

Evaluation of digital literacy and competence levels on the usage of e-learning tools for learning activities among undergraduates in Kwara State, Nigeria

Ismail Abiodun ABDULMUMIN
Alhikmah University, Ilorin, Nigeria
abdulmuminismail@gmail.com

Mubaraq Ibrahim ABDULSALAM
Alhikmah University, Ilorin, Nigeria
abdulsalammubaraq66@gmail.com

Corresponding author: Department of Science Education, Alhikmah University, Ilorin, Nigeria.
abdulmuminismail@gmail.com

Abstract

This study evaluated digital literacy and competence levels in relation to e-learning tool usage among undergraduates in universities in Kwara State, Nigeria. The study examined the problem of limited effective utilisation of e-learning tools by undergraduates in Kwara State despite increasing exposure to digital technologies. The purpose was to evaluate the digital literacy and competence levels of students and examine how this influences their usage of e-learning tools anchored on frameworks such as TPACK and SAMR. A descriptive cross-sectional survey design was adopted, and data were collected from 300 undergraduates across federal, state, and private universities using a validated researcher-designed questionnaire. A pilot study yielded a reliability coefficient of 0.74, confirming the instrument's suitability. Descriptive statistics were used to answer research questions, while Pearson Product-Moment Correlation tested the hypotheses at 0.05 significance. The findings showed that undergraduates relied heavily on informal platforms such as WhatsApp and Telegram for learning, while structured platforms like Google Classroom and LMS were less utilised. The results also revealed moderate levels of digital literacy and competence, with stronger skills in online collaboration and information searching but weaker skills in productivity tools and digital safety. Significant positive relationships were found between digital literacy and e-learning tool usage, and between competence levels and usage. The study concluded that digital literacy and competence contribute meaningfully to effective e-learning adoption and recommended the integration of structured platforms into teaching, targeted digital skill training, and improved institutional infrastructure.

Keywords: Digital literacy, E-learning tools, Competence level, Evaluation, Undergraduates

1. Introduction

In the rapidly evolving landscape of higher education, the COVID-19 pandemic has pushed many educators out of their comfort zones, accelerating the integration of digital technologies in teaching and learning practices. This shift has forced universities in Nigeria to adopt e-learning tools and platforms during lockdowns and social distancing measures. Consequently, e-learning is no longer just an advantage but a necessity for academic success and future employability. This is particularly true for undergraduates in Kwara State, Nigeria, where e-learning is gaining momentum. Students now need to become proficient in online learning environments in order to benefit from the digital revolution in education. This change focuses on e-learning resources, such as digital libraries, virtual classrooms, and learning management systems. With the help of these technologies, education is becoming more adaptable, interactive, and accessible, turning students from passive observers into active participants. Education is changing as a result of e-learning, which provides a vibrant and inclusive environment for the digital age (United Nations Educational, Scientific and Cultural Organisation, UNESCO, 2020).

E-learning tools are the digital powerhouses that are revolutionising how to teach and learn. These tools encompass a wide range of digital technologies and online resources designed to facilitate learning, teaching and assessment processes. From sophisticated learning management systems and immersive virtual classrooms to dynamic online discussion forums and vast digital content repositories, e-learning tools are diverse and ever-evolving (Dhawan, 2021). The growing use of online learning tools in universities is changing education significantly. These tools make learning more flexible and accessible and allow for more interactive ways of teaching. This shift affects both what students learn and how they learn it. As a result, being able to effectively use digital technology has become crucial in modern education. This new approach to learning, centred on e-learning and is reshaping higher education.

Contextually, effective integration of e-learning tools into curricular activities fosters collaborative learning environments, promotes self-paced study and offers personalised learning experiences. They also facilitate the development of digital skills crucial for the modern workforce (Alqahtani & Rajkhan, 2020). However, the

successful implementation of e-learning tools faces challenges such as technical infrastructure limitations, internet connectivity issues and device availability. These factors can significantly impact the accessibility and usability of these tools (Pokhrel & Chhetri, 2021). Therefore, the effectiveness of e-learning tools is closely tied to users' digital literacy levels and competency. As students become more proficient in navigating digital environments, they are likely to engage more effectively with e-learning platforms, maximising the benefits of these educational resources (Anthonysamy et al., 2020). This correlation underscores the importance of digital literacy as a foundational skill in modern education. Digital literacy encompasses the skills, knowledge and attitudes necessary to effectively use digital technologies for learning, work and daily life. It involves the ability to locate, evaluate, and create digital content, as well as communicate and collaborate in digital environments (Spante et al., 2018).

