

AFRICAN JOURNAL OF BUSINESS, ECONOMICS AND INDUSTRY (AJOB EI)



**KIRINYAGA
UNIVERSITY**



nanoschematic
This software is a powerful tool for creating
3D models of nanoscale structures. It is
designed to be used by researchers in
physics, chemistry, and materials science.
The software is available for free download
at the following URL: <http://www.nanoschematic.com>



**AFRICAN JOURNAL OF BUSINESS, ECONOMICS AND INDUSTRY
(AJOB EI)**

Volume 7 (2), 2026

KIRINYAGA UNIVERSITY, KENYA

ISO 9001: 2015 Certified

AFRICAN JOURNAL OF BUSINESS, ECONOMICS AND INDUSTRY (AJOBEL)

Editorial Board

Editors

Prof. Charles Omwandho, PhD

Prof. Jane Kerubo, PhD

Dr. Jotham Wasike, PhD

Advisory Board

Prof. Mary Ndung'u, PhD

Prof. Charles Omwandho, PhD

Administration & Logistics

George Ngorobi

Nellyann Kathomi

Francis Kamau

© Copyright 2026, Kirinyaga University

Copyright Statement

All rights reserved. Seek the University permission to reproduce, distribute, display or make derivative content or modification.

AFRICAN JOURNAL OF BUSINESS, ECONOMICS AND INDUSTRY (AJOBEI)

Email: journals@kyu.ac.ke

ISSN: 1410-6779

KIRINYAGA UNIVERSITY

P.O Box 10500

NAIROBI, KENYA

<http://journal.kyu.ac.ke/index.php/library>

TABLE OF CONTENTS

Educational Technology Is Not a Luxury in the 21st Century, It Is a Necessity.	1
How Can Digital Equity Initiatives Address Gender Disparities in Access to Technology and Knowledge?	14
Effect of the Scope of the Information Literacy Curriculum on Academic Performance Among University Students in the Nairobi Metropolitan Area	31
Influence of Compliance with CUE Standard No. LIBR/STD/10 on Academic Performance Among University Students in the Nairobi Metropolitan Area	48

EDUCATIONAL TECHNOLOGY IS NOT A LUXURY IN THE 21ST CENTURY, IT IS A NECESSITY.

Nyamundundu V.A., Biningu H.
Pedagogical Research Advisor-TTC GACUBA II
Pedagogical Research Advisor -TTC ZAZA

Correspondences: alicenyamundundu@yahoo.com, hbininguu@mail.com

ABSTRACT

Educational technology is no longer a luxury, but an important component of the 21st century education system. Modern societies have hinged their socio-political and economic development on technology. This has made use of technology in teaching and learning processes indispensable. Thus, there is need for both teachers and learners to access educational technology to support teaching and learning, improve access to quality education and make learning more inclusive and effective. Many African countries, including Rwanda, are investing in educational technology to modernize their education systems and align their human resource development to National economic demands. However, the question is; to what extent is educational technology being employed by teachers in the classroom. This study investigated the extent to which teachers in Rwandan Teacher Training Colleges use educational technology in the teaching and learning processes. The study employed case study approach at TTC Gacuba II. Qualitative desktop research approach was used. Results highlight the need for use of educational technology in the teaching and learning processes.

Keywords: Educational technology, indispensable, luxury, access, quality education, inclusive, necessity socio-political development, economic development.

INTRODUCTION

Modern Educational technology is no longer a luxury, but an indispensable component of the 21st century education system. The world of schooling has been revolutionized by technology and that the reliance and dependence on technology cannot be dispensed [1]. Educational technology has thus provided solution to problems in education, making it indispensable in the teaching and learning processes [2]. Elsewhere, it has been asserted that information and communication technology has become a way of life that children have adopted [3]. Mishra et al (2024) [4] observed that despite the negative perceptions about educational technology, no one has seriously disagreed with the fact that it has become an important factor in education. Consequently, educational technology is here to stay owing to the critical role it plays in the teaching and learning processes.

The global investment in educational technology was projected at USD404 billion in 2025^[5, 6]. This deliberate positive policy formulation and massive investment in educational technology is evident that there is no turning back on use of technology in education. Thus it is globally accepted that quality of education depends on the extent to which technology is used in the teaching and learning processes. Rwanda, like the other countries of the globe is making huge investments premised on their conviction that technology is central in driving Rwanda's transformation to a knowledge-based economy. To this end, the government has crafted strong policies and strategy framework for integration of technology in education supported by implementation of several policies to promote the integration process. For instance, the 2015 ICT in Education Master Plan and 2016 ICT in Education aimed at achieving educational transformation [7]. Rwanda thus became one of the first countries in Africa to implement the One Laptop per Child and to date, there is massive computerization of schools in Rwanda through provision of ICT tools to support teaching and learning processes.

In the Curriculum Framework for Teacher Training Colleges, REB (2020) clearly states the need for intensive integration of ICT in education. The 2020 Teacher Professional Standards further asserts adequate knowledge in the use of ICT as one of the general learning outcomes (exit profile) of a student teacher. To date, use of technology has become a norm in the teaching and

learning processes in Rwanda. However, the question is; to what extent is educational technology being employed by teachers in the classroom. It has been pointed out that the potential of technology cannot be realized by mere provision of computers in schools, hence the need to enquire the extent to which technology is being employed in the classroom setting [8].

Purpose of the research

This study investigated the extent to which teachers in Rwandan Teacher Training Colleges are using educational technology in the teaching and learning processes and TTC teachers' perception and appreciation of the role played by these technologies in the teaching and learning processes.

Research Objectives

1. To identify factors which promote use of technology in teaching and learning.
2. To establish use of technology in teaching and learning in TT'Cs.
3. To make recommendations on how technology in teaching and learning can be improved.

Methodology

The study applied a qualitative research design through sampling of students and teachers at Gacuba TTC in Rubavu District, Western Province of Rwanda. Data was collected using questionnaires, interviews and observations. Results are presented in narrative descriptions from which conclusions and recommendations were drawn.

Sampling

Purposive sampling was used in this study based on the characteristics of the population and the objective of the study. The study was carried out at a TTC in Rwanda, namely Gacuba II TTC in the Rubavu District in the Western Province of Rwanda. Both teachers and students gave their views on the questionnaires. Ten of twenty-five teachers were purposively selected based on their cooperation while forty students were selected from different year groups,

namely year 1, year 2 and year 3. The students represented three different categories namely sciences, humanities and languages. The sample had both female and male teachers and students.

LITERATURE REVIEW

Educational technology

Education refers to the process where knowledge, skills, and habits are transferred and transformed from one generation to the next through teaching, training and research ^[9]. While Grubler (2015) ^[10] defines technology as manufactured tools whose practical use enhance human capabilities, Magtibay (2019) ^[11] defines technology as a mix of processes and products used in application of knowledge to accomplish different tasks. Putting this together, educational technology is an organized process of applying modern technology to improve quality of education ^[9, 12]. The technology has evolved from use of simple tools to radio and television progressing to digital platforms like databases, e-books and other computer programs. In the 21st century, educational technology has transformed by maximizing and perfecting digital inventions culminating in, inter alia; e-learning programs, artificial intelligence and machine learning ^[13]. Thus, the technology in its modern form, refers to use of ICT tools and digital platforms to enhance teaching and learning processes.

The indispensability of educational technology

Educational technology has made learning more liberal, democratic and exciting as teachers, learners interact easily with each other and with content. Thus, before introduction of Education technology, teachers dictated the way learners learnt and the end of the school day and closure of the school library signaled the end of learning. Educational technology has thus brought a new dimension in terms of how, where and when should learning take place. The technology appeals to learners' different learning styles as it interfaces the learning and social life of the learner. Hoge et al (2017) ^[14] stated that technology enhances learning, socialization and creativity among learners. Thus, in the age of technology, there is no labour in explaining education to children because it has become part of their daily lives which they do not wish to

miss. Technology has also provided solutions to many educational challenges such as distance, time, facilities, teaching and learning materials. That teaching and learning can take place anywhere at any time even beyond the classroom and school timetable is plausible. Verma (2019) ^[15] asserted that computer technology has removed time, distance and cost constraints in processing educational information. Equally, students can receive instructions and ask for clarity through phone calls, emails, social media, and different education platforms. They can also source learning materials and illustrations on the internet while at the same time addressing challenges related to classroom shortages through use of technology.

Educational technology has made the processes much simpler enabling authors to bypass publishing houses, connecting directly with editors and with just a few clicks, readers can access libraries and books of their choice while students and teachers can access the latest information on the internet through electronic books, research articles, online libraries and other online platforms that provide information related to desired subject content. Whereas, use of smart boards, projectors and computer-generated teaching aids has made lesson delivery much easier than before, use of spreadsheets and other computer-based programs has brought much more precision in computation and presentation of quantitative data.

It is also worth noting that the current industrial changes, dubbed industry 4.0, have made technology occupy a special place in education making use of educational technology critical in teaching and learning processes. In the Rwandan curriculum, ICT is considered a cross-cutting tool empowering students with communication and technological skills required in the country's development programs. The implication is that technology has to be taught and technological approaches have to be used for learners to grasp the concepts. For students to have good grasp of the subject matter, there is no way a teacher can teach about how to use a computer without using the computer itself as media, making inclusion of technology as content in the school curriculum unavoidable.

The nurturing and cultivation of 21st-century skills in learners require modern educational technologies targeting skills, knowledge, competencies that would enable learners to acquire skills including information, media, and technology, creativity, critical thinking, innovative thinking, problem-solving, research, communication and collaboration and citizenship as well as global awareness of civil rights and global trends ^[16]. Ramalia and Molwele (2022) ^[17] emphasized the role played by digital technologies in driving innovation and fostering creativity which are crucial life skills.

Factors that promote use of technology in teaching and learning.

Whilst use of educational technology in the 21st century cannot be questioned or avoided; several factors determine its full employment in teaching and learning. Firstly, policies can either promote the use of educational technology or do otherwise. In many cases, there are government policies and school-based policies, both of which determine use of technology in schools. These include budget allocation, security and cultural factors. Thus, in the Rwandan case, implementation of policies encouraging use of technology in education are included in National budget and in their education master plan and Curriculum framework ^[7]. However, in all societies across the globe, adequacy and effective implementation of these policies may need scrutiny. Both National and school policies define restriction of such items as use of smart telephones by students at school.

Because use of educational technology depends so much on availability and accessibility of relevant infrastructure and digital tools, furnished smart rooms and digital tools like computers, projectors, smart boards and internet connectivity are essentials in the use of educational technology. There is therefore a need for a strong foundation which includes internet enabled classrooms, strong Wi-Fi signal, continuous supply of electricity and a wide range of ICT tools. In Tanzania, it was revealed that lack of or insufficient infrastructure and other resources such as poor electricity supplies in the rural areas posed a great challenge to implementation of educational technology ^[18]. Thus, successful use of educational technology depends on how much authorities invest in provision of relevant facilities and resources.

Teachers and students constitute an important factor in that they determine how educational technology is used in teaching and learning. Harrell & Bynum (2018) ^[19] observed that despite increasing access to technology in schools, teachers are usually portrayed as hesitant users being accustomed to the old standards of teaching and their lack of relevant skills creating frustration as they try to shift to new technology driven teaching and learning processes. Students on the other hand, tend to have a positive attitude toward integration of technology in education ^[20]. Consequently, assessing use of technology in the classroom should consider perceptions and attitudes of both students and teachers.

RESULTS

Results of this study demonstrate consensus among teachers and students regarding definition of educational technology. Participants demonstrated a shared understanding of technology, with the majority identifying it as utilization of modern tools and digital media – such as laptops, tablets, projectors, headphones, smartphones, and internet connectivity – to facilitate and enhance teaching and learning processes. The study noted that both students and teachers have a general awareness of the fundamental components and applications of technology in education.

Table 1. What do you understand by educational technology?

Sample	ICT tools	Media	Other
Students	26	10	4
Teacher	10	5	-

The data presented on table 1 indicate that 26 students defined educational technology as the use of Information and Communication Technology (ICT) tools, such as laptops and projectors, to enhance learning ^[21]. Ten students associated technology with media, specifically referring to use of the Internet. However, the remaining four students described educational technology in terms of research and analysis. Thus, while technology indeed facilitates

research and analytical processes, student responses suggest to a certain extent a misunderstanding of the core focus of the question by some students.

Table 2. Are you/your teachers using technology in the classroom?

