



The influence of digital competency and awareness on students' e-resources usage in selected universities in Tanzania

Flora M. Chuma¹
Andrew W. Malekani²

¹floramsiga@gmail.com

²malekani@sua.ac.tz

^{1,2}College of Natural and Applied Science, Agriculture, Tanzania

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ABSTRACT

This study assessed the influence of digital competence and awareness on e-resource usage in universities. Specifically, it aimed to determine the types and levels of digital competence possessed by students, evaluate students' level of awareness regarding digital competencies required for accessing and using e-resources, and examine how students' digital competences and awareness influence their actual usage of e-resources. This study was guided by the DigComp model 2.2, which provides a well-established framework for assessing digital competence and awareness of the use of resources. A sequential explanatory research design was used. The total study population was 61,324, and the study sample size was 397. A stratified random sampling technique was employed to ensure that the sample represented different student groups across the three universities. Key informants were selected purposively, including library directors, IT technicians, and e-resources management staff. A questionnaire was used to collect data from respondents, and the return rate was 360. Quantitative data were analyzed using IBM SPSS v20 to obtain frequency and percentages. Binary logistic regression was performed to determine factors influencing the usage of e-resources. While qualitative insights were gathered through interviews with nine key informants. The findings revealed high awareness of e-resources among students, with a preference for open-access platforms. Digital content creation and problem-solving have been observed to be a noted gap in this study. Effective implementation of information literacy training was found to significantly influence e-resource usage in universities. The study recommends implementing digital literacy training, integrating digital skills training in the university curricula, and improving ICT infrastructures in universities. The study calls for policymakers to embed governance, privacy, and ethics discussions within digital competence and the utilization of e-resources.

Keywords: Digital Competence, Electronic Resources, E-Resource Usage, Universities

I. INTRODUCTION

In this modern era, Information and Communication Technology [ICT] plays a pivotal role in education. Technically, ICT refers to all forms of technologies that are being used for collecting, storing, editing, processing, and passing on information in various forms to the end-user. Previous literature by Ahmed and Malik (2020) found that in this digital era, ICT can be considered as a fundamental factor in the education sector, which has tremendous improvement in the passing of instructions, which has turned teaching into a form that embraces independent learning. In embracing the use of ICT in education, Higher Learning Institutions (HLIs) have been adopting the provision of electronic resources for learning purposes. Such electronic resources include multimedia, e-journals, and databases. These resources support teaching, learning and research (Yemi-Peters et al., 2022). However, even though there has been increased e-resources accessibility, the effective use of such resources remains upon the digital competence possessed by users (Kallas & Pedaste, 2022). Therefore, effective use of e-resources requires one to possess digital competency skills and knowledge.

According to Fernández-Batanero et al. (2022), digital competence is the ability and skills to use information technology tools to retrieve, assess, store, produce, present and exchange electronic information. Possessing digital competencies by e-resources users is essential to enable them to acquire, share and disseminate knowledge and enhance academic performance (Inamorato et al., 2023). In developed nations, there have been strategies to integrate digital competence into teacher education curricula and institutionalize it through national policies.

There are disparities existing globally in terms of digital competencies because some parts of the globe are limited by technological infrastructures (Vuorikari et al., 2022). In Europe and Nordic countries, digital competences are mapped as crucial in the education context, and it is included in teacher education curricula (Godhe, 2019; Sánchez-Caballé et al., 2021). The curricula put more emphasis on learners to have technical skills, critical thinking and the use



of modern technology tools. Despite this, however, there are disparities existing globally in some parts with limited infrastructure.

In Tanzania, several studies have revealed that University students possess digital competencies that allow them to access e-resources. For instance, the study conducted at Mzumbe University by Mosha et al. (2022) noted underutilization of e-resources by university students that was caused by a lack of appropriate ICT infrastructure and skilled personnel.