Mahyoob, (2020) agreed that digital literacy encompasses the ability to effectively and critically navigate, evaluate and create information using a range of digital technologies. It involves competencies in Information and Communication Technology (ICT), information literacy and media literacy, enabling individuals to participate fully in a digital society. For undergraduates, possessing digital literacy skills is crucial for academic success, as it empowers them to access and utilise digital information resources, engage in online learning platforms, and collaborate through digital means. Digital literacy also contributes to responsible digital citizenship, empowering students to understand issues of privacy, security, and ethical behaviour in online environments (Nagle, 2018). This awareness is crucial in an era of pervasive digital interactions. Yila (2024) asserted that undergraduates at the University of Lagos have high digital literacy skills but make low use of digital information resources, showing the need for targeted training to improve effective utilisation.

Furthermore, Anthony Samy et al. (2020) opined that in higher education, digital literacy plays a crucial role in students' academic success and future career prospects. It enables learners to critically assess and interpret digital information, participate in online discussions, and leverage digital tools for research and collaboration. The development of digital literacy skills prepares students for the demands of the modern workplace, where digital competencies are increasingly valued. Employers seek graduates who can navigate complex digital environments, analyse data, and adapt to evolving technologies (van Laar et al., 2020). The Nigerian government has recognised the importance of digital literacy in national development. Initiatives such as the National Information Technology Development Agency (NITDA) Digital State Initiative aim to train youths in digital skills, including digital marketing, productivity tools, and content creation, to foster a digitally literate populace. Nevertheless, the relationship between digital literacy and digital competency is symbiotic, with each reinforcing and enhancing the other. As students develop their digital literacy skills, they build a foundation for more advanced digital competencies, essential for effective e-learning tool utilisation (Iordache et al., 2017). This interconnection highlights the importance of

considering both digital literacy and digital competency in evaluating the use of e-learning tools among undergraduates. Ijeh (2024) found that WhatsApp use among undergraduates in Nigeria is very high, particularly as a teaching supplement, and students generally benefited from its use despite challenges

Digital competency refers to the confident and critical use of digital technologies for various purposes, including learning, work, and societal participation. It encompasses a range of skills, from basic operational abilities to advanced proficiencies in data analysis, content creation, and digital problem-solving (Zhao et al., 2021). Additionally, in higher education, digital competency is increasingly recognised as a core skill set. It enables learners to effectively navigate complex digital learning environments, utilise advanced e-learning tools, and adapt to emerging technologies (Tejedor et al., 2020). The development of digital competency prepares students for the challenges of an increasingly digitised workforce. It contributes to lifelong learning capabilities, enabling students to continuously adapt and acquire new digital skills in a rapidly evolving technological landscape. Many industries require professionals who can not only use digital tools but also innovate and solve problems using technology (Sá & Serpa, 2020).

The relationship between digital competency and e-learning tool usage is significant. As students become more digitally competent, they engage more effectively with e-learning platforms, maximising educational benefits (Blau et al., 2020). This correlation highlights the importance of integrating digital competency development into curricula to enhance the effectiveness of e-learning initiatives. To comprehensively assess the impact of digital literacy and competency levels on e-learning tool usage, several evaluation models provide frameworks for this assessment, each offering unique perspectives on the integration of technology in education. Adewumi and Oladele (2023) identified a significant disparity between students' appreciation for digital literacy skills and their actual implementation of these abilities. Although a considerable portion, 64.4%, indicated that they frequently used technology in their coursework, the study revealed a gap between recognizing the importance of digital skills and their practical application in educational settings. Ngozi (2024) discovered that although students recognise the significance of e-skills and digital literacy, they do not consistently utilise these skills in their academic work. The research emphasises a discrepancy between perceived abilities and the real application of digital tools.

The Technological Pedagogical Content Knowledge (TPACK) model, developed by Mishra and Koehler, emphasises the interplay between technology, pedagogy, and content knowledge in effective teaching with technology (Voogt et al., 2013). TPACK considers seven knowledge domains: Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006). Elom et al. (2025) found that students highly accepted WhatsApp and Telegram for discussing

course content with peers and lecturers, as the tools improved learning, mastery, performance, and assignment support, with mean scores above 3.0 and low variability.

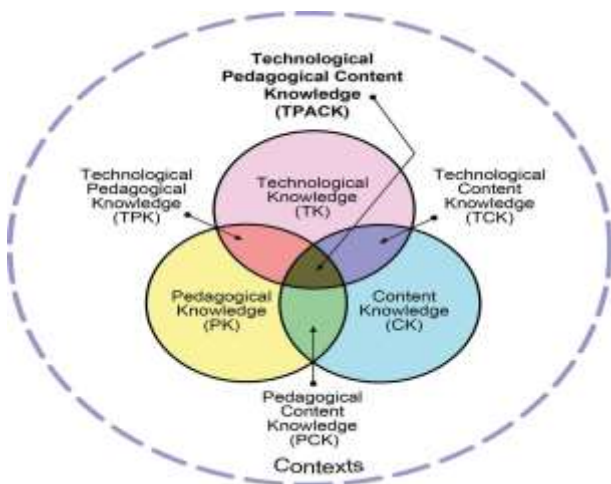


Figure 1: Image of TPACK Model

This model is particularly relevant in evaluating how digital competency influences the effective use of e-learning tools within specific subject areas. It helps identify areas where teachers may need additional support or professional development to integrate technology effectively (Koehler et al., 2013). Recent studies have applied TPACK to assess the readiness of educators to implement e-learning tools in various educational contexts, providing insights into the relationship between digital competency and effective technology integration (Chai et al., 2019).

