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Kwame Baah-Acheamfuor

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Kwame Baah-Acheamfuor

Graduate School of Business, University of Zambia.
Lusaka, Zambia

Corresponding Author:

Kwame Baah-Acheamfuor

kbacheamfuor@gmail.com

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ABSTRACT

Digital competence has emerged as essential for employers and employees amid the digital transformation within organisations. This study referenced the European Union Digital Competency Framework 2.2 (DigComp 2.2) and assessed the digital competencies required for employment in the Ghanaian labour market. The "post-positivist" research collected and analysed data from 316 Ghana Employers Association member organisations. The findings revealed that communication and collaboration, information and data literacy, problem-solving and safety digital competencies are highly valued for first-entry recruitment and promotions. More than half of the organisations provide training in digital competency areas except for problem-solving and digital content creation. A chi-square test result indicated that digital competency areas utilised by organisations depended on the economy sector, even though each digital competency area is utilised for competitive advantage. The study results have managerial implications on digital transformation, recruitment and promotion of individuals with digital competencies, employability, human resource development and policy interventions.

La competenza digitale è emersa come essenziale per i datori di lavoro e i dipendenti nel contesto della trasformazione digitale all'interno delle organizzazioni. Questo studio ha fatto riferimento al Quadro delle Competenze Digitali 2.2 dell'Unione Europea (DigComp 2.2) e ha valutato le competenze digitali richieste per l'occupazione nel mercato del lavoro ghanese. La ricerca post-positivista ha raccolto e analizzato i dati di 316 organizzazioni membri dell'Associazione dei datori di lavoro del Ghana. I risultati hanno rivelato che la comunicazione e la collaborazione, l'alfabetizzazione informatica e dei dati, la risoluzione dei problemi e le competenze digitali in materia di sicurezza sono molto apprezzate per le assunzioni e le promozioni di primo ingresso. Più della metà delle organizzazioni offre formazione in aree di competenza digitale, ad eccezione della risoluzione dei problemi e della creazione di contenuti digitali. Il risultato di un test del chi-quadrato ha indicato che le aree di competenza digitale utilizzate dalle organizzazioni dipendono dal settore economico, anche se ogni area di competenza digitale è utilizzata per ottenere un vantaggio competitivo. I risultati dello studio hanno implicazioni manageriali sulla trasformazione digitale, il reclutamento e la promozione di individui con competenze digitali, l'occupabilità, lo sviluppo delle risorse umane e gli interventi politici.

Keywords: digital transformation, human resource development, digital competency, employability, competitive advantage

1 – Introduction

1.1 – *Digital Competence Framework*

Digital transformation within organisations requires human resource capabilities to navigate and leverage digital tools and systems. van Laar, van Deursen, van Dijk, and van Dijk (2017) highlighted the need for individuals to possess robust digital competencies to remain competitive in the job market. Researchers have identified various essential digital competencies in the contemporary labour market. Binkley, Erstad, Herman, Raizen, Ripley, Miller-Ricci, and Rumble (2012) argue that digital competencies range from using office productivity software to other capabilities such as data analysis, digital communication, and cybersecurity. The European Union's Digital Competence Framework is a widely recognised reference for digital proficiency. The latest version of the Digital Competence Framework (DigComp 2.2), authored by Vuorikari, Kluzer, and Punie (2022) has five dimensions, each comprising distinct features. Dig Comp 2.2 maintained the five areas of digital competence: communication and collaboration, problem-solving, digital content creation, information and data literacy, and safety. The framework delineates 260 indicators encompassing knowledge, skills, and attitudes relevant to employability and learning. The framework guides the proficiency assessment of an individual according to the abilities in each area of digital competency.

In contrast, the African continent currently lacks a structured digital competency framework to guide the development of digital competencies. The United Nations (2024) report revealed that 70% of Africa's population is under 30 years old, making it the continent with the youngest population. The young African populace is theoretically digital natives and best suited with digital competencies to participate in a digital economy. Iliashenko and Mardenova (2023) suggested conceptualising how key choice determinants influence people, especially Generation Z, amid digital transformation in social life.

However, the current state of digital competencies among African youth is uneven and often inadequate. Fox and Filmer (2019) shared that youth employment in sub-Saharan Africa has declined since 2010. The continent urgently needs to explore and address the digital competency gap to harness the potential of its young workforce to meet the demands of the modern job market. Given the critical role of digital competencies in shaping employability and the unique challenges faced by Africa, this study aims to explore the digital competencies required for employment.

Ampong (2020) shared that graduate unemployment in Ghana has increased despite various government employment programmes. Further studies over the years (Aboagye & Puoza, 2021; Agwu, 2019) attribute unemployment in Ghana to the mismatch between the competencies of university graduates and industry demands. There is a lack of knowledge regarding the digital competencies employers require in Ghana. Asumadu, Ofori, Adomako, and Sefa (2022) found that eighty-nine per cent of the unemployed in Ghana are the youth and suggested that the youth take advantage of social media for entrepreneurial initiatives. Consequently, this study aims to investigate the various aspects of digital competencies required across different

economic sectors in Ghana. The research intended to identify the DigComp2.2 digital competency areas that government and private employers in Ghana seek during employee recruitment across all organisational levels to gain a competitive advantage.

1.2 – *Technology Acceptance Model (TAM)*

Digital competencies have become integral to employability and are influenced by various theoretical frameworks. The study reviewed the technology acceptance model regarding digital competency for employability and competitive advantage. The Technology Acceptance Model (TAM) provides a framework for understanding technology adoption (Davis, 1989, p.319). TAM posits that perceived ease of use and perceived usefulness are predictors of users' acceptance of technology. These constructs influence the development and utilisation of digital competencies. Venkatesh and Davis (2000) suggest that users must perceive digital tools as beneficial and easy to use. Davis shares that employers often seek candidates who possess digital competencies and are willing to adopt new technologies readily. Previous research findings align with user acceptance and positive perception of TAM.

