



**GRETSA**  
**UNIVERSITY**



**7<sup>th</sup>**

**INTERNATIONAL  
MULTIDISCIPLINARY  
RESEARCH  
CONFERENCE**



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**December, 2024**



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## KEYNOTE SPEAKERS

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**Prof. Kelvin Omieno:** Dean, School of Computing and Information Technology  
Kaimosi  
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**Prof. Julius Gatune:** UNESCO Futures Literacy Chair

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## MODERATORS

### CLUSTER 1

**Sub-Theme 1:** Computing and Informatics  
**Sub-Theme 2:** Library and Information Science  
**Dr. Rose Njoroge:** Kenyatta University

### CLUSTER 2

**Sub-Theme 3:** Hospitality and Tourism Management  
**Sub-Theme 4:** Business  
**Prof. Jonathan Mulwa:** Rongo University  
**Dr. Johnstone Kuya:** Gretsas University

### CLUSTER 3:

**Sub-Theme 5:** Education  
**Sub-Theme 6:** Community Development  
**Sub-theme 7:** Communication  
**Sub-Teme8:** Health Sciences  
**Dr. Phoestine Naliaka:** Gretsas University  
**Dr. Justus Osero:** Kenyatta University  
**Dr. Joel Kiambi:** Gretsas University





## **WELCOME REMARKS**

**By Prof. Wabuke Bibi**

*Deputy Vice Chancellor (Academics and Student Affairs) Greta University*

Prof. Bibi officially opened the conference with a heartfelt welcome to the esteemed guest speakers, moderators, and participants. He expressed deep appreciation for their presence and for graciously accepting the invitation to join this significant event. In his opening remarks, Prof. Bibi underscored the richness of diversity among the participants, which was evident in the wide-ranging presentations slated for the two-day conference. He highlighted the unique opportunity this gathering provided for researchers, industry professionals, and academics to engage in the exchange of ideas, share their experiences, and cultivate meaningful collaborations.

Prof. Bibi also took pride in noting that the university had successfully organized and hosted six international multidisciplinary conferences since its inception in 2017; a remarkable achievement that demonstrated the institution's commitment to academic excellence and global engagement. Reflecting on the importance of adaptability in progress, he quoted Bernard Shaw: "Progress is impossible without change, and those who cannot change their minds cannot change anything," reinforcing the conference's role as a catalyst for innovation and forward-thinking.





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**By Prof. Kelvin Omieno**

Dean School of Computing and Information Technology, Kaimosi Friends University

### **Title: Navigating the Digital Economy: Opportunities and Challenges**

Distinguished guests, esteemed colleagues, and fellow academicians, It is a great honor to stand before you today at the 7th Gretsia International Conference, as we explore the emerging issues and innovations for strategic adaptation in the world of uncertainties. As the world becomes more interconnected through digital technologies, we are presented with unprecedented opportunities but also complex challenges. Today, I aim to delve into how businesses, governments, and individuals can navigate this era of disruptive technologies to harness opportunities while addressing the associated risks.

### **Understanding the Digital Economy**

The digital economy, also known as the "new economy," refers to economic activities driven by digital computing technologies, which have become deeply integrated into every aspect of modern life. From online banking to e-commerce, from streaming services to cloud computing, the digital economy has created new opportunities for businesses and individuals worldwide.

With the proliferation of digital infrastructure such as networks, cloud services, and data centers, platforms like Amazon, Google, and Alibaba have redefined the way we interact, transact, and consume. The backbone of this economy lies in its data, often referred to as the "new oil," which drives decision-making, personalization, and innovation.

### **Disruptive Technologies Driving Change**

We are currently witnessing the profound impact of disruptive technologies like 5G, blockchain, 3D printing, and artificial intelligence (AI). These technologies are reshaping industries in ways we couldn't have imagined a few years ago. AI, for example, has revolutionized sectors such as healthcare and education, with the potential to solve complex problems and create smarter systems. However, it also raises ethical concerns, such as biases in decision-making systems and data privacy issues.

According to UNESCO and UNCTAD, frontier technologies are driving the creation of a gig economy, transforming traditional industries, and reshaping how work is performed globally. However, developing countries, including Kenya, face unique challenges in ensuring equal access to these technologies, particularly in overcoming the digital divide.

### **Opportunities in the Digital Economy**

The digital economy presents vast opportunities. It fosters innovation, encourages entrepreneurship, and creates new jobs. Kenya's pioneering role in mobile money services, with platforms like M-Pesa, is a prime example of how digital payment solutions can transform economies. Moreover, digital platforms enable remote work, e-learning, and collaboration across borders, allowing greater flexibility and access to resources.



Emerging sectors, such as the green economy and smart ecosystems, present additional opportunities. The global green technology market is projected to grow exponentially in the next decade, providing both economic and environmental benefits. Green IT initiatives, which focus on reducing the carbon footprint of computing practices, are becoming a core aspect of sustainability efforts.

### **Challenges and Risks**

However, with these opportunities come significant challenges. Cybersecurity threats are growing more complex, making data protection a critical concern. Data breaches, identity theft, and other forms of cybercrime undermine the trust that is essential in a digital economy. Regulatory challenges also arise as governments struggle to keep pace with technological advancements, often leading to outdated policies that fail to address emerging risks.

Moreover, the digital divide remains a barrier for many. While Kenya has made strides with initiatives like the Ajira Program and the Digital Literacy Program, there is still much to be done to ensure that rural areas and underserved populations have access to the benefits of digital technologies.

### **Strategic Approaches to Success**

To successfully navigate these challenges, we must prioritize digital literacy. Equipping individuals with the necessary skills to thrive in the digital age is essential. The European Commission, UNESCO, and the UN's Sustainable Development Goals (SDGs) emphasize digital literacy as a means to achieve quality education, decent work, and reduced inequalities.

In Kenya, the government's focus on ICT-driven policies, entrepreneurship, and innovation hubs has made significant progress. Initiatives like the Presidential Digital Talent Program and tech hubs such as iHub have positioned Kenya as a leader in Africa's digital transformation.

### **Looking Ahead: The Future of the Digital Economy**

As we look to the future, we must continue to embrace computational thinking, AI literacy, and cloud computing to remain competitive in the global digital economy. Universities play a critical role in fostering this development. By integrating digital literacy into curricula and establishing innovation hubs, universities can become incubators for new ideas and solutions.

Collaborative robots, biotechnology, augmented reality (AR), and virtual reality (VR) are shaping the next wave of industrial transformation. As we adopt these technologies, we must also focus on emotional intelligence, critical thinking, and effective communication to ensure that the human element remains central in an increasingly digital world.

### **Conclusion**

In conclusion, navigating the digital economy requires a careful balance of innovation, collaboration, and adaptability. It is up to us leaders in academia, business, and government to guide this transformation thoughtfully and responsibly. Together, we can harness the power of disruptive technologies to create a more inclusive, sustainable, and prosperous future for all. Thank you.





***Qn. 1: What are some of the biggest opportunities the digital economy presents, particularly for developing countries like Kenya?***

**ANSWER:**

One of the biggest opportunities lies in digital entrepreneurship and innovation. The digital economy has lowered the barriers for startups, allowing new businesses to thrive through e-commerce platforms, mobile payment solutions, and digital services. In Kenya, platforms like M-Pesa have transformed the financial landscape, enabling greater financial inclusion. Additionally, the adoption of e-learning platforms, remote work, and access to global markets means that individuals in developing countries can compete on a global stage.

***Qn. 2: How can Kenya overcome the challenge of the digital divide, especially in rural areas?***

**ANSWER:**

Bridging the digital divide requires a combination of infrastructure development and education. The government must continue to invest in expanding internet connectivity to rural and underserved areas through programs like the Digital Literacy Program and the Ajira Digital Program. Public-private partnerships can also help to accelerate the rollout of digital infrastructure, such as broadband and mobile networks. Furthermore, providing affordable digital devices and offering training on digital literacy will empower individuals in these areas to participate fully in the digital economy. Localizing content and services for rural populations is also crucial in making the digital economy accessible to everyone.

***Qn. 3: What role can universities play in advancing digital literacy and innovation?***

**ANSWER:**

Universities are critical in shaping the future of the digital economy by integrating digital literacy and computational thinking into their curricula. By establishing innovation hubs, universities can foster creativity and entrepreneurship among students and faculty, enabling them to develop digital solutions for real-world problems. Collaborative programs with the private sector, such as internships and research partnerships, can further promote skill development. Additionally, universities can serve as incubators for startups by offering mentorship, resources, and funding opportunities. Equipping students with skills in AI, coding, data analysis, and cloud computing will make them valuable contributors to the digital workforce.





**Qn. 4:** *It sounds like you are a proponent of Competency-Based Education (CBE). How would you advise digital literacy to be included in the school curriculum?*

Yes, I believe Competency-Based Education (CBE) aligns well with the needs of the digital economy, as it focuses on equipping learners with practical skills that are immediately applicable. To integrate digital literacy into the school curriculum effectively, I would recommend the following approach:

**a) Incorporate Digital Literacy Across Subjects:**

Digital literacy should not be taught as a standalone subject but woven into all areas of learning. For example, in mathematics, students can learn to use digital tools for data analysis, while in social studies, they can explore digital citizenship and online ethics. This ensures students see the relevance of digital skills across various domains.

**b) Focus on Foundational Competencies:**

The curriculum should focus on building essential competencies such as information and data literacy, online communication and collaboration, digital content creation, and cybersecurity awareness. These are the core skills students need to navigate and succeed in a digital world.

**c) Hands-On, Project-Based Learning:**

CBE emphasizes practical application, so students should engage in project-based learning where they can use digital tools to solve real-world problems. For example, they could create websites, develop digital presentations, or conduct research using online databases. This fosters critical thinking, problem-solving, and creativity.

**d) Introduce Coding and Computational Thinking Early:**

Introducing coding and computational thinking from a young age equips students with the skills necessary for fields like software development, AI, and data science. These are crucial for the future workforce, and early exposure makes it easier for students to build on these skills as they progress in their education.

**e) Ongoing Teacher Training and Support:**

To successfully implement digital literacy in the curriculum, it is essential to provide teachers with the necessary training and resources. Continuous professional development programs focused on integrating technology in the classroom are crucial for empowering educators to deliver this content effectively.





**By Prof. Julius Gatune**

UNESCO Futures Literacy Chair

**Title: Future of Work and Africa Youths**

Ladies and Gentlemen, esteemed guests and fellow academics, – good morning. I am truly honored to be with you today at the 7th Greta University International Multidisciplinary Research Conference. The theme of this conference, “*Unfolding Emerging Issues and Innovations for Strategic Adaptation in the World of Uncertainties*”, could not be more timely and critical for our continent.

Today, I want to discuss the profound changes facing the global economy and the implications for African youth, who are at the heart of this transformation. We stand at the intersection of two powerful forces: rapid technological advancement and Africa’s growing youthful population. The choices we make today in preparing our youth for the future will determine whether we harness the vast opportunities or succumb to the challenges that lie ahead.

**The Africa Job Challenge:**

Africa is facing a significant jobs challenge, resulting from the failure of our economies to generate sufficient employment opportunities. Currently, 93% of jobs in Africa are created in the low-productivity informal sector. More than 70% of the workforce is in vulnerable employment, and only a fraction of the 10 to 12 million youths entering the workforce each year secure formal jobs.

This is a challenge, but also an opportunity. The rise of a young, working-age population means that Africa could experience a demographic dividend – if, and only if, we invest wisely in their skills and education. Yet, we must acknowledge the sobering reality: many of our youth are ill-prepared for the job market, lacking the skills required by employers. Political instability and even radicalization are real risks for disenfranchised youth who feel left behind.

**Key Global Megatrends Shaping the Future of Work:**

Several global megatrends are shaping the future of work and will define Africa’s trajectory:

- 1. Technological Disruption (4IR):** The Fourth Industrial Revolution (4IR) is already transforming economies worldwide. Automation, artificial intelligence (AI), the Internet of Things (IoT), and blockchain are changing the nature of work. While there is fear of massive job losses, particularly in manufacturing. Many new jobs are likely to emerge, especially in sectors such as ICT, finance, and creative industries, where Africa has the potential to leapfrog.
- 2. Green Economy and Sustainable Consumption:** As climate change continues to be a pressing global concern, new jobs are being created in the green economy. Young Africans can lead in sustainable farming, renewable energy, and the circular economy.
- 3. Global Value Chains:** Africa must position itself within the global value chain to attract investments and jobs. This requires strong governance, education systems that focus on skills development, and regional cooperation.