In addition to this, Harrison and Deans (2021) too pointed out that lacked skills for retrieving and evaluating available e-resources. This led to the underutilization of e-resources by students in universities. There have been efforts by Higher Learning Institutions (HLI) in Tanzania to make subscription to e-resources for use in teaching and learning purposes, but the reports indicate a low rate of usage of e-resources by students. The noted e-resources underutilization in (HLI) is caused by the limited availability of important infrastructures such as reliable internet connectivity, lack of digital skills among students, lack of access to e-resources and ICT infrastructures.

This suggests the existence of a huge gap between the availability of e-resources in universities and the students' digital competence to use the available resources. The problem addressed in this study is that even when the entire necessary infrastructure to harness the values of e-resources is present, students may fail to use the available e-resources in universities. Such a gap reinforced the need to conduct this study to find out the importance of digital skills in the retrieval and use of e-resources. The main aim of this study was to find out how the students' awareness and digital skills influence the use of e-resources in higher learning institutions in Tanzania.

The study aims to identify the digital competence that most significantly influences e-resources usage by students, and provide recommendations that may help to take action to incorporate digital competence knowledge and skills in the university's curriculum. In addition, the study intended to address the existing gaps so as to plan interventions to train and improve students' digital literacy. University students with digital competence can effectively use available ICT infrastructures embedded with e-resources. Therefore, this study was conducted to identify types of digital competencies, evaluate students' digital competence levels and assess the influence of digital competence on the use of e-resources in selected universities in Tanzania.

1.1 Research Objective

- i. To determine the types and levels of digital competences possessed by students
- ii. To evaluate students' level of awareness regarding digital competencies required for accessing and using e-resources.
- iii. To examine how students' digital competences and awareness influence their actual usage of e-resources.

II. LITERATURE REVIEW

2.1 Theoretical Literature Reviews on Digital competence and Awareness on the Use of E-resources

Understanding the digital competence and awareness of e-resources usage in selected universities in Tanzania required a framework grounded in capturing the complexity of the adoption of digital competence skills and e-resource usage. This study was guided by DigComp model 2.2, which provides a well-established framework for assessing digital competence and awareness on the use of resources.

2.1.1 Digital Competence Framework for Citizens (DigComp 2.2)

The European Union Developed the Digital Competence Framework for European Citizens (DigComp 2.2). The DigComp 2.2 was developed within European settings, and later on, the framework was adopted in the African context. Its applicability to Tanzania is supported by this prior adaptation to Africa. Several studies have been conducted in Tanzania, Kenya and South Africa assessing digital literacy in higher education, showing its applicability in low-resource environments (Malekani, 2024; Mtebe & Gallagher, 2022; Ndlovu, 2025).

Furthermore, Tanzania's National Information and Communication Technology Policy emphasize the development of digital skills for education and workforce readiness. This study reports the documented evidence of the existing underuse of e-resources due to skills gaps. The previous work by Mungwabi (2018) indicated reasons for underutilization of e-resources mentioning limited ICT infrastructures, and low digital literacy as the main cause.

Moreover, a study conducted at the University of Dar es Salaam and Sokoine University of Agriculture by Nalaila and Elia (2014) reported the existence of deficiencies in digital learning skills, minimal gender disparity and no competency gains across academic years. Furthermore, Mbago et al. (2025) reveal the existence of moderate digital proficiency in basic systems and weak areas like video conferencing. According to Komba and Mwakilasa (2019), students in Tanzania showed strength in collaborative digital and operational tasks, but they had limitations on critical



thinking, awareness and creativity skills. By using DigComp 2.2, this study offers a comprehensive way to evaluate digital competence among students from Tanzanian universities.

2.2 Empirical Review

2.2.1 Students' Awareness of Digital Competencies for E-Resource Use

Experience has shown that there has been an existing gap between the awareness of e-resources and possession of digital skills for retrieving, evaluation and use of e-resources. Cook et al. (2023) point out that student in Europe and the United States admit the importance of digital skills for employability, but many lack the capabilities to use such skills in the academic arena. In line with this the study that was conducted in China by Zhao et al. (2021) reported that students were noted to do better in social networking while were struggling to use the advance skills such as evaluation of e-resources.