	YES	NO	SOMETIMES
TEACHERS	6	-	4
STUDENTS	12	-	28

A significant proportion of both teachers and students acknowledge use of technology in teaching and learning. However, its application is not consistent due to a shortage of necessary equipment. Thus, while projectors are used for PowerPoint presentations, the institution had less than five projectors for 25 staff members. Equally, there were insufficient laptops for students use. Consequently, teachers and students shared and rotated access to these resources. No participant reported complete absence of technology for use in teaching and learning processes.

Table 3. In what ways do you use technology in teaching and learning?

	LESSON PREPARATION	RESEARCH	ASSESSMENTS
TEACHERS	11	2	2
STUDENTS	3	37	

The data presented on table 3 indicate that technology is used for various purposes at the Teacher Training College (TTC). It was observed that while some individuals used technology primarily for research, teachers frequently used it for lesson preparation, with computers and internet access being the most commonly used tools. These findings underscore the essential role of technology in modern education, highlighting its necessity in contemporary academic and professional settings.

Table 4. What are the advantages and disadvantages of using technology in teaching and learning?

Advantages	Disadvantages
It helps in research	It is time-consuming
It improves knowledge retention	
It enhances creativity and innovation	
It provides up-to-date information	
Enables access to information	
It is more interesting and encourages individual learning.	
It makes learning easier	
Develops digital literacy	
It improves collaboration and communication	
It creates new ways to learn	

Teachers and students came up with the advantages and disadvantages presented on the table above

Both teachers and students acknowledge benefits of technology in education, particularly in facilitating lesson preparation, enhancing student motivation, and increasing engagement in the learning process. Given its transformative impact on teaching and learning, technology is not merely a luxury but an essential component of modern education.

Table 5. What factors can promote use of technology in the classroom within your TTC?

Statement	Number of Participants
Good administration	25
Skilled tutors	28
Availability of technology tools	18
Learner's attitude	14
High-speed internet	30
Curriculum	6
ICT LAB	14
E-learning courses	10
English proficiency	8

The aforementioned factors were identified by participants as key contributors to integration of technology in the classroom. Among the most significant factors are effective administration, skilled educators, and high-speed internet, followed by availability of technological tools. This suggests that when an institution possesses strong administrative support, qualified instructors, and reliable internet connectivity, alongside adequate technological resources, it is more likely to successfully implement technology in educational settings. Additionally, it was observed that well-developed infrastructure, such as ICT laboratories, facilitate students' use of technology [22]. However, the Teacher Training College (TTC) in this study had only one ICT laboratory serving approximately 300 students and was staffed by only two ICT instructors, thereby limiting students' access to technological resources. Students' attitudes and socioeconomic backgrounds hindered effective utilization of technology in the classroom since majority of students come from low-income families that cannot afford technological gadgets and most schools in the village rarely engage in

technology. This means that a number of students come to TTC with limited technological skills thereby developing a negative attitude towards use of technology. The fact that ICT is not an examinable subject in secondary schools in Rwanda making it more of an option than a compulsory examinable subject leads to poor preparation among students from rural secondary schools. Many students in TTC Gacuba have limited English proficiency which further affects their use of technology in learning. Although the TTC is doing well, improvement on the highlighted factors can improve technology in teaching and learning immensely.

Table 6. What challenges do you face in using technology in the teaching and learning process?

Challenges	Number of participants
Lack of enough time	20
Unstable internet connection	16
Lack of skills in learners	18
Lack of enough infrastructure	10
Inadequate technological tools	12

Both students and teachers expressed concerns regarding the limited time available for using technology in the learning process. Students, for instance, have a maximum of two lessons per week in the ICT laboratory, which is insufficient for full integration of technology in their studies. Teachers, on the other hand, face challenges related to students' limited digital literacy, hindering effective delivery of instructional content when using technology. As a result, educators often resort to traditional teaching methods, which are perceived as more time-efficient. Additionally, unstable internet connectivity disrupts planned technology-based lessons. These and other challenges, as presented on the tables above present significant barriers to full-scale integration of technology in teaching and learning processes.

RECOMMENDATIONS

There is need to;

- (i) Provide more ICT laboratories and infrastructure in the teacher training colleges to cater for expanded technological needs.
- (ii) Motivate teachers and students to use technology.
- (iii) Allocate more time in the teaching timetables to cover computing and ICT related lessons.
- (iv) Provide Institutional online assignments in every subject to enable students get used to using technology.
- (v) Provide regular ICT Training workshops for both teachers and students as a way of integrating technology in teaching and learning.
- (vi) Ensure un-interrupted access to internet access and employment of ICT trained teachers.

REFERENCES

1. Arvindham, M. (2019). "A Research Paper on Modern Technology" in JETIR, January 2019, 6(1) (www.jetir.org/ISSN-2349-5162)
2. Etesike, C. N. (2019). Indispensable roles of educational technology resources in achieving education for all: Implications to sustainable peace and security in Nigeria. *International Journal of Educational Policy Research and Review*, 6(1):15-20.
3. Murati, R., Ceka, A. (2017). The use of Technology in Educational Teaching" in *Journal of Educational and Practice* 8(6)
4. Mishra, P., Oster, N., Henriksen, D. (2024). Generative AI, teacher knowledge and educational research: Bridging short-and long-term perspectives. *TechTrends*, 68(2), 205-210.
5. North, C., Trucano, M. (2024). "The Rise of Technology for Education: Launch of the Global Reference Group" retrieved from <https://www.globalpartnership.org>
6. HolonIQ. (2021). (2021). Global Education Outlook. HolonIQ. <https://www.holoniq.com>
7. UNESCO 2023, "Global Education Monitoring Report, Rwanda Technology" <https://educationprofiles.org>
8. Rubagiza, J., Were, E (2011). "Introducing ICT into Schools in Rwanda: Educational Challenges and Opportunities, *International Journal of Educational development*, 31(1): 37-43

9. Budhwar, K. (2017). "The Role of Technology in Education", *International Journal of Engineering Applied Sciences and Technology*, 2(8): 55-57
10. Grubler (2015). "Technology: Concepts and Definitions" in *Technology and Global Change* retrieved from <https://www.cambridge.org>
11. Magtibay, C. L. (2019). "What is Technology?" retrieved from <https://www.scribid.com>
12. Stoistic (2015). "The Importance Educational technology in Teaching", retrieved from *International journal of Cognitive Research in Science, Engineering and Education*, 3(1)
13. Maduka, C. (2024). "Why Educational Technology is Important? The importance of educational technology in 2024" retrieved from learnwithpride.co.uk
14. Hodge, S., Lieberman, L., & Murata, N. (2017). *Essentials of teaching adapted physical education: Diversity, culture, and inclusion*. Routledge.
15. Verma, A. (2019). "Use of Information Technology in Research" *JETIR*, June 2019, Volume 6, Issue 6; www.jetir.org(ISSN-23-5162) rdb.rw (2025)
16. Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). *Assessment and teaching of 21st century skills*. Assessment and teaching of 21st century skills, 17-66.
17. Ramalia, S. and Molwele, A. J. (2022) "The Role of Science and Technology Education" in the *International Journal of Higher Education* Vol. 11. No.5. 2022 <http://ijhe.scidupress>
18. Mwinyi H. (2024). "Challenges and Opportunities of Implementing Education Technology in Rural and Underserved Areas of Tanzania: Assessing the Sustainability and Educational Impact of Such Initiatives" in *African Journal of Education and Practice* 10(4): 27-39
19. Harrell, S. Bynum, Y. (2018). "Technology Integration in the Classroom" in *Alabama Journal of Educational Leadership*, 5, 12-18,
20. Ubaidiallah, N. Z. Baharuddin, N. N (2020). *Students' Perception of the Use of Technology in Education*, in *Environment Behaviour Proceedings Journal* 5(15). 117-122
21. Parveen, D. S., Ramzan, S. I. (2024). *The role of digital technologies in education: benefits and challenges*. *Int. Res. J. Adv. Eng. Manag*, 2, 2029-2037.
22. Mpuangnan, K. N. (2024). *Teacher preparedness and professional development needs for successful technology integration in teacher education*. *Cogent Education*, 11(1), 2408837.

HOW CAN DIGITAL EQUITY INITIATIVES ADDRESS GENDER DISPARITIES IN ACCESS TO TECHNOLOGY AND KNOWLEDGE?

Nyamundundu A.V.

Educational Leadership and Management, University of South Africa (UNISA).

Correspondence: alicenyamundundu@yahoo.com

ABSTRACT

Persistent gender disparities in access to technology and knowledge remain a critical barrier to achieving inclusive participation in the digital age. While global initiatives have increasingly emphasized digital equity as a cornerstone of sustainable development, the uneven distribution of technological resources continues to enable existing social disparities. This study interrogates how digital equity initiatives can be strategically designed to address gender disparities, situating the discussion within broader debates on social inclusion, post-colonial contexts and educational leadership. Drawing on intersectional perspectives, the analysis foregrounds the ways in which gender interacts with socio-economic status, geography, and cultural norms to shape unequal opportunities in digital ecosystems. The study examines structural challenges such as affordability, infrastructure gaps, and policy gaps, alongside cultural barriers including gender stereotypes and limited representation in digital spaces. It highlights promising strategies, including targeted digital literacy programs, inclusive curriculum design, and gender-sensitive policy frameworks that prioritize inclusion of marginalized voices. Particular attention is paid to the role of educational institutions and leadership models in embedding equity principles into digital transformation agendas. The discussion also considers how sustainability frameworks, notably the Sustainable Development Goals (SDGs), provide normative anchors for integrating gender equity into digital inclusion policies. By moving beyond access to encompass agency, empowerment, and redistribution of knowledge, digital equity initiatives can challenge entrenched biases and foster meaningful participation. Ultimately, there is need for systemic approaches that combine technological innovation with critical pedagogy and policy reform, ensuring that digital transformation contributes to Both Gender Justice and Broader Social Inclusion.

Keywords: Gender equity, disparities, stereotypes, leadership, gender, sustainability and critical pedagogy.

INTRODUCTION

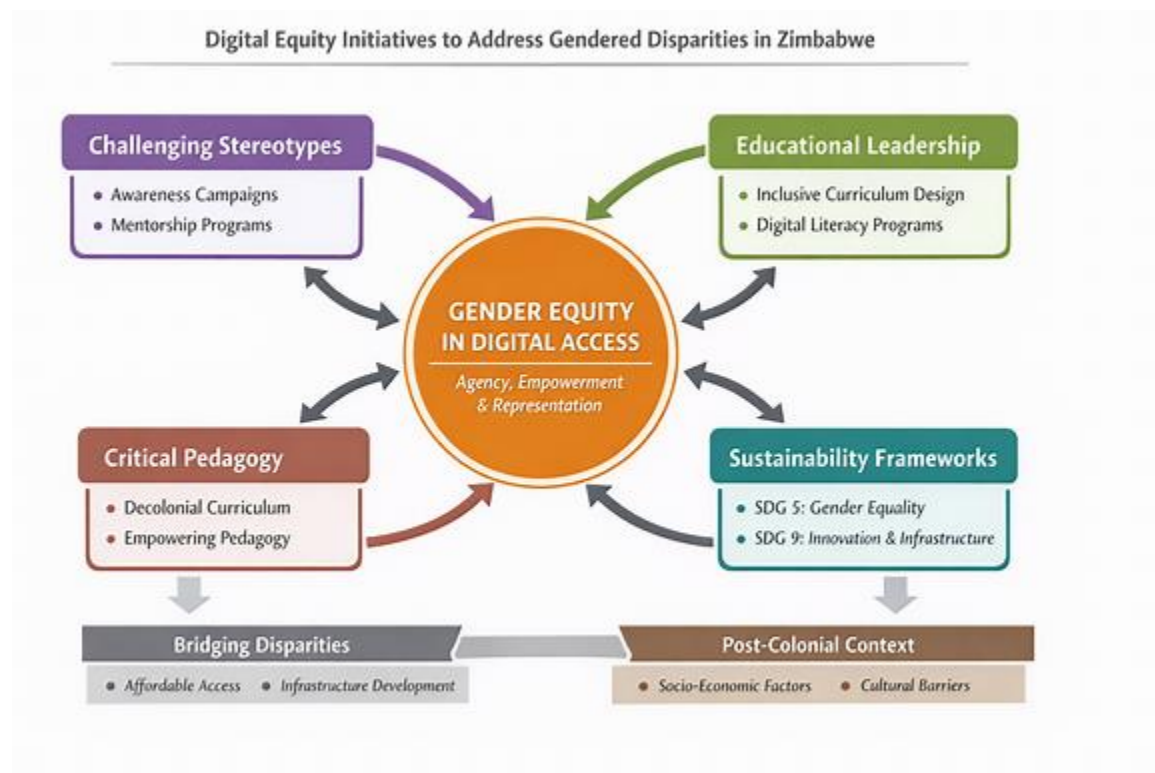
Persistent gender disparities in digital access remain a pressing challenge across Africa, particularly in Zimbabwe where socio economic inequalities and cultural stereotypes continue to shape women's engagement with technology. Feminist perspectives on digital equity show that access alone is insufficient, agency, empowerment and representation must also be considered [1]. Studies in Zimbabwe reveal that while mobile telephone penetration has increased, women's use of digital tools often remains limited to passive communication, with inadequate opportunities for innovation or computational thinking. These realities underscore the need to interrogate how digital equity initiatives can overturn hierarchies and foster inclusive participation in the digital age [2].

