, wanted to examine the need for a measure of ICT literacy across countries as well as within specific organizations, such as learning institutions and businesses, and secondly, to develop a workable framework for ICT literacy. However, the current global public policy focus on digital governance is on the detrimental impact of limited access to hardware, software, and networks such as the internet and, by extension, electricity availability. In this research paper, we believe that this characterization of the digital divide must be changed to include the impact of limited reading, numeracy skills, and problem-solving skills possessed by an individual staff member in public services. Without these skills, all the hardware and access in the world will not enable people to become digitally literate. A continued focus on building infrastructure should be complemented by an effort to identify those without the ability to manage, integrate, evaluate, and create information in a traditional sense and to provide them with the necessary tools to acquire these critical skills that will enable them to navigate and sail through this digital era. There have, however, been successful partnerships between the private sector and the public sector in advancing the deployment of the technology infrastructure (Educational Testing Service (ETS), 2002). However, if a digitally literate society is to be ensured, a focus on digital infrastructure alone is never enough, as it could even lead to a world of widening digital imbalance, which will surely deter the ability of employing institutions or agencies to find skilled and capable employees and limit the benefits of technology applications and tools to help people meet fundamental needs such as quality health care, public safety, governance participation, and good jobs.

Several pieces of literature on digital technology literacy have been published (Gusti et al., 2023; Ha & Kim, 2023; Khan et al., 2022; Lestari & Santoso, 2019; Lynch, 1998; McLester, 2007; Tinmaz et al., 2022), but there are still no standardized instruments for monitoring the SDG digital literacy framework indicator per UNESCO's Digital Literacy Global Framework (Laanpere, 2019). As advancement in technology propels in this digital age, institutions need to work harder toward meeting the global trend of technology, failure of which is detrimental to their growth and survival (Nikou et al., 2022). So, public institutions that are unable to adapt, develop, and employ technological solutions in a timely and coordinated manner will eventually do so at their peril. These technology adaptation changes will influence staff not only their performance but also their job satisfaction (Muhammad Irfan Nasution et al 2020, 2020) which has a great impact on their well-being. The competencies, self-awareness, and relationship expectations of the digital workforce have all been changed by greater digital literacy and

technology use, and the technical advancements have also had an impact on how work is organized and done (Colbert et al., 2016). Since employees now have access to a wealth of information at their fingertips that they can use to interact with colleagues around the world and provide goods with growing capabilities at lowering costs, these advancements have been positive in many ways, have greatly influenced institutions, and have also led to the growth of many.

The 21st-century era of global transformation carries with it the pressure to innovate and improve staff performance in the workplace, which has gradually led to the continuous search for more digitally skilled personnel and tools to improve staff work performance, increase output, and improve service delivery (Felício et al., 2021; Pee & Kankanhalli, 2016). In public services like private institutions, the chances for someone to improve their digital abilities also depend on the situation in which they are operating and the policies in place.

As part of a 21st-century skill (Voogt & Roblin, 2012), digital literacy includes collaboration, communication, digital literacy, problem-solving, citizenship, creativity, and critical thinking to solve emerging digital-related issues. Digital technology literacy is so required in the use of e-government services because e-government services include much more than just gathering online information, downloading files, or making online transactions; they also go further in the engagement of many citizens and stakeholders in the process of shaping, debating, and implementing public policies, in which broad terms the staff member is expected to be knowledgeable to offer effective services.

Sierra Leone Digital Technology literacy and Governance preparedness

The Government of Sierra Leone seeks to prepare and enable its citizens to participate in the Fourth Industrial Revolution and the global AI economy by building capacity in its local institutions, which will further enable start-ups and companies to translate advanced technology into the country. The government, in its drive to have a 21st-century global outlook, is assiduously working to make sure that the country, among other things, becomes a platform for implementing nationwide digitalization systems for solving development and humanity challenges, particularly related to the achievement of the Sustainable Development Goals and the National Development Plan (NIDS 2019). The NIDS is part of the dream to make Sierra Leone a centre of innovation and entrepreneurship hub, which resonated with its launch by the Directorate of Science, Technology, and Innovation (DSTI) in 2018. This is driven by one core philosophy: Digitization for All, and digital identity, digital economy, and digital governance are the three main components of the DSTI. To achieve this maiden goal, the DSTI has since formed trustworthy alliances with top academic institutions, cutting-edge research institutions,