In the case of Tanzania, many students do not have a good background in ICT use because many of them come from disadvantaged families. Many students from disadvantaged families have low digital literacy. This is supported by a study by Jackman et al. (2021), which revealed that individuals from underprivileged environments have limited exposure to the use of modern technology. A study conducted by Martzoukou et al. (2020) noted that the main challenge in using technology is to identify skills gaps among individuals due to the lack of standardized evaluation tools that can measure digital competence embedded in individuals. Several studies have indicated the existing gap between awareness and digital competence. This difference is a result of the socio-economic status of individuals. Thus, there is a need to integrate digital competence training into the formal curricula.

2.2.2 Types and Levels of Digital Competence Possessed by Students

Recently, digital competence has gained growing importance for university students. A study conducted by Timotheou et al. (2023) pointed out that digital technologies and digital competence provide students with access to e-resources, but also provide the best chances to learn and engage with learning materials. On the other side Kim et al. (2018) noted the existence of a relationship between possession of digital skills and the ability to learned faster, which leads into positive academic achievement.

Moreover, in line with this, a study by Limniou et al. (2021) noted that students with digital literacy were observed to concentrate in and kept fully engaged in classrooms, and has better academic performance even in difficult situations. In addition, students with digital capabilities performed better in informal education. A competent, digitally skilled person can use skills to retrieve e-resources from diverse sources. Moreover, Lopez et al. (2020) proposed a DigComp model, which stipulated that a digitally competent person can communicate and collaborate with fellows.

2.2.3 Students' Level of Awareness Regarding Digital Competencies Required for Accessing and Using E-resources

The global view of digital competence awareness among students varies across different educational and demographic contexts. According to Cook et al. (2023), revealed that even though students are aware of the importance of digital competence there is a gap that exists between awareness and the use of such skills. The difference is a result of factors, firstly, varying levels of access to technology, and secondly, the differences in education curricula.

In the Tanzanian context, some noted challenges face students in achieving the effective use of e-resources in universities. Some of these challenges include uneven exposure to technology among students, and a lack of effective institutional support. Martzoukou et al. (2020) noted that the lack of evaluation tools for identifying digitally competent individuals was a gap that exists. These differences are a result of differences in background and education curricula. Besides, Sanhueza et al. (2025) noted that students with limited exposure to technology were not able to use e-resources effectively. This requires a comprehensive plan beyond orientation programs to this bridge gap. Such plans should integrate the digital skills training in the national curricula at all levels and plan for regular information literacy programs.

2.2.4 Factors Influencing Student to Use E-resources in Universities

There has been a tendency for students and academic staff to use e-resources for learning, teaching and research purposes. In Tanzania, several studies have indicated factors which influence students to use e-resources in universities. A study by Mwantimwa et al. (2021) noted that information literacy skills were among the factors which influenced students to be able to retrieve, access, and use e-resources. However, many students had no formal training in digital competence.

Moreover, the study at the University of Dodoma by Komba and Mwakilasa (2019) revealed that students lacked digital skills for electronic resources access and use. Also, other factors that hinder e-resources usage were unreliable internet connectivity and other ICT infrastructure for e-resources usage. Findings from the study by Mbughuni (2023) revealed factors that hinder the usage of e-resources in universities. Such factors were insufficient ICT infrastructures.



Study by Ntorukiri et al. (2022), findings concur with other previous studies mentioned the limitation with ICT infrastructures as the challenges faced by university students to access and use electronic resources. Likewise, a study by Malekani (2024), conducted at the Sokoine University of Agriculture (SUA) findings revealed that orientation programs, and the creation of awareness were important strategies to increase the use of e-resources. However, information literacy training in universities is periodic, and the focus is on first-year students.