Stereotypes and cultural norms further exacerbate disparities, restricting women's ability to fully participate in digital ecosystems [2]. Research in Harare demonstrates that socio-economic determinants, infrastructural gaps and persistent gender assumptions continue to marginalise women to ICT access and use. Leadership within educational institutions and policy frameworks plays a pivotal role in challenging these barriers. By embedding gender -sensitive approaches into digital transformation agenda, leaders can disrupt exclusionary practices and promote equity [3]. Feminist critiques emphasize that digital equity must be situated within broader post- colonial debates, recognizing how historical legacies intersect with contemporary inequalities in Zimbabwe and across Africa.

Sustainability frameworks particularly the sustainable Development Goals (SDGS) provide normative anchors for integrating gender equity into digital inclusion policies [4]. Critical pedagogy offers transformative lens enabling educators and policy makers to interrogate power relations and foster inclusive learning environments. Recent scholarship on African education system calls for decolonial approaches that align pedagogy, technology and equity to address systemic disparities. In Zimbabwe, feminist informed strategies such as targeted digital literacy programs, inclusive curriculum design and gender sensitive policy reforms have shown promise in advancing equity. By combining technological innovation with critical pedagogy and systemic reform, digital transformation can contribute not only to gender justice

but also to broader social inclusion and sustainability. The diagram below illustrates gender equity initiatives to address gender disparities [5].

GENDER EQUITY INITIATIVES: Figure 1.



Digital equity initiatives in Zimbabwe, as illustrated in the framework, emphasize the need for multidimensional strategies to address persistent gender disparities in digital access. Central to this model is the pursuit of gender equity in digital access, framed around agency, empowerment, and representation. The diagram above (Figure (1)) highlights how challenging entrenched stereotypes through awareness campaigns and mentorship programs is essential for shifting social perceptions that restrict women's participation in digital spheres. Complementing this, educational leadership particularly through inclusive curriculum design and targeted digital literacy programs serves to build the foundational skills and confidence necessary for women and girls to engage meaningfully with digital technologies. Together,

these interventions work to overturn structural and cultural barriers that disproportionately affect women.

The framework also situates gender digital equity within broader socio-political and developmental contexts. Critical pedagogy, including decolonial curriculum reforms and empowering educational practices, challenges the legacy of post-colonial inequalities, ensuring that digital inclusion efforts do not replicate historical power imbalances [6]. Moreover, sustainability frameworks aligned with global goals, such as SDG 5 (Gender Equality) and SDG 9 (Innovation and Infrastructure), underscore the importance of integrating gender considerations into national development agendas.

Feminist theorists argue that digital inequity is rooted not only in material barriers but also in cultural norms, gendered stereotypes, and historical exclusion issues that critical pedagogy likewise seeks to expose through reflective and dialogic learning [7]. Additionally, both frameworks emphasize agency and empowerment: critical pedagogy advocates for learners to become co-creators of knowledge, while feminist digital equity initiatives seek to equip women with the skills, confidence, and autonomy necessary to navigate and shape digital environments. In this way, integrating critical pedagogy within feminist approaches strengthens efforts to build digital systems and educational spaces that are equitable, culturally responsive, and transformative.

Finally, the model acknowledges that bridging digital disparities requires addressing practical barriers such as affordability and infrastructure deficits while being attentive to socio-economic conditions and cultural norms [8]. In doing so, it presents a holistic approach that recognizes gender digital equity as both a technological and socio-cultural imperative.

Feminist Theory and Patriarchal Systems

Feminist theory critiques patriarchal systems that perpetuate gender disparities in access to digital technologies. In Zimbabwe, patriarchal norms continue to shape women's opportunities, limiting their ability to engage with ICT's and digital knowledge economies. Research in Harare shows that socio economic determinants and cult ^[9].

Bhattacharya (2026)^[10] argues that feminist perspectives emphasize dismantling these structures by foregrounding women's agency, justice and empowerment in digital equity initiatives. This critique is vital. Zimbabwe is a country dominated by patriarchal systems intersected by poverty and infrastructural deficits which leads to exclusion in digital knowledge and use.

Digital Exclusion as Gendered Power Relations

Digital exclusion is not merely a technical gap but a reflection of deeper gender power relations. Studies in rural Zimbabwean communities ^[11] reveal that women face intersecting barriers that is limited infrastructure, socio-economic constraints and cultural restrictions that reinforce marginalization. Feminist theory frames these exclusions as manifestations of unequal power where access to digital tools becomes a site of contestation over autonomy and representation. Bhattacharya (2026) ⁽¹⁰⁾ emphasize that addressing digital inclusion requires more than providing devices, it demands structural transformation that challenges patriarchal control over knowledge and resources.

Feminist approaches to digital equity initiatives in Zimbabwe underscore the importance of empowerment, justice and agency. Bridging the digital divide requires interventions that prioritise women's voices and lived experiences ensuring that technology serves as a factor for liberation rather than reinforcing dependency ^[2]. For example, community based digital literacy programs in Zimbabwe have shown promise in enabling women to participate more fully in civic and economic life. By centering feminist principles, digital equity initiatives can transform exclusion into empowerment, creating pathways for women to assert agency in

knowledge production and technological innovation. This aligns with previous observations [10] that feminist informed strategies are essential for achieving justice in digital spaces.

Feminist theory reveals that digital exclusion in Zimbabwe is anchored on patriarchal power relations. Addressing these disparities requires initiatives that anchors women's empowerment, justice and agency ensuring that digital equity becomes a transformative force rather than a superficial fix.

Purpose

The purpose of this research was to critically assess the gendered dimensions of digital exclusion among women in rural and urban Zimbabwe and to analyze how existing national ICT policies address these inequalities.

Aim

The study sought to assess the structural, cultural, and infrastructural barriers that continue to marginalize rural women despite the country's adoption of progressive digital policies. By applying a feminist and intersectional framework, focused on uncovering how factors such as class, geography, age, and disability intersect to shape women's access to, use of, and agency within digital technologies.

Objectives

1. To assess how structural, cultural, and infrastructural barriers contribute to continued digital exclusion of rural and urban women in Zimbabwe, despite the presence of national ICT policies that promote universal access.
2. To assess the extent to which the National ICT Policy (2021) interrogates feminist and intersectional perspectives, particularly regarding the differentiated challenges faced by women based on class, geography, age, and disability.

Problem Statement

Despite Zimbabwe's adoption of progressive ICT policies, digital exclusion remains deeply entrenched among rural women due to intersecting structural and cultural barriers. While the National ICT Policy (2021) promotes universal access, it lacks a feminist-informed framework that addresses the unique challenges faced by women based on class, geography, age, and disability. This omission perpetuates patriarchal norms and infrastructural deficits that disproportionately affect rural communities.

Recent studies reveal that rural Zimbabwean women are excluded not only by poor connectivity and limited electricity, but also by restrictive gender roles that limit their autonomy in technology use ^[11]. Furthermore, without an intersectional lens, digital resilience policies risk reinforcing systemic inequalities rather than dismantling them ^[12]. Feminist theory emphasizes that digital equity must go beyond access and include agency, representation, and justice – principles currently absent in Zimbabwe's digital strategy.

Questions

1. How do structural and cultural barriers intersect to shape digital exclusion among women in Zimbabwe?
2. To what extent does Zimbabwe's National ICT Policy (2021) address the intersectional needs of women?
3. What feminist-informed strategies can promote agency, representation, and justice in digital inclusion for marginalized women?

Methodology

This study adopted a qualitative research design grounded in feminist and intersectional frameworks to explore how rural Zimbabwean women experience digital exclusion. Qualitative methods were used to capture the lived experiences, narratives, and agency of marginalized groups, allowing for nuanced insights into how structural and cultural barriers intersect. Data was collected using semi-structured interviews with women from diverse rural communities, ensuring representation across age, class, and disability categories. Reflexivity

and positionality were central, acknowledging the researcher's role in shaping knowledge production and ensuring ethical engagement with participants [13]. Data was analysed using thematic coding to identify recurring patterns of exclusion and empowerment, guided by feminist principles of justice and representation. This approach aligns with recent scholarship emphasizing the importance of intersectionality in qualitative inquiry to uncover overlapping disadvantages in African contexts [14]. By situating women's voices at the center, the methodology ensures that findings contribute to both academic debates and practical interventions in Zimbabwe's digital inclusion policies.

LITERATURE REVIEW

Structural Barriers in Rural and urban Digital Access

Recent scholarship emphasizes that rural Zimbabwean communities continue to face persistent infrastructural deficits that hinder digital inclusion. Sullivan-Daly et al. (2023) [11] conducted a scoping review mapping the digital divide in rural Zimbabwe, showing that poor connectivity, unreliable electricity, and limited ICT infrastructure remain critical obstacles. These deficits disproportionately affect women, who often lack access to devices and affordable data, reinforcing systemic exclusion. The review highlights that without targeted interventions, rural women remain marginalized from digital opportunities, perpetuating socio-economic inequalities.

Structural barriers to urban digital access in Zimbabwe extend beyond infrastructural and economic constraints to include significant gender-based disparities [15]. While cities like Harare have higher connectivity than rural areas, women in urban low-income and peri-urban communities remain disproportionately excluded from full digital participation. Research shows that women in Harare are 20–30% less likely than men to own smartphones, regularly use mobile internet, or engage meaningfully with digital technologies, largely due to affordability challenges, limited digital literacy, and concerns about online safety. These gender related obstacles intersect with broader structural issues such as high data costs, unreliable power supply, and inadequate ICT infrastructure planning, all of which constrain

equitable access for marginalised groups. To stay connected for an entire month in Zimbabwe, an individual needs to spend over US\$30 on mobile data while households that install wi-fi often pay more than US\$50 per month. These costs are prohibitively high for many ordinary Zimbabwean women especially those who rely on informal trading, are unemployed or live below the poverty datum line. As a result, such financial barriers continue to deepen gender disparities in digital access for women in both urban and rural areas ^[16].

Institutional limitations further reinforce both general and gender-specific digital exclusion in urban Zimbabwe. Weak policy coordination and fragmented implementation undermine efforts to expand inclusive digital access in cities. Studies on digital transformation in Zimbabwean local governments highlight persistent structural challenges such as infrastructure deficits, limited financial resources, and weak institutional capacity that restrict widespread ICT adoption. When combined with gendered social inequalities, these systemic barriers make it harder for women to benefit from digital services in education, employment, entrepreneurship, and civic participation ^[16]. Addressing these challenges requires not only investment in urban ICT infrastructure but also gender-responsive digital inclusion strategies that improve affordability, enhance digital literacy for women, strengthen online safety protections, and ensure coordinated policy action across institutions

Gender and Cultural Restrictions

Beyond infrastructure, cultural norms play a decisive role in shaping women's access to technology ^[9]. Studies reveal that patriarchal household dynamics restrict women's autonomy, with men often controlling financial resources and technology use. A 2021 analysis of gender differences to ICT access observed that women in both rural and urban Zimbabwe face greater barriers in device ownership, digital literacy, and affordability compared to men ^[17]. These findings underscore how cultural expectations intersect with economic constraints, creating compounded exclusion for rural women.

Policy Gaps and Feminist Critiques

Although Zimbabwe's National ICT Policy (2021) promotes universal access, feminist scholars argue that it lacks an intersectional lens. Mweha (2025)^[12] critiques Zimbabwe's digital resilience policies, noting that without feminist-informed frameworks, they risk reinforcing inequalities rather than dismantling them. His work on decolonizing digital resilience highlights the need for transformative, gender-responsive social protection policies that address systemic inequalities and digital divides. This critique aligns with broader feminist theory, which insists that digital inclusion must encompass agency, representation, and justice, not just access.