The TPACK model's holistic approach to technology integration aligns well with the multifaceted nature of digital competency, making it a valuable tool for evaluating the impact of digital literacy and competency on e-learning tool usage. This comprehensive view of technology integration sets the stage for considering other models that focus on specific aspects of the online learning experience. The Community of Inquiry (CoI) framework, proposed by Garrison, Anderson and Archer, focuses on the creation of deep and meaningful learning experiences through the development of three interdependent elements: social presence, cognitive presence and teaching presence (Garrison, 2019). Social presence refers to the ability of learners to project themselves socially and emotionally in an online environment. Cognitive presence is the extent to which learners can construct meaning through sustained reflection and discourse. Teaching presence encompasses the design, facilitation and direction of cognitive and social processes to achieve personally meaningful and educationally worthwhile learning outcomes (Garrison et al., 2020).

The CoI framework provides a lens through which to evaluate how digital literacy and competency contribute to the creation of effective online learning communities. It can help assess whether students with higher levels of digital competency are better able to establish social presence, engage in cognitive tasks and benefit from teaching presence in e-learning environments (Fiock, 2020). Therefore, the application of the CoI framework is called

for to analyse the effectiveness of various e-learning tools and strategies, providing insights into how digital competencies influence the quality of online educational experiences (Castellanos-Reyes, 2020).

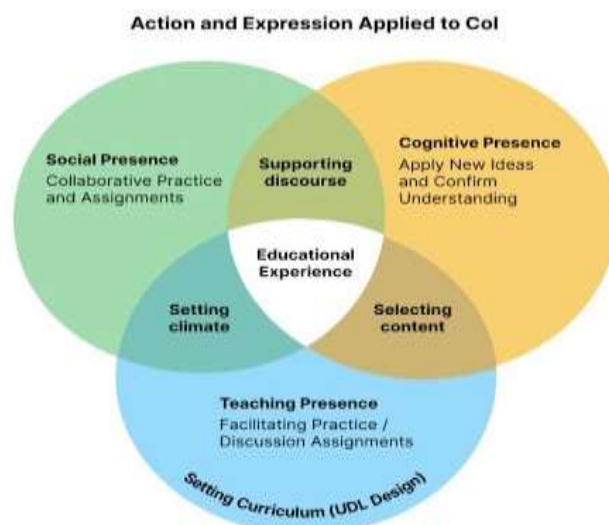


Figure 2: Image of Action & Expression and the Community of Inquiry Model

By considering the interplay between social, cognitive and teaching presence, the CoI framework offers a comprehensive approach to evaluating the impact of digital literacy and competency on e-learning outcomes. This holistic view of online learning experiences complements the technological focus of the TPACK model and paves the way for considering institutional-level evaluation frameworks. The e-Learning Maturity Model (eMM) provides a means by which institutions can assess and compare their capability to sustainably develop, deploy and support e-learning (Marshall, 2010). This model focuses on the processes that underpin successful e-learning rather than specific outcomes. The eMM consists of five process categories: Learning, Development, Support, Evaluation and Organisation. Each category is further divided into practices, which are assessed on a five-point scale of capability (Marshall & Mitchell, 2002). This model can be used to evaluate the institutional factors that support or hinder the development of digital competencies and the adoption of e-learning tools. It helps identify areas where institutions may need to improve their processes to better support students' digital literacy and competency development (Marshall, 2012).

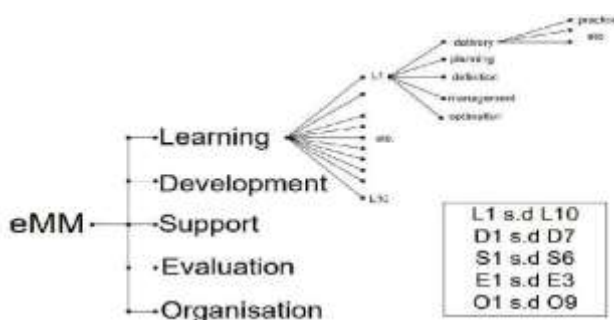


Figure 3: eMM Scheme

However, applications of the eMM have provided valuable insights into institutional readiness for e-learning and the factors that contribute to successful digital transformation in higher education (Sangrà et al., 2019). The eMM's focus on institutional processes and capabilities provides a broader context for understanding how digital literacy and competency are developed and supported within educational organisations. This institutional perspective complements the individual and pedagogical focus of the TPACK and CoI models, setting the stage for a model that considers the transformative potential of technology in education.