2 – Method

2.1 – *Study Design*

The "post-positivist" research employed a semi-structured questionnaire to collect data. Apuke (2017) posits that the quantitative approach utilises statistics to measure knowledge and explain a phenomenon by collecting numerical, static data that is subsequently evaluated. The study applied a deductive approach to identify and understand the digital competencies considered essential for employability by employers in the Ghanaian labour market. The study design allowed the researcher to identify the digital competency areas employers value for entry-level employment, promotions, and training. The deductive approach facilitated the empirical analysis of various employer preferences and situated the results within the framework of related theories.

2.2 – *Participants of Study*

The study was conducted among the 1500 organisations registered as members of the Ghana Employers Association (GEA) as of 2023, when the study commenced. The GEA is the largest employers' association in Ghana, and its membership comprises public organisations and private enterprises operating under twenty sector categories. The membership is further categorised into four types based on the number of employees and annual revenue.

2.3 – *Sampling Technique and Sample Size*

Simple random sampling was employed during the survey, giving each member organisation an equal chance of being selected. The sampling frame comprised 1,500 registered members. Casteel and Bridier (2021) suggested that the sampling frame serves as an operationalised representation of the target population.

The sample size of the study was calculated using the Yamane formula below:

$$\mathrm{n} = \frac{\mathrm{N}}{1 + Ne^2}$$

where:

n = sample size

N = total population of association members

e = degree of error expected is the level of error = (0.05)

$$n = \frac{1500}{1 + 1500(0.05)^2} = 315.8$$

This study required the involvement of at least 316 respondents. Accordingly, the sample size was set at 316.

2.4 – *Data Collection Procedure*

Participants were issued a semi-structured questionnaire with dominantly closed-ended questions to quantify the variables of interest. The initial section asked for the participants' characteristics. The remaining section focused on the objectives of the study, with questions grouped under digital competencies for employability, entry-level recruitment, promotions, training, and competitive advantages. The association's outlet published an online semi-structured questionnaire accessible to all participants. The completed questionnaires received within two months of its issuance were considered for analysis.

2.5 – *Data Analysis*

The data collected from the GEA members was exported from the online form used for collecting data. The Jamovi open-source software was used to process and analyse the responses as well as to display descriptive statistics for each closed-ended question. The responses to the open questions were analysed to understand the related closed-question responses. The chi-square tests assessed the relationships between digital competencies, employment, and competitive advantage across various sectors.

2.6 – *Validity and Reliability*

The study examined construct validity regarding the relationships between the relevance of digital competencies for employability across various sectors and their contribution to competitive advantage. Construct validity involves verifying that the questionnaire accurately measures the theoretical construct it intends to measure. This often employs statistical techniques such as factor analysis to confirm that the items on the questionnaire align with the expected underlying constructs (Cronbach & Meehl,1955, p.282). The questionnaire was tested on different days within a week, and no inconsistencies were identified across or among sectors. Internal consistency examined the interrelatedness of items within the questionnaire to determine whether they consistently measure the same construct.

3 – Results

3.1 – *Description of Respondent Sectors*

A total of 316 responses were received from various organisations under GEA. The GEA includes public and private organisations, of which 53% of the 316 responses were from the

public sector, while 47% were from the private sector. Out of the total data collected, the top three highest responses in descending order were from the banking/financial sector (19.6%), the manufacturing sector (13.3%), and the health sector (10.4%). The lowest responses were from the timber industry (1.6%) and affiliated members (1.6%). There were no responses from seven out of the twenty sectors of GEA: Airways/ Inland Transport, Building and Civil Engineering, Insurance, Pharmaceutical, Private Protective Security, Press and Publishing, and Shipping and Ports sectors were received. The responses shared by the various sectors are in Table 1.

Table 1 – Responses from Sector Categories (Author's compilation)

Sector/Industry Category	Frequency (n)	Percent (%)
Agricultural/Fishing	20	6.3%
Banking/Financial	62	19.6%
Educational/Learning	27	8.5%
Health	33	10.4%
Hotel, Catering and Tourism	26	8.2%
Information Communication Technology	21	6.6%
Manufacturing	42	13.3%
Mining	22	7.0%
Petroleum and Power	22	7.0%
Shipping and Publishing	20	6.3%
Timber	5	1.6%
Utility Interest	11	3.5%
Affiliated members	5	1.6%

As shown in Figure 1, most respondent organisations (93%) employed more than 50 individuals, indicating that most companies within the Ghana Employers Association can be classified as large firms based on their size. Six percent of the respondent organisations have between 5 and 24 employees, and only one percent have between 25 and 50.