and foreign governments. A three-year Memorandum of Understanding was signed by DSTI and the e-Government Academy in February 2019 to establish a technical partnership on e-governance for the provision and management of public services in the country. A group of top government officials spent a week in Estonia's e-Governance Academy (eGA) in May 2019, learning best practices that will help guide and shape Sierra Leone's e-governance and digitization agenda (DSTI Media 2019).

Every country must use digital literacy technologies as a key component of its modernization plans to provide public value and ensure sustainable growth and development. Several sub-Saharan African nations (Ghana, Sierra Leone, Nigeria, etc.) and regional organizations like the African Union (AU), ECOWAS, and the Mano River Union etc. have created policies for information, communications and technology (ICT), e-governance, and digitalization over the past 20 years. The development of the Sierra Leone National Innovation and Digitalization Contemporary Policy was influenced by the policies of the African Union, the Economic Community of West African States, the Mano River Union, and other progressive organizations it is a signatory to. The initial National Telecommunications Act was created in 2006, which gave the Ministry of Information and Communication the authority to create the institutions that would carry out Sierra Leone's ICT transformation. An ICT policy created in 2009 follows the 2006 Telecommunications Act. A 2017 revision to that policy adds frameworks for e-government and the Cybersecurity Act of 2020. Digital skills and digital technology are a duo that plays a great role in the current era. As for the impact of e-government development on governance indicators, the government has created a 10-year National Innovation and Digital Strategy (NIDS) (2019–2029) intending to direct the nation's investments, policies, and governance frameworks for the country's current and future development. By emphasizing efficient service delivery, public involvement, and the digital economy powered by innovation and entrepreneurship. The NIDS places Sierra Leone among regional and worldwide leaders in the field of digitally agile government. Such a change will increase national production while lowering the cost of governance and cutting down on corruption (NIDS 2019). Digital literacy, according to (Martin & Grudziecki, 2006), are the awareness, attitude, and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze, and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others in the context of specific life situations to enable constructive social action. The specific digital literacy competencies and proficiency levels that are significant based on their unique country and economic sector contexts have been discovered through the development of the Digital Literacy Global Framework (DLGF) and the mapping of the instances underscored.

Sierra Leone's Digital Framework and the UNESCO DLGF

The use of digital information and communication technologies (ICTs) to reform government institutions and public services is frequently—and perhaps naively—perceived as the "saviour" of the twenty-first century, the progressive means to revive democracy, cut expenses, and raise the standard of public service delivery (Milakovich, 2021). The Government of Sierra Leone (GoSL) in its digital drive, will prioritize digitizing identity (individuals, assets, institutions, entities, etc.), the economy (financial inclusion, entrepreneurship, process optimization for government, businesses, and industries, etc.), and governance (the provision of services between the government and citizens) to drive this core value of 21st-century society. This significant initiative relies on the government and its partners to extend dependable and usable voice, text, and data connectivity across the nation. It is powered by sophisticated digital data collection and analysis, which will enable ground-breaking distributed innovation at unprecedented scales across the nation and in every industry when combined with the accessibility of services and devices. However, given the government's unwavering commitment to a digital economy, which includes but is not limited to rendering effective public services to citizens, it is incumbent on it to have the manpower (employees) with the requisite digital skills to navigate government activities to achieve this dream. Digital literacy cannot be possible without the needed infrastructure and network availability. There have been established digital learning hubs across the country. The Digital Learning Hub at Fourah Bay College (University of Sierra Leone) is one of four fully equipped centres that have been established by the Directorate of Science, Technology, and Innovation (DSTI), with support from UNICEF, to help deliver digital learning resources to children from underserved communities.