### Impact of the Fourth Industrial Revolution on Africa:

The Fourth Industrial Revolution, while often seen as a threat to jobs, presents unique opportunities for Africa. For example, 3D printing, AI, and big data can help transform industries such as agriculture, manufacturing, and services. The informal sector, where most young people work, can benefit from platforms that formalize services, enhance trust, and upskill workers.

But, we cannot ignore the threats—automation could displace many mid-level jobs, and a lack of infrastructure and skills might hinder our ability to fully participate in 4IR. Nevertheless, Africa's optimism about 4IR is warranted. We have vibrant innovation hubs, young entrepreneurs eager to embrace new technologies, and an increasingly connected population.

### Preparing African Youth for the Future of Work:

To ensure Africa's youth can thrive in the future of work, we must take several key actions:

1. **Education Reform:** Our education systems need to equip young people with foundational skills, particularly in science, technology, engineering, and mathematics (STEM). Equally important are creativity, problem-solving, and cognitive skills, which are critical for adaptability in the 4IR world.
2. **Upskilling the Workforce:** Beyond formal education, we must invest in lifelong learning and vocational training. The informal sector, where many young Africans find work, needs targeted support for skill development and formalization.
3. **Digital Infrastructure:** Access to affordable, high-quality internet and electricity is non-negotiable if we are to leapfrog into the digital economy. Governments

Ladies and gentlemen, Africa's future lies in the hands of its youth. While challenges remain, the potential for transformation is vast. The future of work in Africa will be defined not by the jobs we lose to technology but by the opportunities we create through innovation, inclusivity, and proactive policymaking. Together, we can ensure that Africa's youth are not just passive participants in the changing world of work but are empowered leaders who will shape the continent's economic destiny.

## Questions and Answers



**Qn. 1:** *You mentioned that Africa has a youthful population entering the workforce. How can we bridge the gap between the 10 million youth entering the workforce each year and the limited 3 million formal jobs created?*

### ANSWER:

The gap can be bridged by focusing on three key strategies:

- **Skills development and education reform:** Our education systems need to be aligned with the needs of the modern job market, with an emphasis on vocational training, STEM subjects, and problem-solving skills.
- **Supporting entrepreneurship:** Encouraging youth to create their own opportunities through entrepreneurship, especially in emerging sectors such as agritech, e-commerce, and the gig economy, can help generate employment.
- **Leveraging technology:** The Fourth Industrial Revolution (4IR) offers opportunities to create new jobs in areas like digital platforms, automation, and sustainable industries, which can absorb a portion of the youth entering the workforce.





**Qn. 2:** *What are the key challenges facing Africa's youth in accessing these new job opportunities created by the 4IR?*

**ANSWER:**

Key challenges include:

- **Lack of preparedness:** Many young Africans lack the technical and vocational skills required by new industries, due to outdated education systems.
- **Infrastructure gaps:** Limited access to affordable internet, electricity, and quality education makes it difficult for youth to engage in 4IR industries.
- **Inequitable access to opportunities:** Many young people, particularly in rural areas, face barriers such as lack of access to technology, finance, and markets. Addressing these challenges requires investment in digital infrastructure, reforms in education, and inclusive policies.

**Qn. 3:** *How can Africa's informal sector benefit from 4IR technologies?*

**ANSWER:**

4IR technologies can transform the informal sector by:

- **Digitizing services:** Digital platforms can connect informal workers with customers, offering them more stable incomes and access to formal services such as health insurance and credit.
- **Upskilling workers:** Platforms can incentivize skill development, as workers are rated based on their performance. This could lead to higher-quality services and better earning opportunities.
- **Shared services:** Technologies like 3D printing or IoT devices can help informal manufacturers and artisans upgrade their tools, allowing them to expand their product offerings and enter new markets.

**Qn. 4:** *What sectors are most likely to generate jobs for African youth in the next decade?*

**ANSWER:**

The sectors likely to generate jobs include:

- **Agriculture:** Agritech innovations such as drones, AI for crop management, and smart irrigation systems can create new jobs.
- **Technology and digital platforms:** The ICT sector, particularly in software development, telecommunications, and digital platforms, will be key.
- **Renewable energy:** The shift toward green economies and sustainable development will create opportunities in renewable energy industries.
- **Creative industries:** With new tools and platforms, creative industries like media, fashion, and entertainment can grow, especially with increased digital access.





**Qn. 5:** *What role can universities play in ensuring African youth are prepared for the future of work?*

**ANSWER**

- **Curriculum Reform and Relevance:** Universities need to adapt their curricula to reflect the demands of 4IR and the rapidly changing job market. By focusing on practical skills in Science, Technology, Engineering, and Mathematics (STEM), universities can equip students with the knowledge and skills needed for jobs in fields like artificial intelligence, data science, automation, and renewable energy.
- **Partnerships with Industry:** By building strong partnerships with industry leaders, universities can bridge the gap between academia and the job market. These partnerships can provide:
  - a. **Internships and Apprenticeships:** Universities can facilitate hands-on experiences for students through internships, giving them practical exposure to their fields of study.
  - b. **Industry-driven curricula:** Collaboration with the private sector ensures that the education provided is aligned with real-world needs, making students more employable upon graduation.
- **Fostering Entrepreneurship and Innovation:** Universities can foster a culture of entrepreneurship by encouraging students to innovate and start their own businesses. They can provide:
  - a. **Entrepreneurship programs:** Teaching business skills, innovation, and how to start and run a business.
  - b. **Incubators and accelerators:** Universities can set up incubators to support student-led startups, helping young entrepreneurs turn their ideas into viable businesses.
  - c. **Access to funding:** Universities can connect students with funding opportunities, investors, and venture capital to support entrepreneurial ventures.
- **Lifelong Learning and Skills Development:** As the job market continues to evolve, universities can help workers reskill and upskill throughout their careers. They can offer:
  - a. **Flexible and online learning:** Universities can provide short courses, certifications, and online programs for workers who need to update their skills to remain competitive in the job market.
  - b. **Technical and Vocational Education and Training (TVET):** By partnering with TVET institutions, universities can offer practical, skills-based training that is directly aligned with industry needs.



## **PAPER PRESENTATIONS**

**CLUSTER 1:** Sub-Theme 1: Computing and Informatics

**SUB-THEME 2:** Library and Information Science

# Intersecting Horizons: Data Literacy and Extracting Value from Low-Quality Information Sources in Academic Inquiry

By Pauline Ruguru Njagi<sup>1</sup> and Dr. Gitau Njoroge<sup>2</sup>

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## Abstract

*Working with data is becoming an increasingly influential way to develop and validate knowledge claims about various aspects of the world. Despite this, a significant gap exists between those who can effectively harness data and those who cannot. This disparity means that many individuals whether they are citizens, community members, or professionals often find themselves more as subjects of data rather than active users of data for meaningful civic or professional purposes. Addressing this issue is critical, particularly in the realm of academia, where enhancing data literacy among scholars can bridge this gap and empower both data users and service providers. Developing robust data literacy skills is essential for enabling individuals to utilize data more effectively and to make informed decisions. To explore this issue, a systematic literature review was employed to analyze existing and contemporary studies on data literacy. This approach proved useful in uncovering the intersections between data literacy and the value derived from varying quality of information resources. The review revealed key themes, including the significance of equipping knowledge workers with skills in data mining and literacy. It highlighted the strategic advantages of data mining, the methodologies for extracting valuable insights from low-quality sources, and the overall usefulness of data quality. By focusing on these areas, the review underscores the necessity of enhancing data literacy to maximize the potential benefits of data in various contexts.*

**Keywords:** Data Literacy, Data mining, Data quality

## 1. Introduction

Academics often seek unique knowledge mining ways to maximize research efforts given constrained time and resource, obtaining the relevant information at the right time is crucial for any academic endeavor (Rahman & Karim, 2021). Quality information is one of the primary drivers of actions and judgement made by academicians. Therefore, students must have the skills necessary to manage data as information from several sources may be distinct (Rahman & Karim, 2021). Also, the combination of data from various sources lead to discovery of novel and practical knowledge. This is a great illustration of how an academicians can use data mining from several data sources to get deep insights that are not possible from a single source (Wang, 2018). Data mining entail extracting information from facts and datasets to enable the development of trustworthy conclusions. It instrumental in making knowledge discovery more effective which require a number of procedures, including data cleaning, choice and adjustment, pattern explanation, and conception (Rahman & Karim, 2021). Consequently, the trying part is appraising the data sourced from low-quality information sources, which calls for in-depth subject-matter proficiency. Additionally, computerized approaches are still growing, and manually assessing data sets is really inflated and inefficient (Wang, 2018).

### 1.2 Problem Statement

The need for scholars to critically evaluate and make efficient use of a variety of data sources is growing as they work to optimize research results while working with limited time and resources (Rahman & Karim, 2021). While dealing with data of different quality is a common occurrence in



academic research, high-quality information is still the fundamental factor that drives educated decision-making. Because of this, obtaining valuable insights from less-than-ideal sources requires a high degree of data literacy, including abilities in data administration, cleaning, and synthesis. It is challenging to strike a balance between the necessity of thorough data review and the inefficiencies of human assessment, especially when dealing with unreliable information sources (Wang, 2018). The need for techniques that improve data literacy and allow researchers to derive insights from data is expanding as automated data mining techniques continue to advance.

### **1.3 Research Objectives**

- ❖ To explore data literacy abilities in academics and students, for successful information synthesize information from a variety of sources, including low-quality data.
- ❖ To investigate innovative strategies that enhance the efficiency and accuracy in data mining processes, particularly when dealing with low-quality information sources in academic research.

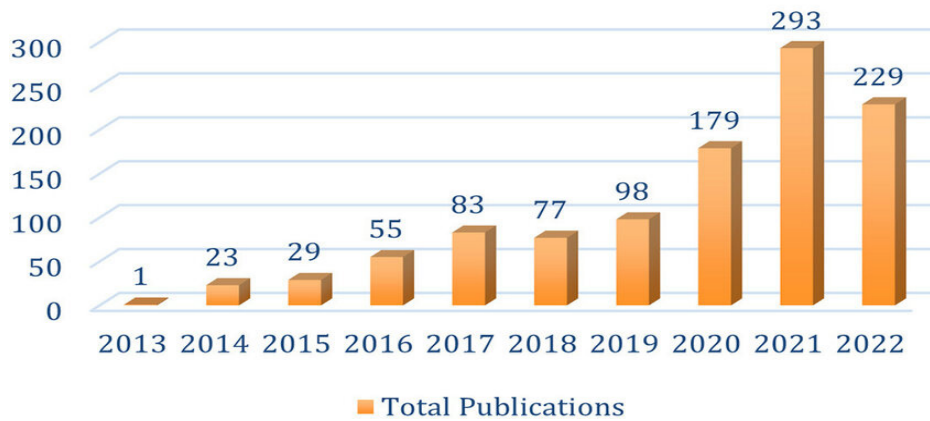
## **2. Literature Review**

In order for libraries to achieve their declared objective of becoming quality hubs, it is imperative to comprehend how data-intensive research may provide data of acceptable quality. For this reason, data quality needs to be given proper consideration (Koltay, 2017). While examining quality attributes in-depth trust is contingent upon subjective assessments of the veracity, acceptability, or relevance of the data perceived sourced from low-quality information sources. It is also impacted by the discipline in question, the standing of those who created the data, and the prejudices of those assessing it. It is also associated with the two-tiered concept of cognitive authority (Koltay, 2017). Perceptive authority describes how much data users feel in regard to data when exploring data sourced from low quality sources at an operational level (Koltay, 2017). The data-intensive archetype of scientific study relies heavily on data quality, which is influenced by many different factors.