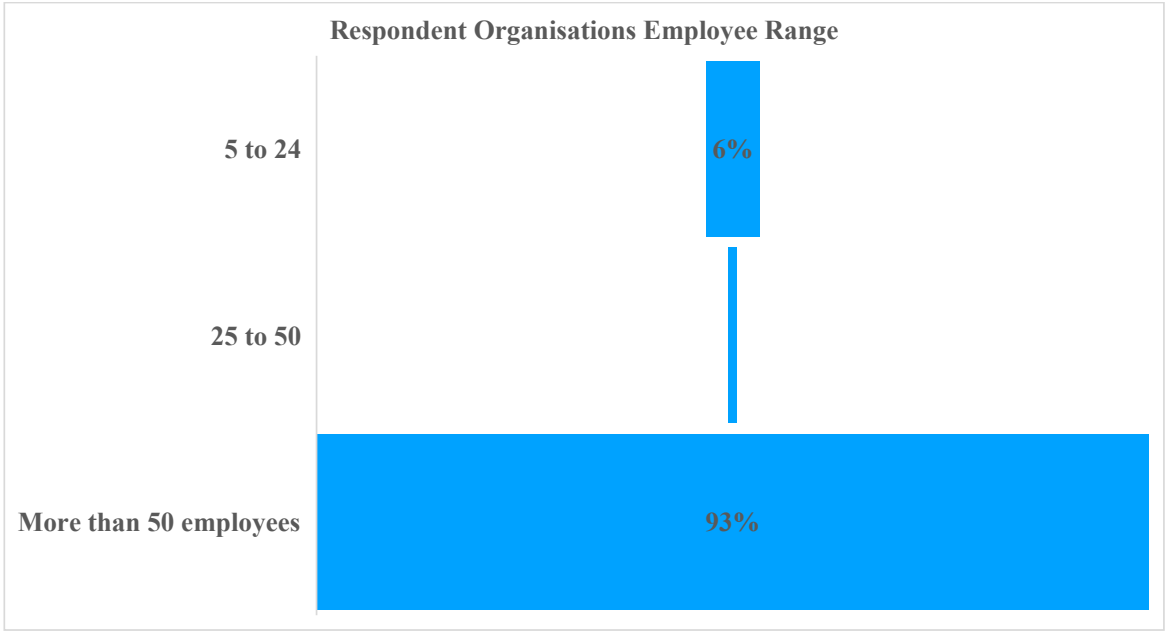

Fig. 1 – Range of Employees in Respondent Organisations (Author's elaboration using Excel)

3.2 – *Digital Competencies for Employee Recruitment and Promotion*

The test to assess the influence of the sector or industry on the digital competencies essential for employability found that the digital competence critical for an organisation is independent of the type of sector, thus whether public or private. The chi-square test analysis of the collected survey data resulted in a p-value of 0.064, greater than the significant level of 0.05, as detailed in Table 2.

Table 2 – Comparison of Digital Competencies for Employability and Type of Sector (Analysis by Author from Jamovi)

	Value	df	p
χ^2	10.4	5	0.064
N	316		

The digital competency areas that organisations identified for recruiting and promoting employees are presented in Table 3:

Table 3 – Digital Competency Relevant to Employment (Author's compilation)

Question	Frequency (n)	Percent (%)
Do you consider digital competency as a required competency for employability in your organisation?		
No	41	13%
Yes	275	87%
Which of these competencies are required for employment in your organisation? (Multiply response question)		
Information and data literacy	268	85%
Communication and collaboration	308	97%
Digital content creation	69	22%
Problem-solving	280	89%
Safety	243	77%
Which of these competencies is the most critical for employability in your organisation?		
Information and data literacy	63	20%
Communication and collaboration	94	30%
Digital content creation	3	1%
Problem-solving	94	30%
Safety	57	18%
Others	5	2%
What digital competencies are required for recruitment at the entry-level in your organisation? (Multiply response question)		
Information and data literacy	227	72%
Communication and collaboration	219	69%
Digital content creation	30	9%
Problem-solving	170	54%
Safety	149	47%

What digital competencies are required for promotion to the Supervisor level in your organisation? (Multiply response question)		
Information and data literacy	245	78%
Communication and collaboration	302	96%
Digital content creation	50	16%
Problem-solving	307	97%
Safety	222	70%
What digital competencies are required for promotion to Senior Management level in your organisation? (Multiply response question)		
Information and data literacy	269	85%
Communication and collaboration	286	91%
Digital content creation	99	31%
Problem-solving	314	99%
Safety	201	64%

3.2.1 – The Importance of Digital Competencies

The survey results found that the Ghanaian market labour needs digital competencies. The organisations from the private and public sectors were asked whether digital competency was considered a required employability competency. Most organisations, eighty-seven per cent (87%), regarded digital competency as a factor for employability. However, thirteen (13%) did not consider digital competency necessary.

Ratings of Digital Competencies for Employability

The organisations responded to multiple choices of competencies required for employability. Ninety-seven per cent (97%) chose Communication and collaboration, making it the most chosen by organisations. The universal regard could be due to the increasing importance of teamwork and effective communication through digital means at the workplace. Eighty-nine per cent (89%) of the respondents chose problem-solving as the second most required. The score reflects the need for employees who utilise digital means to advance organisational tasks. Information and data literacy followed with eighty-five per cent (85%), Safety with seventy-seven per cent (77%), and Digital content creation with twenty-two per cent (22%). The digital competency areas, except for digital content creation, are valued by most organisations, indicating the diverse digital competencies needed in the Ghanaian job market.

Moreover, thirty per cent (30%) of the organisations chose Communication and collaboration as the most critical digital competence needed for employability. Another thirty per cent (30%) of the organisations chose problem-solving digital competence as the most critical digital competence for employability. Twenty per cent (20%) chose Information and data literacy, another eighteen per cent (18%) chose safety, and one per cent (1%) chose digital content creation as the most critical digital competence for employability. Two per cent (2%) of the organisations consider competencies other than any of the five dimensions of digital competencies as most critical for employability.

3.2.2 – Digital Competencies Considered at Entry-level Employment

At the entry level, seventy-two percent (72%) of organisations consider individuals with information and data literacy competence for employment. This is followed by communication

and collaboration skills from sixty-nine percent (69%) of organisations, problem-solving skills from fifty-four percent (54%) of organisations, Safety from forty-seven percent (47%) of organisations, and digital content creation from nine percent (9%) of organisations.

3.2.3 – Digital Competencies Considered for Promotion to Supervisory Level

Ninety-seven per cent (97%) of organisations consider problem-solving skills for promotion to supervisory level. Communication and collaboration follow closely with ninety-six per cent (96%), information and data literacy with seventy-eight per cent (78%), safety with seventy per cent (70%) and digital content creation at sixteen per cent (16%).