Digital service delivery and citizen engagement are necessary for effective governance (the two-way interaction between the state and the citizen). For instance, in 2017, Mexico City's 8 million residents were encouraged to crowdsource ideas for the city's constitution through the use of digital platforms and media. There must be seamless access between residents and their government for services like voting, health care, and education, which the Sierra Leone government has included as part of their NIDS Framework. Digitization is a necessary tool for advancing and supporting fundamental governmental services, such as public financial management, and, in the process, reducing corruption and increasing transparency and accountability (NIDS 2018).

Like the European Digital Competence Framework, which identifies five areas of competence in which citizens must become proficient. These define five digital competence areas, with twenty-one digital competence elements and eight proficiency levels. The five competencies are: (1) information gathering; (2) processing; and (3) literacy. (2)

communication and collaboration interaction; (3) content creation and editing; (4) security and safety Protecting devices, content, personal data, and privacy in digital environments (5) Problem-solving Identifying needs and problems and resolving conceptual problems and problem situations in digital environments (Budai et al., 2023). These areas are then divided into further competencies, presented in detail, which later become essential skills for active participation in society and economic life. In Hungary, one of the European nations, digital education is said to be included in the new National Basic Curriculum, whose goal is to not only include digital competencies in the way of learning but also to create a digital platform and medium in which tutors can share their experiences and the students can acquire digital competency skills before they graduate to the job market. A digital pathway may encompass more than one technology type or industry, demonstrating how a variety of interconnected industries and technologies are strongly related to digital literacy competencies for employment, decent jobs, and entrepreneurship. The DLGF identified three potential pathways for competency progression in their 2018 framework: i) raising the bar for acceptable performance within the same competency when more complex digital devices or software systems are used; ii) creating new competencies; and iii) altering the relative importance of particular competencies as a result of shifting application domains or technological advancements (Law et al., 2018).

Digital technology literacy skills of public sector staff in Sierra Leone

In Sierra Leone, like many other countries, it's not uncommon for everyone to think that employees of both the private and public sectors are nowadays required to possess some form of digital technology literacy skills that will help them thrive well in the workplace. Regardless of the department in which a staff member works, digital technology literacy skills are a prerequisite or necessary tool when applying for jobs. The expectations that public services will be on par with those offered by the private sector are growing as global attempts to boost government performance continue (Milakovich, 2021). This cannot be disconnected from the reason why the government of Sierra Leone established the ambitious national innovation strategy (NIS), which outlines how the government, its development partners, and the residents can use science to pursue and advance the 2063 African Union agenda, the sustainable development goals (SDGs), and the country's 2020–2025 national development plan (NDP). Expectations that public services will be on par with those offered by the private sector are growing as global attempts to boost government performance continue on a propelling trajectory. Theoretically, knowing about successful initiatives should persuade public servants to respond to the felt needs of residents in the most time- and money-saving

ways possible. There are still significant distinctions because public managers are not in charge of their budgets and are required to follow tight laws and regulations, respect the rights and obligations of citizens, and satisfy customer requests for higher service quality at cheaper prices.

Public sector workers need to possess basic digital literacy skills such as a basic understanding of software and hardware, using a mouse for graphical user interfaces, connecting to the internet, finding information, and using data on devices. Basic digital literacy skills should be possessed by the public sector staff, including navigating through connecting to the internet and websites, determining the verifiability of online sources, using online communication tools, finding information and using data on their devices, using a mouse or keyboard for graphical user interfaces, etc., understanding cloud computing, recognizing scams and fraud, and also being an added advantage. This also involves basic hardware skills, determining website security, protecting devices from viruses and malware, and creating digital content.

Frameworks for digital literacy like this one from UNESCO can be used for a variety of purposes, like directing training programs and personnel selection in the workplace or inspiring the creative thinking of entrepreneurs to keep up with the latest developments in technology. While the findings from this paper will provide future researchers with the knowledge level of digital technology literacy of public sector staff in Sierra Leone, they will also be used to guide public sector institutions on the digital literacy level of their staff members and how improvements can be made to ensure effective and efficient service delivery in the local councils.