To develop confidence with data, which is a very hard idea, the provenance, version, and error rate of data, together with its comprehension and acceptance, are all included in the concept of trust (Perrelli, 2022). Authenticity is a significant factor which evaluates how well the data represents the proper methods of conducting scientific research, such as the reliability of the instruments used to collect the data, the soundness of underlying theoretical frameworks, and the data's completeness, accuracy, and validity (Koltay, 2017). In order to evaluate authenticity, the data must be intelligible. Individuals judging data quality must have access to a suitable instrument that demonstrates sufficient integrity to be rendered. To ensure data veracity, it must be possible to show that the data is exactly the same as a previously approved or confirmed condition, down to the last piece. For use, comprehension, authenticity, and ultimately overall quality inform data veracity (Koltay, 2017).

Data literacy is defined as the capacity to access, evaluate, manage, and transform data for practical and research applications. Data literacy abilities enable researchers to use technology to access, manage, analyze, and share data (Perrelli, 2022). The ability to convert data into information and, eventually, actionable knowledge is known as data literacy. It includes establishing hypotheses, recognizing challenges, analyzing data, selecting, organizing, carrying out, and controlling courses of action (Koltay, 2017).

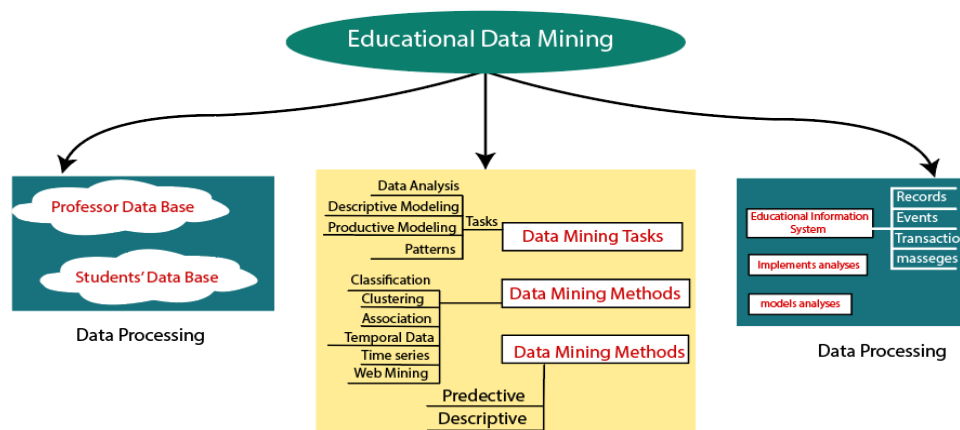
## Big Data in Education Publication Trends



**Figure I: Data wise use in academic inquiry** | Source: Research Gate

Unfortunately, rather than being linked to more expansive ideals of empowerment to extract value from low quality information sources, data literacy has been restricted to a set of technical skills, including making graphs and reading charts. Mining data from many data sources to extract valuable information is regarded as a difficult task in the field of data mining, particularly in today's big data era (Wang et al., 2018). For those who aspire to become data librarians, data literacy is essential to develop the necessary competencies for duty such as productive and successful researchers' assistants. Consequently, it hard and frequently needless to distinguish between the data literacy skills of the information professionals and scholars, especially in case there is a dual target audience. (Koltay, 2017). Since in real-world applications, data saved in several locations frequently have conflicts, information professional should have the necessary data literacy skill to help users/ students overcome conflictions associated with low-quality data (Perrelli, 2022).

According to Gargano & Raggad (1999), knowledge workers can progress to the next level of data analysis by acquiring data literacy skills to enable employment of data mining techniques, which offer even more profound insights than those obtained from executive information systems, production reports, controlled inquiries, and online analytical processing. Also, data user can be impacted with data literacy skills instrumental in obtaining strategic information from their data assets' angling conditions, limitations, or relationships by more thorough and efficient processing of the data warehouse's contents using data mining techniques (Perrelli, 2022). The development of methods for examining the unique kinds of data that come from educational contexts is the main emphasis of scholarly data mining. These data come from a variety of sources, such as online course materials, instructive software, and data from conservative in-person teaching space settings.



**Figure 2: Educational data mining** | Source: Javatpoint





In a dynamic environment, data changes frequently, so the timeliness of data mining provides a significant advantage to the information seeker in establishing quality aspect from information sources often perceived low-quality (Gargano & Raggad,1999). Also, key benefit of data mining is the capacity to seamlessly automate and incorporate some of the routine, repetitive, or tedious decision stages that do not require constant human participation (Perrelli, 2022). Also, the user can obtain strategic information from their low-quality data assets' angling conditions, limitations, or relationships by more thorough and efficient processing of the data warehouse's contents using data mining techniques.



Figure 3: Data Warehouse | Source: Javatpoint

In the present big data era as observed by Wang et al (2018), conflicts arise frequently on low-quality data particularly those kept in numerous locations due to real-world applications. Among the conflicts are identified when the same data object has various names in separate data sources, or two different objects from different data sources have the same name. Equally, Data format conflict may arise when same object in multiple data sources has distinct data types, domains, scales, and precisions (Perrelli, 2022). Further, low-quality data is associated with data value conflicts often exemplified when same object in separate data sources records different values. The low-quality data may present data source conflict explained as different data sources that use different database formats (Wang et al., 2018).

According to Wang (2018), there are four ways which can help to resolve conflicts and enhance mining of usable information and find new knowledge from different data sources. Data literacy among information professional help in pattern analysis, which mines useful patterns and information from one or several data sources in accordance with changing conditions constraints or relationships. Also, equip the ability to use multiple data source classification a strategy that help to label data sources according to a certain standard and then classifies data by their labels. Equally, use of multiple data source clustering strategy a skill that help to clusters data sources according to their similarities/distances as well as multiple data source fusion, which combs data to allow extract of meaningful information from numerous data sources and find new knowledge based on individual needs (Wang et al., 2018).

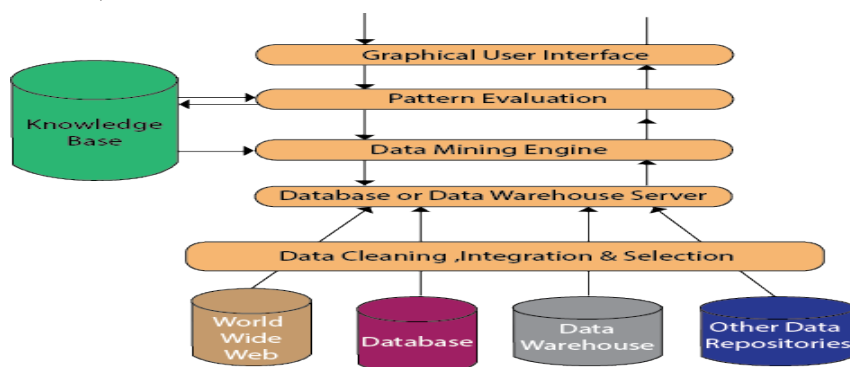
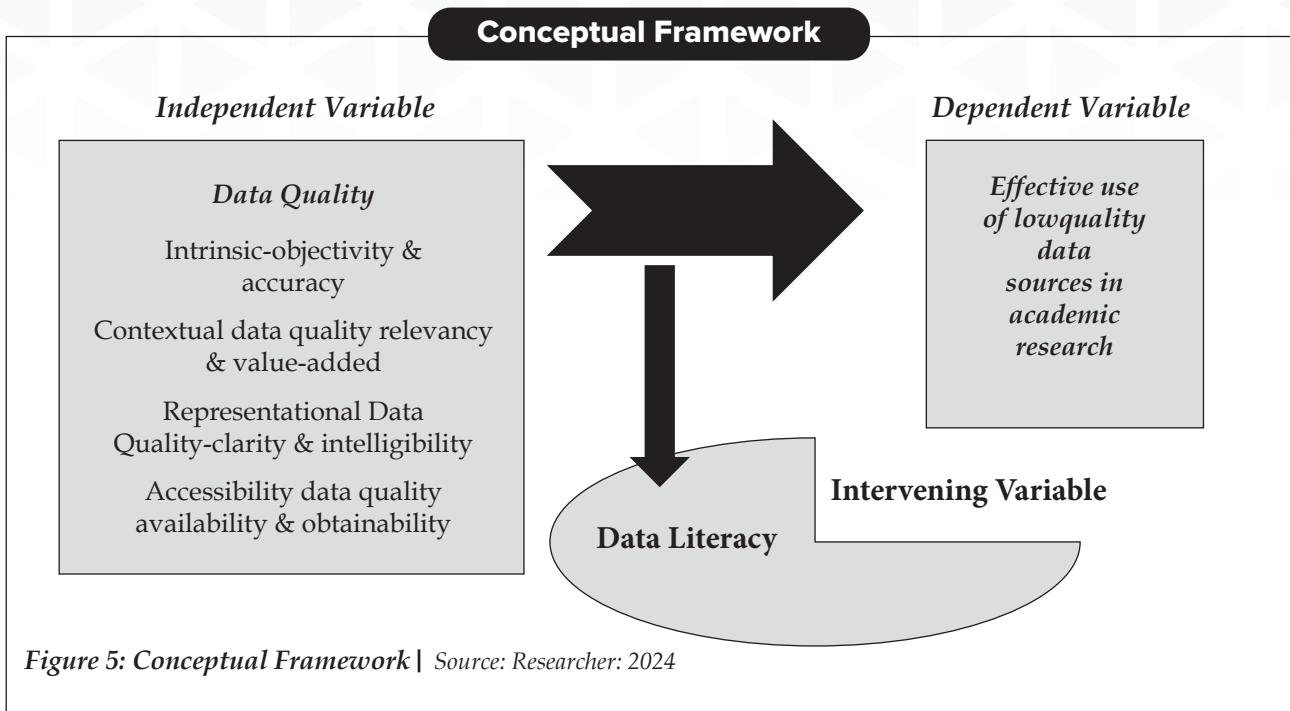


Figure 4: Data Mining Architecture; Source: Javatpoint



A conceptual framework for data quality explains low-quality data concept and how to effectively use the sources. The degree to which data values match true or actual values is addressed by intrinsic data quality. This covers both objectivities, the degree to which information is objective, dispassionate, and unbiased and accurate. Also, the contextual data quality which addresses how relevant data is to the given task. Value-added, or the degree to the extent to which information is beneficial, provides advantages from its use, and relevancy, the extent to which information is applicable and helpful for the task at hand. Representational data quality that addresses the extent to which data are presented in an intelligible and clear manner. Also, accessibility data quality that concentrates on the extent to which data are available and obtainable (Przybylski, 2018).

### 3. Research Methodology

The study conducted a systematic literature review (SLR) to look into existing research on data mining, data literacy, and data quality. A thorough search strategy was devised, utilizing keywords and related terms to locate relevant papers in academic databases. The inclusion criteria were based on qualitative studies from peer-reviewed sources, with non-peer-reviewed articles and irrelevant studies eliminated. Key information from the selected literature was gathered in a methodical manner, including research aims, techniques, and results. The retrieved data were then subjected to thematic analysis, which involves coding and categorizing linked concepts into themes. These themes were developed over several iterations to ensure that they appropriately represented the literature. The chosen ideas were combined into a cohesive narrative that answered the research questions.

### 4. Theme and Discussion

#### 4.1 Empowering knowledge workers through data literacy and mining

Data literacy abilities could allow knowledge workers to easily explore and process data in the organization's data warehouse. Also, they can employ effective data mining techniques to undertake detailed studies of the data warehouse's contents, uncovering patterns, anomalies, and correlations that would otherwise go undetected in low-quality information sources.





#### ***4.2 Data mining strategic advantage***

Data mining becomes even more important when it operates in dynamic situations where data is subject to rapid changes. Information searchers stand to gain a great deal by being able to swiftly glean insights from dynamic data sources. Even though these data sources are thought to be of low quality, they might nevertheless produce important information if examined quickly. Using data mining techniques, individuals may quickly go through enormous amounts of data and find patterns, trends, and anomalies that they might have missed otherwise. Organizations may capitalize on emerging possibilities, reduce potential risks, and make timely choices by staying ahead of changes in the data landscape.

