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Graduates' Digital Literacy and Employability in Tanzania: A Review of Required Competencies

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Abstract

This study comprehensively reviewed the literature on the essential digital literacy skills required for graduates to enhance their employability in today's Tanzania labour market. The researcher obtained the articles from five academic databases. Snowballing was employed across the existing articles to find peer-reviewed articles published in the last ten years. The key results indicate that there is a range of multi-layered digital competencies required by graduates who enter into their careers, including information literacy, communication, and collaboration literacy, media literacy, technical literacy, office productivity software proficiency as well as web application awareness such as social media platforms knowledge and also familiarity with data analysis tools. Furthermore, critical thinking should be fostered alongside problem-solving capabilities within digital environments - these are regarded as essential, where learners have to think critically while solving problems through technology-mediated learning. The review further established that most employers expect candidates with knowledge in these areas, but unfortunately, many graduates lack such knowledge; hence, this calls for curriculum changes to equip them appropriately for continuous learning towards skill building, making them more marketable than before. Joint efforts between different actors are vital to improve graduates' digital capabilities, thereby creating a friendly employability environment.

Keywords: Digital literacy, Employability, Information literacy, Skills gap, Curriculum development

1.
2. Introduction

Digital literacy is progressively becoming a vital skill set for today's jobs and employability for higher education graduates. The proliferation of digital technologies across organizations, industries, and economic sectors, compels employers to expect graduates with foundational digital competencies to succeed in the modern workplace (Smith, 2021). Digital literacy incorporates the individual skills, knowledge, and abilities needed to efficiently use digital devices, communication applications, networking platforms, and information systems

(Glister, 1997; Bawden, 2008). All these may enable individuals to access, evaluate, create, and communicate various data and information in digital environments.

A gap between what employers expect and what higher education graduates can offer in terms of digital competencies has become very clear. Employers' expectations of graduates' digital skills and the current scenario have been different. According to Randstad (2021), 78% of 500 US hiring managers surveyed said that new graduates do not possess important digital skills vital for success at work. Downton (2020) states that only 31% of graduate recruiters in a UK study on 300 entry-level candidates met more rigorous requirements such as data analytics, cybersecurity awareness, and multimedia communication.

In the African context, however, there is a wide gap between what graduates know about technologies and what they should know, given the rapidly changing digital landscape. This problem is exceptionally distinct in Tanzania, where most schools have been unable to keep up with new technology because of a lack of funds or awareness. A recent report from UNESCO (2021) stated that sub-Saharan Africa needs more teachers who can teach kids how to use computers so that they can eventually get jobs in the 21st-century workforce. The same study found that only 10 per cent of all students have access to online learning at their school while many others lack necessary equipment like laptops or tablets; moreover, most institutions do not even own enough modems, let alone trained staff needed for such an endeavour.

Socio-economic factors also contribute meaningfully towards worsening this situation in Tanzania, where the majority of people live under the poverty line and cannot afford to buy digital gadgets as well as pay for internet service providers (Hooker, 2022). As a result, many Tanzanian graduates enter the job market without proper knowledge of navigating through various sectors which require one to be conversant with different computer operations systems thus making it difficult for them to secure employment opportunities. For instance, according to TCU's survey conducted last year, most university leavers exhibited weak skill sets, including information literacy; computing science basics such programming languages were poorly understood, limiting their chances of becoming successful candidates during recruitment exercises across organizations in the country.

To address the highlighted challenges that face young people graduates from colleges and universities, Tanzania's ICT Policy must be implemented over time

(NICT, 2016). This policy offers guidelines concerning infrastructure development at the national level, promoting programs that equip individuals with the necessary knowledge of communication technologies and how to effectively utilize them while integrated into the formal education system, among others. Nonetheless, there seem to be some delays made during the rolling-out process since still many fresh graduates lack the relevant skills needed for the digital era (Hooker, 2022). Therefore, immediate initiatives are required to tap into potential benefits associated with the global ICT revolution, which requires all workers to possess basic computer literacy skills irrespective of their job designations or employment categories.