The Substitution, Augmentation, Modification, and Redefinition (SAMR) model, developed by Puentedura, offers a method for selecting, using, and evaluating technology in education (Hamilton et al., 2016). This model provides a framework for understanding how technology can transform learning experiences. The SAMR model comprises four levels: Substitution (technology directly replaces traditional tools without changing the task), Augmentation (technology replaces traditional tools with some functional improvements), Modification (technology significantly redesigns the task), and Redefinition (technology enables the creation of entirely new tasks that were previously impossible) (Hamilton et al., 2016).



Figure 4: Image of SAMR Model

This model can be applied to assess how increasing levels of digital competency enable more transformative uses of e-learning tools. It helps identify whether students and educators are using technology to simply replicate traditional learning activities or to create novel, technology-enabled learning experiences (Hilton, 2016). Recent studies have used the SAMR model to evaluate the impact of digital literacy and competency on the adoption and use of e-learning tools, providing insights into how these skills influence the depth and quality of technology integration in education (Kali et al., 2019). The SAMR model's focus on the transformative potential of technology provides a valuable perspective on how digital literacy and competency can lead to innovative and impactful e-learning experiences. This model complements the institutional focus of the eMM by considering how individual competencies can drive technological innovation in education.

Moreover, the rapid integration of e-learning tools in higher education, accelerated by the COVID-19 pandemic, has highlighted significant disparities in digital literacy and

competency among undergraduates, particularly in Kwara State, Nigeria. Despite the growing implementation of these tools, many students face challenges in effectively utilising them, potentially hindering their learning outcomes. This issue is compounded by uneven access to technology, varying quality of ICT education across institutions, and the persistent technical infrastructure and internet connectivity issues common in developing countries. There is a pressing need to understand the relationship between students' digital literacy, digital competency and their effective use of e-learning resources. Second, the rapid pace of technological change requires continuous adaptation, which many students struggle to keep up with due to inadequate digital skills. This situation creates a gap in educational experiences and potentially impacts future employability.

Therefore, a systematic evaluation of current digital literacy and competency levels among undergraduates in Kwara State is necessary. This evaluation should identify areas requiring improvement and examine how these skills impact students' ability to engage with and benefit from e-learning tools. Additionally, there is a need to assess the effectiveness of current e-learning implementations using established frameworks such as TPACK, CoI, eMM, and SAMR. This comprehensive assessment will provide crucial insights for identifying barriers to effective e-learning adoption, informing curriculum design, and ensuring students are adequately prepared for both academic success and future career demands in an increasingly digital world.

1.1 Purpose of the Study

The main purpose of this study is to evaluate the digital literacy and competence levels on the usage of e-learning tools for learning activities among undergraduates in Universities in Kwara State. Specifically, the study aims to;

1. identify the e-learning tools used for learning activities among undergraduates in universities in Kwara State.
2. assess the level of digital literacy among undergraduates in universities in Kwara State.
3. examine the digital competence level among undergraduates in universities in Kwara State.
4. examine the usage level of e-learning tools among undergraduates in universities in Kwara State.
5. explore the relationship between digital literacy level and usage of e-learning tools for learning activities among undergraduates in universities in Kwara State; and
6. explore the relationship between competence levels and usage of e-learning tools for learning activities among undergraduates in universities in Kwara State.

1.2 Research Questions

1. What are the e-learning tools used for learning activities among undergraduates in universities in Kwara State?
2. What is the level of digital literacy among undergraduates in universities in Kwara State?
3. What is the competence level of e-learning tools usage

among undergraduates in universities in Kwara State?

4. What is the usage level of e-learning tools among undergraduates in universities in Kwara State?

1.3 Research Hypotheses

H01: There is no significant relationship between digital literacy level and usage of e-learning tools for learning activities among undergraduates in universities in Kwara State.

H02: There is no significant relationship between competence level and usage of e-learning tools for learning activities among undergraduates in universities in Kwara State.

2. Methodology

This study employed a descriptive research design of a cross-sectional survey method using a quantitative approach. The population of this study comprised all Undergraduates in Universities in Kwara State, Nigeria, while the target population is 300 undergraduates from three selected universities based on ownership of federal, state and private. A researcher-designed questionnaire was used as the instrument to collect data, which consists of four sections. Section A sought the e-learning tools used for learning, Section B answered questions on the level of digital literacy, Section C dealt with the digital competence level, and Section D sought the usage level of e-learning tools. The instrument was subjected to both validity and reliability of the instrument. Validity was done through expert reviews and content and construct validation, while the reliability was tested through a pilot study with Cronbach's Alpha correlation coefficient analysis, with the values of 0.85 for e-learning tools, 0.80 for digital literacy, 0.83 for competence level, and 0.81 for usage levels. Descriptive statistics (frequency, percentage and mean) were used to answer the research questions, and Pearson Product-Moment Correlation statistics (PPMC) were used to test the hypotheses. All hypotheses were tested at a 0.05 level of significance using the Statistical Product and Service Solution (IBM-SPSS) version 26.0.