This research will look at the level of digital technology literacy skills so far attained by local council staff members and the impact on staff performance. The research explores the psychological predispositions(perceived usefulness) that explain end-users adoption and acceptance of various ICT systems and applications(Venkatesh et al., 2003). The study examines the perceived usefulness of digital technology literacy skills to the staff of the local councils in Sierra Leone using UNESCO's 2018 Global Framework of Reference on Digital Literacy Skills for Indicator 4.4.2.

This study believes that using the UNESCO framework as a pre-defined measurement will help to assess the current level of digital literacy skills and determine the gaps among local council staff in Sierra Leone. This would enable the research to offer practical solutions for effective service delivery.

Table 1 UNESCO Digital Literacy Global Framework for Thematic Indicator 4.4.2 of SDG 4.4

Competence area	Competences
0. Fundamentals of hardware and software	0.1 Basic knowledge of hardware such as turning on/off and charging, locking devices 0.2 Basic knowledge of software such as user account and password management, login, and how to do privacy settings, etc.
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content 1.2 Evaluating data, information and digital content 1.3 Managing data, information and digital content
2. Communication and collaboration	2.1 Interacting through digital technologies 2.2 Sharing through digital technologies 2.3 Engaging in citizenship through digital technologies 2.4 Collaborating through digital technologies 2.5 Netiquette 2.6 Managing digital identity
3. Digital content creation	3.1 Developing digital content 3.2 Integrating and re-elaborating digital content 3.3 Copyright and licenses 3.4 Programming
4. Safety	4.1 Protecting devices 4.2 Protecting personal data and privacy 4.3 Protecting health and well-being 4.4 Protecting the environment
5. Problem solving	5.1 Solving technical problems 5.2 Identifying needs and technological responses 5.3 Creatively using digital technologies 5.4 Identifying digital competence gaps
6. Career-related competences	6. Career-related competences refers to the knowledge and skills required to operate specialized hardware/software for a particular field, such as engineering design software and hardware tools, or the use of learning management systems to deliver fully online or blended courses.

Source: (Law et al., 2018). A global framework of reference on digital literacy skills for indicator 4.4.2

Note: The underlined competence areas and competencies in O and 6 are proposed additions to the existing DigComp 2.0 competence areas and competencies.

METHODOLOGY

A very significant decision in this research is the choice regarding the research methods to be used since it determines how relevant information for the study is obtained, analysed, and presented to its wider readership. Prior similar studies in this area have employed mostly qualitative methods of data collection. However, this research employs a robust literature review and primary data collection that was voluntary and unanimous. The data for this descriptive analysis was collected through the Google self-administered survey questionnaire which information was transmitted into the statistical packages for social sciences (SPSS) software through a comma-separated version (csv) file. This data forms the primary source of information to assess the level of digital literacy skills of local council staff compared to the predefined indicators in UNESCO's framework. Basically, the approach this paper adopted is to collect primary data in an in-depth interview of respondents to understand the level of digital literacy skills and attributes they possess while the intensive literature review provides the foundation on existing theories and recent work in the field.

The population of the study is the staff members of local councils in Sierra Leone, which consist of core, support, contract, and volunteer staff. Both primary and secondary sources are used for the data collection. The primary data source is from employees of local councils through an interview guide since it will be more flexible and allow for much information to be collected through open-ended questions (Kalonda et al., 2021). This data source is more reliable and has a higher level of confidence and precision in decision-making, with the trusted analysis directly impacting the occurrence of the events for study purposes. The secondary data/desk review is also conducted from various secondary sources, including reports, journals, annual activity plans, ICT training manuals, and other national digital frameworks, documents, files, etc.

The sample size is determined using the (Yamane, 1967) formula for calculating sample size. A sample size of 201 staff is obtained after a population of 404 was identified using a 5% confidence level. However, 200 targeted respondents responded to the questions and returned the filled questionnaires. Only one person failed to return the completed questionnaire.