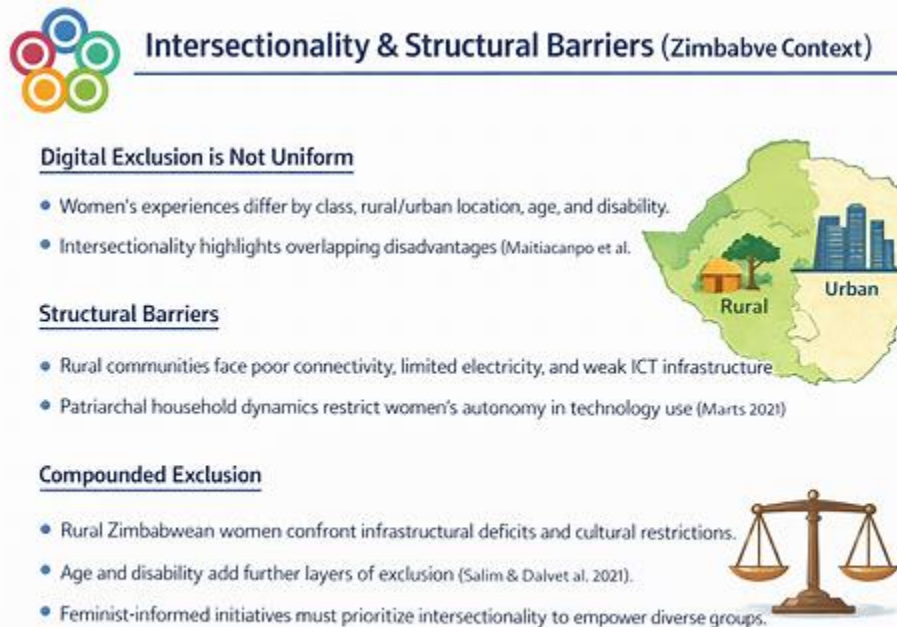
Intersectionality and Emerging Approaches

Intersectionality has become a central analytical tool in recent African scholarship, emphasizing how class, geography, age, and disability intersect with gender to deepen exclusion. Sullivan-Daly et al. (2023)^[11] argued that intersectional approaches are essential to uncover overlapping disadvantages in rural Zimbabwean communities. This perspective resonates with global feminist debates that call for participatory, qualitative research methods to center women's voices and experiences. By situating rural women's narratives within intersectional frameworks, scholars highlight the urgency of designing policies that move beyond one-size-fits-all solutions and instead prioritize context-specific empowerment strategies.

Rural Zimbabwean communities continue to face persistent infrastructural challenges that severely limit digital inclusion. Sullivan-Daly et al. (2023)^[11] observed that poor connectivity, unreliable electricity, and weak ICT infrastructure remain widespread, creating systemic barriers to participation in the digital economy. These deficits not only hinder access to online services but also exacerbate existing inequalities by isolating rural populations from educational, economic, and social opportunities. The lack of reliable infrastructure thus forms the foundation of digital exclusion, disproportionately affecting women who already face

multiple layers of disadvantage (Policy.O.P.G, 2024). Their situation is clearly outlined in the diagram presented below (figure 2):

Figure 2.



The diagram clearly illustrates the divide between rural and urban women, highlighting the structural barriers that contribute to digital exclusion. The weighing scale in the diagram symbolizes the imbalance in digital access, affordability and utilization across these communities. When measured, these factors do not align evenly thereby revealing significant inequities in how technology is experienced and accessed. When infrastructural deficits and cultural restrictions intersect, they create a compounded form of digital exclusion. A rural woman may be willing and capable of engaging with technology, but without electricity, internet, or social permission, she remains excluded. Multiple layers of disadvantages geography, gender, class, and age – combine to deepen exclusion. Addressing this requires not

just technical solutions, but feminist-informed strategies that empower women and challenge the norms that hold them back.

Evolution of ICT Policies in Zimbabwe and Southern Africa

ICT policy development in Zimbabwe and across Southern Africa has been shaped by efforts to bridge the digital divide, often focusing on infrastructure expansion, mobile penetration, and economic modernization. Early initiatives emphasized connectivity and e-governance, but they rarely addressed the structural inequalities that limit women's participation. For example, Mare (2021)^[18] observed that while technologies offer opportunities for marginalized communities, access remains limited to passive mobile phone use, with inadequate digital skills training for women and girls in STEM fields. This reflects a broader regional trend where ICT policies prioritize economic growth over social equity.

Gender Blind Spots

Despite progress in ICT adoption, gender has often been sidelined in national digital strategies. These blind spots reinforce patriarchal systems by failing to recognise women's unique barriers to digital participation. In Zimbabwe, policies have historically overlooked the intersection of gender, poverty and rural marginalisation resulting in uneven access to digital resources. Regional strategies such as the Southern African Development Community (SADC) ICT frameworks, similarly, emphasise competitiveness and innovation but lack explicit gender sensitive approaches. Such an omission perpetuates digital exclusion as a reflection of deeper gendered power relations, aligning with the feminist theory's critique of patriarchal policy environments.

Zimbabwe National ICT Policy (2021)

The Zimbabwe National ICT Policy (2021) acknowledges digital inclusion as a national priority but does not fully integrate feminist perspectives on equity. While the policy promotes universal access and digital literacy, it frames inclusion in general terms without addressing the specific socio-cultural and economic barrier faced by women. This limits the policy's transformative potential, as it risks reinforcing existing inequalities rather than overturning

them ^[18]. Feminist informed approaches would demand explicit commitments to women's empowerment, agency and justice in ICT strategies. They ensure that digital equity initiatives go beyond technical fixes to challenge structural gendered exclusions. Therefore, gender exclusion is not accidental but rooted in policy blind spots and patriarchal structures.

RESULTS

Structural Exclusion

Results show that rural women in Zimbabwe remain digitally excluded due to persistent infrastructural challenges. As Sullivan-Daly et al. (2023)^[11] noted, poor connectivity, unreliable electricity, affordability and weak ICT infrastructure continue to undermine access to digital technologies in rural communities. These structural deficits not only limit opportunities for education, employment, and social participation but also reinforce existing inequalities by isolating rural women from broader national and global digital networks. The lack of reliable infrastructure thus forms a critical barrier to inclusion.

Device Ownership and Affordability

Another key finding is that women are disproportionately affected by gaps in device ownership and affordability. Men are more likely to own mobile phones and have consistent access to digital resources, while women often rely on shared devices or lack access altogether. This disparity is compounded by economic constraints, as women in rural areas typically have lower incomes and less financial autonomy, making it difficult to afford data bundles or maintain devices ^[16]. These affordability challenges deepen the digital divide and limit women's ability to participate meaningfully in the digital sphere.

Patriarchal Household Dynamics

Results of this study also highlight the role of patriarchal household dynamics and restrictive gender norms in reinforcing exclusion. According to *Digital Inclusion & Social Inequality* (2021) ^[17], men often control financial resources and decision-making within households, limiting women's autonomy in technology use. This dynamic embeds gender power relations into

everyday access to digital tools, ensuring that women's participation remains secondary. Cultural expectations that prioritize male authority further restrict women's ability to engage independently with digital technologies, compounding structural barriers. Additionally, the 'second shift' that women shoulder at home further exacerbates digital inequality. Ongoing household responsibilities leave many women limited time to explore or engage with digital technologies.

Compounded Exclusion

Taken together, these structural and cultural barriers create a compounded form of exclusion for rural women in Zimbabwe. The intersection of infrastructural deficits, affordability gaps, and patriarchal norms produces overlapping disadvantages that cannot be addressed through one-dimensional solutions. Instead, the findings underscore the need for intersectional and feminist-informed approaches that recognize the complexity of rural women's experiences. Without such frameworks, digital inclusion policies risk reinforcing inequalities rather than dismantling them, leaving rural women marginalized in the digital age.

CONCLUSION

This study concludes that both urban and rural women in Zimbabwe remain disproportionately marginalized in the digital sphere due to intersection of structural deficits, affordability gaps, and patriarchal household dynamics. Persistent infrastructural challenges such as poor connectivity, affordability, unreliable electricity, and weak ICT systems continue to undermine access, while economic inequalities limit women's ability to own and maintain digital devices (Sullivan-Daly et al., 2023)^[11]. Cultural and gender norms further restrict women's autonomy, embedding exclusion within household decision-making and reinforcing systemic inequalities^[17]. Taken together, these findings demonstrate that digital exclusion is not a singular issue but a compounded phenomenon, shaped by overlapping disadvantages across geography, class, and gender. Addressing this exclusion requires feminist-informed, intersectional approaches that prioritise agency, representation, and justice, ensuring that digital inclusion policies move beyond access to embrace empowerment and equity. By

situating women's voices at the center of analysis, this study contributes to both academic debates and practical strategies for building inclusive digital futures in Zimbabwe.

RECOMMENDATIONS

There is need to;

1. Strengthen ICT infrastructure in Rural areas, reliable electricity, affordable internet connectivity and community ICT hubs for women in rural and urban areas to reduce infrastructural deficits that perpetuate exclusion.
2. Promote affordable access to devices and Data, introduce subsidies for women, community based device-sharing programs to ensure digital ownership by women.
3. Integrate feminist informed frameworks into ICT policies to explicitly address intersectional challenges faced by rural women to ensure inclusivity.
4. Challenge Patriarchal Household Dynamics through awareness Campaigns.
5. Provide targeted training in rural communities to build women's confidence and skills in using digital technologies ensuring they can participate meaningfully in education, business and governance.

REFERENCES

1. Women, U. N. (2025). The gender snapshot 2025.
2. Siphugu, S. A., Moloi, T. (2025). The Role of Rural Women in the Digital. *Digitalization and Women's Rights: Women and Sustainability: Volume 2*.
3. Nkosi, N., Maphalala, M. C. (2026). Bridging the Gendered Digital Divide: Strategies for Enhancing Access and Inclusion for Students in Higher Education. *Gender Issues*, 43(1), 18.
4. Rodrigues, C. U., Nhamitambo, B. (2025). United Nations Sustainable Development Cooperation Framework Evaluation Mozambique (2025).
5. Mwansa, G., Ngandu, M. R., Mkwambi, Z. (2025). Bridging the digital divide: exploring the challenges and solutions for digital exclusion in rural South Africa. *Discover Global Society*, 3(1), 54.

6. Malatji, M. (2026). Bridging the AI divide in sub-Saharan Africa: Challenges and opportunities for inclusivity. *arXiv preprint arXiv:2601.06145*.
7. Işıklı, Ş., Fazlıoğlu, E. F. (2026). Technological effects on gender studies: An intersectional perspective. *Feminist Encounters: A Journal of Critical Studies in Culture and Politics*, 10(1), 23.
8. Collins, V. E. (2025). *Women's Resistance in Global Context: Challenging Oppression and Inequality*. Taylor & Francis.
9. Bashir, H. (2026). Socio-Cultural Constraints and Gender Equality: Challenges to Achieving SDG 5 in Khyber Pakhtunkhwa, Pakistan. *Journal of Higher Education and Development Studies (JHEDS)*, 6(1), 17-33.
10. Bhattacharya, M. (2026). 'The Bethune College Sensation': Gender, Archive and Radical Passivity. *Gender & History*.
11. Sullivan-Daly et al, (2023). A scoping review of digital inclusion and the digital divide in rural Zimbabwean communities: An African perspective (2021–2026). Zenodo. CERN European Organization for Nuclear Research.
12. Mweha, M. (2025). Breaking Barriers or Reinforcing Inequalities? A Systematic Review of Women's Economic Empowerment and Financial Inclusion Initiatives in Zimbabwe (2020–2025): Policy Gaps, Feminist Perspectives, And Pathways to Inclusive Growth. *International Journal of Latest Technology in Engineering, Management & Applied Science*, 14(7), 462-482.
13. Weisser, S. (2024). The Socratic Background of Philo's Ethics: The Case of Piety. *Schriften des Institutum Judaicum Delitzschianum*, 57.
14. Moyo, Z., Perumal, J. (2020). Systematic review of research on women leading and managing education in Zimbabwe. *Gender and Behaviour*, 18(2), 15688–15697. <https://doi.org/10.4314/gab.v18i2>
15. Chirinda, B., Sunzuma, G., Muredzi, P. (2025). Access and Equity in STEM Education in Zimbabwe. In *STEM Education in Poverty: Insights from Zimbabwe and Beyond* (pp. 75-91). Cham: Springer Nature Switzerland.

16. Sharma, K., Raj, A. (2025). Assessing Digital Literacy and Internet Access Among Rural Women in India-Challenges and Policy Imperatives. *Journal of Constitutional & Parliamentary St POLICY*, O. P. G. (2024). *Harnessing the green and digital transitions for gender equality: insights from the 2024 OECD forum on gender equality. studies*, 59.
17. Digital Inclusion and Social Inequality, 2021)
18. Mare, A. (2021). Addressing digital and innovation gender divide: Perspectives from Zimbabwe. In *Entrepreneurship, technology commercialization, and innovation policy in Africa* (pp. 33-54). Cham: Springer International Publishing.