It is worth noting that while the government is trying its best to bridge this gap among graduates, a few challenges need to be addressed. Firstly, educational institutions must provide the necessary resources and infrastructure learners require to enhance their understanding of using different technologies; secondly, policymakers should develop strategies to make access affordable through subsidized internet bundles or free Wi-Fi zones, especially within schools and colleges (UNESCO, 2021). Lastly, the government has to work hand in hand with private sectors making sure that such efforts are implemented successfully and internships should be provided where students can get practical skills about different phases of ICT. Therefore, a united force from learning organizations, public institutions, NGOs, and businessmen would narrow down the digital divide existing among graduates today.

Therefore, this systematic review aims to summarise existing literature on digital skills expected from graduates by employers to highlight specific digital competencies essential for graduates' future jobs. The current need to address digital literacy demands among graduates and organizations in the context of increasingly competitive digital workplaces explains why this has become a top priority when searching for employment opportunities after graduation. This review is intended to explicitly document those key digital competencies that should be developed as priorities for students through the accumulation of empirical findings. Results will facilitate the identification of weak points in graduate digital capabilities as well as identify digital-related areas within educational programs and workforce training initiatives that need more attention.

Digital literacy and employability are intricate and multifaceted matters. A broad definition of digital literacy adopted in this study incorporates cognitive, socio-emotional, and technical abilities associated with it – and here are the

terminologies that are commonly used – "21st-century skills[1]," "digital capabilities[2]", or "new media literacies[3]" as forms or expressions of "digital literacy" based on the measured competencies.

To date, there is no analytical review focusing explicitly on employers' expectations about graduates' ability vis-a-vis information technology adoption into their work life after completing higher education. Other reviews have been conducted for general populations alone (Gama & Jesus, 2020) or only students (Pangrazio & Selwyn, 2021). This indicates that there is still a gap in literature synthesis related to new entrants to the labour market, with high regard given to digital skills for securing a job. Graduates should be aware that their target employers have specific expectations regarding the kinds of abilities they possess upon graduation.

Generally, the study focuses on the required digital literacy competencies by graduate students from higher learning institutions (HLIs) for employability. The review specifically aimed to identify the essential digital competencies graduates require for employability and workplace success.

3. Methodology

This study used a desk review methodology using MAXQDA computer-based software for qualitative data analysis. The MAXQDA was used to search the key terms related to the study to synthesize the literature concerning digital competencies requisite for graduate employability. To this end, the following databases, including Google Scholar, ERIC, PubMed, and Scopus, were used to download articles which were then imported into MAXQDA to explore the studies

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[1] 21st-century skills is a set of abilities that students need to develop to succeed in the information age such as learning skills (4Cs: *Critical Thinking, Creativity, Collaboration, and Communication*), literacy Skills and life Skills.

[2] "Digital capabilities" refers to the set of skills and knowledge that enable an individual to use digital technology effectively, responsibly, and confidently in various aspects of life. The concept goes beyond basic computer literacy; it involves a deeper, more comprehensive understanding and proficiency with digital tools and environments.

[3] "New media literacies" refer to a set of cultural competencies and social skills that young people need in the new media landscape to engage, collaborate, and communicate effectively. These literacies go beyond the basic ability to read and write — they include skills related to navigating the digital, interactive, and transmedia environments that characterize the 21st century.

that highlighted key variables related to digital skills, digital literacy, digital competencies, graduates, employers, recruitment, and work readiness-related terms. The search was limited to English language publications from 2010 to the present.

The screening and selection of articles involved the assessment of titles, abstracts, and full texts using predetermined eligibility criteria. The inclusion criteria for studies were cantered around the thematic area of digital competencies demands in graduate jobs as required by employer needs. On the other hand, opinion pieces, conceptual models, and studies that solely focus on student experiences were excluded.