Mollet and Mwantimwa (2019) conducted a study at Nelson Mandela African Institution of Science and Technology (NM-AIST). The findings show that e-resources usage was facilitated by the presence of a subscription policy, availability of user support services, individual motivation, possession of digital skills, and perceived usefulness. However, weak institutional support always pulled students to resort to general internet searches rather than using e-resources from a subscription database.

Komba and Lwoga (2020) revealed that electronic resources use by postgraduate students was higher compared to that of undergraduates. Postgraduate students are research-demanding, which is why they rely on e-resources. From prior literature, few studies have thoroughly compared Tanzania students' competencies with regional and global perspectives, limiting understanding of how local challenges align with or diverge from the wider trends. Addressing these gaps, this study aimed to assess the award-winning possession of digital competences among Tanzanian universities.

III. METHODOLOGY

3.1 Research Design

This section presents the methodology employed in assessing digital competence and awareness on the use of e-resources in the selected universities in Tanzania. The study was carried out at three HLIs in Tanzania: Sokoine University of Agriculture, University of Dodoma, and Mzumbe University. These universities were purposively selected because they represent a diverse range of academic disciplines, and because they have established digital platforms and ongoing investments in ICT infrastructure and resources, as well as digital literacy programs, and they are regulated by the Tanzania Commission for Universities. A mixed research approach was used in this study, and a sequential explanatory research design was employed. This research design was applied due its suitability in mixed methods research. This research design allows quantitative data to be analyzed first then followed by the qualitative data to explain the quantitative results in more detailed.

3.2 Target Population

The target population of the study from three universities included SUA (15,800) students, UDOM (35,330), and MU (10,194) to make a total target population of 61,324 students across the three universities.

3.3 Sampling and Sample Size

A stratified random sampling technique was employed to ensure that the sample represented different student groups across the three universities. Key informants were selected purposively including library directors, IT technicians, and e-resources management staff. The study sample size for this study was 397.

The Israel table for sample size determination was used to get a sample for this study. The table provides guidelines for determining an appropriate sample size for a given population size and desired confidence level. According to Israel sample size table, if a precision of $\pm 5\%$ is chosen when the population is 61,324 this justifies the sample used in this study which is 397.

3.4 Data Collection Methods

Data was collected using questionnaire and interview methods. A total of 397 questionnaires were distributed, and questionnaire returned were 360 yielding a high response rate. Additionally, semi-structured interviews were conducted with a total of nine (09) key informants, three from each university. The study utilized both quantitative and qualitative methods. Quantitative method was used to collect numerical data from university students, while qualitative methods were employed to collect non-numerical data. Quantitative data were collected using a structured questionnaire, and qualitative data were collected. These methods were chosen basically to provide in-depth information about digital competence and e-resources usage.

3.5 Data Analysis

Quantitative data were analyzed using IBM SPSS v20, where descriptive statistics, such as frequency and percentage were examined. In addition, binary logistic regressions were performed to determine factors influencing the usage of e-resources. Qualitative information from Key Informant Interview (KIIs) was conceptualized, summarized, and analyzed using content analysis.



3.6 Validity and Reliability Test

The study ensured the validity by using the triangulation method by giving the instrument of data collection to experts in the field, including academic supervisors, and cross-checking the data through methods to confirm the consistency of the findings, and enhancing the overall validity of the research results. The validation process also involved piloting the instrument with a small sample of students from a different university to further refine the questions.

Reliability of the instrument was assessed using Cronbach's Alpha (α), a widely used measure of internal consistency. The instrument was subjected to a pre-test on a few participants, and reliability was calculated based on the pretest data. A Cronbach's Alpha score of $\alpha = 0.972$ was achieved, indicating a high level of internal consistency. This ensured that the instrument produced stable and consistent results across repeated trials.

IV. FINDINGS & DISCUSSIONS

4.1 Demographic Characteristics of Respondents

This section aims to present the demographic profile of the study respondents. Understanding the characteristics of the sample population provides important context for the study's findings, especially in relation to digital competence and e-resource utilization.