EFFECT OF THE SCOPE OF THE INFORMATION LITERACY CURRICULUM ON ACADEMIC PERFORMANCE AMONG UNIVERSITY STUDENTS IN THE NAIROBI METROPOLITAN AREA

Masinza F.L.,¹ Juma I.,² Lagat G.,¹ Malanga K.N.³

¹Kirinyaga University, Kenya

²Garissa University, Kenya

³Karatina University, Kenya

Correspondence: famasinza@gmail.com

ABSTRACT

A comprehensive information literacy curriculum should enable university students to identify information needs, retrieve relevant resources, evaluate credibility, cite evidence correctly and use information ethically. This study evaluated the effect of the scope of information literacy curriculum on academic performance among university students in the Nairobi Metropolitan Area. The study adopted a positivist orientation and a concurrent triangulation mixed-methods design embedded in a descriptive survey. The target population comprised approximately 142,000 undergraduate students, nine university librarians and nine academic registrars from nine public and private universities. A student sample of 399 was obtained by systematic simple random sampling, and a purposive census was used to obtain all 18 key informants. Questionnaires, interview and document reviews were used for data collection. Thirty-five of the 305 usable student responses were obtained, representing 76.4% of the students. Reliability of the curriculum-scope scale was good, with Cronbach's alpha = 0.942; the construct validity was good, with an average loading of 0.860 and a minimum loading of 0.749; the sampling adequacy of the scale was very good, with KMO = 0.889. The range of competency for students' awareness of a formal information literacy curriculum was 8.5% (3.87 to 4.10). There was weak but significant correlation between curriculum scope and academic performance ($r = 0.127$, $p = .026$). Regression model was significant, $F(1, 303) = 4.990$, $p = .026$, and accounted for only 1.6% of the variance in performance. Academic performance increased by 0.213 units for every one-unit increase in scope of curriculum, with a beta coefficient of 0.127 and a p of .026. Curriculum breadth is necessary but insufficient; thus practical delivery, visibility, disciplinary integration and assessment determine whether information literacy content improves performance.

Keywords: academic performance; curriculum scope; information literacy curriculum; information retrieval; university students

INTRODUCTION

The expansion of digital information has made information literacy a central graduate competency. Thus, University students need to formulate information problem, choose the right search tools, find relevant information sources, assess the evidence, collate information, cite appropriately and ethically, and use information. These competencies enhance independent learning, research, critical thinking, and quality of academic work [1,2,3].

An information literacy curriculum is structured to enable these competencies to be taught and measured. It covers identification of information needs, searching databases and libraries, evaluating sources, citing and referencing, ethical usage, digital and media literacy, critical reflection and appraisal of online information. Thus, the scope of the curriculum is not only about the breadth of skills taught but also whether students have the opportunity to learn these skills in real-life and discipline-relevant contexts.

Kenyan Universities employ different strategies to sensitize students to the dangers of cyberbullying such as during orientation sessions, communication-skills units, librarian-led workshops, orientation guides online, and curriculum-based instruction. Multiple delivery modes means that there are multiple access points to information literacy instruction across academic podia.

Ideally, information literacy curricula should be made visible, comprehensive, and be increasingly embedded in university academic programmes. The skills should be used in assignments, tests, research projects and other evaluative academic activities.

The students' information needs, librarians' teaching practices and online guides and information literacy training strategies have been described in previous studies conducted in Kenya and other countries. However, a number of these studies focused on a limited institutional setting or a limited population of disciplines and/or used a non-probability sampling, or failed to include academic performance as an outcome. Thus, there was little evidence on the impact of the extent of information literacy curriculum at different universities in Nairobi Metropolitan area on students' academic performance. This study attempted to fill

the contextual, conceptual and methodological gap. The purpose of the study was to evaluate the effect of the scope of the information literacy curriculum on academic performance among university students in the Nairobi Metropolitan area, Kenya. The study asked: What is the scope of information literacy curricula among universities in the Nairobi Metropolitan area? The alternative hypothesis stated that the scope of information literacy curriculum has a significant effect on academic performance.

LITERATURE REVIEW

Theoretical Review: Socio-cultural Learning Theory

The article is guided by Vygotsky's Socio-cultural Learning Theory, which explains learning as a socially and culturally constructed process. Cognitive development is an interactive process with lecturers, librarians, fellow students and instruments used in the learning environment. The Zone of Proximal Development is the difference between what participants can do on their own and what they can do with the support of other more knowledgeable participants [4].

The theory is important to curriculum scope because information literacy is not an ability that can be taught by merely stating a set of skills in a curriculum. Students learn skills with coaching, teaching, discussion, feedback, and then applying the skills in relevant academic activities. Academic achievement, therefore, may not be strongly affected by a curriculum that provides a wide array of skills without scaffolding and the application of those skills to the discipline. On the other hand, integration of information literacy content with the language, evidence standards and research practices of particular disciplines can be achieved with librarians' support. The theory's strong emphasis on social interaction may understate individual motivation and unequal access to digital resources. The study therefore examined both students' reported competencies and institutional evidence on how curricula were developed, integrated and delivered.

Empirical Review

Ankamah et al. (2021) ^[5] examined information literacy among medical students at the University of Ghana and found that students needed information primarily for assignments, project work and learning new subject matter, with books, e-books and journals serving as major sources. The study was useful in identifying core information needs but used a narrow disciplinary context and non-probability sampling, limiting generalization to the wider Kenyan university sector.

Moin Ud Din et al. (2022) ^[6] investigated librarians' perceptions, practices and barriers in university libraries in Islamabad. Although Librarians recognized the importance of information literacy and generally considered themselves capable of teaching it, institutional barriers affected delivery. Stelah et al. (2022) ^[7] observed that the Catholic University of Eastern Africa used written materials, one-to-one instruction, demonstrations, orientation, seminars and workshops to teach information literacy. However, the study did not link these strategies to academic performance.

Elsewhere Masinde et al. (2024) ^[8] examined the conceptualization and practice of information literacy pedagogy in seven Kenyan universities and found that online guides and manuals did not cover all dimensions of information literacy. The study demonstrated that the breadth and coherence of curriculum content can vary significantly, but it did not examine academic performance as the dependent variable. In yet another study Waltz et al. (2020) ^[3] observed that information literacy competencies can be mapped within professional curricula, supporting the need for explicit and discipline-sensitive curriculum design.

The empirical evidence therefore established the value of information literacy content and instruction but left three gaps namely The contextual gap on the need for multi-university evidence from the Nairobi Metropolitan area, The conceptual gap on the omission of academic performance from several curriculum studies and methodological gap on the need to combine probability-based student data with qualitative and documentary evidence on curriculum implementation.

METHODOLOGY

Research Philosophy

The study was guided by the positivist research philosophy, which treats reality as capable of systematic examination through observation, measurement and empirical evidence. The positivism was appropriate because it translated information literacy and academic performance into measurable indicators, and then employed statistical analysis to establish the strength, direction and significance of the relationships. This approach was an evidence based, structured, objective interpretation, not based on the researcher's opinion [9,10].

Research Design

A concurrent triangulation mixed methods design within a descriptive survey was used. Qualitative and quantitative data was collected and analyzed separately and integrated at the interpretation stage. The quantitative strand involved students' perception and examined the relationship between the focal information literacy variable and academic performance. The qualitative strand involved three university librarians and three academic registrars of universities in interviews to elucidate institutional policies, curriculum practices and experiences of implementing these practices. Triangulation added to the credibility by comparing the findings from students, institutional officers and documentary sources [11,10].

Study area

The study was conducted in nine selected public and private universities within the Nairobi Metropolitan area, Kenya. The selected metropolitan setting had high concentration of universities with established information literacy initiatives, diverse student populations, digital learning environments and library systems. The selected institutions provided appropriate setting for examining the relationship between information literacy and undergraduate academic performance.

Target Population

The target population comprised approximately 142,000 undergraduate students in the nine universities, together with nine university librarians and nine academic registrars. Undergraduate students were the primary unit of observation because they were direct beneficiaries of information literacy initiatives. Librarians and registrars were included as key informants because of their responsibility for information literacy delivery, institutional policy, curricula and academic records. The student population comprised approximately 62,000 second-year, 41,000 third-year and 39,000 fourth-year students.

Sampling Technique and Sample Size

Systematic simple random sampling was used to select undergraduate students from official enrolment lists. After a random starting point was identified, students were selected at regular intervals, thereby reducing selection bias and giving eligible students an equal chance of inclusion. Yamane's (1967) ^[12] formula, $n = N/(1 + Ne^2)$, was applied to the population of 142,000 at a 5% margin of error, producing a sample of 399 students. The samples obtained gave 175 second year students, 116 third year students and 108 fourth year students. In a purposive sample, all 18 key informants were identified due to the small size of the group, its accessibility and its institutional expertise ^[13].

Research Instruments

Four instruments were employed; namely a structured questionnaire for undergraduate students, an interview guide for university librarians and academic registrars, curriculum review checklist and document review checklist. A five-point Likert scale (1=No extent, 5=Very great extent) was used to gather demographic, predictor and academic-performance information. The interview guide provided context information on institutional policies, curriculum integration and programme delivery. The curriculum checklist evaluated information literacy breadth and the information literacy fusion. The document template included pertinent information literacy policy, curriculum and academic-record evidence. Multiple instruments were used to provide methodological triangulation.

Questionnaire for Undergraduate Students

The structured questionnaire collected standardized quantitative data from undergraduate students. Its objective-specific section contained statements measuring the independent variable, while the academic-performance section measured achievement, research and information skills, quality of academic work and learning outcomes. Closed-ended items facilitated consistent coding and statistical comparison across institutions.

Interview Guide for University Librarians and Academic Registrars

The semi-structured interview guide elicited institutional explanations concerning policy development, curriculum integration, programme delivery, staff roles, student participation and the perceived relationship between information literacy and academic performance. Open-ended questions enabled key informants to clarify differences in implementation strategies across universities.

Curriculum Review Checklist

The curriculum review checklist examined whether information literacy content was formally documented, the competencies covered the delivery approach, the level of integration into academic programmes and the extent to which content reflected emerging information needs.

Document Review Template

The document review template was used to capture institutional policies, information literacy curricula and academic-performance records. Academic records covered the 2020-2024 period and included degree classifications and graduation indicators, thereby supplementing self-reported student evidence.

Pilot Study

A pilot study involving 40 undergraduate students from a university with characteristics comparable to participating institutions was conducted before the main survey. Pilot participants were excluded from the final study. The pilot assessed clarity, relevance, sequencing and the time required to complete the questionnaire. Ambiguous language was

removed and instruments were improved as a result of feedback prior to the main data collection exercise.

The Research Instruments are considered valid.

Content validity was determined by examining questionnaires by supervisors and research experts for relevance, clarity and adequacy of the items in reference to the goal of the study and the conceptual framework. Principal Component Analysis was used to examine whether the items on the scale for each group were constructed to measure the same construct. For the factor loadings, values higher than 0.50 were considered acceptable [14,15,16] and the Kaiser-Meyer-Olkin measure was used to determine whether the data was appropriate for factor analysis.

The research instruments used in this study were reliable.

Cronbach's alpha was used to assess internal consistency. A coefficient of 0.70 or higher was deemed acceptable, values greater than 0.80 were rated as good and greater than 0.90 as excellent. Reliability of the scales used to measure the focus predictor and academic performance were validated from the pilot results [17, 15].

Table 1. Pilot reliability and validity results

Construct	Items	Cronbach's alpha	Average loading	Minimum loading	KMO
Scope of IL curriculum	7	0.942	0.860	0.749	0.889
Academic performance	13	0.852	0.814	0.550	0.671

All coefficients met the acceptance criteria used in the thesis.

Data Collection Procedure

Two trained research assistants assisted with administration of questionnaires after receiving institutional and regulatory approvals. The assistants were trained on the aims of the study, administration of the instruments, confidentiality, informed consent and consensual participation. Personal interviews were arranged with the librarians and academic registrars. The interviews were conducted in English to ensure uniformity, while secondary data was

gathered using the curriculum and document review tools. Data was assessed and verified for completeness, coded and securely stored prior to analysis.