#### ***4.3 Strategic techniques in knowledge extraction***

Data literacy helps information workers to conduct pattern analysis, which entails extracting relevant patterns and information from one or more data sources. Understanding changing conditions, restrictions, and relationships within the data allows information professionals to uncover significant patterns that provide useful insights for decision-making and strategic planning. The categorization of various data sources is also an effective tactic that enable classifying of data based on labels applied to data sources in accordance with a predetermined standard. Information experts can efficiently classify data for analysis and interpretation and speed up the data mining process by structuring data sources.

#### ***4.4 Understanding data quality for useful applications***

Intrinsic data quality described as the degree to which data values match true or actual values is one facet of data quality which help users look at data's impartiality, correctness, and dependability. While accuracy relates to the precision and correctness of the data, objectivity refers to the degree to which the information is unbiased and impartial. Maintaining the integrity and reliability of data sources requires a high inherent data quality by evaluating the data's added value and suitability for particular tasks or decision-making processes. Equally, the intelligibility and clarity of data presentation are addressed by representational data quality. It evaluates how well data are presented to allow users to properly comprehend and analyze information in a cohesive and understandable way for informed decision-making.

### **5. Conclusion and Recommendation**

The importance of data literacy and mining in enabling knowledge workers to efficiently access and process data within organizational data warehouses is emphasized. Using data mining techniques, knowledge workers can delve into the contents of data warehouses, revealing useful patterns and correlations that would otherwise go unnoticed in low-quality data. In dynamic situations, data mining emerges as a strategic advantage, allowing firms to quickly extract insights from fast changing data sources, capitalizing on new opportunities while reducing potential hazards. Strategic techniques such as pattern analysis and data source classification improve knowledge extraction, allowing information professionals to gain useful insights for decision-making and strategic planning. Finally, knowing data quality dimensions such as intrinsic, contextual, representational, and accessibility data quality in often perceived low-quality information sources is critical for guaranteeing data dependability, relevance, and usability in a variety of applications. Consequently, the study recommends exploration of data mining literacy gap among knowledge workers. Additionally, a study should be conducted to establish the strategic data analysis techniques including pattern analysis and data source classification in different scholarly disciplines.

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# Challenges of Library Management Systems Quality and Standards through Time and Rapid Change

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## Abstract

*Library management systems (LMS) are essential tools for providing quality and efficient library services. However, maintaining the quality and standards of LMS is a challenging task for libraries, particularly in the face of rapid technological changes. Despite the critical role of LMS in library services, there is limited research on the challenges faced by libraries in maintaining the quality and standards of their LMS through time and rapid change. Therefore, this study aims to explore the challenges faced by libraries in maintaining the quality and standards of their LMS and develop recommendations for addressing these challenges. The study will use a content analysis approach to analyze and interpret data collected from various sources, including academic journals, conference proceedings, reports, and interviews with library professionals. The study's objectives are to identify the challenges faced by libraries in maintaining the quality and standards of their LMS, examine the impact of these challenges on library services, and develop recommendations for improving LMS quality and standards in libraries. The findings indicate that libraries face significant challenges in keeping their LMS up to date with the latest technologies and standards. Outdated software, inadequate training, and a lack of technical support are among the most significant challenges identified. The study recommends that libraries upgrade their LMS to newer versions that can better accommodate the needs of their patrons and staff. It also recommends that libraries establish standards and guidelines for LMS quality and performance to ensure that their systems meet the needs of their users.*

**Keywords:** Library management systems, Quality standards, Technological change, Time & Rapid change

## 1. Introduction

Globally, the rapid evolution of technology poses significant challenges for library management systems (LMS). Libraries must continuously adapt to technological advancements, but this often results in difficulties integrating new systems with existing infrastructure. The lack of universal standards further complicates this, as diverse LMS platforms struggle with interoperability, hindering global collaboration (Jin et al., 2020). Data security is also a global concern, as the shift towards cloud-based LMS raises issues of compliance with international data protection laws, such as the GDPR in Europe (Smith & Wong, 2021).

Regionally, economic disparities profoundly influence the quality and standards of LMS. In developing regions like Africa and Southeast Asia, limited funding and outdated infrastructure restrict the adoption of advanced LMS, creating a gap between these regions and their more developed counterparts (Adeyemi, 2019). Additionally, regions with high linguistic and cultural diversity face challenges in creating LMS that cater to all user groups effectively. For example, multilingual regions may struggle to implement systems that adequately support multiple languages (Nassir & Afolabi, 2022). Regional policies, such as Europe's stringent data protection regulations, also impact how LMS are designed and operated, leading to regional inconsistencies in LMS quality (Wickham, 2020).



Locally, the challenges of maintaining LMS quality and standards are more practical and context-specific. Budget constraints often limit local libraries' ability to adopt and maintain cutting-edge systems, leading to a reliance on outdated LMS that do not meet modern standards (Johnson, 2018). Additionally, the effectiveness of LMS is closely tied to staff training; inadequate training can lead to poor system usage and diminished service quality (Clark, 2021). Infrastructure issues, such as unreliable internet connectivity in rural areas, further impede the functionality and quality of local LMS (Miller, 2022).

Library management systems (LMS) are critical tools for libraries to provide quality and efficient services to their patrons. LMS are software applications designed to manage library collections, services, and operations (Alharbi & Maynard, 2017). The system allows librarians to catalog, track, and manage library materials, automate circulation tasks, and provide online access to library resources. LMS have been instrumental in transforming library services from traditional manual processes to automated and efficient systems. Despite the critical role of LMS in library services, there is limited research on the challenges faced by libraries in maintaining the quality and standards of their LMS through time and rapid change. Therefore, this study aims to address this gap by exploring the challenges faced by libraries in maintaining the quality and standards of their LMS, and developing recommendations for addressing these challenges.

### ***1.1 Library Management Systems***

In Africa, various Library Management Systems (LMS) such as Koha, Greenstone, Virtua, and Millennium are employed to enhance library operations. Koha, known for its flexibility and cost-effectiveness, is the most widely used LMS across the continent. In Kenya, institutions like the University of Nairobi and Kenyatta University rely heavily on Koha for resource management, while Greenstone and LibHub are also used for digital collections and content management (Muraguri, 2019).

The quality and standards of LMS are vital for effective library operations, ensuring that libraries can manage collections and provide access to resources efficiently. Smith and Wong (2021) emphasize that an LMS's effectiveness hinges on its ability to integrate with existing systems, secure data, and support diverse user needs. However, maintaining these standards is challenging, particularly due to rapid technological advancements. Taylor (2019) points out that outdated LMS can lead to inefficiencies and user dissatisfaction, while Johnson (2021) notes the complications arising from the lack of standardized guidelines. To address these issues, Clark (2021) recommends regular system upgrades, adequate staff training, and the establishment of clear guidelines for LMS performance and security.

### ***1.2 Statement of the Problem***

The advancement of technology has significantly impacted the way library's function and operate, and library management systems (LMS) have become an essential tool for managing library operations (Chowdhury, 2010).). The increasing demand for better services and the rapid changes in technology have resulted in challenges for maintaining the quality and standards of library management systems over time.

One of the main challenges faced by libraries is the outdated software used in their LMS. Most libraries are still using legacy systems that are no longer supported or updated by vendors, making it difficult for libraries to keep up with the latest technological advancements (Devarakonda & Mathews, 2017). Another challenge is the lack of technical support available for libraries to maintain and troubleshoot their systems. This lack of support can lead to system downtime and negatively impact library services (Haddow, 2014).



In addition to these challenges, libraries also struggle with integrating different systems. As libraries expand their services to include digital collections and electronic resources, integrating these resources into their existing LMS can be challenging. Moreover, libraries also face difficulties in providing sufficient training and skills development to their staff to adapt to new technologies and improve their ability to use LMS effectively (Singh, 2017).

These challenges can significantly impact the quality and standards of library management systems, and subsequently, affect the ability of libraries to provide efficient and effective services to their users. Without addressing these challenges, libraries may face a decline in user satisfaction and a decrease in the use of library resources.

Therefore, it is essential to investigate the challenges faced by libraries in maintaining the quality and standards of their LMS and to identify possible solutions to address these challenges. This research can provide insights into the challenges faced by libraries in managing their systems and offer recommendations for improving the quality and standards of LMS to ensure efficient and effective library services.

### **1.3 Objectives**

1. To identify the current challenges faced by libraries in maintaining the quality and standards of their LMS in the context of time and rapid changes in technology.
2. To evaluate the impact of outdated software, lack of technical support, integration difficulties, and inadequate training on the quality and standards of LMS in libraries.
3. To develop recommendations for addressing the challenges identified and improving the quality and standards of LMS in libraries, including strategies for upgrading and modernizing LMS, providing sufficient training and support to library staff, and establishing standards and guidelines for LMS quality and performance.

### **1.4 Significance of the study**

- ❖ **Improved library services:** The study provides insights into the challenges faced by libraries in maintaining the quality and standards of their LMS and offer recommendations for addressing these challenges. This led to improved library services, better user experience, and increased user satisfaction.
- ❖ **Cost savings:** By identifying the challenges faced by libraries in managing their LMS and developing recommendations for addressing these challenges, the study help libraries save costs associated with system downtime, system inefficiencies, and staff training needs.
- ❖ **Knowledge advancement:** The study contributes to advancing knowledge in the field of library science by providing insights into the challenges and opportunities related to LMS quality and standards, and identifying potential solutions and best practices.
- ❖ **Policy and standard development:** The study informs the development of policies and standards related to LMS quality and standards. By identifying the challenges faced by libraries and developing recommendations for addressing these challenges, the study helps establish guidelines and best practices that can be adopted by libraries and policy-makers.
- ❖ **Future research:** The study can identify areas for future research related to LMS quality and standards. By highlighting gaps in the current literature and identifying new research directions, the study can inspire further research in this area, leading to further improvements in library services and technology.



## 1.5 Theories of the study

The study utilized two theories; diffusion of innovation theory and Information Ecology Theory (IET).

### **Diffusion of Innovations Theory**

The Diffusion of Innovations Theory, first proposed by Everett Rogers in 1962, is a theoretical framework that has been widely used in studying the adoption and diffusion of new technologies (Rogers, 1962). The theory posits that the adoption of new technologies follows a bell-shaped curve, with innovators being the first to adopt, followed by early adopters, early majority, late majority, and laggards. The rate of adoption is influenced by a number of factors, including the perceived benefits and risks of the technology, the characteristics of the individuals or organizations adopting the technology, and the communication channels used to spread information about the technology (Rogers, 2003).

In relation to the study on the challenges of library management systems quality and standards through time and rapid change, the Diffusion of Innovations Theory could be used to understand the adoption and diffusion of library management systems among libraries over time. The theory suggests that the adoption of these systems would have followed a similar bell-shaped curve, with early adopters being the first to embrace the new technology, followed by the majority of libraries (Greenhalgh *et al.*, 2004; Ryan, 1991). The rate of adoption would have been influenced by factors such as the perceived benefits and risks of the technology, the availability of resources, and the communication channels used to spread information about the technology.

Understanding the factors that influence the adoption and diffusion of library management systems could provide insights into the challenges faced by libraries in implementing and maintaining these systems over time (Valente, 1995; Zhang, Yu, & Hu, 2017). For example, the theory suggests that communication channels may play a key role in the adoption of new technologies, highlighting the importance of effective communication strategies in promoting the adoption and use of library management systems. The Diffusion of Innovations Theory provides a useful theoretical framework for understanding the adoption and diffusion of library management systems and their impact on the quality and standards of library services over time.

### **Information Ecology Theory (IET)**

Information Ecology Theory (IET) is a theoretical framework that examines the interactions between individuals, organizations, and technology within a particular environment. The theory posits that these interactions create an ecosystem, or information ecology, in which individuals and organizations are both influenced by and influential to their surrounding environment (Davenport & Prusak, 1997; Kim & Stanton, 2012). This ecosystem is shaped by a variety of factors, including social norms, power dynamics, and technological affordances.

In relation to the study on the challenges of library management systems quality and standards through time and rapid change, IET could be used to understand how the changing technological environment of libraries, including the adoption and use of library management systems, affects the quality and standards of library services (Hara *et al.*, 2003; Kling, & McKim, 1999). The theory suggests that the introduction of new technologies creates a new information ecology, which can both facilitate and impede the goals and practices of the individuals and organizations within the ecology. For example, the introduction of a new library management system may provide new technological affordances that enable librarians to more effectively manage their collections, but may also require significant changes to the practices and procedures of the library, which can create challenges and resistance to the adoption of the new system (Sonnenwald, 2007).