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Table 1

Demographic Characteristics of Respondents

Variables		Frequency	Percentage
University	MU	68	18.9
	SUA	101	28.1
	DOM	191	53.1
	Total	360	100.0
Sex of respondents	Male	231	64.2
	Female	129	35.8
	Total	360	100.0
Education level	Undergraduate	250	69.4
	Postgraduate	110	30.6
	Total	360	100.0
Age of respondents	Less than 25 years	187	51.9
	25 to 35 years	122	33.9
	36 to 46 years	46	12.8
	47 to 57 years	5	1.4
	Total	360	100.0

The demographic information provides a picture of students from three selected Tanzanian universities: MU (18.9%), SUA (28.1%), and DOM (53.1%). The University of Dodoma had higher enrollment, reflecting its larger enrollment or sampling strategy. Regarding gender distribution, male respondents accounted for 64.2%, while females represented 35.8% of the sample. This gender imbalance may mirror existing enrollment patterns in certain fields of study or institutions, potentially influencing the level and type of digital engagement observed in the findings. In terms of educational level, a significant majority of participants were undergraduates (69.4%), while 30.6% were postgraduate students. This indicates that the findings largely reflect the experiences and competencies of undergraduate students, who are typically the primary users of e-resources for academic learning. The age distribution shows that more than half of the respondents (51.9%) were under the age of 25, followed by 33.9% aged between 25 and 35. Smaller proportions were in the 36–46 age (12.8%) and the 47–57 (1.4%). The dominance of younger students aligns with expectations for a university population and may have implications for digital competence, as younger users are often more familiar with digital tools, although not necessarily more skilled in academic e-resource usage.

4.2 Digital Competences Possessed and that Facilitate the Use of E-Resources

This subsection sought to assess the digital competences possessed by students and how these competences facilitated their ability to effectively utilize electronic resources. The results in Table 5 provided insight into the average proficiency and variability of skills in each competence. Key: *Decision Rule if mean is 1.00 to 1.74= Not competent; 1.75 to 2.49 = Average competent; 2.50 to 3.24 = Competent, 3.25-4.00 = highly competent

Table 2

Digital Competences that Facilitate the Use of E-Resources

Digital competencies	N	Min	Max	Mean	Std. D
Information and digital literacy skills	360	1	4	2.15	.634
Digital content creation skills	360	1	4	1.98	.766
Communication and collaboration skills	360	1	4	2.84	.995
Problem solving skills	360	1	4	2.41	.733
Ethical and Safety skills	360	1	4	2.49	1.053
Overall average mean				2.37	0.84

The results in Table 2 found competency (=2.84) for communication and collaboration among university students in applying electronic resources, reflecting their ability to use reference software management tools. On the other hand, the results show competency (=2.41) in elementary problem solving as digital competence among students in addressing and resolving problems using digital tools and technologies. This is especially in areas of using anti-viruses to protect devices. Therefore, the findings demonstrated good competency possession among students, with notable weakness in digital content creation.

4.3 Awareness level of E-resources

This section discusses the distribution of students' self-reported awareness levels of e-resources. Table 3 presents the percentage of students' awareness levels.

Table 3

Awareness level of E-resources

Awareness level	Frequency	Percentage
Highly aware	114	40
Moderate aware	108	30
Slightly aware	58	16.1
Not aware at all	50	13.9
Total	360	100.0

Results in Table 3 reveal that the majority of students (70%) perceive themselves as highly or moderately aware of e-resources, indicating a generally positive level of awareness. Nonetheless, 16.1% and 13.9% reported being slightly aware and not aware at all, highlighting the concern in knowledge for a portion of the students. This gap could potentially limit equitable access to academic and research materials, thereby affecting their academic performance and research activities

4.3.1 Awareness of Electronic Resources Available in Universities

This subsection examined the awareness of students on the available e-resources in their respective universities as indicated in Table 4.