3.3 – *Digital Competencies Training for Employees*

Most organisations train staff in information and literacy competence. Table 4 shows the digital competency areas where organisations indicated that employees are trained.

Table 4 – Digital Competencies Training for GEA Employees (Author's compilation)

Question	Frequency (n)	Percent (%)
In your organisation, which digital competencies are employees trained on? (Multiply response question)		
Information and data literacy	223	71%
Communication and collaboration	210	66%
Digital content creation	92	29%
Problem-solving	152	48%
Safety	200	63%
What digital competencies are assessed during performance appraisal in your organisation? (Multiply response question).		
Information and data literacy	152	48%
Communication and collaboration	271	86%
Digital content creation	13	4%
Problem-solving	264	84%
Safety	187	59%

3.3.1 – Training on Digital Competencies

Seventy-one per cent (71%) of organisations invest in training their employees in information and data literacy competency. Sixty-six per cent (66%) of organisations train in Communication and collaboration, sixty-three per cent (63%) train in Safety, forty-eight per cent (48%) in problem-solving and twenty-nine per cent (29%) in digital content creation competency.

3.3.2 – Digital Competencies Assessed During Appraisal

Eighty-six per cent (86%) of organisations consider communication and collaboration competencies when conducting performance appraisals. Following closely, eighty-four per cent (84%) of organisations consider problem-solving during appraisals, fifty-nine per cent (59%) consider safety competency, forty-eight per cent (48%) consider Information and data literacy competency, and four per cent (4%) consider digital content creation.

To clarify the different combinations of digital competencies considered during appraisals by employees, the corresponding reasons shared in an open question and their summary were as follows:

Information and Data Literacy.

Employers who consider information and data literacy competency during appraisals share the need to find industry data to benchmark organisational performance indicators. Employees must be able to interpret and utilise industry data effectively to meet performance targets. These responses indicated the organisational reliance on industry data to measure performance indicators, making information and data literacy a critical competency.

Information and Data Literacy; Communication and Collaboration.

Employers who consider information and data literacy competency, as well as Communication and collaboration during appraisal, seek that employees understand the importance of data protection through information and data literacy. Communication and collaboration are crucial as they allow staff to communicate effectively and efficiently. These responses highlight that information and data literacy is essential for guiding data protection strategies and critical for overall operations. Additionally, Communication and collaboration are vital for ensuring effective and efficient interactions among staff, which is fundamental to organisational success.

Information and Data Literacy; Communication and Collaboration; Problem Solving.

Employers considering digital competencies except for Digital content creation and Safety reasoned that these digital competencies align with their strategic objectives. Given that the core nature of business depends on data, it is imperative that all employees are data literate and can utilise data to resolve real-time issues in their work. Employees must possess strong problem-solving competence when organisations interact with remote clients with needs and complaints.

These responses suggest that Information and data literacy, Communication and collaboration, and Problem-solving are viewed as competencies that empower businesses to thrive. Their association with strategic objectives underscores their importance. Problem-solving is particularly critical in relationship management and serves the specific needs of their remote clientele, while Information and data literacy ensures adaptability in a technology-driven environment.

Information and Data Literacy; Problem-Solving; Safety.

During appraisals, employers considering Information and Data literacy, Problem-solving, and Safety competencies seek information accuracy and security. Their responses underscore the critical nature of data integrity and safety in organisational operations.

The Five Digital Competency Areas.

Employers who consider the five digital competencies during appraisal do so because we exist in a digital era where enhancing the achievement of organisational goals and objectives through all digital competencies is paramount. The entire set of digital competencies reflects the comprehensive digital landscape in which the organisation operates. These employers suggest that these competencies are integral for maximising organisational goals and objectives in a digitally driven world.

3.4 – *Digital Competencies to Gain a Competitive Advantage*

3.4.1 – The need for sector-specific digital competencies

The chi-square analysis of the independence test regarding the type of sector using digital competencies to gain a competitive advantage showed that the digital competencies organisations use for competitive advantage are indeed influenced by the sector category, whether public or private. As indicated in Table 5, the p-value of 0.001 is below the significance level of 0.05.

Table 5 – Comparison Between Digital Competencies for Competitive Advantage and Type of Sector (Analysis by Author from Jamovi.)

	Value	df	p
χ^2	40.4	4	< 0.001
N	316		

These findings have practical implications indicating the need for sector-specific digital competencies to achieve competitive advantage. The survey questions and responses on digital competency areas for competitive advantage are in Table 6.

Table 6 – Digital Competences for Competitive Advantage (Author's compilation)

Question	Frequency (n)	Percent (%)
Which of these digital competencies does your organisation employ to gain a competitive advantage? (Multiply response question)		
Information and data literacy	190	60%
Communication and collaboration	241	76%
Digital content creation	86	27%
Problem-solving	185	59%
Safety	171	54%
Which of these digital competencies does your organisation consider critical for competitive advantage?		
Information and data literacy	100	32%
Communication and collaboration	81	26%
Digital content creation	3	1%
Problem-solving	104	33%
Safety	28	9%

3.4.2 – Digital Competencies for Competitive Advantage

For competitive advantage, seventy-six percent (76%) of organisations depend on communication and collaboration as essential digital competencies. Following closely, the Information and data literacy area is at sixty percent (60%), while problem-solving is at fifty-nine percent (59%), safety at fifty-four percent (54%), and digital content creation at twenty-

seven percent (27%). Most organisations do not view digital content creation as a means to achieve a competitive edge. A further probe into the most critical digital competency for competitive advantage showed that thirty-three per cent (33%) of the organisations considered problem-solving a key digital competency area. Information and data literacy followed closely with thirty-two per cent (32%), Communication and collaboration with twenty-six per cent (26%), Safety with nine per cent (9%) and content creation at one per cent (1%). These responses indicate low adoption of digital competencies for competitive advantage.