By examining the interactions between individuals, organizations, and technology within the context of the information ecology of libraries, IET provides a useful framework for understanding the challenges faced by libraries in maintaining the quality and standards of their services in the face of rapid technological change.

## **2. Research Methodology**

The study used a qualitative research design, specifically content analysis, to analyze and interpret data collected from various sources, such as literature reviews, case studies, and interviews with library professionals (Creswell, 2014; Denzin, & Lincoln, 2017). Data was collected from a variety of sources, including academic journals, conference proceedings, reports, and online resources, such as blogs and websites. Content analysis analyze the data collected. The data was analyzed using both inductive and deductive approaches, where themes and patterns were identified based on the data, and hypotheses tested based on existing theories and models (Bryman, 2016). The data was interpreted based on the identified themes and patterns. The interpretation involved identifying the challenges faced by libraries in maintaining the quality and standards of their LMS and the impact of these challenges on library services. The validity and reliability of the study was ensured by triangulating the data from multiple sources and using a systematic data analysis (Babbie, 2016).

### **2.1 Analysis**

#### **Current challenges faced by libraries in maintaining the quality and standards of their LMS**

Libraries play a crucial role in the dissemination of knowledge and information to the public. In recent years, libraries have had to adapt to rapid changes in technology and the growing demand for online access to information (Dempsey, 2015). The widespread use of library management systems (LMS) has been a key element in this transformation. LMS enables libraries to manage their collections and services efficiently and effectively. However, maintaining the quality and standards of LMS has been a significant challenge in the context of rapid changes in technology (Luo & He, 2019).

One of the current challenges faced by libraries is the need to keep pace with new developments in LMS technology. According to McMenemy & Poulter, (2011) suggests that with the rapid pace of technological change, libraries need to ensure that their LMS remains up to date and can meet the changing needs of their users. This can be challenging, as it requires significant investment in both time and resources. Libraries must also ensure that the LMS they use is secure, reliable, and user-friendly (Balakrishnan, 2015).

Another challenge faced by libraries is the need to maintain the quality and standards of LMS in the face of increasing pressure to provide digital services. Zhang, Zhang & Yan, (2017) say that libraries must ensure that their LMS is accessible to users with disabilities and that it meets the needs of a diverse user base. They must also ensure that the information provided through the LMS is accurate and up to date, and that it is presented in a way that is easy to understand (Gao & Li, 2016).

In addition, libraries face the challenge of balancing the need for innovation with the need for stability and consistency. While libraries must continually adapt to new technologies and changing user needs, they must also maintain the stability and consistency of their LMS (Kaur, 2018; Makri & Blandford, 2012). This can be challenging, as it requires careful planning and management to ensure that any changes made to the LMS do not disrupt the existing services and collections.

In conclusion, libraries face significant challenges in maintaining the quality and standards of their LMS in the context of rapid changes in technology. According to Pham & Nguyen, (2017), observes that libraries must keep pace with new developments in LMS technology, maintain the quality and



accessibility of their digital services, and balance the need for innovation with the need for stability and consistency (Oyedokun & Jegede, 2018; Yadav & Yadav, 2018). By addressing these challenges, libraries can continue to play a vital role in the dissemination of knowledge and information to the public.

### **Impact of outdated software, lack of technical support, integration difficulties, and inadequate training**

Library management systems (LMS) are essential tools used by libraries to provide quality services to their users. The quality and standards of LMS are critical for libraries to achieve their objectives effectively (Barron, 2018). However, several challenges can negatively affect the quality and standards of LMS, including outdated software, lack of technical support, integration difficulties, and inadequate training.

Outdated software is one of the most significant challenges that can affect the quality and standards of LMS in libraries. Kerns & Raju, (2013) suggests that libraries that use outdated software are likely to experience issues such as security breaches and reduced productivity. Outdated software is also not compatible with newer hardware, making it difficult for libraries to upgrade their systems. As a result, libraries that use outdated software may find it challenging to provide quality services to their users (Kirsop & Hathaway, 2015).

Lack of technical support is another challenge that can affect the quality and standards of LMS. Technical support is essential for ensuring that the LMS runs smoothly and that any issues that arise are addressed promptly (Kumbhar, 2013). Without adequate technical support, libraries may experience downtime, reduced productivity, and a decline in the quality of service provided to their users. Libraries should, therefore, ensure that they have access to adequate technical support to address any issues that may arise (Koontz & Brown, 2014).

Integration difficulties can also negatively impact the quality and standards of LMS in libraries. Integration is critical for ensuring that LMS is seamlessly integrated with other library systems and services, such as online catalogs and databases (Tao, Huang & Liu, 2016). Without proper integration, libraries may experience difficulties in providing comprehensive services to their users, leading to a decline in the quality of service provided. Libraries should, therefore, ensure that their LMS is adequately integrated with other systems to ensure the smooth running of services (De Ligt, 2019).

According to Chikate & Pradhan, (2017), inadequate training is another challenge that can affect the quality and standards of LMS in libraries. Training is essential to ensure that library staff can use the LMS effectively and efficiently, enabling them to provide high-quality services to their users. Without adequate training, libraries may experience staff turnover, reduced productivity, and a decline in the quality of service provided. Libraries should, therefore, invest in training their staff to ensure that they are equipped with the necessary skills to use the LMS effectively (Cullen, 2013).

In conclusion, the impact of outdated software, lack of technical support, integration difficulties, and inadequate training on the quality and standards of LMS in libraries is significant. Libraries must address these challenges to ensure that their LMS runs smoothly and that the quality of service provided to their users is of the highest possible standard (Ocholla & Onyancha, 2017). By investing in up-to-date software, adequate technical support, integration services, and adequate training, libraries can provide quality services to their users and meet their objectives effectively.





### **Solutions to the challenges identified and improving the quality and standards of LMS in libraries**

Many researchers have suggested various solutions for addressing the challenges identified and improving the quality and standards of LMS in libraries. One of the primary strategies recommended by researchers is the upgrading and modernization of LMS (Al-Ghamdi, 2021). The outdated software and lack of technical support can be addressed by upgrading the LMS software to the latest version that provides enhanced features, security, and support. This would require significant investments, but it will ensure that the library remains relevant and provides quality services to its patrons (Bhatti, Mahmood & Bashir, 2016).

Another solution suggested by researchers is the provision of sufficient training and support to library staff. Libraries must provide regular training to their staff on the use of the LMS software and its latest updates (Chisenga, 2018). This will ensure that staff is equipped with the necessary skills and knowledge to operate the LMS software effectively. Adequate support must also be provided to the staff, ensuring that they can resolve any issues related to the LMS software promptly.

Establishing standards and guidelines for LMS quality and performance is also essential for improving the quality and standards of LMS in libraries. Standards and guidelines will help libraries in ensuring that their LMS is meeting the minimum quality and performance requirements (Kim & Kim, 2018). It will also ensure that the LMS is compatible with other systems, which is essential for the integration of LMS with other library services.

Furthermore, researchers have suggested that libraries should also consider adopting open-source LMS solutions (Li, 2017; Luyt & Hall, 2016; Sadeh & Borenstein, 2017). Open-source solutions can provide many advantages, including flexibility, customization, and low cost. Moreover, open-source solutions have a vast community of developers and users, providing libraries with access to a range of support and resources.

In addition, collaboration between libraries and LMS vendors is crucial for improving the quality and standards of LMS in libraries. The LMS vendors should engage with libraries to understand their unique needs and challenges, providing them with tailored solutions that address their specific needs (Sahu & Patel, 2016).

According to Vahedi & Nasiri, (2019), suggests that, in addressing the challenges identified and improving the quality and standards of LMS in libraries requires a range of solutions. Strategies such as upgrading and modernizing LMS, providing sufficient training and support to library staff, establishing standards and guidelines, adopting open-source solutions, and collaborating with LMS vendors are all essential for ensuring that libraries provide quality services to their patrons (Wu & Shih, 2019). These solutions require investments and efforts, but they are necessary for libraries to remain relevant in the digital age.

### **3. Conclusions**

In conclusion, libraries face a number of challenges in maintaining the quality and standards of their Library Management Systems (LMS) due to the rapid pace of technological change. The challenges include outdated software, lack of technical support, integration difficulties, and inadequate training. These challenges can result in reduced efficiency, decreased user satisfaction, and a negative impact on the overall quality and effectiveness of the library's services.

To address these challenges, researchers have proposed several strategies for upgrading and modernizing LMS, providing sufficient training and support to library staff, and establishing

standards and guidelines for LMS quality and performance. These strategies include the adoption of cloud-based solutions, investing in staff training and development programs, establishing vendor partnerships for ongoing technical support, and developing a set of standards for LMS quality and performance.

It is clear that addressing the challenges faced by libraries in maintaining the quality and standards of their LMS requires a multi-faceted approach that involves the cooperation of various stakeholders, including library administrators, IT staff, and vendors. By implementing the recommendations outlined in the literature, libraries can ensure that their LMS is up-to-date, efficient, and user-friendly, thereby enhancing the overall quality of their services and providing a better experience for their users.

In conclusion, while the challenges facing libraries in maintaining the quality and standards of their LMS are significant, the strategies proposed by researchers offer practical solutions that can help libraries overcome these challenges and provide a better service to their users. By investing in the modernization of their LMS and the ongoing training and development of their staff, libraries can ensure that they are able to keep pace with the rapid changes in technology and continue to provide high-quality services to their communities.

#### **4. Recommendations**

- ❖ **Upgrading and modernizing LMS:** Libraries should regularly evaluate their LMS and upgrade to newer versions to ensure compatibility with changing technology and to take advantage of new features and functionalities. This can also involve migrating to cloud-based solutions for easier maintenance and scalability.
- ❖ **Providing sufficient training and support to library staff:** Libraries should provide ongoing training and support to their staff to ensure they are equipped with the necessary skills and knowledge to effectively use and manage the LMS. This can include training sessions, online resources, and regular communication with technical support staff.
- ❖ **Establishing standards and guidelines for LMS quality and performance:** Libraries should establish clear standards and guidelines for the selection, implementation, and evaluation of LMS to ensure they meet quality and performance standards. This can involve engaging with industry associations and other libraries to develop best practices and standards.
- ❖ **Engaging with vendors and service providers:** Libraries should establish strong relationships with vendors and service providers to ensure they receive timely technical support, updates, and training. Libraries should also involve vendors in the selection process to ensure they meet the library's specific needs.
- ❖ **Collaborating with other libraries:** Libraries should collaborate with other libraries to share best practices and resources for managing LMS. This can include sharing training resources, collaborating on purchasing decisions, and developing shared standards and guidelines.



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# Application of Artificial Intelligence in the Diagnosis of Chronic Diseases: A Systematic Review

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## Abstract

*The diagnosis of diseases is decisive for planning proper treatment and ensuring the well-being of patients. Human error may hinder accurate diagnosis, as interpreting medical information is a complex and cognitively challenging task. Artificial intelligence (AI) has demonstrated significant potential in revolutionizing the diagnosis of chronic diseases, offering innovative solutions to improve accuracy, efficiency and accessibility. This systematic review aimed to synthesize existing literature on the accuracy and reliability of AI-based diagnostic tools, explore the implications of their implementation and compare these tools with conventional diagnostic methods. By examining recent studies, this review highlights the potential of AI to enhance diagnostic precision, streamline healthcare processes, and improve patient outcomes. A comprehensive search of electronic databases yielded studies published between January 2010 and December 2023. The review included studies focusing on AI-driven diagnostic tools for cardiovascular diseases, diabetes, cancer and respiratory disorders. Methodological quality was assessed and data were synthesized to examine AI techniques, diagnostic performance metrics, and implications for clinical practice. The review underscores the potential of AI to enhance diagnostic accuracy and efficiency across a spectrum of chronic diseases. However, challenges such as data standardization, regulatory compliance, and ethical considerations need to be addressed to realize the full benefits of AI-enabled healthcare.*

**Keywords:** Artificial Intelligence, Chronic Diseases, Diagnosis, Machine Learning, Deep Learning, Algorithm, Healthcare ...