The findings in Table 4 reveal that students' awareness and usage of the available e-resources vary significantly across universities. The results show that open access resources such as Google Scholar (242; 67.2%) and Wikipedia (236; 65.6%) were well-known by students. Similarly, Oxford Journals (165; 48.8%) and Nature Journals (129; 35.8%) were known and relatively well-utilized compared to other subscription-based resources. However, specialized academic databases recorded much lower recognition and usage, with Cochrane Reviews (45; 12.5%), AGORA (63; 17.5%), and TEEAL (57; 15.8%) being among the least used. PubMed (85; 23.6%) and AJOL (69; 19.1%) had a moderate presence, suggesting that certain fields, such as medical and African research, had some visibility among the students.

The dominance of freely accessible platforms indicates that while students are engaging with electronic resources, their reliance leans heavily towards open and easily accessible sources rather than subscribed scholarly databases. This trend may reflect issues of accessibility, awareness, training, or ease of navigation of these platforms.

Table 4*Electronic Resources used in Universities*

E-Resource	MU n (%)		SUA n (%)		UDOM n (%)		Total n (%)	
HINARI	8	8.5	34	36.2	52	55.3	94	100.0
Sage Publications	13	14.8	22	25.0	53	60.2	88	100.0
AGORA	6	9.5	23	36.5	34	54.0	63	100.0
OARE	8	13.3	25	41.7	27	45.0	60	100.0
Wiley Online Library	16	12.7	39	31.0	71	56.3	126	100.0
Emerald Insight	12	12.5	35	36.5	49	51.0	96	100.0
JSTOR	14	14.9	28	29.8	52	55.3	94	100.0
Taylor & Francis	18	18.2	24	24.2	57	57.6	99	100.0
TEEAL	3	5.3	36	63.2	18	31.6	57	100.0
PubMed	5	5.9	16	18.8	64	75.3	85	100.0
BioMed Central	8	13.3	16	26.7	36	60.0	60	100.0
Google Scholar	37	15.3	63	26.0	142	58.7	242	100.0
AJOL	8	11.6	31	44.9	30	43.5	69	100.0
Cochrane Reviews	6	13.3	10	22.2	29	64.4	45	100.0
DOAJ	10	13.0	30	39.0	37	48.1	77	100.0
Wikipedia	42	17.8	56	23.7	138	58.5	236	100.0
Nature Journals	20	15.5	27	20.9	82	63.6	129	100.0
Oxford Journals	31	18.8	33	20.0	101	61.2	165	100.0

4.3.2 Frequency of E-Resources Usage across Universities

Table 5 shows the frequencies of students at the selected universities: Mzumbe University, University of Dodoma and Sokoine University of Agriculture, measuring the frequency of e-resources usage.

Table 5*Frequency of E-Resources Usage across Universities*

	Daily	Weekly	Monthly	Once in three months	Never used
MU	15.5	19.8	12.5	29.2	42.9
SUA	28.4	28.1	34.4	16.6	28.6
UDOM	56.1	52.1	53.1	54.2	28.5
Total	100.0	100.0	100.0	100.0	100.0

The findings reveal that students from UDOM showed the highest frequency of e-resource usage, whereby 105 (56.1%) students used e-resources daily, compared to 53 (28.3%) students from SUA, indicating that students in these universities are actively engaged with digital learning resources. In contrast, Mzumbe University MU had the lowest proportion of students accessing e-resources across all categories of usage. Notably, 42.9% of MU students reported that they had never used e-resources, the highest proportion among the three universities.

4.3.3 Ways in Which Students' Digital Competences and Awareness Influence Usage of E-resources

This subsection examined the extent to which students' digital competences and socio-demographic factors influence their use of e-resources.