4 – Discussion

The findings are discussed in relation to the technology acceptance model and prior research findings.

4.1 – *Digital Competency Adoption*

The results indicate that eighty-seven percent of the respondent organisations consider digital competency essential for employability in the Ghanaian labour market. These organisations perceive digital competency as useful for improving job performance and achieving organisational goals. The thirteen percent of organisations that do not consider digital competency essential may perceive digital competencies as less relevant to their operations. The low interest in digital competencies may be supported by the lack of responses from seven out of the twenty sector categories of GEA. The high percentage of organisations considering digital competency essential for employability suggests a strong intention to adopt and utilise digital technologies. However, the actual utilisation of digital technologies may differ based on factors such as the nature of operations, the relevance of digital transformation to the operations, organisational culture, resources, and infrastructure.

4.2 – *Employability*

The high percentage of organisations choosing Communication and collaboration (97%), Problem-solving (89%), Information and data literacy (85%), and Safety (77%) as required competencies suggests that most organisations perceive these competencies as useful for improving job performance and achieving organisational goals. Twenty-two percent of organisations choose digital content creation, which indicates its relevance across the respondent organisations. Sixty-nine percent of organisations consider communication and collaboration at entry-level recruitment. In contrast, fifty-four percent of organisations consider problem-solving at entry-level recruitment even though either area was chosen by thirty percent of the organisations as a critical area for employability. However, at the entry-recruitment stage, 92% of organisations instead prioritise Information and data literacy. Less than half of the organisations (47%) consider safety, and nine percent of organisations considering digital content creation for entry-level roles may perceive these areas as less essential. These results suggest that academia and entry-level job seekers need to prioritise their digital competencies in three areas: Information and data literacy, communication and collaboration, and problem-solving.

For promotion to the supervisory level, ninety-seven percent of organisations consider Problem-solving, followed by ninety-six percent consider Communication and collaboration, Seventy-eight percent Information and data literacy and seventy percent of organisations

consider Safety. Sixteen percent of organisations consider digital content creation for promotion to the supervisory level. These results suggested increased organisations interested in communication and collaboration, and problem-solving areas. Even though the percentage of organisations was reduced for the Information and data literacy area, safety was chosen by seventy percent of the organisations. Therefore, the Safety area is considered in addition to the three areas most organisations consider at the entry-level level. This is understandable as the safety area could be tacit knowledge for employees to practice. Similar to promotion to senior management level, ninety-nine percent of organisations consider Problem-solving, followed by ninety-one percent consider Communication and collaboration, eighty-five percent Information and data literacy and sixty-four percent of organisations consider Safety. There was increased interest in digital content creation, with thirty-one percent of organisations regarding promotion to senior management level.

The focus on digital competencies is increasingly evident in the recruitment and promotion criteria of various organisations. van Laar et al. (2017) highlighted the importance of these competencies, especially as organisations undergo digital transformation. Candidates for entry-level roles and those seeking promotions are expected to demonstrate proficiency in communication and collaboration, information and data literacy, safety, and problem-solving capabilities. Most organisations particularly value information and data literacy for entry-level positions. At the same time, problem-solving skills have become increasingly important for promotions to supervisory and senior management roles. This finding aligns with Horak, Taube, Yang, and Restel (2019), suggesting that higher organisational positions often require advanced problem-solving abilities to address complex challenges. Furthermore, digital competencies in communication and collaboration, as well as information and data literacy, were highly regarded at these advanced levels, reflecting the necessity of these competencies in leadership positions (Murray & Pérez, 2014).

4.3 – *Human Resource Development on Digital Competencies*

The study results indicate that seventy-one organisations prioritise training programs for Information and data literacy, sixty-six percent for Communication and collaboration, and sixty-three percent for Safety. These competencies are perceived as useful for addressing digital competency gaps, improving job performance, and achieving organisational goals. The forty-six percent of organisations training their employees on problem-solving suggests that some organisations are not training their employees despite the competency area appraised among employees, even though it is considered critical for promotion to supervisory and senior management roles. The relatively lower interest by organisations in digital content creation training suggests that organisations perceive the competency area as less essential for employee development. Also, eighty-six percent of organisations consider Communication and collaboration, eighty-four percent Problem-solving, fifty-nine percent Safety and forty-eight Information and data literacy during appraisals when conducting performance appraisals. The four percent of organisations considering digital content creation for appraisal suggest that most organisations perceive the competency area as less essential for employee performance assessment. The disregard of digital content creation by most organisations for employment, training and performance appraisal is consistent. Logan (2018) posited that most organisations will need the necessary Artificial Intelligence (AI) and data literacy capabilities to realise economic value in the future. However, Pothier and Condon (2020) stated that trained

employees are required to close the existing labour market gap. The gap is the reason most organisations are involved in training in information and data literacy. Bean and Davenport (2019) suggested that firms must deliberate and creatively address the human side of data if they genuinely expect to derive business value. Technology becomes a barrier to organisational success without talented employees with data literacy competence.

4.4 – Competitive Advantage

The high percentage of organisations relying on communication and collaboration (76%), information and data literacy (60%), problem-solving (59%) and safety (54%) for competitive advantage suggests that these areas are perceived as useful for enhancing organisational performance and achieving strategic goals. The relatively low percentage for digital content creation (27%) suggests that organisations perceive these areas as less essential for gaining competitive advantage. However, the actual use of these competencies among organisations and sectors may vary based on the need and depth of digital transformation. Thirty-three percent of the organisations leverage problem-solving competencies for competitive advantage, whereas another thirty-two percent leverage information and data literacy. In addition, twenty-six percent leverage communication and collaboration competencies, nine percent leverage safety and one percent leverage digital content creation. The finding supports the suggestions of Baah-Acheamfuor, Qutieshat, and Yangailo (2023), who posited that various sectors of an economy may have unique priorities and requirements for digital competencies.