3. Results and Discussion

- (a) **Research question one:** Identify the e-learning tools used for learning activities among undergraduates in universities in Kwara State.

Table 1 illustrates that undergraduate students in universities located in Kwara State utilise a diverse array of e-learning tools, albeit at different levels of frequency. The tools most commonly employed include WhatsApp (92.0%), Google Classroom (79.0%), Google Meet (81.7%), Telegram (81.3%), and Email (76.3%). YouTube also reports substantial usage at 74.0%. Conversely, tools such as Microsoft Teams (26.0%), Moodle and other Learning Management Systems (25.0%), online platforms like Coursera, edX, and Udemy (25.0 %), and Edmodo (18.3%) demonstrate comparatively lower usage rates, with PhET Interactive Simulations having the least usage at 11.3 %. The average mean score of 1.49 reflects that undergraduates primarily depend on more accessible and informal platforms, particularly social media and commonly available applications, while the uptake of

structured learning management systems and specialised tools remains limited. This trend indicates a tendency towards preferring adaptable, familiar, and cost-effective platforms to facilitate learning activities. This is corroborated by the findings of Elom et al. (2025), which found that students use WhatsApp and Telegram to discuss course content and assignments with peers and lecturers.

Table 1: *e-learning tools used for learning activities among undergraduates*

S/N	E-Learning Tools	Used Frequency %	Not Used Frequency %	Mean
1.	Google Classroom	237 79.0%	63 21.0%	1.21
2.	Zoom	203 67.7%	97 32.3%	1.32
3.	Microsoft Teams	78 26.0%	222 74.0%	1.74
4.	Moodle (or other Learning Management Systems - LMS)	75 25.0%	225 75.0%	1.75
5.	WhatsApp (for academic group discussions)	276 92.0%	24 8.0%	1.08
6.	Telegram	244 81.3%	56 18.7%	1.19
7.	Email (e.g., Gmail for assignment submissions)	229 76.3%	71 23.7%	1.24
8.	YouTube (for academic tutorials and videos)	222 74.0%	78 26.0%	1.26
9.	Google Meet	245 81.7%	55 18.3%	1.18
10.	Edmodo	55 18.3%	245 81.7%	1.82
11.	Kahoot or Quizlet (for assessments or quizzes)	53 17.7%	247 82.3%	1.82
12.	Coursera / edX / Udemy (for online courses)	75 25.0%	225 75.0%	1.75
13.	Online Library Resources / Databases (e.g., JSTOR)	132 44.0%	168 56.0%	1.56
14.	PhET Interactive Simulations (science-specific)	34 11.3%	266 88.7%	1.89
15.	Academic websites and blogs (e.g., Khan Academy)	128 42.7%	172 57.3%	1.57
	Average mean			1.49

- (b) **Research question two:** What is the level of digital literacy among undergraduates in universities in Kwara State?

Table 2 indicates that undergraduates at universities in Kwara State have a moderate degree of digital literacy. A significant portion expressed proficiency in basic computer usage for academic purposes, with 65.0% stating they are very skilled, resulting in a mean score of 1.56. Similarly, 57.7% evaluated their abilities in searching and downloading academic resources online as very competent, demonstrated by the lowest mean score of 1.50, reflecting strong capabilities in this area. Online communication and collaboration also received high competence ratings, with 55.3% asserting they are very competent, leading to a mean score of 1.61. Conversely, only 21.0% considered themselves very competent with productivity tools like word processors and spreadsheets, while 43.7% confessed to being not very skilled, resulting in the highest mean of 2.42. In terms of digital safety and responsibility, the results were mixed, with 29.0% claiming very competent status, but 41.7% admitting to lower competence levels, which gave a mean of 2.28. The overall mean of 1.87 implies that although students are self-assured about their fundamental digital skills and online academic involvement, their

proficiency in productivity tools and digital safety is still lacking. This aligns with the study of Yila (2024) found that undergraduate students demonstrated a very high level of digital literacy skills, yet their use of digital information resources remained low.

Table 2: *level of digital literacy among undergraduates in universities in Kwara State?*

S/N	Items	VC Frequency %	Competent Frequency %	NVC Frequency %	NCAA Frequency %	Mean
1.	I can use a computer for basic academic tasks (e.g., typing reports, organising files, installing software).	195 65.0%	48 16.0%	50 16.7%	7 2.3%	1.56
2.	I am competent in using productivity tools (e.g., Word processors, spreadsheets, presentation software) for my coursework.	63 21.6%	77 25.7%	131 43.7%	29 9.7%	2.42
3.	I can effectively search for and download academic materials online (e.g., using library databases or search engines).	173 57.7%	104 34.7%	23 7.7%	0 0.0%	1.50
4.	I can communicate and collaborate online for schoolwork (e.g., sending academic emails, joining virtual meetings).	166 55.3%	95 31.7%	29 9.7%	10 3.3%	1.61
5.	I understand and practice digital safety and responsibility (e.g., protecting my data, avoiding plagiarism or scams).	87 29.6%	88 29.3%	80 26.7%	45 15.0%	2.28
Average mean						1.87

(c) **Research question three:** What is the competence level of e-learning tools usage among undergraduates in universities in Kwara State?