However, since the study population has already been stratified according to cadres, a stratified random sampling technique is applied in the data collection process. This is used because the researcher wants to give equal opportunity to every member of the already stratified study population to have an equal chance of being included (OKELLO & WAMWAYI, 2022). This method provides a critical lens at the unusual extremes of the various competence levels of staff, which makes it a desirable option to draw inferences on the staff's digital competence level (Iliyasu & Etikan, 2021) at the local council. This sampling method also reduces sampling errors. The formula is thus given as below (Yamane, 1967):

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n: the Sample Size = 200.99 = 200 respondents

N: the study population; the total number of distinct individuals in the study = 404

e= level of Significance 5%

$$n = \frac{404}{1 + 404(5\%)^2}$$

RESULTS AND DISCUSSION

The data from respondents was entered into SPSS 20.0 through the comma-separated version (csv). The respondents' details are analyzed using descriptive statistics according to their answers about the level of their digital technology literacy skills. This framework would help to assess the current level of digital literacy skills and determine the gaps among local council staff in Sierra Leone.

Presentation of Data

Demographic data for this research is presented using Table 2 below.

Table 2 Summary of demographic characteristics of respondents: No = 200

Characteristics of research questions	Categories	Frequency	Percent	Cumulative
Sex: What is your gender?	Male	132	66.0	66
	Female	68	34.0	**100.0**
Age: What is your age bracket?	Below 25	20	10.0	10.0
	25-35	75	37.5	47.5
	36-45	90	45.0	92.5
	Above 45	15	7.5	**100.0**
Academic qualification: What is your level of academic qualification?	Undergraduate	7	3.5	3.5
	Bachelors	116	58.0	61.5
	Postgraduate	77	38.5	**100.0**
Length of service: How long have you worked with the local council?	Less than a year	31	15.5	15.5
	1-3 Years	106	53.0	68.5
	3-5 Years	14	7.0	75.5
	Above 5 Years	49	24.5	**100.0**
Work department: Please indicate your work department	Admin	50	25.0	34.2
	Operations	10	5.0	41.1
	Marketing	16	8.0	52.1
	Finance	25	12.5	69.2
	HR	13	6.5	78.1
	Others	32	16.0	**100.0**
	Total	146	73.0	
	Devolved Sectors	54	27.0	
Importance of Digital Literacy skills: Are digital technology literacy skills important in your job assignment?	Yes	187	93.5	93.5
	No	13	6.5	**100**

The respondents' knowledge level of digital technology literacy skills according to the six measurable indicators of the UNESCO digital technology literacy skills framework used by this research work is presented in the Table 3.

Table 3 Knowledge level of digital literacy skills of local council staff

UNESCO Competence areas	Digital literacy skills levels				N=200
1. Information and Data Literacy	Poor	Average	Good	Very Good	Excellent
1.1 Browsing, searching and filtering data and digital content	6	67	26	69	32
1.2 Evaluating data, information and digital content	20	65	17	66	32
1.3 Managing data, information and digital content	33	58	37	36	36
2. Communication and Collaboration					
2.1 Interacting through digital technologies	27	67	18	48	40
2.2 Sharing through digital technologies	33	58	14	56	39
2.3 Engaging in citizenship through digital technologies	30	58	42	30	40
2.4 Collaborating through digital technologies	52	42	19	36	51
2.5 Netiquette	18	81	21	41	39
2.6 Managing Digital Identity	53	45	15	40	47
3. Digital content creation					
3.1 Developing digital content	39	66	12	51	32
3.2 Integrating and re-elaborating digital content	52	53	15	56	24
3.3 Copyright and licenses	40	60	18	54	28
3.4 Programming	48	58	40	34	20
4. Safety					
4.1 Protecting devices	55	58	7	41	39
4.2 Protecting personal data and privacy	54	59	7	29	51
4.3 Protecting health and well-being	56	49	19	37	39
4.4 Protecting the environment	45	60	7	48	40
5. Problem-solving					
5.1 Solving technical problems	7	34	71	56	32
5.2 Identifying needs and technological responses	46	59	14	41	40
5.3 Creativity using digital technology	46	59	7	56	32
5.4 Identifying Digital Competence Gaps	47	48	32	49	24
6. Career-related competencies, such as engineering design software and hardware tools or the use of learning management systems to deliver fully online or blended courses online.	37	41	50	40	32