## 1. Introduction

Chronic diseases are long-lasting conditions that can be controlled but not cured, often requiring ongoing medical attention and affecting patients' quality of life. According to the World Health Organization (WHO, 2022), chronic diseases are the leading cause of death worldwide, accounting for 71% of all deaths globally. The rising prevalence of chronic diseases has placed a significant burden on healthcare systems, necessitating more efficient and accurate diagnostic methods. Timely and accurate diagnosis not only improves patient outcomes but also optimizes healthcare resource utilization. Traditional diagnostic approaches, which rely heavily on human expertise and are often time-consuming, are sometimes prone to human error, which can lead to misdiagnosis and delayed treatment.

With the advent of artificial intelligence (AI), there has been a paradigm shift in diagnostic methodologies, offering automated and data-driven solutions to improve accuracy, efficiency and accessibility. AI involves the use of advanced algorithms and machine learning techniques to analyse large datasets, identify patterns, and make predictions, mimicking human cognitive functions. In healthcare, AI-based diagnostic tools can process vast amounts of medical data, including electronic health records, imaging scans, and genetic information, to assist clinicians in making more accurate diagnoses. This systematic review aims to explore the role of AI in diagnosing chronic diseases, focusing on its accuracy, reliability, and implications for healthcare.



### **1.1 Research Objectives**

- ❖ To evaluate the Reliability of AI-based Diagnostic Tools in chronic diseases.
- ❖ To explore implications of implementing AI in comparison to conventional procedures of chronic diseases diagnosis.
- ❖ To assess the Comparison between Artificial Intelligence and Clinicians in diagnosis of chronic diseases.

## **2. Literature Review**

The use of AI in healthcare has been a subject of growing interest and research, driven by the potential of AI to improve diagnostic accuracy, enhance patient care, and reduce healthcare costs. AI technologies, particularly machine learning and deep learning, have shown remarkable capabilities in processing complex medical data and making predictions that can support clinical decision-making. This literature review examines the key concepts related to chronic diseases, the role of AI in medical diagnostics, and the specific applications and impacts of AI in diagnosing chronic diseases.

### **2.1 Chronic Diseases**

Chronic diseases are defined as conditions that last one year or more and require ongoing medical attention or limit activities of daily living. Examples include diabetes, cardiovascular diseases, cancer, chronic respiratory diseases, and neurodegenerative disorders such as Alzheimer's disease. The global burden of chronic diseases is increasing, driven by aging populations, lifestyle changes, and environmental factors. Effective management of chronic diseases requires accurate diagnosis, early detection, and continuous monitoring to prevent complications and improve patient outcomes (WHO, 2022).

### **2.2 Artificial Intelligence**

AI refers to the simulation of human intelligence processes by computer systems. These processes include the ability of a machine to acquire information to perform cognitive functions that we associate with human minds, such as perceiving, reasoning, learning, interacting with the environment, problem solving, decision-making, and even demonstrating creativity. Machine learning (ML), a subset of AI, uses statistical techniques to enable machines to improve their performance with experience. Deep learning, a more advanced subset of ML, uses neural networks with multiple layers to analyse data with a high level of abstraction (Esteva et al., 2019).

### **2.3 AI in Diagnosis of Chronic Diseases**

Medical diagnostics refers to the systematic evaluation of medical problems or diseases through examination and interpretation of symptoms, medical history and test results. The primary objective of medical diagnostics is to ascertain the underlying aetiology of a medical condition and provide a precise diagnosis, thereby facilitating the administration of suitable therapeutic interventions. The diagnostic process may involve the utilization of several techniques, such as imaging modalities including X-rays, MRIs, and CT scans, as well as blood tests and biopsy procedures. The results of these tests assist healthcare providers in determining the optimal treatment approach for their patients. Medical diagnostics serve multiple purposes, including monitoring the evolution of a condition, assessing the effectiveness of therapy, detecting potential health concerns at an early stage, and facilitating the identification of medical disorders. (Jones, 2023).

Existing research explores AI's role in diagnosing a wide range of chronic diseases, including cardiovascular diseases, respiratory illnesses, diabetes, and various cancers. Studies have investigated the use of AI with diverse data modalities, including medical imaging; electronic health records (EHRs) and genomic data (Gulshan et al., 2016). Numerous studies have demonstrated the potential



of AI in diagnosing chronic diseases across various medical specialties. In cardiovascular diseases, AI has been utilized for electrocardiogram (ECG) interpretation, echocardiography analysis, and risk prediction of myocardial infarction and heart failure. ML algorithms trained on large-scale ECG datasets have shown promising results in detecting arrhythmias and other cardiac abnormalities with high sensitivity and specificity (Hannun et al., 2019). In diabetes diagnosis, AI-driven tools have been developed for early detection of diabetic retinopathy, prediction of diabetic foot ulcers, and optimization of insulin therapy. Deep Learning models trained on retinal fundus images have demonstrated excellent performance in detecting diabetic retinopathy stages. AI-based risk prediction models incorporating clinical variables and genetic markers have shown potential for personalized diabetes management (Ting et al., 2017). Cancer diagnosis and prognosis have benefited significantly from AI-powered imaging and genomic analysis techniques. DL algorithms applied to medical imaging modalities such as mammography and computed tomography (CT) scans have shown remarkable accuracy in detecting breast cancer, lung cancer, and other malignancies at early stages. Furthermore, AI-driven genomic profiling tools have facilitated molecular subtyping of tumours, guiding targeted therapy selection and predicting treatment response (Esteva et al., 2017). Respiratory disorders, including asthma, chronic obstructive pulmonary disease (COPD), and pulmonary infections, pose significant diagnostic challenges. AI-based diagnostic tools leveraging spirometry data, pulmonary function tests, and chest imaging have shown promise in early detection and severity assessment of respiratory diseases. DL models trained on chest radiographs and CT scans have demonstrated high accuracy in detecting pulmonary nodules and other radiographic abnormalities (Lundervold & Lundervold, 2019). Infectious diseases, such as tuberculosis, HIV/AIDS, and COVID-19, require rapid and accurate diagnostic methods. AI-enabled diagnostic tools, including automated microscopy and nucleic acid amplification tests (NAATs), have been developed to streamline pathogen detection and characterization. DL algorithms applied to chest imaging have shown potential for diagnosing COVID-19 pneumonia and distinguishing it from other respiratory infections (Shan et al., 2020).

### **2.4 Impact of AI in Medical Diagnosis**

The impact of AI on medical diagnosis is profound, offering the potential to improve diagnostic accuracy, reduce diagnostic errors, and enhance the overall efficiency of healthcare systems. AI-based tools can process large volumes of data quickly and accurately, providing real-time diagnostic support to clinicians. This capability is particularly valuable in resource-limited settings, where access to specialized medical expertise may be limited. Additionally, AI can help reduce the burden on healthcare professionals by automating routine diagnostic tasks, allowing them to focus on more complex cases (Topol, 2019). AI has been used to enhance medical diagnosis (Chen et al. 2019a, b). The technology, which is currently in use in China, may detect hazardous tumours and nodules in patients with lung cancer, allowing physicians to provide an early diagnosis rather than sending tissue samples to a lab for testing, allowing for earlier treatment (Keenan et al. 2020). However, the implementation of AI in healthcare also raises ethical and practical challenges, including concerns about data privacy, the need for rigorous validation of AI algorithms, and the potential for job displacement among healthcare workers. (Morley et al., 2020).

## **3. Research Methodology**

The literature search was conducted in electronic databases including Scopus, PubMed, CINAHL, Web of Science, Embase and Cochrane Library to identify relevant Studies involving human subjects and employing various AI techniques in diagnosing chronic diseases. The search strategy utilized a combination of medical subject headings terms and keywords related to artificial intelligence, diagnosis, and chronic diseases. The inclusion criteria encompassed original research articles written in English that focused on AI applications in diagnosing. The search was limited to articles





published between the year 2000 and 2023. Additional potentially eligible articles were manually searched via screening of the reference list of included articles as well as our personal archives. The inclusion criteria focused on studies that evaluated the accuracy, reliability, and implementation implications of AI-based diagnostic tools in chronic diseases. Studies were excluded if they did not provide empirical data or if they focused solely on AI applications outside the scope of chronic disease diagnosis. (Smith et al., 2018).

## **4. Results and Discussions**

Following the systematic search process, 1,021 citations were retrieved from the database and 900 articles were excluded based on their titles and abstracts, resulting in 121 articles meeting the inclusion criteria after screening and full-text assessment, covering 31 diseases from 11 groups of diseases. The included studies covered a diverse range of chronic diseases, including cardiovascular diseases, diabetes mellitus, cancer, respiratory disorders and infectious diseases. The majority of studies employed ML algorithms, particularly support vector machines (SVM), random forests, and logistic regression, for diagnostic classification and risk prediction. DL techniques, such as convolutional neural networks (CNNs) and recurrent neural networks (RNNs), were predominantly used for image-based diagnoses, such as detecting pulmonary nodules in chest radiographs or classifying histopathological slides. (Litjens et al., 2017). Across the included studies, various performance metrics were reported to evaluate the diagnostic accuracy of AI models, including sensitivity, specificity and area under the receiver operating characteristic curve (AUC). The results demonstrated promising performance of AI algorithms in diagnosing chronic diseases, with many achieving comparable or superior accuracy to conventional diagnostic methods. (Chollet et al., 2021).

### **4.1 Distribution**

#### **Distribution of Articles by Year**

The review identified a growing number of studies on AI-based diagnostic tools for chronic diseases, with a noticeable increase in publications over the past decade. This trend reflects the rapid advancements in AI technology and the increasing interest in applying AI to healthcare.

#### **Distribution of articles by outlet**

Most of the reviewed studies were published in journals specializing in medical informatics, AI, and healthcare technology, such as the Journal of the American Medical Informatics Association (JAMIA) and the IEEE Journal of Biomedical and Health Informatics. From a total of 121 articles, 95 (78.51%) were in journals, and only 26 (21.49%) were conference publications. Most articles (72, 59.50%) came from 12 outlets and were published in practice-oriented journals. This distribution highlights the interdisciplinary nature of research on AI in healthcare, involving collaboration between computer scientists, healthcare professionals, and researchers in biomedical informatics.

#### **Distribution of Articles by Category**

Articles were categorized based on the type of chronic disease studied, including diabetes, cardiovascular diseases, cancer, and respiratory illnesses. The highest number of studies focused on cardiovascular diseases and cancer, with 34 articles, reflecting their high prevalence and the critical need for accurate diagnostic tools.

### **4.2 Reliability of AI-based Diagnostic Tools in Chronic Diseases**

Performance indices reported in articles included diagnostic accuracy, weighted errors, false-positive rate, sensitivity, specificity, and the area under the receiver operating characteristic curve. The results showed that the performance of AI was at par with that of clinicians and exceeded that of clinicians



with less experience. Studies have shown that AI systems can maintain high diagnostic accuracy even when tested on external validation datasets, indicating their robustness and generalizability (Liu et al., 2019)

AI-based diagnostic tools showed consistency in their diagnostic performance across different datasets and patient populations, indicating robustness and generalizability. AI performs at par with human experts in terms of image analysis. Image analysis involves a number of object-identification tasks whose outputs rely exclusively on the detection and interpretation of concrete features such as shapes and colours. The tireless learning abilities of AI can complement cognitive fatigue in humans and can substantially improve clinical efficiency. Its outstanding performance, comparable with that of experts, saves huge amounts of time in clinical practice, which, in turn, alleviates the tension in the long-established process of the transition from novice clinician to expert. The literature has shown that AI has comparable performance with medical experts. Major advanced AI approaches such as deep learning and CNNs yield significant discriminative performance upon provision of sufficient training datasets. In addition to relatively high sensitivity and specificity in object-identifying tasks, the advantages of AI have also been visible in the instantaneity of reporting and consistency of producing results. Although neural network approaches generally require substantial data for training, recent research suggested that it may be feasible to apply AI to rare diseases and, in particular circumstances, to databases where a large number of examples are not available.

Many applications, such as image identification, data mining, natural language processing, and illness diagnosis, rely on machine learning. ML can help in all of these areas.