Data Processing and Analysis

Quantitative data was coded and analyzed using SPSS Version 22. Frequencies, percentages, means and standard deviations described curriculum awareness and information literacy competencies. Principal Component Analysis assessed whether the curriculum indicators represented a coherent construct. Pearson correlation was used to examine the relationship between curriculum scope and academic performance. Simple linear regression and ANOVA were used to test the alternative hypothesis using $Y = \beta_0 + \beta_1 X_1 + \text{error}$, where Y represented academic performance and X_1 represented the scope of the information literacy curriculum. Multicollinearity, linearity, normality and autocorrelation diagnostics were examined before regression. Interview and curriculum-review evidence was coded thematically and integrated with quantitative results.

Operationalization of Variables

Table 2. Operationalization of the article variables

Variable	Indicators	Measurement	Analysis
Scope of information literacy curriculum (independent)	Information-needs identification; information access and retrieval; evaluation; citation and ethical use; critical analysis; reliability of online information.	Five-point Likert scale from no extent (1) to very great extent (5), plus curriculum-review evidence.	Frequencies, percentages, mean, standard deviation, PCA, correlation, regression and content analysis.
Academic performance (dependent)	Academic achievement; research and information skills; quality of academic work; learning outcomes.	Five-point Likert scale and institutional academic records.	Descriptive statistics, correlation and regression.

Ethical Considerations

Ethical clearance was obtained from the National Commission for Science, Technology and Innovation, and permission obtained from participating universities. The purpose and procedures used in the study were explained to participants, and only those who voluntarily consented were included. Respondents could withdraw at any time. Names were not recorded on questionnaires, confidentiality was maintained, and collected information was used solely for academic research.

Results

Response Rate and Sample Characteristics

Of the 399 student questionnaires administered, 305 were returned and were found usable, giving a response rate of 76.4%. All 18 interview schedules administered to the nine university librarians and nine academic registrars were completed, giving 100% key-informant response rate. Student response exceeded the 70% level treated in the thesis as very good and was adequate for statistical analysis.

Table 3. Response rate

Data source	Target	Usable responses	Response rate
Student questionnaires	399	305	76.4%
Key-informant interviews	18	18	100.0%

Student sample included 167 respondents (54.8%) from public universities and 138 (45.2%) from private universities. Male students comprised 60.3% and female students 39.7%. 41% respondents were aged 21-22 years, followed by those below 20 years (23%) and those aged 23-24 years (22%). Second-year students contributed 140 responses, third-year students 91 and fourth-year students 74. The distribution provided evidence from different institutional types and stages of undergraduate study.

Awareness and Descriptive Results for Curriculum Scope

Only 26 respondents (8.5%) reported awareness of an information literacy curriculum in their universities, while 279 (91.5%) were not aware of it. This low visibility contrasted with students' high self-assessments of specific information literacy competencies.

Table 4. Descriptive statistics for the scope of the information literacy curriculum

Curriculum competency	Great/very great extent	Mean	SD
Clearly defines information needs before a research task	72.1%	3.90	1.12
Finds information using databases, search engines and library tools	78.4%	4.10	1.02
Evaluates credibility and relevance of sources	67.5%	3.87	1.05
Cites sources correctly using the required style	68.2%	3.88	1.08
Analyzes information before accepting or using it	71.4%	3.99	1.11
Assesses reliability of social-media and online information	72.4%	3.95	1.08

Information retrieval recorded the highest mean ($M = 4.10$, $SD = 1.02$), followed by analyzing information before use ($M = 3.99$, $SD = 1.11$). Evaluation of credibility and relevance of sources recorded the lowest mean ($M = 3.87$, $SD = 1.05$), although it remained positive. The overall pattern indicated that students perceived themselves as capable of searching, evaluating, analyzing and ethically using information, even though most did not recognize a formal curriculum.

Factor Analysis

Curriculum indicators loaded between 0.523 and 0.852. Evaluation of source credibility and relevance produced the highest loading, followed by database and library-tool searching and critical analysis. The overall rating of curriculum scope produced the lowest loading, suggesting that specific competencies were more meaningful to students than the abstract idea of a formal curriculum.

Table 5. Factor loadings for curriculum scope

Indicator	Loading
Finds information using databases, search engines and library tools	0.842
Evaluates credibility and relevance of sources	0.852
Analyzes information before accepting or using it	0.838
Assesses reliability of social-media and online information	0.827
Clearly defines information needs before a research task	0.794
Cites sources correctly using the required style	0.785
Overall rating of the scope of university IL curricula	0.523

Diagnostic Tests

Table 6. Diagnostic results

Test	Statistic	Decision
Multicollinearity	Tolerance = 0.661; VIF = 1.512	No multicollinearity concern.
Linearity	$r = 0.127$; $p = .026$	A weak but significant positive linear relationship was present.
Normality	K-S = 2.081; $p < .001$	Normality was rejected; interpretation considered the large sample and graphical assessment.
Autocorrelation	Durbin-Watson = 1.808	Residual independence was acceptable.

Tolerance exceeded 0.10 and VIF was below 5, while the Durbin-Watson statistic was close to 2. The Kolmogorov-Smirnov test indicated non-normality. Regression was interpreted with caution and in light of the relatively large sample and graphical assessment of residual behavior.

Hypothesis Testing

Correlation Analysis

The scope of the information literacy curriculum had a weak positive and statistically significant relationship with academic performance ($r = 0.127$, $p = .026$, $n = 305$). The result indicated that broader curriculum scope was associated with a small improvement in academic performance.

Regression Model Summary and ANOVA

Table 7. Model summary

R	R ²	Adjusted R ²	Standard error
0.127	0.016	0.013	0.867

Table 8. Analysis of variance

Source	Sum of squares	df	Mean square	F	p
Regression	3.750	1	3.750	4.990	.026
Residual	227.729	303	0.752	-	-
Total	231.479	304	-	-	-

The model produced $R = 0.127$ and $R^2 = 0.016$. Curriculum scope therefore explained 1.6% of the variation in academic performance. Although the explanatory contribution was small, ANOVA results confirmed that the model was statistically significant, $F(1, 303) = 4.990$, $p = .026$.

Regression Coefficients and Hypothesis Decision

Table 9. Regression coefficients

Term	B	SE	Beta	t	p
Constant	3.010	0.331	-	9.085	< .001
Curriculum scope	0.213	0.095	0.127	2.234	.026

$$\text{Academic performance} = 3.010 + 0.213(\text{Curriculum scope})$$

A one-unit increase in curriculum scope predicted a 0.213-unit increase in academic performance ($B = 0.213$, $\beta = 0.127$, $t = 2.234$, $p = .026$). The null hypothesis was rejected. The statistically significant result supported the alternative hypothesis, but the weak standardized coefficient and low R^2 showed that curriculum scope alone had limited practical explanatory power.

Qualitative Findings

Interviews revealed considerable variation in curriculum development and integration. Jomo Kenyatta University of Agriculture and Technology, Kenyatta University and the University of Nairobi reported curricula that addressed emerging information needs, digital technologies, research competencies and ethical information use. In some universities curricula were in

place and in others they were awaiting institutional approval. A few institutions still used to offer the library session as a separate unit to the curriculum.

Overall, curriculum content tended to focus on finding, accessing, assessing, organizing appropriately citing and using the scholarly information. Some curricula, however, continued to be library oriented and were not necessarily linked to the learning outcomes of the disciplines, according to key informants. Faculty attendance of orientation, classroom instruction workshops and user-education sessions provided by the librarians was poor. There was a greater link between information literacy and assignments, research, and academic integrity where librarians worked with faculty.

DISCUSSION

Results of this study indicate that students possessed relatively strong information literacy competencies, yet most were unaware of a formal curriculum. This contrast implies that skills can be learned from a variety of activities, including orientation, library work/schools, communication skills courses, and specific academic work, but that they are not seen by students as a part of a coherent programme. This interpretation is confirmed by the low factor loading for the overall curriculum-scope rating, wherein students indicated greater response to the specific abilities than to the name of the institution as an information literacy curriculum.

There was a weak positive relationship with academic performance that lends support to Socio-cultural Learning Theory. The learning value of curriculum in an interactional, scaffolding, feedback and authentic academic practice is more. Thus, a wide curriculum is not a guarantee of delivery of the competencies consistently. This is why scope of curriculum was statistically significant but only explained 1.6% of the variation in performance. The result is consistent with previous observations of 4^[5], that identified the practical importance of accessing appropriate academic sources, and with those that emphasized librarians' instructional role and the barriers affecting delivery ^[6]. Results also support previous observations ^[7], that universities employ multiple instructional strategies. This study extends

these studies by connecting curriculum scope to academic performance and by showing that content breadth alone produces only a modest effect.

Masinde et al. (2024)^[8] observed that guides and manuals did not cover all dimensions of information literacy in the Kenyan universities they examined. Results of this study suggest that even where students report competencies across several dimensions, a curriculum's effectiveness depends on visibility, integration and disciplinary relevance. A curriculum should therefore be evaluated not only by the number of topics covered but also by the sequence of learning, instructional time, faculty involvement, practical application and assessment of competency outcomes.

The strongest reported competency concerned information retrieval, while source evaluation produced the lowest mean despite having the highest factor loading. This pattern is important in an environment characterized by social media, misinformation and artificial intelligence. Thus, students may be confident in finding information while still requiring deeper support in determining information credibility, relevance, authorship, evidential quality and ethical application.

CONCLUSIONS

The study concludes that the scope of the information literacy curriculum has a positive and statistically significant but weak effect on academic performance among university students in the Nairobi Metropolitan area. Students reported strong competencies in searching, analyzing, citing and evaluating information, but awareness of a formal curriculum was low. Curriculum breadth is therefore necessary but insufficient. Its contribution to academic performance depends on whether content is visible, practically delivered, progressively sequenced, assessed and integrated into discipline-specific academic work. Universities should shift from fragmented information literacy activities toward a coherent curriculum jointly owned by libraries and academic departments.

RECOMMENDATIONS

There is need for Universities to develop clearly articulated information literacy curricula that progresses across academic levels and cover information-needs identification, source evaluation, correct citation, academic integrity, ethical use and responsible use of artificial intelligence.

The curriculae should be embedded within discipline-specific courses and assessed through authentic academic tasks. Librarians and academic staff should jointly design learning activities, rubrics and assignments so that information literacy is reinforced within the evidence practices of each discipline.

Universities should increase curriculum visibility by communicating learning outcomes to students, timetabling instruction and making information literacy a recognizable component of programme documentation. Orientation sessions should introduce curriculae but should not substitute for progressive instruction and assessment.

Greater attention should be given to critical source evaluation, online misinformation, social-media content and artificial intelligence-generated information. Continuous professional development and adequate digital infrastructure are necessary to keep curriculum content and teaching methods current.

Further research should use longitudinal or experimental designs to determine whether changes in curriculum content and delivery produce measurable improvements in GPA, research quality and course completion. Comparative studies should also examine discipline oriented differences and include universities outside the Nairobi Metropolitan area.

REFERENCES

1. Association of College and Research Libraries (ACRL) (2016). Framework for information literacy for higher education.
2. Bruce, C. S. (1997). The seven faces of information literacy. Auslib Press.
3. Waltz, M. J., Moberly, H. K., Carrigan, E. E. (2020). Identifying information literacy skills and behaviors in the curricular competencies of health professions. *Journal of the Medical Library Association*, 108(3), 463-479.
4. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
5. Ankamah, S., Gyesei, K., Anaman, A. A. (2021). The evaluation of information literacy among medical students at the College of Health Sciences, University of Ghana. *Library Philosophy and Practice*, 1-39.
6. Moin Ud Din, G., Mairaj, M. I., Sheikh, A. (2022). Information literacy instruction in university libraries of Islamabad, Pakistan: A study of librarians' perceptions, practices, barriers, and strategies. *The Electronic Library*, 40(6), 698-711.
7. Stellah, B., Namande, B., Wabwire, J. (2022). Strategies used to impart information literacy skills among library users at the Catholic University of Eastern Africa, Kenya. *Scholars Journal of Arts, Humanities and Social Sciences*, 10(6), 249-254.
8. Masinde, J. M., Mugambi, F., Wambiri, D. M. (2024). Conceptualization and practice of information literacy pedagogy at universities in Kenya. *Evidence Based Library and Information Practice*, 19(2), 63-73.
9. Ali, I. M. (2024). A guide for positivist research paradigm: From philosophy to methodology. *Ideology Journal*, 9(2), 187-196.
10. Creswell, J. W., Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). Sage.
11. Creswell, J. W., Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage.
12. Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.
13. Saunders, M., Lewis, P., Thornhill, A. (2023). *Research methods for business students* (9th ed.). Pearson.
14. Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). Sage.
15. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.
16. Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31-36.
17. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334.