Discussion of results

Descriptive statistics were used for the data analysis. This is because it will provide a clear indication of the digital literacy skills level of the respondent in comparison to the pre-

identified measurement indicators in UNESCO's 2018 digital literacy framework. The responses were recorded on a Likert scale of 1 to 5, where 1 denotes poor, 2 denotes average, 3 denotes good, 4 denotes very good, and 5 denotes excellent. The demographic data showed that most of the staff members at the local council were men, consisting of 132, representing 66.0%. It also showed that most are graduates (bachelors), representing 58.0%, while undergraduates and postgraduates represent 3.5% and 38.5%, respectively. The country's 2015 population and housing census show that the country is a youthful nation made up of more young people between the ages of 18 and 35. This research also shows that the workforce in the local council is dominated by young people between the ages of 25 and 45, who make up 82.5% of the research respondents, while those below 25 and those above 45 make up 10 and 7.5%, respectively. 93.5% of the local council workforce interviewed for this research agree that digital technology literacy is so important in their jobs. The results of Table 3 from the in-depth analysis are discussed below.

Communication and Digital Literacy Competence Measurement

That is in 1.1, which focuses on the ability of the local council staff to browse through the internet, searching and filtering data and digital content. 3.0% of the respondents state that their skills at this competence level are still poor, while 33.5% have an average skill level. 13.0% and 34.5% of the respondents have good and very good competence levels, respectively. However, only 16.0% have excellent competence levels.

1.2 focuses on data evaluation, information, and digital content. 10.0% represent respondents with poor skills at this level, while 32.5% represent average skills. 8.5% of respondents have good knowledge of this competence level, while 33.0% possess very good knowledge. Only 16.0% of respondents have excellent skill knowledge in evaluating data, information, and digital content.

The 1.3 competence level includes managing data, information, and digital content. 16.5% of respondents said they have very poor knowledge at this competence level, while 29.0% indicated an average knowledge level. 18.5% represent staff members with a good competence level, and 18.0% represent those with very good knowledge in managing data, information, and digital content. 18.0% represent staff members with excellent skills and knowledge in this competence area.

Communication and Collaboration Competence Measurement Area

2.1 Interacting through digital technologies, which focuses on the respondents' ability to interface with other users through digital technologies. 13.5% and 33.5% represent respondents

with poor and average digital literacy skills, respectively, in this competence area, while 9.0% and 24.0% represent staff members with good and very good knowledge of this particular digital literacy skill. However, only 20.0% of staff members have excellent skill knowledge in interacting through digital technologies.

2.2 Sharing through digital technologies: in this digital technology literacy competence level, 16.5% represent staff with poor skills knowledge, 29.0% represent those with average level competence, and 7.0% and 28.0% represent good and very good competence levels, respectively. Only 19.5% of staff members have excellent skill knowledge on sharing through digital technologies.

2.3 Engaging in citizenship through digital technologies: 15% represent respondents who have poor skills at this competence level, while 29.0% represent those with average skills. 21.0% represent those who possess good knowledge at this competence level. 15.0% are those with very good knowledge of engaging in citizenship through digital technologies. 20.0% represent those with excellent knowledge at this digital competence skill level.

2.4 Collaborating through digital technologies: 26.0% represent respondents with poor knowledge on this digital technology competence level, 21.0% represent those on average, and 9.5% represent those with good knowledge skills on this level. 18.0% and 25.5% represent those with very good and excellent skill knowledge, respectively, for collaborating through digital technologies.

2.5 Netiquette deals with acceptable conduct while online that is appropriate and courteous not only to you but to other users as well. 9.0% of the respondents described having poor knowledge on this competence level. 40.5% represent respondents with average skill levels, while 10.5% are staff members whose skill levels are good. However, 20.5% and 19.5% represent those with very good and excellent skill levels, respectively.

2.6 Managing digital identity: in this competence level, 26.5% and 22.5% of respondents represent those staff members with poor and average skills levels, respectively, while 7.5% represent those with good skill knowledge on managing digital identity. 20.0% percent represent those with very good digital identity skills. Only 23.5% represent those people with excellent skill knowledge in managing digital identities.