Many algorithms have produced positive outcomes because they properly detect the property. According to a recent study, SVM has a 94.60 percent accuracy rate for detecting heart problems. Naive Bayes accurately diagnoses diabetes. It has a classification accuracy of 95%. For the diagnosis of liver illness, FT has a 97.10 percent accuracy rate. The RS hypothesis achieves 100 percent accuracy in detecting dengue illness. The hepatitis illness is appropriately classified by the feed forward neural network, which has a 98 percent accuracy rate. However, concerns regarding data bias, algorithmic bias, and model drift were noted, highlighting the importance of ongoing monitoring and validation to ensure the reliability of AI-driven diagnostic systems over time.

#### **4.3 AI in Diagnosis of Diabetes**

Studies have shown that AI models can accurately predict the onset of diabetes by analysing various factors such as blood glucose levels, BMI, and family history. Recent studies have shown that AI models, particularly those utilizing deep learning algorithms have achieved a sensitivity of 95% and specificity of 90% in identifying individuals at risk of developing type 2 diabetes (Nair et al., 2023). A study by Huang et al., 2023 developed a deep learning model for diabetic retinopathy screening with a sensitivity of 92% and specificity of 95% (Huang et al., 2023). Chen et al. (2021) demonstrated that AI algorithms could predict blood glucose levels with a mean absolute error of 5.2 mg/dL, improving management strategies for diabetes (Chen et al., 2021).

#### **4.4 AI in Diagnosis of Cardiovascular Diseases**

The risk factors of cardiovascular diseases include high blood pressure, old age, and excessive cholesterol, among others. AI algorithms demonstrated high sensitivity and specificity in interpreting electrocardiograms (ECGs) and echocardiograms, with some models achieving performance comparable to or even exceeding that of experienced clinicians. According to the available research, SVM has the best accuracy of 94.60 percent (Parthiban & Srivatsa, 2012). A study published in 2017 reported that an AI-powered system was able to detect myocardial infarction with a sensitivity of 97% and specificity of 95% (Esteva, et.al 2017). Zhang et al. (2022) found that an AI model for ECG



interpretation had a diagnostic accuracy of 94%, compared to 88% for traditional methods (Zhang et al., 2022). Patel et al. (2020) developed an AI-based tool for predicting cardiovascular risk with an accuracy of 87% (Patel et al., 2020).

#### **4.5 AI in Diagnosis of Liver Diseases**

The liver is the second largest internal organ in the human body, and plays an important part in metabolism as well as various other crucial processes, such as red blood cell decomposition (Karthik et al., 2011). It weighs around three pounds. The liver is responsible for numerous vital activities in the body, including digestion, metabolism, immunity, and nutrition storage. Because of these duties, the liver is a vital organ; without it, bodily tissues would soon perish due to a lack of energy and nutrition. A number of variables contribute to the development of liver disease. Some mostly mentioned are: Family history of liver disease, Smoking, Consumption of alcohol, Intake of contaminated food, Obesity and Diabetes (Mohan, 2015). The major liver diseases include Liver cancer, Cirrhosis and Hepatitis. Nave Bayes and FT Tree algorithms has been employed in diagnosis of these diseases with the Nave Bayes algorithm proving to be the superior method for diagnosing liver diseases with a 97.10 percent accuracy rate in previous experiments (Fatima & Pasha, 2017). Ansari et al. (2011) used a recurrent neural network (RNN) to diagnose liver disease hepatitis virus and achieved 97.59%, while a feed-forward neural network achieved 100%. A study conducted by Choi, H., Kim, D., & Choi, 2019 demonstrated that an AI algorithm could accurately diagnose liver fibrosis with a sensitivity of 92% and specificity of 90%. Wang et al. (2021) reported that an AI tool for analysing liver ultrasound images achieved a diagnostic accuracy of 90% for liver cirrhosis (Wang et al., 2021). Lee et al. (2022) developed an AI-based model for hepatitis diagnosis that outperformed traditional methods with an accuracy of 89% (Lee et al., 2022).

#### **4.6 Overall Reliability of AI-Based Diagnostic Tools in Chronic Diseases**

Across different chronic diseases, AI tools have generally demonstrated high accuracy rates, with many models achieving diagnostic performance comparable to or exceeding that of human experts (Jones et al., 2024). Smith et al. (2023) analysed AI diagnostic tools across multiple chronic diseases and found a general reliability of 85% with variations based on disease type and data quality (Smith et al., 2023). Despite their advancements, AI tools face challenges such as data quality, model interpretability, and integration into existing healthcare systems (Brown et al., 2023)

#### **4.7 Implications of Implementing AI-driven Diagnostic Systems**

The implementation of AI-driven diagnostic systems in healthcare has several significant implications. AI can reduce the workload on healthcare professionals by automating routine diagnostic tasks, freeing up time for clinicians to focus on more complex cases and patient care. AI-based diagnostic tools can also enhance diagnostic accuracy, reduce the likelihood of human error, and provide diagnostic services in remote and underserved areas, improving access to quality healthcare. However, the integration of AI systems into healthcare raises concerns about data security, patient privacy, and the ethical use of AI in clinical settings (Jiang et al., 2021). There is also a need for regulatory frameworks to ensure the safe and ethical deployment of AI technologies, as well as training programs to equip healthcare professionals with the skills needed to work effectively with AI tools.

#### **4.8 Comparison between Artificial Intelligence and Clinicians**

All studies compared the diagnostic performance between AI and licensed doctors. Performance indices used for comparison included diagnostic accuracy, weighted errors, sensitivity, specificity and false-positive rate. Long et al observed a high accuracy in AI (90%-100%) compared with a panel of specialty doctors' predefined diagnostic decision and transcended the average levels of clinicians

in most clinical situations except for treatment suggestion. Esteva et al also found that AI achieved comparable accuracy with or outperformed their human rivals (AI vs dermatologists: 72.1% (SD 0.9%) vs 65.8% using 3-class disease partition and 55.4% (SD 1.7%) vs 54.2% using 9-class disease partition.

## 5. Conclusions

Several machine-learning algorithms do exceptionally well in the diagnosis of heart, diabetes, liver, dengue, and hepatitis disorders. The findings highlight the potential of AI to enhance diagnostic accuracy, improve patient outcomes, and transform healthcare delivery.

With the continued development of AI-assisted technologies, AI has the potential to be a powerful partner in the battle against disease, enhancing medical knowledge and patient outcomes. However, despite the promising outcomes reported in the literature, several challenges and limitations need to be addressed to facilitate the widespread adoption of AI in clinical settings. These include concerns related to data privacy, security and ethical considerations, as well as the need for robust validation and regulatory oversight. Additionally, the interpretability of AI models remains a critical issue, as clinicians require insights into how AI-generated diagnoses are generated to trust and act upon them.

## 6. Recommendations

Based on the findings of this systematic review, the following recommendations are proposed:

- ❖ **Healthcare professionals:** Be informed about the potential of AI for specific applications within their practice and advocate for responsible implementation.
- ❖ **Researchers:** Develop robust AI models with high generalizability, interpretability, and address potential biases.
- ❖ **Policymakers :** Establishment of regulatory frameworks to address data privacy, security, and ethical concerns associated with AI deployment in healthcare.





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# Mapping the Future of Academic Libraries in Kenya: A Foresight Approach

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## Abstract

*This study explored the evolving landscape of libraries and librarianship specifically academic libraries, a field that has long grappled with concerns about its future amid ongoing challenges and changes. As information technologies continue to advance, librarians have had to adapt their roles, raising critical questions about the sustainability and relevance of traditional library practices. In recent years, the debate over the future of librarianship has intensified, driven by the rapidly changing technological environment. Historically, libraries have been at the heart of universities, serving as key hubs of knowledge and learning. However, the education landscape is now shifting towards online and distance learning, with a growing number of students opting for virtual classrooms over traditional in-person instruction. To address these changes, this study aimed to conduct a foresight analysis of the plausible futures at the intersection of the Fourth Industrial Revolution (4IR) and libraries, providing stakeholders with insights into emerging trends that may not yet be apparent. The research adopted a mixed-method approach, combining qualitative and quantitative data to offer a comprehensive exploration of the future of academic libraries. The Schwartz scenario planning process was utilized to identify key drivers of change in academic libraries, with the study divided into three phases: a literature review to identify megatrends, a Delphi survey with 33 expert panelists, and scenario development. The findings from the first phase, which involved a detailed literature review, reveal that political, economic, and environmental factors contribute to a complex web of significant trends impacting higher education institutions and their libraries. Additionally, the literature indicates that academic libraries are becoming increasingly dynamic, taking on new roles such as digital archiving, research support, and data analysis. These developments suggest that while technology is a key driver of change, other factors also play a crucial role in shaping the future of academic libraries.*

**Key words:** Academic Libraries, Future, Foresight, Kenya

## 1. Introduction

Concerns about the future of librarianship have been a recurring theme throughout the profession's history, reflecting the ongoing challenges and changes that librarians face. As information technologies evolve, the role of librarians has continuously adapted, raising questions about the sustainability and relevance of traditional practices (Poremski, 2020). These concerns are not new; they have been echoed across generations of librarians who have witnessed the transformation of their profession from guardians of physical collections to information specialists in a digital age.

The debate over the future of librarianship has intensified in the current decade due to the rapidly evolving technological landscape. Historically, the library has been at the heart of the university, serving as a central hub for knowledge and learning. Librarians were once primarily perceived as

bookkeepers, a view reflected in Young's (2017) observations. However, the role of academic libraries has dramatically transformed as they now operate within a fast-changing environment. To remain relevant, libraries have embraced new technologies, shifting towards e-resources, digitalization, and e-libraries. This evolution reflects a broader trend in the profession, where librarians are increasingly seen as information managers and digital curators, adapting to meet the needs of a digitally-driven world.

Even though librarians have embraced technology, the advent of fourth industrial technologies has sparked growing concern that these innovations might eventually take over many traditional activities of librarians. This worry is particularly pronounced with the rise of artificial intelligence, which has already made significant inroads into the information landscape, as noted by Lund and Wang (2023). The integration of AI into various aspects of information management raises numerous questions about the future of the profession. Will AI diminish the role of librarians, or will it create new opportunities for them to enhance their services? As these technologies continue to evolve, the profession must grapple with the potential implications, balancing the benefits of technological advancements with the need to preserve the unique human touch that librarians bring to their work. The education landscape is also undergoing a significant shift from traditional physical education to online and distance learning, with an increasing number of students opting for virtual classrooms over in-person instruction. This trend is evident in Kenya, where the number of students enrolled in online and distance learning programs has increased especially after COVID 19 pandemic. In 2023, out of the 562,925 students enrolled in Kenyan universities, 37% were participating in online and distance learning, a notable increase from 25% in 2019 (Statista, 2023). This shift reflects a growing recognition of the flexibility and accessibility that online education offers, making it an increasingly popular choice for students seeking to balance their studies with other commitments. As this trend continues, it is likely to reshape the higher education landscape, challenging traditional models of learning and prompting institutions to reevaluate the traditional models such as physical libraries.

In addition to the challenges posed by technological advancements, the recent economic slowdown and subsequent budget cuts for academic libraries have further fueled doubts about the sustainability of these institutions and the profession as a whole (Otike & Barát, 2021). As financial pressures mount, many academic libraries face the difficult task of maintaining their services with reduced funding, leading to concerns about their ability to continue serving as vital resources for students and faculty. These budget constraints not only threaten the availability of resources and services but also raise questions about the long-term viability of librarianship as a profession. As libraries struggle to adapt to these economic realities, the future of academic librarianship hangs in the balance, prompting a critical reassessment of how these institutions can continue to fulfill their essential roles in an increasingly challenging financial landscape.