Digital competencies allow employers to serve their customers better, retaining them and improving their customer base. Vrana (2016) stated that global labour market changes are redefining and establishing new jobs with different requirements for ICT-related knowledge and competencies. Hack (2015) shared that employees should be able to use appropriate communication, collaboration, and information management technologies, as most jobs require an understanding of technology. Nordström and Järvelä (2021) suggested that organisations must adapt and evolve to stay up with the quick digital technological changes or risk losing their relevance. Hamid, Islam, and Hazilah (2014) posited that employers place a high value on communication competencies because they may help firms compete successfully in the age of globalisation and competition. Consequently, Krishnan. Ching, Ramalingam and Maruthai (2019) shared that employers in various industries globally actively seek and screen potential employees with strong communication competencies and language proficiency to operate better. Bucăţa and Rizescu (2017) elaborated that a permanent touch with the expanding organisation fosters ties, whether with customers, suppliers, competitors, employees, or other audiences, all of which cannot exist without the ability to communicate. Plekhanov, Franke, and Netland (2023) stated that data is one of the enablers for organisations to remain competitive amid these rapid changes.

Data was formerly thought to be only a commodity used to aid organisations in process optimisation. However, Nani (2023) indicated that data has become a critical intangible asset when firms want to generate value. Nordström and Järvelä shared that the opportunity that this data presents can help a business grow in various ways, including by lowering operational costs, gaining more insight into how customers use products, or improving how an organisation can better capture market share by focusing its advertising. Making data an asset and transforming it into useful information are the challenges that still lay ahead. Some studies (Ongena, 2023; Pedersen & Caviglia, 2019) suggest data must be processed before being used to

its most significant potential. Thus, organisations need information and data literacy to study competitively. Rausch, Schley, and Warwas (2015) stated that changing demand for goods and services and increasing competitiveness in global markets necessitate effective industrial management. Bloop Global (2023) shared that employers frequently consider solutions to common problems as critical to the success of their organisations in today's rapidly changing global economy. Today, working in the back offices of industrial and service firms entails more problem-solving and dealing with non-recurring exceptions. Instead of just following standard procedures, Rausch et al. (2015) suggested that workers must cope with complexity and grasp the concepts that underpin their work. Popjanev (2022) shared that employees with problem-solving abilities operate more efficiently with coworkers, clients, partners, and suppliers. Effective problem-solving necessitates a thorough awareness of the problem's context and environment. Organisations need to have employees to gain a comprehensive understanding of the complexity of the environment and its intricacies. Bloop Global emphasised that individuals can better equip themselves to thrive in their jobs and make a positive difference in their organisations by knowing the value of problem-solving abilities.

5 – Managerial Implications

Discussing the research findings related to TAM and prior research findings leads to managerial implications for digital transformation, employability, human resource development, and policy interventions.

5.1 – *Digital Transformation*

Organisations should undertake digital transformation initiatives to incorporate digital technologies into their operations and improve competitiveness. As part of their transformation program, they should invest in and develop the digital competencies of their workforce. Organisations should prioritise digital competencies such as safety and digital content creation. Safety digital competence protects against reputational damage and revenue losses from cyber-attacks and electronic crime. On the other hand, digital content creation can enhance service and product deliveries with customisations and intellectual property earnings as an additional organisational revenue stream.

5.2 – *Recruitment*

The study found that communication and collaboration competencies are the most sought-after digital skills by employers. Employers are interested in candidates who can use digital media to communicate and collaborate with other employees to achieve organisational goals. Balcar, Šimek, and Filipová (2018) suggest that job seekers should prepare to meet employers' requirements to enhance their employability. At their entry-level positions for employment, a cognitive understanding and application of digital tools are necessary for at least communication and collaboration, information and data literacy, and problem-solving digital competency areas. Candidates with these competencies have a greater advantage in being recruited than those without them. At the job, employees are expected to develop their safety competency in addition to the earlier three competencies to be promoted to supervisor and senior management levels. Employees with digital competencies are more likely to be promoted than those lacking. Employees must consistently equip themselves to meet their employers'

requirements. Organisations should consider all digital competency areas when recruiting and selecting employees to ensure employees have the necessary capability to perform their jobs effectively.

5.3 – *Human Resource Development*

The study also found that most organisations train staff in information and literacy competence. Employers within these organisations regard information and data literacy as very important and seek competencies that their employees require for effective work and productivity. Additionally, it suggests that employers have identified information and data literacy as the most lacking competency among their employees, highlighting the necessity to equip them (Jewell et al., 2020; MN et al., 2020; Vuorikari et al., 2016). Employers should conduct surveys to analyse employees' training gaps before considering specific training. Organisations should invest in training courses to enhance employees' digital competencies and employability. They should focus on continuous training that includes Communication and Collaboration, Problem-Solving, and Information and Data Literacy. Furthermore, orientation programs should concentrate on Information and Data Literacy, Communication and Collaboration skills, and safety for entry-level employees. Additionally, organisations should implement continuous training programs targeting Safety, Problem-Solving, Communication and Collaboration, and Information and Data Literacy skills for employees aiming for promotion to supervisory and senior management roles. Organisations must prioritise employee development programs that address the digital competency gaps in Safety and Digital Content creation.

Organisations should evaluate the effectiveness of their training programs to ensure that each employee meets the digital competency levels required to perform and complete tasks. Furthermore, organisations should allocate resources towards employee development programs to bridge digital competency gaps. Organisations should incorporate digital competencies into their performance appraisal processes to ensure employees meet the required standards. Organisations should prioritise the development of digital competencies in their employees to prepare them for leadership roles and incorporate digital competencies into their succession planning processes to ensure that future leaders possess the necessary skills. Employers will place a higher value on employees with information and data literacy, as well as problem-solving competencies leveraged for competitive advantage. Organisations should incorporate all digital competency areas into their competitive strategy to gain a competitive advantage.