Table 6*Factors Influencing Usage of E-Resources*

Variables in the Equation	B	S.E.	Wald	df	Sig.
Information and Digital Literacy skills	78.635	30565.674	7.981	28	1.000
Digital Content Creation skills	-19.183	11619.705	9.339	12	.674
Communication and Collaboration skills	15.582	41214.186	8.204	4	.084
Problem Solving skills	-1.757	18895.044	9.171	9	.422
Ethical and Safety skills	.486	1.356	.175	3	.981
Sex	-113.376	310.791	.133	1	.715
Education	-89.810	277.339	.105	1	.746
Age (years)	.119	.078	2.368	1	.124
Experience in using e-resources	-.046	.110	.176	1	.674
Availability of infrastructure	12.462	41514.054	8.301	1	.065



The binary regression results indicate no statistically significant predictors of the variable that influence use. This contributes to the moderate use of e-resources. The Wald χ^2 values for all predictors are very small, and their corresponding p-values are well above the conventional significance threshold of 0.05, as shown in Table 5. The findings revealed that there is no statistically significant difference between digital competencies and use of e-resources since the $p > 0.05$ (Table 5). This implies that although all the factors had an influence on usage of e-resources, none of them had a unique influence over others. This was confirmed during the interview, as one of the respondents said that;

“I have never attended any training related to information literacy that aimed to equip students with necessary skills for utilizing e-resources, but I managed to use library e-resources” (Librarian 3).

4.4 Discussion

4.4.1 Students' Level of Awareness Regarding Digital Competencies Required for Accessing and Using E-resources

The study found that most students in Tanzanian universities are aware of the digital competencies required for the utilization of the e-resources. This reflects the efforts by Higher Learning Institutions (HILs) in Tanzania by promoting access to e-resources through orientation program, library guides and digital platforms. This finding is consistent with the study done by Dhiman (2021), which revealed that research scholars have high awareness of e-resources. Similarly, the study conducted in Nigeria by Adenariwo (2022) found that Nigerian undergraduate students perceive a high level of awareness and active use of e-resources. However, the contribution of this study lies in clarifying that high awareness is not sufficient to ensure effective use of e-resources.

However, awareness alone does not always translate into effective engagement. As shown in this study, most of the students depend on open access resources such as Google Scholar and Wikipedia over specialized databases, which reveal the gap between knowledge and the ability to use e-resources meaningfully. The study done by Sulle and Wema (2023) supports that while awareness of e-resources is relatively high in Tanzanian universities, students, particularly undergraduates, often lack exposure to structured training on how to use these resources effectively. Likewise, Sanhueza et al. (2025) reinforced this by showing that when institutions actively promote resources through workshops and training, awareness translates more directly into use, improving academic outcomes. On the other hand, the study adds potential to the awareness debate by revealing that in low-resource settings like Tanzania, awareness without skill development creates only partial engagement with digital resources. This provides a decisive and actionable direction for university policy, shifting the focus from promotional campaigns about e-resource existence to integrative training modules on e-resource utilization.

4.4.2 Types and Levels of Digital Competences Possessed by Students

The study findings indicate that Tanzania university students possessed varied levels of digital competence; they showed to have relative abilities in collaboration, digital safety and communication. Findings indicate that students were comfortable using social media platforms, basic online security practices, and group messaging apps such as WhatsApp, reflecting the spread of mobile phone technologies in Tanzania. This indicates that university students in Tanzania possess average levels of digital skills. These findings relate to a previous study by Jackman et al. (2021) which found that students indicated possessing moderate to low digital skills across the technical and information fields. The findings are similar to the study by Lopez et al. (2020), which described that students scored better in information literacy and collaboration than in digital content creation.

However, findings show that students lacked skills in advanced digital problem-solving and content creation. This meant that university students lack formal training in areas of content creation and problem-solving. Students certified this by revealing they experience difficulties in creating academic content, data presentation or multimedia learning resources despite being experts at using social media in accessing and disseminating online materials. Findings revealed students had limitations on critical problem-solving skills, such as assessing the trustworthiness of electronic resources and differentiating predatory journals from genuine journals. During the interview, a Head of Section from a visited university commented that.

“What we have observed is that, despite taking efforts to subscribe to e-resources from different publishers, very few e-resources from diverse databases are being used by students. In our university, very few postgraduate students have been able to use e-resources from subscribed databases. As a result, we have been receiving complaints from our donors due to this inappropriate practice” (Head of Section, 2025).