INFLUENCE OF COMPLIANCE WITH CUE STANDARD NO. LIBR/STD/10 ON ACADEMIC PERFORMANCE AMONG UNIVERSITY STUDENTS IN THE NAIROBI METROPOLITAN AREA

Masinza F.L.,¹ Juma I.,² Lagat G.,¹ Malanga K. N.³

¹Kirinyaga University, Kenya

²Garissa University, Kenya

³Karatina University, Kenya

Correspondence: famasinza@gmail.com

ABSTRACT

Information literacy standards provide an institutional mechanism for ensuring that university students acquire the competencies required to locate, evaluate and ethically use information. This study examined the effect of compliance with Commission for University Education Standard No. LIBR/STD/10 on academic performance among university students in the Nairobi Metropolitan area. A positivist orientation and concurrent triangulation mixed-methods design embedded in a descriptive survey was adopted. The target population comprised approximately 142,000 undergraduate students, nine university librarians and nine academic registrars from nine public and private universities. Systematic simple random sampling produced a student sample of 399, while all 18 key informants were included through a purposive census. Data was collected using questionnaires, interviews, curriculum review and document review. Of the 399 questionnaires, 305 were usable, representing a 76.4% response rate. The compliance scale demonstrated excellent reliability (Cronbach's alpha = 0.907), strong construct validity (average loading = 0.854; minimum loading = 0.802) and adequate sampling adequacy (KMO = 0.742). Students generally perceived considerable compliance, with item means ranging from 3.25 to 3.86. Compliance had a very strong positive correlation with academic performance ($r = 0.921$, $p < .001$). The reported regression model was significant ($F = 2027.291$, $p < .001$), with $R^2 = 0.849$ and a positive coefficient ($B = 0.867$, $\beta = 0.933$, $p < .001$). The null hypothesis was rejected. Institutional compliance, particularly curriculum integration, policy implementation and librarian-supported instruction, is strongly associated with academic performance. Universities should institutionalize the standards, monitor implementation and resource information literacy as a core academic function.

Keywords: academic performance; CUE Standard No. LIBR/STD/10; information literacy; institutional compliance; university students

INTRODUCTION

Universities are expected to produce graduates who can participate effectively in a knowledge economy. This expectation requires more than access to books, databases and digital technologies; it requires the ability to identify information needs, locate appropriate sources, evaluate credibility, synthesize evidence and use information ethically. Information literacy therefore supports critical thinking, independent learning, research competence and informed decision-making, all of which contribute to academic performance [1, 2, 3].

In Kenya, the Commission for University Education provides standards intended to promote quality and consistency across higher education institutions. Standard No. LIBR/STD/10 requires university libraries to implement information literacy and competency initiatives that support lifelong learning and academic achievement [4]. Compliance is reflected in integration of information literacy into academic programs, development of relevant curricula, librarian-led instructional support, institutional policies and mechanisms for monitoring implementation.

The Nairobi Metropolitan area contains a diverse concentration of public and private universities that have invested in library systems, digital resources and learning technologies. However, institutional access to information does not automatically ensure that students can use information effectively. The practical value of Standard No. LIBR/STD/10 therefore depends on whether institutions translate it into coordinated policy, curricula, teaching and academic support.

Ideally, universities should comply with CUE Standard No. LIBR/STD/10 by embedding information literacy within academic programs, providing structured instruction and monitoring students' acquisition of information competencies. Such compliance should create an environment in which students can conduct research effectively, evaluate information critically, avoid academic misconduct and produce higher-quality academic work.

Despite investments in digital infrastructure and electronic resources, academic performance remains uneven, and only a relatively small proportion of students attain the highest degree

classifications. Earlier Kenyan studies have addressed quality guidelines, library facilities, digital literacy and access to electronic resources, but much of the evidence is institution-specific and does not directly test whether compliance with the designated CUE information literacy standard predicts academic performance across public and private universities. The absence of such evidence limits the ability of regulators and university managers to distinguish documentary compliance from effective implementation. This study addressed that contextual, conceptual and outcome gaps.

The purpose of the study was to determine the effect of compliance with CUE Standard No. LIBR/STD/10 on academic performance among university students in the Nairobi Metropolitan area. The study asked: To what extent have universities in the Nairobi Metropolitan area complied with CUE Standard No. LIBR/STD/10 on information literacy and competency initiatives? The alternative hypothesis stated that compliance with the standard has a significant effect on academic performance.

Theoretical Review

Literacy Competency Theory

The article is anchored in Literacy Competency Theory, which draws on competency-based learning perspectives and treats literacy as a multidimensional combination of knowledge, skills, attitudes and abilities required for effective learning and performance. Literacy extends beyond basic reading and writing to include the capacity to access, evaluate, interpret, communicate and apply information in different settings [5,6,7]. The theory predicts that learners with stronger competencies in information evaluation, digital literacy, critical thinking and communication are better positioned to undertake research, solve problems and perform successfully in academic environments.

The theory is relevant to CUE Standard No. LIBR/STD/10 because competency development requires institutional structures, programs, resources and learning opportunities. Adhering to the standards can then be interpreted as the institutional input that allows measurable information literacy competencies to be acquired. Academic programs that integrate

information literacy, systematic curriculum development and implementation of library policies, along with librarian-led instruction, offer repeated opportunities to students to practice and demonstrate these competencies.

Another drawback of the competency approach is its focus on skills that can be measured, thus potentially underestimating inequalities in terms of culture, motivation and resources. The limitation was offset by conducting interviews and a review of institutional documents, which helped to document some contextual variations in the enactment of compliance across universities.

Empirical Review

Bello and Ajao (2024) ^[8] studied digital-literacy policies and educational pathways in Nigeria and observed that digital skills, at both basic and intermediate levels, was mostly provided by universities and related institutions. The study showed the significance of policy but analysed a more comprehensive set of institutions which did not address the Kenyan regulatory regime or academic performance. Elsewhere, Omolo (2021) ^[9] evaluated students' perception on CUE quality guidelines implementation at the University of Nairobi, Kisumu Campus. Although the institution was perceived to provide quality instruction by students, deficiencies in physical facilities, ICT infrastructure and affordability of online learning were identified. However, the single-campus focus limited cross-institutional generalization.

Nyakwebwa et al. (2020) ^[10] assessed compliance with CUE standards for library physical facilities in a public university in Western Kenya and identified limitations in staffing, facilities, equipment, funding and information services. The study demonstrated that compliance must be supported by resources. Notably however, the study concentrated on physical library standards and did not test the relationship between information literacy compliance and academic performance. International frameworks similarly emphasize that structured information literacy provision strengthens students' engagement with evidence and scholarly practices ^[1,3].

The reviewed literature revealed three connected gaps. First, there was a contextual gap because evidence from individual institutions or other countries could not explain compliance across the Nairobi Metropolitan area. Second, there was a conceptual gap because studies often focused on general quality, facilities or digital access rather than Standard No. LIBR/STD/10. Third, there was an outcome gap because the direct statistical relationship between compliance and academic performance remained insufficiently examined.

METHODOLOGY

Research Philosophy

The study was guided by the positivist research philosophy, which treats reality as capable of systematic examination through observation, measurement and empirical evidence. Positivism was appropriate because the study translated information literacy and academic performance into measurable indicators and used statistical analysis to determine the strength, direction and significance of relationships. The approach supported structured instruments, objective interpretation and use of evidence rather than the researcher's personal views [11, 12].

Research Design

A concurrent triangulation mixed-methods design embedded within a descriptive survey was adopted. Quantitative and qualitative data was collected during the same phase, analyzed separately and integrated during interpretation. Quantitative strand described students' perceptions and tested the relationship between the focal information literacy variable and academic performance. Qualitative strand used interviews with university librarians and academic registrars to explain institutional policies, curriculum practices and implementation experiences. Triangulation strengthened credibility by enabling evidence from students, institutional officers and documentary sources to be compared [12, 13].

Study Area

The study was conducted in nine selected public and private universities within the Nairobi Metropolitan area. The metropolitan setting contains a high concentration of universities with

established information literacy initiatives, diverse student populations, digital learning environments and library systems. The selected institutions provided appropriate setting for examining the relationship between information literacy and undergraduate academic performance.

Target Population

The target population comprised approximately 142,000 undergraduate students in the nine universities, together with nine university librarians and nine academic registrars. Undergraduate students were the primary unit of observation because they were direct beneficiaries of information literacy initiatives. Librarians and registrars were included as key informants because of their responsibility for information literacy delivery, institutional policy, curricula and academic records. The student population comprised approximately 62,000 second-year, 41,000 third-year and 39,000 fourth-year students.

Sampling Technique and Sample Size

Systematic simple random sampling was used to select undergraduate students from official enrolment lists. After a random starting point was identified, students were selected at regular intervals, thereby reducing selection bias and giving eligible students an equal chance of inclusion. Yamane's (1967) ^[14] formula, $n = N/(1 + Ne^2)$, was applied to the population of 142,000 at a 5% margin of error, producing a sample of 399 students. Sampling resulted in 175 second year students, 116 third year students and 108 fourth year students. Due to the small number of key informants, being easily located and having specific institutional knowledge, a purposive census was used, and all 18 key informants were included.

Research Instruments

The instruments used were: structured questionnaires for undergraduate students, interview guide for university librarians and academic registrars, curriculum review checklist, and document review template. Previous Likert scale (1 = no extent to 5 = very great extent) was used in the questionnaire; it gathered demographic data, the predictor and academic-performance data. The interview guide yielded contextual evidence of institutional policies,

curriculum integration and program delivery. The curriculum checklist was used to review the scope and coherence of information literacy content and the document template to gather information about policy documents, curriculum and academic-records. Methodological triangulation was used by employing multiple instruments.

Questionnaire for undergraduate Students

A structured questionnaire was used to collect standardized quantitative data from undergraduate students. Its objective-specific section contained statements measuring the independent variable, while academic-performance section measured achievement, research and information skills, quality of academic work and learning outcomes. Closed-ended items facilitated consistent coding and statistical comparison across institutions.

Interview Guide for University Librarians and Academic Registrars

A semi-structured interview guide was used to obtain institutional explanations concerning policy development, curriculum integration, program delivery, staff roles, student participation and the perceived relationship between information literacy and academic performance. Open-ended questions enabled key informants to clarify differences in implementation across universities.

Curriculum Review Checklist

A curriculum review checklist was used to determine whether information literacy content was formally documented, the competencies covered, the delivery approach, the level of integration into academic programs and the extent to which content reflected emerging information needs.

Document Review Template

A document review template was used to capture institutional policies, information literacy curricula and academic-performance records. Academic records covered the 2020-2024 period and included degree classifications and graduation indicators, thereby complimenting self-reported student evidence.

Pilot Study

A pilot study involving 40 undergraduate students from a university with characteristics comparable to the participating institutions was conducted before the main survey. Pilot participants were excluded from the final study. The pilot assessed clarity, relevance, sequencing and the time required to complete the questionnaire. Before the main data collection exercise, the instruments were revised using feedback, to improve and remove any ambiguity on the wording.

Validity of the Research Instruments

To ensure content validity, the supervisor and research experts reviewed the relevance, clarity and adequacy of the items contained in the questionnaires in relation to the study's objective and conceptual framework. Principal Component Analysis (PCA) was used to evaluate the construct validity. The Kaiser-Meyer-Olkin (KMO) measure was used to determine data suitability for factor analysis [15, 16, 17], and factor loadings exceeding 0.50 were considered acceptable.

The Research Instruments used in the study were reliable.

Cronbach's alpha was used to test for internal consistency. A coefficient of 0.70 or more was judged to be acceptable, above 0.80 was taken as good and above 0.90 as excellent reliability. The pilot findings showed that the scales measuring the pilot's focus and academic performance were appropriate for the main survey [16, 18].

Table 1. Pilot reliability and validity results

Construct	Items	Cronbach's alpha	Average loading	Minimum loading	KMO
CUE Standard compliance	5	0.907	0.854	0.802	0.742
Academic performance	13	0.852	0.814	0.550	0.671

Data Collection Procedure

Following institutional and regulatory approvals, two trained research assistants administered the questionnaire. The assistants were oriented on the goals of the study, administration of the instruments, confidentiality, informed consent and voluntary participation. After arranging an interview with the researcher, it was conducted personally with the librarians and academic registrars. Interviews were conducted in English, and secondary data was gathered using curriculum and document review tools. Data was coded and stored in safe place for analysis.

Data Processing and Analysis

SPSS Version 22 was used to code and analyze quantitative data. Frequencies, percentages, means and standard deviations were used to describe compliance and sample characteristics. The factor structure of the compliance scale was explored through Principal Component Analysis (PCA). Pearson correlation was used to quantify the correlation between compliance and academic achievement. For simple linear regression and analysis of variance the alternative hypothesis was tested using $Y = \beta_0 + \beta_1 X_1 + \text{error}$, with Y being academic performance, and X_1 being compliance with CUE Standard No. LIBR/STD/10. Multicollinearity, linearity, normality and autocorrelation diagnostics were examined before regression. Interview data was coded thematically and integrated with the quantitative findings during discussion.