Table 3: *competence level of e-learning tools usage among undergraduates in universities*

S/N	Items	SA Frequency %	Agree Frequency %	Disagree Frequency %	SD Frequency %	Mean
1.	I can create and format academic documents using Microsoft Word or Google Docs.	142 47.3%	91 30.3%	38 12.7%	29 9.7%	1.85
2.	I can use spreadsheet applications (e.g., Excel or Google Sheets) to organise and analyse academic data.	110 36.7%	101 33.7%	55 18.3%	34 11.3%	2.04
3.	I can critically evaluate information from online sources for academic assignments and research.	169 56.3%	91 30.3%	40 13.3%	0 0.0%	1.57
4.	I can participate in virtual learning environments such as LMS, Zoom, or Google Classroom.	176 58.7%	104 34.7%	20 6.7%	0 0.0%	1.48
5.	I can effectively create and share academic content (e.g., slides, infographics, or videos) using digital tools.	116 38.7%	133 44.3%	51 17.0%	0 0.0%	1.78
Average mean						1.74

Table 3 indicates that university undergraduates in Kwara State show a moderate level of proficiency in utilising e-learning tools. A significant number expressed confidence in engaging with virtual learning platforms like LMS, Zoom, or Google Classroom, with 58.7% indicating strong agreement and a mean score of 1.48, the lowest in the table, which suggests a high level of competence. Likewise, 56.3% strongly agreed that they are capable of critically assessing information from online sources, resulting in a mean of 1.57. The ability to create and format academic documents also scored well, as 47.3% strongly agreed, and the mean was 1.85. Conversely, proficiency in using spreadsheet applications showed less favourable results, with only 36.7% strongly agreeing and 18.3% expressing disagreement, leading to the highest mean of

2.04. The ability to create and share academic materials, like slides and infographics, was at a moderate level, yielding a mean of 1.78. This is in line with the study of Tejedor et al. (2020), which found that digital competency is increasingly recognised as a core skill set. It enables learners to effectively navigate complex digital learning environments, utilise advanced e-learning tools, and adapt to emerging technologies.

(d) **Research question four:** What is the usage level of e-learning tools among undergraduates in universities in Kwara State?

Table 4: *Usage level of e-learning tools among undergraduates in universities*

S/N	Items	VF Frequency %	Frequently Frequency %	Occasionally Frequency %	Never Frequency %	Mean
1.	I use Google Classroom to access and submit my course materials.	33 11.0%	69 23.0%	58 19.3%	140 46.7%	3.02
2.	I attend online classes or tutorials using Zoom, Google Meet, or Microsoft Teams.	83 27.7%	50 16.7%	112 37.3%	55 18.3%	2.46
3.	I use WhatsApp or Telegram academic groups to receive updates and interact with classmates.	243 81.0%	29 9.7%	21 7.0%	7 2.3%	1.31
4.	I access recorded lectures or tutorial videos from platforms like YouTube for study purposes.	162 54.0%	39 13.0%	73 24.3%	26 8.7%	1.88
5.	I use the university's Learning Management System (e.g., Moodle) to take quizzes, submit assignments, or read notes.	62 20.7%	69 23.0%	31 10.3%	138 46.0%	2.82
Average mean						2.30

Table 4 illustrates that the frequency of e-learning tool usage among university undergraduates in Kwara State differs across various platforms. WhatsApp and Telegram academic groups are utilised the most, with 81.0% indicating they use them very frequently, resulting in a mean score of 1.31, which reflects a strong dependence on social media for educational purposes. YouTube also demonstrates considerable engagement, with 54.0% of students using it very frequently and a mean of 1.88. The participation in online classes via Zoom, Google Meet, or Microsoft Teams is moderate, with 27.7% engaging in these platforms very frequently and a mean of 2.46. In contrast, formal platforms like Google Classroom and institutional LMS have low user rates, as 46.7% and 46.0% respectively, stated they never use them, leading to higher mean scores of 3.02 and 2.82. The overall average mean of 2.30 suggests that undergraduates primarily depend on informal, flexible tools like WhatsApp and YouTube for their learning, while the use of organised e-learning platforms is relatively limited. This is supported by the findings of Ijeh (2024), which found that WhatsApp use among undergraduates in Nigeria is very high, particularly as a teaching supplement, and students generally benefited from its use despite challenges.

3.1 Hypotheses Testing

H01: There is no significant relationship between digital literacy level and usage of e-learning tools for learning activities among undergraduates in universities in Kwara State.