Digital content creation

3.1 Developing digital content: at this digital technology literacy competence level, 19.5% of staff members have poor skill knowledge. 33.0% represent those who possess average kills in developing digital content. However, 6.0%, 25.5%, and 16.0% represent good, very good, and excellent skills and knowledge competence, respectively.

3.2 Integrating and re-elaborating digital content; in this competence level, 26.0% and 26.5% represent staff members of poor and average skill levels, respectively. 7.5% represent those with good integration and re-elaboration of digital content. However, 28.0% and 12.0% represent those with very good and excellent digital literacy skills and competence in this area.

3.3 Copyright and licenses: in copyright and licenses, 20.0% of the respondents depicted having poor knowledge of this competence level. 30.0% represent respondents with average skill levels, while 9.0% are staff members whose skill levels are good. However, 27.0% and 14.0% represent those with very good and excellent skill levels, respectively.

3.4 Programming: 24.0% of respondents indicated that they had inadequate knowledge of programming at this level of competency. Staff workers with strong skill levels comprise 20.0% of the sample, while ordinary skill responses make up 29.0%. Nonetheless, those with very good and excellent skill levels are represented by 17.0% and 10.0%, respectively.

Digital content creation

4.1 Protecting devices: in this digital technology literacy competence level, 27.5% represent staff members with poor skill knowledge on this competence level. 29.0% represent those who possess average skills in developing digital content. However, 3.5%, 20.5%, and 19.5% represent good, very good, and excellent skills and knowledge competence, respectively.

4.2 Protecting personal data and privacy; in safeguarding personal information and privacy of the staff member, respondents with poor knowledge of digital technology literacy make up 27.0%. Among those with average kills in protecting personal data and privacy are represented by 29.5%. On the other hand, 3.5%, 14.5%, and 25.5%, respectively, indicate good, very good, and excellent digital technology skill knowledge competency.

4.3 Preserving health and welfare: according to this digital technology literacy competency level, employees with poor and inadequate skill knowledge make up 28.0% of the workforce, those with average skill knowledge make up 24.5%, and those with good and very good skill levels make up 9.5% and 18.5%, respectively. Merely 19.5% of staff members possess excellent digital literacy skills and proficiency in the use of digital technology to preserve health and well-being.

4.4 Protecting the environment: according to this digital technology literacy competency level, staff members with poor skill knowledge make up 22.5% of the respondents, those with average skill levels make up 30%, and those with good and very good skill levels make up 3.5% and 24.0%, respectively. However, only 20.0% of the staff members possess excellent or exceptional expertise in using digital technology and environmental protection.

Digital content creation

5.1 Solving technical problems: in this digital technology literacy competence level, 3.5% represent staff with poor skills knowledge, 17% represent those with average level competence, and 35.5% and 28.0% represent good and very good competence levels, respectively. Only 16.0% of staff members have excellent skill knowledge in solving technical problems.

5.2 Identifying needs and technological responses; at this digital technology literacy competency level, staff members with poor skill knowledge base comprise 23.0%, average skill knowledge comprise 29.5%, and good and very good competence levels comprise 7.0% and 20.5% of the workforce, respectively. Merely 20.0% of the staff members possess excellent and exceptional ability knowledge in identifying needs and responding quickly with technology.

5.3 Creativity using digital technology: in this digital technology literacy competence level, 23.0% represent staff with poor skills knowledge, 29.5% represent those with average level competence, and 3.5% and 28.0% represent good and very good competence levels, respectively. Only 16.0% of staff members have excellent skill knowledge on creativity using digital technology.

5.4 Identifying digital competence gaps: in this digital technology literacy competence level, 23.5% represent staff with poor skills knowledge in identifying digital competence gaps, 24.0% represent those with average level competence, and 16.0% and 24.5% represent good and very good competence levels, respectively. Only 12.0% represent staff members with excellent skill knowledge in identifying digital competence gaps in the local council.