The extracted data encompassed digital competencies as presented by different scholars and concerning study objectives. Several search techniques to identify digital literacy competencies in the MAXQDA were employed, including text search and autocode, extended text search, word explorer, and visualization using word cloud (see Figure 1). The output from the text search and autocoding was presented in a tabular format (see a summary in Table 1). The qualitative data were thematically analysed to add depth and richness to the research.
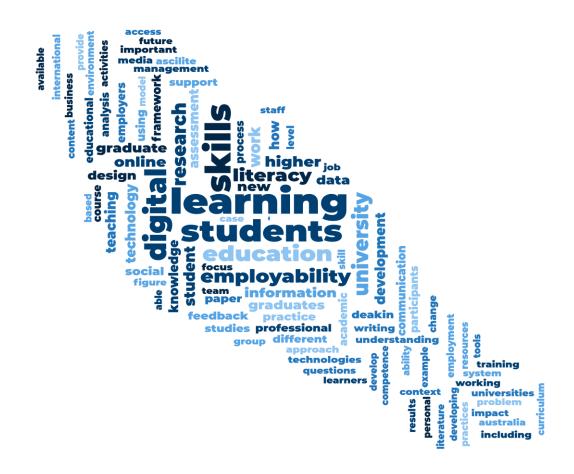
Figure 1: MAXQDA Wordcloud showing the text search technique using visualization

Word cloud helped in the screening, selection, and word selection for text search queries; whereas the bigger the word in the image, the greater the coverage in the reviewed articles. This extraction approach ensured that the review was thorough, reliable, and robust. It helped to provide a clearer understanding of digital skills demands and graduate competencies, further advancing our knowledge in this critical area. Critical appraisal was intended to evaluate study quality and risk of bias using established tools for the included methodologies. The review synthesized evidence to address the focus on required digital literacy competencies.

4. Results

The database search yielded 245 records, with 228 remaining after removing duplicates. Screening of titles and abstracts using the MAXQDA crosstab feature excluded 78 records, leaving 150 articles for full-text review. After assessing eligibility, 65 studies were included in the final qualitative synthesis. Across the

studies, the most frequently identified essential digital competencies for graduates were digital communication (35%), collaboration tools (26%), data analysis (18%), critical thinking (12%), and content creation (9%). These percentages were acquired through the emerging hits from the analysis in the MAXQDA system.

Table 1: The most frequently identified essential digital competencies for graduates (n= 65)

SN	Digital competency	Hits	%
1	Digital communication	23	35
2	Collaboration tools	17	26
3	Data analysis	12	18
4	Technology critical thinking skills	8	12
5	Content creation	6	9
	TOTAL	**65**	**100**

The review of documents demonstrated that information and data literacy is an essential digital skill for graduates' employability and workplace success. Employers in various fields require graduates to be able to find, appraise, and use information from multiple sources efficiently. This capacity allows the graduate to identify relevant facts, retrieve them, interpret them in context, deliver informed decision-making, and solve complicated issues (Smith, 2021; Bawden, 2008).

The reviewed articles significantly emphasized effective communication and collaboration digital skills as key graduates' digital competencies. Employers considerably prefer using digital platforms to communicate with colleagues, clients, or even stakeholders from different parts of the world (Vuorikari *et al.*, 2016; Rodrigues *et al.*, 2019). The ability to operate video conferencing software, collaborative document editing tools, or project management platforms makes teamwork seamless, enabling an efficient flow of communication that also helps improve workforce productivity (Rodrigues *et al.*, ibid)

According to the review, employers are interested in having graduates who have mastered content creation using digital technologies and multimedia skills. This involves designing digital content like presentations, reports, and graphics videos so that they can express opinions and ideas more adequately (Carretero *et al.*, 2017). In business areas like advertisement and marketing, a candidate with

outstanding creative skills can create digital content to produce attractive visual materials that appeal directly to audiences.

Graduates must have excellent problem-solving abilities related to technology and competency in computational thinking for their survival in workplaces today. Computer programming, modelling, and other forms of computation are used under this competency when solving complex problems (Fraillon *et al.*, 2019). By enhancing computational thinking ability, some graduates would come up with new engineering-related ideas. In contrast, others would automate operations, thus minimizing costs involving finance matters, while others would optimize healthcare practices, resulting in improved efficiency and increasing job opportunities (Barr & Stephenson, 2011).

The review also found that graduates should understand digital technologies' ethical and social implications. Some of the things that make up this competency are knowledge of data privacy, digital citizenship, responsible use of digital tools and platforms, and cybersecurity (Carretero *et al.*, 2017; Vuorikari *et al.*, 2016). Graduates with such skills would better be placed to solve ethical dilemmas by considering the broader societal and environmental impacts posed by digital technologies, hence ensuring employability and workplace success.