Table 5: PPMC showing a significant relationship between the digital literacy level and usage of e-learning tools for learning activities

Correlations		Digital Literacy	Usage
Digital Literacy	Pearson Correlation	1	.481**
	Sig. (2-tailed)		.000
	Sum of Squares and Cross-products	2337.930	1452.720
	Covariance	7.819	4.859
	N	300	300
Usage	Pearson Correlation	.481**	1
	Sig. (2-tailed)	.000	
	Sum of Squares and Cross-products	1452.720	3900.880
	Covariance	4.859	13.046
	N	300	300

** . Correlation is significant at the 0.01 level (2-tailed).

Table 5 shows a significant positive relationship between digital literacy and usage of e-learning tools among undergraduates in universities in Kwara State. The Pearson correlation coefficient is 0.481 with a significant value of 0.000, which is less than 0.01, indicating a moderate but statistically significant relationship. This means that as students' digital literacy increases, their usage of e-learning tools for learning activities also increases. The null hypothesis of no significant relationship is therefore rejected. This negates the finding of Adewumi and Oladele (2023), which found a notable gap between how much students valued digital literacy skills and their actual use of these competencies.

H02: There is no significant relationship between competence level and usage of e-learning tools for learning activities among undergraduates in universities in Kwara State.

Table 6: PPMC significant relationship between competence level and usage of e-learning tools for learning activities

Correlations		Competency Levels	Usage
Competency Levels	Pearson Correlation	1	.292**
	Sig. (2-tailed)		.000
	Sum of Squares and Cross-products	1540.037	716.840
	Covariance	5.151	2.397
	N	300	300
Usage	Pearson Correlation	.292**	1
	Sig. (2-tailed)	.000	
	Sum of Squares and Cross-products	716.840	3900.880
	Covariance	2.397	13.046
	N	300	300

** . Correlation is significant at the 0.01 level (2-tailed).

Table 6 shows a significant positive relationship between competence level and usage of e-learning tools among undergraduates in universities in Kwara State. The Pearson correlation coefficient is 0.292 with a significance value of 0.000, which is below 0.01, indicating a weak but statistically significant relationship. This suggests that as students' competence in using e-learning tools improves, their usage of these tools for learning activities also increases. The null hypothesis of no significant relationship is therefore rejected. This finding negates the finding of Ngozi (2024) discovered that although students recognise the significance of e-skills and digital literacy, they do not consistently utilise these skills in their academic work.

4. Conclusion

The research indicates that undergraduate students at universities in Kwara State utilise a range of e-learning tools, with social media applications like WhatsApp and Telegram being the most prominent in their educational activities, while more structured platforms such as Google Classroom and Learning Management Systems (LMS) are used less frequently. Furthermore, the results indicate that students possess moderate levels of digital literacy and competence, demonstrating proficiency in basic computer skills, online communication, and critical information evaluation, but showing less strength in productivity tools, digital safety, and the use of spreadsheets. Their ability to use e-learning tools is also assessed as moderate, revealing greater confidence in engaging with virtual learning environments but lesser skills in data analysis and content creation. The research establishes a meaningful positive correlation between digital literacy and competence levels with the usage of e-learning tools, indicating that advancements in these areas contribute to more effective participation.

5. Recommendation

1. Universities should integrate formal e-learning platforms into their curriculum and provide orientation on their benefits to balance informal and formal learning tools.
2. Institutions should organise regular training workshops focusing on advanced productivity tools and digital ethics to strengthen weaker areas.
3. Universities should embed practical, course-based digital tool training into assignments and assessments to improve competence in these areas.
4. Universities should improve access to reliable infrastructure, such as stable internet and functional LMS, to encourage more frequent use of structured platforms.
5. Policymakers and institutions should design digital literacy development programmes as a pathway to increase adoption and effective use of e-learning.
6. Universities should prioritise skill-based training in their digital education strategy to improve students' competence and, consequently, their engagement with e-learning platforms.