5.4 – *Policy Interventions*

Government agencies and regulatory bodies should develop policies and regulations that promote the development of digital competencies in the workforce. Educational institutions should incorporate digital competency areas into their curricula to prepare students for the workforce.

6 – Conclusion. Limitations and Future Research

The study found that most large organisations consider digital competency relevant to their operations regardless of their sector. These employers expect entry-level employees to possess communication and collaboration, information and data literacy, and problem-solving

capabilities. Most organisations deem digital competency crucial for employability. These organisations perceive all areas of digital competency as essential, except for digital content creation. Communication and collaboration, along with problem-solving competencies, are regarded as top-tier for employability, closely followed by information and data literacy and safety competency areas. More than half of the organisations consider information and data literacy, communication and collaboration, and problem-solving competencies important for entry-level recruitment. However, for promotions to supervisory and senior management positions, these organisations expect candidates to have safety competency in addition to the three areas required at the entry level. Over half of the organisations provide training in various digital competency areas, with fewer organisations providing training in problem-solving and digital content creation. Additionally, more than half of the organisations evaluate competencies, apart from problem-solving and digital content creation, during employee performance appraisals.

The independence test regarding the type of sector employing digital competencies for a competitive advantage revealed that the digital competencies utilised by organisations are influenced by their sector category, whether public or private. Over half of the organisations leverage all digital competency areas, except digital content creation, for competitive advantage. However, thirty-three percent of organisations believe that problem-solving areas are critical; another thirty-two percent highlight information and data literacy; twenty-six percent prioritise communication and collaboration; nine percent regard safety as important, and one percent consider digital content creation vital for competitive advantage.

The high percentage of respondent organisations adopting essential digital competencies for employability suggests a firm intention to adopt and utilise digital technologies. However, some respondent organisations show considerably low interest, supported by the lack of responses from seven out of the twenty sector categories of GEA. Three digital competency areas—information and data literacy, communication and collaboration, and problem-solving—are sought after by most organisations for entry-level recruits. Academia and entry-level job seekers must build their competencies in these areas to enhance their chances of employment with most organisations. Furthermore, as employees progress, safety competency is considered for promotion to supervisory and senior management levels.

Over half of the organisations train their employees in information and data literacy, communication and collaboration, and safety. Meanwhile, problem-solving is considered during appraisals, alongside the three areas covered in training. The results indicate that each digital competency area can be leveraged for competitive advantage, although problem-solving and, communication and collaboration areas stand out prominently. Prior studies have highlighted the opportunities for leveraging each competency area for competitive advantage. Therefore, organisations need to provide training on all competency areas to optimise the opportunities for competitive advantage.

The discussion of the research findings has managerial implications on digital transformation, recruitment and promotion of individuals with digital competencies, employability, human resource development and policy interventions. An organisational culture of digital competence is necessary for the digital transformation initiatives of organisations. Some organisations leverage digital competencies to reduce losses and create new revenue streams to earn a competitive advantage. Employers and academia need to collaborate on developing digital competencies in students for the job market. Similarly,

employees should invest in and encourage continuous development and practice in digital competency areas. Training programs must be assessed before and after delivery to ensure their quality impact on learners' digital competencies. Organisations should incorporate digital competencies into their performance appraisal processes to ensure employees meet the required standards.

Moreover, organisations should prioritise developing digital competencies in their employees to prepare them for leadership roles. These digital competencies should be integrated into succession planning to ensure future leaders possess the necessary competencies. Employers value employees with information and data literacy, as well as problem-solving competencies, which are leveraged for competitive advantage. Organisations should include all digital competency areas in their competitive strategy to gain a competitive advantage. Government agencies and regulatory bodies should develop policies and regulations that promote the development of digital competencies in the workforce. Educational institutions should embed digital competency areas into their curricula to prepare students for the workforce.

The perceived and actual use of digital competency areas for employability, training, and competitive advantage differ in various sectors and countries. Future studies could employ qualitative research methods to understand better the factors influencing the adoption and use of digital competencies in organisations.

7 – References

Ampong, E. (2020). Graduate Unemployment In Ghana: Challenges And Workable Strategies. *International Journal of Research Publications*, *57*(1). https://doi.org/10.47119/IJRP100571720201344

Apuke, O. D. (2017). Quantitative Research Methods : A Synopsis Approach. *Kuwait Chapter of Arabian Journal of Business and Management Review*, *6*(11), 40–47. https://doi.org/10.12816/0040336

Asumadu, G., Ofori, D., Adomako, S., & Sefa, E. O. (2022). The Two Sides of the Coin of Youth Unemployment: Government and the Unemployed Individual. *Asian Journal of Economics, Business and Accounting*, 133–140. https://doi.org/10.9734/ajeba/2022/v22i24901

Baah-Acheamfuor, K., Qutieshat, A., & Yangailo, T. (2023). Critical Review: Measures of Digital Competency Related to Employability. *Economia Aziendale Online – Business and Management Sciences International Quarterly Review*, *14*(2), 379–391. https://doi.org/10.13132/2038-5498/14.2.379-391

Balcar, J., Šimek, M., & Filipová, L. (2018). Soft Skills of Czech Graduates. *Review of Economic Perspectives*, *18*(1), 45–60. https://doi.org/10.2478/revecp-2018-0003

Bean, R., & Davenport, T. H. (2019, February 5). *Companies Are Failing in Their Efforts to Become Data-Driven*. Harvard Business Review. https://hbr.org/2019/02/companies-are-failing-in-their-efforts-to-become-data-driven

Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining Twenty-First Century Skills. In *Assessment and Teaching of 21st Century Skills* (pp. 17–66). Springer Netherlands. https://doi.org/10.1007/978-94-007-2324-5_2