Operationalization of Variables

Table 2. Operationalization of the article variables

Variable	Indicators	Measurement	Analysis
Compliance with CUE Standard No. LIBR/STD/10 (independent)	IL policy and implementation; curriculum integration; library instructional support;	Five-point Likert scale from no extent (1) to	Frequencies, percentages, mean, standard deviation, PCA, correlation,

	monitoring and adherence to CUE guidelines.	very great extent (5).	regression and content analysis.
Academic performance (dependent)	Academic achievement; research and information skills; quality of academic work; learning outcomes.	Five-point Likert scale and institutional academic records.	Descriptive statistics, correlation and regression.

Ethical Considerations

Ethical clearance was obtained from the National Commission for Science, Technology and Innovation, and permission to conduct the study obtained from participating universities. The purpose and procedures of the study were explained to participants, and only those who voluntarily consented were included. Names were not recorded on questionnaires, confidentiality was maintained, and collected information was used solely for academic research.

Results

Response Rate and Sample Characteristics

Of the 399 questionnaires administered to students, 305 were returned and usable, producing a response rate of 76.4%. All 18 interview schedules administered to the nine university librarians and nine academic registrars were completed, giving a 100% key-informant response rate.

Table 3. Response rate

Data source	Target	Usable responses	Response rate
Student questionnaires	399	305	76.4%
Key-informant interviews	18	18	100.0%

The student sample included 167 respondents (54.8%) from public universities and 138 (45.2%) from private universities. Male students constituted 60.3% and female students 39.7%. Respondents aged 21-22 years comprised 41%, followed by those below 20 years,(23%) and

those aged 23-24 years (22%). Second-year students contributed 140 responses, third-year students 91 and fourth-year students 74. The distribution provided evidence from different institutional types and stages of undergraduate study.

Descriptive Results for Compliance with CUE Standard No. LIBR/STD/10

299 (98%) students reported that their institutions had implemented information literacy policy, while 6 (2%) reported that no such policy existed. The item-level findings showed generally positive perceptions, although the strength of implementation differed across institutional practices.

Table 4. Descriptive statistics for compliance with CUE Standard No. LIBR/STD/10

Compliance indicator	Great/very great extent	Mean	SD
Information literacy integrated into academic programmes	63.9%	3.25	0.984
Information literacy developed in the curriculum	61.3%	3.74	1.04
Library curriculum responds to emerging student and faculty needs	69.5%	3.84	1.16
Information literacy programmes taught by librarians	55.1%	3.51	1.20
University complies with CUE information literacy guidelines	67.2%	3.86	1.11

Perceived compliance with CUE policy guidelines recorded the highest mean ($M = 3.86$, $SD = 1.11$), followed by the library's development of curriculum responsive to emerging needs ($M = 3.84$, $SD = 1.16$). Librarian-led teaching recorded the lowest mean ($M = 3.51$, $SD = 1.20$), indicating that institutional policies and curricular intentions were more visible than consistent instructional delivery. Integration into academic programs had a lower reported mean of 3.25 ($SD = 0.984$), despite 63.9% rating it at a great or very great extent.

Factor Analysis

All five indicators loaded strongly on the compliance construct, with coefficients ranging from 0.747 to 0.863. Integration into academic programs produced the highest loading, indicating

that it was the strongest marker of compliance. Librarian-led instruction produced the lowest loading but remained above the acceptance threshold.

Table 5. Factor loadings for compliance

Indicator	Loading
Information literacy integrated into academic programs	0.863
Information literacy developed in the curriculum	0.807
Library curriculum addresses emerging student and faculty needs	0.789
Information literacy programs taught by librarians	0.747
Compliance with CUE information literacy policy guidelines	0.805

Diagnostic Tests

Table 6. Diagnostic results

Test	Statistic	Decision
Multicollinearity	Tolerance = 0.639; VIF = 1.566	No multicollinearity concern.
Linearity	$r = 0.921$; $p < .001$	A significant positive linear relationship was present.
Normality	K-S = 1.694; $p = .006$	Normality was rejected; interpretation considered the large sample and graphical assessment.
Autocorrelation	Durbin-Watson = 1.766	Residual independence was acceptable.

Tolerance exceeded 0.10 and VIF was below 5, while the Durbin-Watson statistic fell within the accepted 1.5-2.5 range. The Kolmogorov-Smirnov result indicated a departure from normality. The thesis therefore interpreted regression in light of the large sample and complementary graphical assessment, consistent with the robustness guidance discussed previously [19, 20].

Hypothesis Testing

Correlation Analysis

Compliance with CUE Standard No. LIBR/STD/10 had a very strong positive and statistically significant correlation with academic performance ($r = 0.921$, $p < .001$, $n = 305$). Higher reported compliance was therefore associated with higher academic performance.

Regression Model Summary and ANOVA

Table 7. Model summary

R	R ²	Adjusted R ²	Standard error
0.921	0.849	0.848	0.340

Table 8. Analysis of variance

Source	Sum of squares	df	Mean square	F	p
Regression	225.326	1	225.326	2027.291	< .001
Residual	33.677	303	0.111	-	-
Total	259.003	304	-	-	-

The model summary reported $R = 0.921$ and $R^2 = 0.849$, indicating that compliance accounted for 84.9% of the variation in the outcome. The ANOVA table showed that the regression model was statistically significant, $F(1, 303) = 2027.291$, $p < .001$.

Regression Coefficients and Hypothesis Decision

Table 9. Regression coefficients

Term	B	SE	Beta	t	p
Constant	0.550	0.074	-	7.445	< .001
CUE compliance	0.867	0.019	0.933	45.025	< .001

$$\text{Academic performance} = 0.550 + 0.867(\text{CUE compliance})$$

The positive unstandardized coefficient indicated that a one-unit increase in compliance predicted a 0.867-unit increase in academic performance. The effect was statistically significant ($B = 0.867$, $\beta = 0.933$, $t = 45.025$, $p < .001$). So, the null hypothesis was rejected, and the alternative hypothesis that compliance has a significant impact on academic performance was accepted.

Qualitative Findings

Interviews confirmed variations in implementation across institutions. There was better integration of information literacy in academic programs at Kenyatta University, KCA University and Jomo Kenyatta University of Agriculture and Technology. Other institutions reported that curricula or policies were still in the approval process or in a staged implementation process and information literacy was therefore being taught primarily through library-based programs.

The main facilitators in the participating universities were librarians and they provided the instruction in the following ways: orientation, classroom sessions, workshops, library-week activities and user education. Structures for coordination, curriculum integration, allocation of resources and quality assurance were more clearly defined at universities that have an information literacy policy in place giving clearer structures for coordination, curriculum integration, allocation of resources and quality assurance. If the policy was not well approved, faculty was not strong, or institutional commitment was not great, implementation was less consistent and less initiated by the policy. Results of qualitative analysis complemented the statistical evidence that compliance is not only a presence of a document, but rather an integration, delivery, and institutional governance.

DISCUSSION

The study established a strong positive relationship between compliance with CUE Standard No. LIBR/STD/10 and academic performance. The result supports Literacy Competency Theory because institutional compliance creates the conditions through which students repeatedly acquire, practise and apply information competencies. The strongest factor loading for curriculum integration reinforces the proposition that competencies develop when information literacy is incorporated into the learning process rather than offered only as an optional library service. This observation is consistent with previous observations ^[1, 3], which emphasized systematic integration of information literacy into higher education and extends a study by Omolo (2021) ^[9] moving beyond perceptions of general quality guidelines to a

specific information literacy standard and by comparing several public and private institutions. Similarly, the resource and facility limitations reported elsewhere ^[10] help explain why formal compliance may vary in practice. These findings demonstrate that policy, curriculum and teaching support operate as connected elements rather than isolated compliance requirements. The descriptive results also show an implementation tension. Thus, while 98% reported availability of information literacy policy and that the average compliance with CUE guidelines was high, integration into academic programs and librarians' teaching was comparatively weak. This could be explained qualitatively, thus some institutions had either a policy or curriculum under development for which approval had yet to be obtained, or the policy or curriculum are already been in place, but not fully integrated into the academic curriculum.

The practical meaning of this is that an indicator of implementation can be used to assess whether a regulation is being met. There is need for Universities to demonstrate that information literacy is available, and that implementation is supported by trained staff from the library and academic disciplines tooled with adequate technologies for periodic evaluation to achieve desirable learning outcomes.

CONCLUSIONS

Compliance with CUE Standard No. LIBR/STD/10 has a strong, positive and statistically significant effect on academic performance among university students in the Nairobi Metropolitan area. Compliance is most meaningful when it results in curriculum integration, policy implementation, librarian-supported instruction and monitoring of student competencies. Although the universities demonstrated substantial progress, differences between policy presence and instructional delivery show that implementation remains uneven. Information literacy should therefore be treated as core academic infrastructure rather than a supplementary library activity.

RECOMMENDATIONS

There is need for;

1. Universities to incorporate information literacy in all the undergraduate supported with appropriate policies, curriculum, technological infrastructure, skilled library and faculty to support implementation and evaluation consistent with requirements of CUE Standard No. LIBR/STD/10
2. integration should not be limited to first year orientation but be implemented across the entire academic levels.
3. There is need for CUE and university quality-assurance units to come up with monitoring indicators to evaluate the actual implementation of the program, encompassing curriculum coverage, participation of students, collaboration between librarians and faculty, assessment of competencies, staffing, availability of digital resources and periodic review.
4. University Managements should provide budgetary allocations to support continuous professional development of the librarians and faculty as well as for a solid digital infrastructure to support the program.
5. Librarians should be involved in curriculum design, classroom instruction and assessment in academic departments through formal collaboration.
6. Longitudinal designs and objective academic-performance measures, like GPA progression, course completion and degree classification, should be used to confirm the long-term impact of sustained compliance in the future.
7. The study should be replicated with other institutional and resource settings outside the Nairobi Metropolitan area to establish whether the results are transferable.

REFERENCES

1. Association of College and Research Libraries. (2016). Framework for information literacy for higher education. <https://www.ala.org/acrl/standards/ilframework>
2. Bruce, C. S. (1997). The seven faces of information literacy. Auslib Press.

3. UNESCO. (2023). Global education monitoring report 2023: Technology in education - A tool on whose terms? UNESCO. <https://doi.org/10.54676/UZQV8501>
4. Commission for University Education. (2018). Universities standards and guidelines. Commission for University Education.
5. Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. Prentice Hall.
6. OECD. (2019). OECD skills outlook 2019: Thriving in a digital world. OECD Publishing.
7. UNESCO. (2017). Education for sustainable development goals: Learning objectives. UNESCO.
8. Bello, O., Ajao, A. O. (2024). Digital literacy and skills development in Nigeria: Policies, barriers and recommendations. Journal of African Innovation and Advanced Studies. <https://africanscholarpub.com/ajaias/article/view/262>
9. Omolo, J. O. (2021). Students' perception on implementation of Commission for University Education guidelines on quality education provision at University of Nairobi, Kisumu Campus [Doctoral dissertation, University of Nairobi]. <http://erepository.uonbi.ac.ke/handle/11295/162421>
10. Nyakweba, I., Muwangu, J., Sendikadiwa, E. N. (2020). Assessing compliance with Commission for University Education standards for library physical facilities at Rongo University Library, Western Kenya. International Journal of Library Science, 9(5), 105-113.
11. Ali, I. M. (2024). A guide for positivist research paradigm: From philosophy to methodology. Ideology Journal, 9(2), 187-196.
12. Creswell, J. W., Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches (6th edition). Sage.
13. Creswell, J. W., Clark, V. L. P. (2017). Designing and conducting mixed methods research. Sage.
14. Yamane, T. (1967). Statistics: An introductory analysis (2nd ed.). Harper & Row.
15. Field, A. (2018). Discovering statistics using IBM SPSS Statistics (5th ed.). Sage.
16. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. (2019). Multivariate data analysis (8th ed.). Cengage Learning.
17. Kaiser, H. F. (1974). An index of factorial simplicity. Psychometrika, 39(1), 31-36.
18. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, 16(3), 297-334.

19. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. (2022). Multivariate data analysis (9th ed.). Cengage Learning.
20. Ghasemi, A., Zahediasl, S. (2012). Normality tests for statistical analysis: A guide for non-statisticians. *International Journal of Endocrinology and Metabolism*, 10(2), 486-489.