These core digital competencies highlighted through the review of various documents are vital for undergraduates to navigate the web-enabled world effectively, work alongside diverse groups, create captivating content, address intricate issues, and choose wisely when making technology decisions. Graduates will increase their chances of securing jobs if they learn these skills since they would be productive or flexible enough for a particular job and any employment task in modern business setups.

4. Discussion

The findings from this review are consistent with and build on previous studies about the digital skills graduate employees need in today's job market. As Smith (2021) argued, this review has emphasized that strong communication abilities and collaboration capacities through digital tools are the most sought-after requirements for employers. The shift towards data analysis also fits into Downton's (2020) observation of a growing tendency towards data-driven industry decision-making.

Digital content creation was considered an essential digital competency reflecting multimedia skills as foregrounded by Carretero et al.'s (2017) frameworks.

Graduates skilled in creating presentations, reports, graphics, and other forms of digital media can use these skills to articulate information and ideas convincingly to diverse audiences. It is associated with communication literacy, which Bawden (2008) recognizes as central to digital literacy.

The findings from the review on problem-solving with technology and computational thinking relate to Fraillon et al.'s (2019) conceptualization. Coding, modelling, and other related proficiencies enable graduates to automate processes, get insights from data analysis, and develop innovative solutions – all highly demanded by contemporary organizations (Barr & Stephenson, 2011). It is a significant focus for change in higher education.

Additionally, the identified necessity for ethical reasoning concerning technology use aligns with the principles behind socio-emotional domains, which are crucial components within digital literacies frameworks (Vuorikari *et al.*, 2016; Carretero *et al.*, 2017). Given students' increasing reliance on powerful technologies, this mindset becomes more crucial than ever before.

Previous reviews have covered digital literacy among general populations (Gama & Jesus, 2020), while other researchers focused on students' perspectives only (Pangrazio & Selwyn, 2021), while this study uniquely synthesizes competencies required from prospective employers of fresh graduates. The competency categorization offers an empirical foundation for designing reskilling programs. Thus, to bridge the gap in graduate preparedness, there is a need for continued alignment between academic institutions and employers based on changing work requirements.

In summary, this review establishes top digital literacies that have to be absorbed by the higher education systems to generate job-holders from these institutions. In meeting the increasing employers' needs within our heavily technology-based economy and society, the education sector must address shortfalls through the creation of new learning approaches as well as strategic workforce development interventions.

5. Conclusion

This review aimed to identify the essential digital competencies required for graduate employability and workplace success in Tanzania. The review concluded with a set of distinct critical digital literacy skills that employers expect from fresh graduates. The skill most sought was effective communication and collaboration using digital tools, in resonance with today's organizations working

within teams. Furthermore, data analysis capability was highly demanded as making decisions based on data across different sectors is increasingly becoming necessary. However, a significant mismatch exists between what employers look for regarding digital competence and what most graduates possess and demonstrate during the employment search.

The review highlighted areas requiring priority attention among higher education institutions in Tanzania, regarding digital literacy to boost graduate employability prospects. These range from promoting strong information literacy skills, proficiency in communication and collaboration digital tools, data analysis digital tools, creating digital content, and understanding ethical considerations when using any technology, especially those tools involving human beings. Higher learning institutions should work closely with industry stakeholders and policymakers to continuously adapt curricula and training programmes to meet the changing needs of the digital workplace if identified skills gaps are to be closed.

The findings call for an all-inclusive appraisal of higher education institutions' curricula to embed the identified core digital skills into them. The same should also involve institutional industry partnerships that will enforce the curricula-harmonized digital skills with prevailing and future labour demands. Building relationships between HLIs and employers is pivotal to facilitating and enhancing internships, guest lecturers, and industry-driven projects. These partnerships would expose students to real work situations and give them practical workplace digital skills. Moreover, it is also on call to introduce continuous staff professional development programs to improve their digital literacy capabilities and keep them updated on technological changes and industrial practices. Lastly, longitudinal research is needed to monitor emerging labour market demands concerning digital skills while evaluating various interventions targeting gaps in graduates' computer literacy over time, improving the country's economic prosperity and enhancing its competitiveness in the age of new technologies.

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