These findings add new understandings into Tanzania students' digital competence behaviors that are mostly shaped by informal peer-driven learning through mobile phone usage, thus creating digital skills competence imbalances. These gaps in digital skills among university students in Tanzania explain why most students rely on free, open-access platforms such as Google Scholar or Research Gate while underutilizing e-resources subscribed to from various databases.



In comparison to European or North American context where digital literacy training is embedded into formal training curricula majority students have digital competency skills to search, evaluate, use and sharing e-resources (Limniou et al., 2021), while Tanzanian universities tends to orient students on general ICT training rather than focusing to digital literacy skills that could help students to develop skills for academic e-resources searching, evaluating, use and sharing. This shows that informal training shown by university students in Tanzania is insufficient to develop higher-order digital competence such as online content creation. Thus, it is high time for universities in Tanzania to include courses of digital competence skills in the universities curricula.

4.4.3 Factors Influencing Usage of E-resources and Digital Competence Possessed by Students

Findings from regression analysis show that none of the predictor variables, including communication, collaboration, content creation, safety, problem solving and demographic factors, indicated a statistically significant influence on e-resources usage. These findings suggest that usage patterns may be shaped by a combination of several aspects rather than a single domain. These findings diverge from the prior study by Mollel and Mwantimwa (2019); Komba and Mwakilasa (2019), which revealed that information literacy and knowledge of library systems were the strong predictors of e-resources use in Tanzanian universities. This meant that two variables determined the usage patterns.

Similarly, another prior study with divergence is the study conducted at the Sokoine University of Agriculture by Malekani (2024), which described that information literacy training significantly increases use of e-resources, while Mwantimwa et al., (2021) highlighted the role of institutional support. Institutional support is important to ensure that available e-resources are effectively used. Lack of sufficient technological infrastructures was mentioned in previous literatures as factors that hinder e-resources use. Furthermore, earlier studies (Mbughuni, 2023) identified several factors that hinder the use of e-resources in universities in Tanzania. Limited ICT infrastructure, unreliable internet supplies. These factors did not indicate statistical significance in the regression analysis results which meant they influenced indirectly thus cannot be ignored.

Lastly, findings indicated a lack of significant influence from demographic variables such as educational level, gender, sex and age. These findings are in line with the results from a previous study by Mosha et al. (2022), which showed that demographic factors become less relevant when access and training are controlled. Furthermore, Komba and Lwoga (2020) found that higher e-resources use among postgraduate students, signifying demographic effects, may be context-specific. The non-significance in this sample may therefore reflect a more similar sample in which motivation and access to resources were relatively evenly distributed.

V. CONCLUSION & RECOMMENDATION

5.1 Conclusion

This study investigated the influence of digital competence and awareness on the use of resources in the selected universities in Tanzania (MU, SUA and UDOM). The study findings showed that most students are aware of available e-resources in their institutions; this awareness often falls into meaningful e-resources usage. Instead, university students access e-resources through open-access platforms such as Wikipedia and Google Scholar. The advanced digital competence skills, such as digital content creation and problem solving, remained underdeveloped among students.

5.2 Recommendation

The study recommends that digital competence be integrated into the university curriculum. Digital literacy and information literacy modules should be incorporated in postgraduate and undergraduate curricula. Integrating digital competence in curricula should be aligned with the international framework, like DigComp2.2. Also, regular and inclusive digital competence training needs to be provided for all students in universities, including hands-on skills, especially the use of advanced skills such as the evaluation of information.

The study recommends that the role of institutional support is very important to ensure e-resources usage; especially investments in stable internet, use updated computer labs, and create an environment for easy accessibility of database hosting e-resources. Lastly, the study recommends that academic libraries need to develop outreach programs and marketing strategies to create awareness among university students. The main emphasis should be to create awareness on the availability of e-resources hosted in several databases, and the need to emphasize to students learns how to use digital tools available in their learning environment.



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