Bloop Global. (2023, February 14). *The Importance of Problem-Solving Skills in the Workplace*. The Future of Work. https://www.linkedin.com/pulse/importance-problem-solving-skills-workplace-bloopglobal/

Bucăţa, G., & Rizescu, A. M. (2017). The Role of Communication in Enhancing Work Effectiveness of an Organization. *Land Forces Academy Review*, *22*(1), 49–57. https://doi.org/10.1515/raft-2017-0008

Casteel, A., & Bridier, N. (2021). Describing Populations and Samples in Doctoral Student Research. *International Journal of Doctoral Studies*, *16*, 339–362. https://doi.org/10.28945/4766

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, *52*(4), 281–302. https://doi.org/10.1037/h0040957

Fox, L., & Filmer, D. (2019). *Youth employment in sub-Saharan Africa.* https://www.brookings.edu/wp-content/uploads/2021/03/21.03.24-IWOSS-Intro-paper_FINAL.pdf

Hack, C. J. (2015). Developing an Open Education Resource to Develop Digital Literacy Skills for Employability in the Life and Health Sciences. *The Journal of Educational Innovation, Partnership and Change*, *1*(1). https://doi.org/10.21100/jeipc.v1i1.206

Hamid, M. S. A., Islam, R., & Hazilah, A. M. N. (2014). Malaysian graduates' employability skills enhancement: an application of the importance performance analysis. *J. for Global Business Advancement*, *7*(3), 181. https://doi.org/10.1504/JGBA.2014.064078

Iliashenko, I., & Mardenova, L. (2023). Student Major Choice as Decision-Making Processes Among Z Generation: Discourse Reopening and Future Research Agenda. *Economia Aziendale Online – Business and Management Sciences International Quarterly Review*, *14*(2), 259–289. https://doi.org/10.13132/2038-5498/14.2.259-289

Jewell, P., Reading, J., Clarke, M., & Kippist, L. (2020). Information skills for business acumen and employability: A competitive advantage for graduates in Western Sydney. *Journal of Education for Business*, *95*(2), 88–105. https://doi.org/10.1080/08832323.2019.1610346

Krishnan, I. A., Ching, H. S., Ramalingam, S., & Maruthai, E. (2019). An Investigation of Communication Skills Required by Employers from the Fresh Graduates. *Pertanika Journal Society Science & Humanities*, *27*(3), 1507–1524. https://www.researchgate.net/publication/335909772_SOCIAL_SCIENCES_HUMANITIES_An_Investigation_of_Communication_Skills_Required_by_Employers_from_the_Fresh_Graduates

Logan, V. (2018). Fostering Data Literacy and Information as a Second Language. *Gartner*. https://www.gartner.com/en/doc/3860965-fostering-data-literacy-and-information-as-a-second-language-a-gartner-trend-insight-report

MN, K., Khalid, F., & Husnin, H. (2020). Preparing Graduates with Digital Literacy Skills Toward Fulfilling Employability Need in 4IR Era: A Review. *International Journal of Advanced Computer Science and Applications*, *11*(6). https://doi.org/10.14569/IJACSA.2020.0110641

Nani, A. (2023). Valuing big data: An analysis of current regulations and proposal of frameworks. *International Journal of Accounting Information Systems*, *51*, 100637. https://doi.org/10.1016/j.accinf.2023.100637

Nordström, F., & Järvelä, C. (2021). *Digital Competencies and Data Literacy in Digital Transformations: Experience from the Technology Consultants*. https://uu.diva-portal.org/smash/record.jsf?pid=diva2%3A1586529&dswid=-7563

Ongena, G. (2023). Data literacy for improving governmental performance: A competence-based approach and multidimensional operationalization. *Digital Business*, *3*(1), 100050. https://doi.org/10.1016/j.digbus.2022.100050

Pedersen, A. Y., & Caviglia, F. (2019). *Data Literacy as a Compound Competence* (pp. 166–173). https://doi.org/10.1007/978-3-030-02351-5_21

Plekhanov, D., Franke, H., & Netland, T. H. (2023). Digital transformation: A review and research agenda. *European Management Journal*, *41*(6), 821–844. https://doi.org/10.1016/j.emj.2022.09.007

Popjanev, I. (2022, November 10). *The Importance of Problem-Solving Skills in the Workplace*. https://management30.com/blog/problem-solving-skills/

Pothier, W. G., & Condon, P. B. (2020). Towards data literacy competencies: Business students, workforce needs, and the role of the librarian. *Journal of Business & Finance Librarianship*, *25*(3–4), 123–146. https://doi.org/10.1080/08963568.2019.1680189

Rausch, A., Schley, T., & Warwas, J. (2015). Problem solving in everyday office work—a diary study on differences between experts and novices. *International Journal of Lifelong Education*, *34*(4), 448–467. https://doi.org/10.1080/02601370.2015.1060023

United Nations. (2024). *World Population Prospects: The 2024 Revision*. https://population.un.org/wpp/Publications/

van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, *72*, 577–588. https://doi.org/10.1016/j.chb.2017.03.010

Vrana, R. (2016). *Digital Literacy as a Boost Factor in Employability of Students* (pp. 169–178). https://doi.org/10.1007/978-3-319-52162-6_17

Vuorikari, R., Kluzer, S., & Punie, Y. (2022). *DigComp 2.2: The Digital Competence Framework for Citizens - With new examples of knowledge, skills and attitudes*. https://publications.jrc.ec.europa.eu/repository/handle/JRC128415

Vuorikari, R., Punie, Y., Carretero, S., & Brande, L. Van den. (2016). *DigComp 2.0: The Digital Competence Framework for Citizens*. https://publications.jrc.ec.europa.eu/repository/handle/JRC101254