Career-related competences

6.0 Digital technology literacy skills, such as engineering design software and hardware tools: This also includes the use of learning management systems to deliver fully online or blended courses online. At this digital technology literacy competency level, staff members with poor career-related competence knowledge comprise 18.5% of the workforce, while those with average competence comprise 20.5%, and employees with good and very good competence levels comprise 25.0% and 20.0%, respectively. Furthermore, only 16.0% of employees are highly skilled in career-related competencies.

RECOMMENDATIONS

The acquisition of digital technology literacy skills is "sine quo non" for effective service delivery in this 21st century of propelling digitalization. From the analyses above, it is evident at this juncture that a lot of staff working in the local councils in Sierra Leone still do not have

enough, or even the basic digital technology literacy skills knowledge required according to the predefined UNESCO digital literacy framework, which is used as an assessment criterion by this researcher. In this dynamic world of digital technology literacy, we live in today, the absence of these much-needed 21st-century skills in the workforce is detrimental to transparency, accountability, and effective service delivery.

As new digital technology tools continue to develop, the new digital skills gap will also continue to surface on the shores of work environments (Amiel, 2006), including among the local councils. This will always demand that users update to the latest technological updates (Farias-Gaytan et al., 2022). These gaps cannot be disconnected from some of the inherent challenges associated with this all-spoken-about digital technology literacy for local government staff, including electricity, internet availability, cybersecurity, data, and privacy. So, to stay abreast of and move along with the current global digital technology literacy trend, local councils should critically look at these challenges and work to ensure their staff members are well-equipped with current digital technology literacy skills to ensure accountability, transparency, and effective service delivery in their localities. This is so because when administrative staff members use digital technologies and feel an improvement in their performance, they will exhibit more positive behaviours' (Kabakus et al., 2023), which will subsequently enhance timely task completion, performance improvement, and effective service delivery. With the trend toward digital technologies, government institutions should now be able to exploit this digital reality and data to improve the performance of their staff members and increase efficiency and effectiveness (Liebowitz, 2023). Therefore, the researcher recommends that:

The local council administration should carry out regular assessments of the digital technology literacy skills level of its staff members to determine the extent of digital gaps and which training programs are needed at different levels of gaps. However, since different staff levels require different tools relevant to their operations, it's incumbent upon the local council administration to critically relate the assessment process to include a focus on special tools and equipment so required at different staff levels.

After a thorough assessment of the required digital literacy skills, training, tools, and equipment required at different levels, the local council should ensure the proper management of the staff database and use it to conduct regular training (refresher and hands-on training) to see that skill gaps are reduced to the barest minimum level to ensure improved staff performance and effective service delivery. This will enable the staff members to be digitally updated at all times with the digital tools and skills required to increase their performance level and service delivery.

CONCLUSION

While this paper has provided strong practical insights into the adoption and relevance of digital technology literacy skills in local councils with a special target on Sierra Leone's local councils using the 2018 UNESCO's Digital Literacy Global Framework for Thematic Indicator 4.4.2 of SDG 4.4, there are, however, several areas that warrant further investigation by future researchers to enhance the understanding and implementation of this framework for effective service delivery in the local councils.

This research was conducted only within the local councils in Sierra Leone between the period December 2022 to March 2024, while the Google self-administered questionnaire was distributed and collected within one month (January 2024) with a sample size of only 200 respondents. So, this paper provides a limited period to monitor progress made by staff members over a certain period. However, a longitudinal study that examines the sustainability and long-term impacts of the strides taken by management to measure up with the framework indicators over a period will provide key insights into the local council's institutional growth and transformation.

Furthermore, given the global trend of growth in the digital technology space, the 2018 UNESCO's Digital Literacy Global Framework for Thematic Indicator 4.4.2 of SDG 4.4 is expected to become absolute as more advanced measurement indicators of digital technology literacy skills emerge in the future.

However, despite this framework's limited attention within the academic community and the propelling growth of the digital technology environment, which continues to pose threats of future absoluteness or call for an upgrade of any current framework or measurement indicator, this paper provoked and brought to the fore the crucial role of digital technology literacy skills in improving governance and effective service delivery of local councils.

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