References

- Alqahtani, A. & Rajkhan, A. A. (2020). E-learning critical success factors during the COVID-19 pandemic: A comprehensive analysis of e-learning managerial perspectives. *Education Sciences*, 10(9), 232.
- Anthonyamy, L., Koo, A.-C. & Hew, S.-H. (2020). Self-regulated learning strategies and digital literacy skills as mediators in the relationship between the community of inquiry and perceived learning in online learning environments. *Learning and Individual Differences*, 30, 179–187.
- Blau, I., Peled, Y. & Nusan, A. (2020). Technological, pedagogical, and content knowledge: The impact of teachers' digital competency on meaningful use of e-learning systems. *Educational Technology Research and Development*, 68(2), 411–432.
- Castellanos-Reyes, D. (2020). 20 years of the Community of Inquiry Framework. *TechTrends*, 64(4), 557–560.
- Chai, C. S., Koh, J. H. L. & Tsai, C.-C. (2019). A review of the quantitative measures of Technological Pedagogical Content Knowledge (TPACK). *British Journal of Educational Technology*, 50(1), 25–36.
- Dhawan, S. (2021). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5–22.
- Elom, C. O., Ayerakwa, H. M., Ibrahim-Olesin, S., Deffor, E. W., Uwaleke, C. C., & Onyeneke, R. U. (2025). Determinants of WhatsApp and Telegram usage for learning support in Nigerian universities: a quantitative study. *Frontiers in Education*, 10. <https://doi.org/10.3389/educ.2025.1581514>
- Fiock, H. (2020). Designing a Community of Inquiry in online courses. *International Review of Research in Open and Distributed Learning*, 21(1), 134–152.
- Garrison, D. R. (2019). E-learning in the 21st century: A framework for research and practice. *Routledge*.
- Hamilton, E., Rosenberg, J. M. & Akcaoglu, M. (2016). The substitution, augmentation, modification, and redefinition (SAMR) model: A critical review and suggestions for its use. *TechTrends*, 60(5), 433–441.
- Hilton, J. (2016). Open educational resources and college textbook choices: A review of research on efficacy and perceptions. *Educational Technology Research and Development*, 64(4), 573–590.
- Iordache, D., Mariën, I. & Baelden, D. (2017). Developing digital skills and competences: A quick-scan analysis of 13 digital literacy models. *Italian Journal of Sociology of Education*, 9(1), 6–30.
- Kali, Y., Goodyear, P. & Markauskaite, L. (2019). Researching design practices and design cognition: Contexts, experiences, and pedagogical knowledge-in-pieces. *Learning: Research and Practice*, 5(3), 301–316.
- Koehler, M. J., Mishra, P. & Cain, W. (2013). What is Technological Pedagogical Content Knowledge (TPACK)? *Journal of Education*, 193(3), 13–19.
- Mahyoob, M. (2020). Challenges of e-learning during the COVID-19 pandemic experienced by EFL learners. *Arab World English Journal*, 11(4), 351–362.
- Marshall, S. (2010). A quality framework for continuous improvement of e-learning: The e-Learning Maturity Model. *Journal of Distance Education*, 24(1), 143–166.
- Marshall, S. (2012). Improving the quality of e-learning: Lessons from the eMM. *Journal of Computer Assisted Learning*, 28(1), 65–78.
- Marshall, S. & Mitchell, G. (2002). An e-learning maturity model? Proceedings of the 19th Annual Conference of the Australian Society for Computers in Learning in Tertiary Education, Auckland, New Zealand. Retrieved from <http://www.ascilite.org>
- Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054.
- Nagle, J. (2018). Twitter, cyber-violence, and the need for critical social media literacy in teacher education: A review of the literature. *Teaching and Teacher Education*, 76, 86–94.
- Ngozi, H. (2024). Impact of Information Literacy on Academic Performance among Undergraduate Students in Nigeria. *African Journal of Information and Knowledge Management*, 3(1), 13–25. <https://doi.org/10.47604/ajikm.2431>
- Pokhrel, S. & Chhetri, R. (2021). A literature review on the impact of COVID-19 pandemic on teaching and learning. *Higher Education for the Future*, 8(1), 133–141.
- Puentedura, R. (2006). Transformation, technology, and education. Presentation given August 18, 2006, as part of the Strengthening Your District through Technology workshops, Maine, US. Retrieved from <http://hippasus.com/resources/tte/>
- Sâ, M. J. & Serpa, S. (2020). The global crisis brought about by SARS-CoV-2 and its impacts on education: An overview of the Portuguese panorama. *Science Insights Education Frontiers*, 5(2), 525–530.
- Sangrà, A., Raffaghelli, J. E. & Guitert-Catasús, M. (2019). Learning ecologies through a lens: Ontological, methodological, and applicative issues. *British Journal of Educational Technology*, 50(4), 1619–1638.
- Spante, M., Hashemi, S. S., Lundin, M. & Algiers, A. (2018). Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent Education*, 5(1), 1519143.
- Tejedor, S., Cervi, L., Pérez-Escoda, A. & Jumbo, F. T. (2020). Digital literacy and higher education during COVID-19 lockdown: Spain, Italy, and Ecuador. *Publications*, 8(4), 48.
- van Laar, E., van Deursen, A. J., van Dijk, J. A. & de Haan, J. (2020). Determinants of 21st-century skills and 21st-century digital skills for workers: A systematic literature review. *Computers in Human Behavior*, 107, 106273.
- Voogt, J., Fisser, P., Roblin, N. P., Tondeur, J. & van Braak, J. (2013). Technological Pedagogical Content Knowledge – A review of the literature. *Journal of Computer Assisted Learning*, 29(2), 109–121.
- Yila, U. M. (2024). Undergraduate students' utilisation of digital information resources at the University of Lagos, Nigeria. *University of Dar Es Salaam Library Journal*, 19(2), 130–139. <https://doi.org/10.4314/udslj.v19i2.10>
- Zhao, F., He, W. & Deng, L. (2021). The role of digital literacy in individual technology readiness. *Journal of Educational Computing Research*, 59(6), 1079–1101.