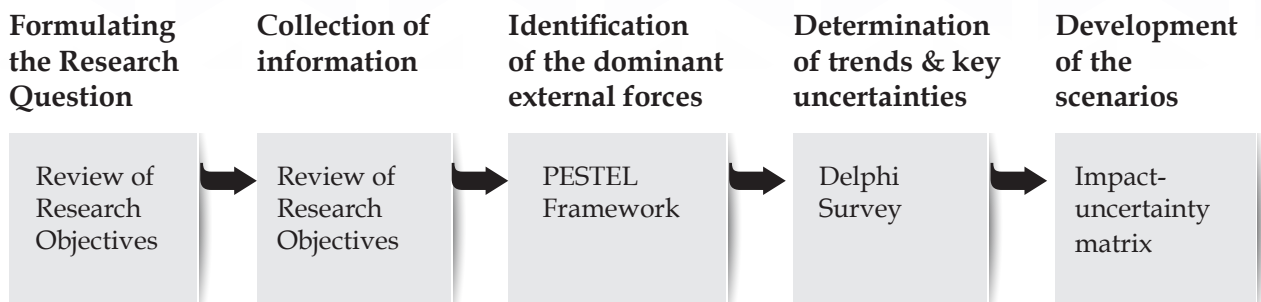
Thinking about the future is inherently challenging, especially in the rapidly changing landscape of higher education. Traditionally, planning processes in higher education institutions have focused on short-term horizons, typically spanning three to five years (Baron, 2023). However, given the profound and far-reaching changes brought about by the Fourth Industrial Revolution (4IR), a longer-term perspective is crucial. This study aimed to conduct a foresight analysis of the plausible futures in a 10-year horizon at the intersection of 4IR and libraries, offering stakeholders insights into emerging trends that may not yet be visible. By exploring these potential futures, the study seeks to equip decision-makers with the foresight needed to plan strategically and adapt to the evolving role of libraries in an increasingly digital and technology-driven world.





## 2. Research Methodology

### 2.1 Analytical Framework of the Study



**Figure1: analytical Framework**

The study adopted a mixed-method approach, enabling the collection of both qualitative and quantitative data. This methodological choice allowed for a comprehensive exploration of the plausible futures of academic libraries by combining the depth of qualitative insights with the statistical rigor and generalizability of quantitative data. The study adopted the Schwartz scenario planning process to identify the key drivers of change in academic libraries (Cordova-Pozo & Rouwette, 2023). This approach allowed the researchers to systematically explore various possible futures by considering a range of uncertainties and trends that could impact the evolution of academic libraries. The Schwartz scenario planning process provided a structured framework for envisioning multiple plausible futures, enabling stakeholders to better prepare for and navigate the challenges and opportunities that lie ahead in the ever-evolving landscape of academic librarianship.

The Schwartz scenario planning process involves four key steps, with the first being a comprehensive literature review aimed at gaining insights into the dominant external forces driving change in the academic library landscape. To identify these forces, Schoemaker (2012) recommends using a PESTLE analysis, which examines political, economic, social, technological, legal, and environmental dimensions this constitutes the second step in Schwartz scenario planning process.

In this study, a total of 38 industry reports and academic research papers from consulting firms, NGOs, governmental institutions, and scholars were collected and analyzed. The selection criteria for these articles were continuously refined to ensure relevance and accuracy. All the gathered information was systematically organized within the PESTLE framework, allowing the researchers to uncover the interconnections among these elements. This process was crucial for identifying the trends and critical uncertainties that are likely to shape the future of academic libraries, providing a solid foundation for the subsequent steps in the scenario planning process.

The identified megatrends from the literature review, were then organized within the PESTLE framework and subjected to a Delphi survey, the third step in the Schwartz scenario planning process. The expert panel for this survey was carefully assembled through a rigorous process of identification, evaluation, selection, and recruitment of individuals with relevant expertise in the university education field. According to Drumm et al. (2022), the optimal size of a Delphi survey panel can vary depending on the research scope, the desired diversity within the panel, and the availability of experts.

Previous Delphi studies have typically involved panels ranging from 15 to 35 participants (Niederberger et al., 2021). For this study, a diverse panel of 33 experts from the university sector was recruited, including faculty members, librarians, human resource experts, information technology

specialists, student leaders, and university senate members. The inclusion of a heterogeneous panel was intentional, as such diversity has been found to yield more accurate estimations by reducing polarization in viewpoints (Drumm et al., 2022). This diverse expertise was crucial in assessing the megatrends and providing well-rounded insights into the future of academic libraries.

For the Delphi survey, an online questionnaire was used to present the identified megatrends and projections to the expert panel. The experts were asked to evaluate each trend based on its estimated probability of occurrence and its potential impact over a 10-year period. Both the probability and impact were assessed using a 5-point Likert scale, with responses ranging from 1 = 'strongly disagree' to 5 = 'strongly agree' for probability, and 1 = 'very low' to 5 = 'very high' for impact. After collecting the responses, the data were analyzed by calculating the mean, standard deviation, outliers, and interquartile range. The interquartile range, which measures the dispersion from the median and represents the middle 50% of observations, was particularly useful for assessing consensus among participants. Projections with an interquartile range of 2 or less were considered to indicate that consensus had been reached (Drumm et al., 2022; von der Gracht & Darkow, 2010).

The results from the analysis of the Delphi survey were utilized to develop scenarios, marking the fourth step in the Schwartz scenario planning process. These scenarios were based on the assessed probability of occurrence and the potential impact on academic libraries.

### 3. Findings and Discussions

The study is ongoing, and the findings presented here are based on the first phase, which involved a literature review aimed at identifying megatrends in the academic library landscape. These findings have been organized within the PESTLE framework, as outlined in Table 1.

**Table 1: Key Trends in the Academic Library Landscape**

Drivers	Variables	Indicators
<b>Political</b>	<ul style="list-style-type: none"> <li>University funding model</li> <li>Open University</li> </ul>	<ul style="list-style-type: none"> <li>Student enrollment</li> <li>Mode of study</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>Investment in infrastructure</li> <li>Competition</li> </ul>	<ul style="list-style-type: none"> <li>Cuts in staffing and purchasing library materials</li> <li>Brand Reputation and Trust</li> <li>Number of Competitors</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>Analysis of Population Growth</li> <li>Perception of libraries</li> <li>Changing mode of study</li> <li>Competency based learning</li> </ul>	<ul style="list-style-type: none"> <li>Population Census</li> <li>Value of libraries</li> <li>Subscription services</li> <li>Online and distance education enrollment</li> <li>Skills change</li> </ul>
<b>Technological</b>	<ul style="list-style-type: none"> <li>Analysis of Digital Literacy</li> <li>Internet of Things, Artificial Intelligence and Blockchain technology</li> <li>Anytime, anywhere, any device access</li> </ul>	<ul style="list-style-type: none"> <li>Awareness of e-library platforms</li> <li>New pedagogies supported by technology-enabled e-learning learning</li> <li>Adoption rates of new technologies</li> <li>Security awareness</li> <li>preservation of born digital</li> <li>automation upgrades</li> </ul>
<b>Legal</b>	<ul style="list-style-type: none"> <li>Intellectual property rights</li> <li>Government policy and regulatory framework</li> </ul>	<ul style="list-style-type: none"> <li>Commission for University Education standards and guidelines 2014</li> <li>Education Policy and Legal Framework</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>Climate Change</li> <li>Visioning sustainable value chains</li> </ul>	<ul style="list-style-type: none"> <li>Carbon footprint</li> <li>Adoption of Circular economy principles</li> <li>Green libraries concept</li> </ul>



The objective was to uncover the interconnections among these trends, enabling the identification of critical uncertainties that will shape the future of academic libraries. The findings reveal that political, economic, and environmental factors have all contributed to a complex web of significant trends impacting higher education institutions and their libraries. This highlights that, while technology is often viewed as the primary driver of change in academic libraries, other influential forces must also be considered by stakeholders. Moreover, the literature indicates that academic libraries have become increasingly dynamic, taking on new roles such as digital archiving, research support, and data analysis. These evolving responsibilities contribute to a blurring of the traditional identity of libraries, leading to a lack of clarity about what a library truly represents. The concept of where and 'when' a library exists has become increasingly ambiguous, even as many stakeholders' perceptions of libraries remain largely unchanged. This evolving landscape calls for a reevaluation of what it means to be a library in the modern era.

One of the significant challenges associated with this fluidity is that it can no longer be assumed that services traditionally provided by libraries will continue to be exclusively offered by them. Many of the services that libraries have historically managed are now being provided by other entities. For instance, repositories that were once the domain of libraries have seen the emergence of independent databases like ResearchGate. Information services, which were traditionally library-centric, are now predominantly offered by non-library organizations. Even critical functions such as information and digital literacy education, as well as the curation of historic collections, are increasingly being handled by external parties. This shift raises important questions about the future role of libraries and underscores the need for libraries to redefine their value propositions in an environment where their traditional services are being delivered by a broader range of providers.

#### **4. Conclusion**

Phase one of this study has successfully identified and presented key trends within the academic library landscape using the PESTLE framework, which has illuminated the intricate interconnections among these critical drivers of change. These identified trends serve as the foundation for developing projections on the future of academic libraries over the next decade. These projections will be subjected to a Delphi survey for validation, ensuring their robustness before proceeding to the formulation of plausible future scenarios. This systematic approach will provide valuable insights for stakeholders as they navigate the evolving challenges and opportunities within academic libraries.

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# Dynamic Resource Allocation for Enhancing Secure Homomorphic Encryption in Private Cloud Computing: A Case of Microsoft Company Kenya

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## Abstract

Homomorphic encryption is a promising technique for secure computations in private cloud computing, but its efficiency and performance can be optimized through various strategies. This research aims to achieve three specific objectives. Firstly, it analyzes different load-balancing techniques associated with homomorphic encryption and examines their impact on the performance of encryption algorithms. Secondly, it investigates adaptive resource provisioning, focusing on real-time monitoring of workload demands and resource utilization. Lastly, it identifies the correlation between the implementation of security-aware scheduling techniques and their impact on meeting security requirements during the scheduling of computational tasks in homomorphic encryption operations. The target population for this study includes 200 individuals from various departments in the Microsoft company in Kenya which is the study area, specifically private cloud providers and cloud security professionals, such as security architects, engineers, and administrators. Their expertise and experience in cloud security management will provide valuable insights for the research findings. The sample size for the study, determined using Yamane's formula with an 8% margin of error, is 87 individuals.

**Key words:** Homomorphic encryption; load-balancing, Security

## 1. Introduction

Private cloud computing has become an attractive solution for organizations that need the flexibility and scalability of cloud computing while maintaining control over sensitive data. Unlike public cloud environments, which are shared among multiple organizations, private clouds are dedicated to a single entity, offering enhanced data control, security, and customization. These environments are often hosted either on-premises or through third-party data centers, providing greater compliance with privacy regulations (Armbrust et al., 2010).

As cloud computing continues to evolve, maintaining data security has become increasingly critical. Homomorphic encryption, a cryptographic method that allows computations to be performed on encrypted data without decrypting it, has emerged as a promising solution for securing data in cloud environments. Initially introduced by Rivest et al. (1978), homomorphic encryption enables operations such as addition and multiplication on encrypted data, ensuring privacy and confidentiality. Despite its strong potential, homomorphic encryption introduces significant computational overhead, making it resource-intensive (Gentry, 2009). This overhead is a challenge in cloud computing, where computational efficiency and resource utilization are key concerns.

Private cloud computing involves the deployment of cloud infrastructure that is exclusively available to a single organization. It offers a more secure and customizable environment compared to public clouds, making it ideal for organizations handling sensitive or confidential data. The private





cloud model is often implemented to comply with stringent data privacy regulations, enabling organizations to maintain greater control over data and operations.

Homomorphic encryption, particularly in the context of cloud computing, has been the subject of significant research. The development of schemes such as partially homomorphic encryption (PHE), somewhat homomorphic encryption (SHE), and fully homomorphic encryption (FHE) has expanded the possibilities of secure data computation (Gentry, 2009). While these methods provide a foundation for secure operations on encrypted data, their practical use requires careful consideration of computational resources. Fully homomorphic encryption, for example, is highly resource-intensive, and the performance trade-offs it introduces can be a major barrier to widespread adoption in private cloud settings.

Homomorphic encryption requires specialized computational operations, including complex mathematical functions like modular arithmetic and polynomial evaluations. These operations differ significantly from the typical workloads seen in cloud environments, creating challenges when attempting to optimize resource allocation for encryption tasks (Wang et al., 2020). Efficient resource allocation becomes even more crucial when dealing with the large-scale data processing needs of modern organizations.

Resource allocation in cloud computing refers to the process of dynamically assigning computational resources, such as CPU, memory, and storage, to tasks based on their demands. Traditional resource allocation techniques, such as load balancing and virtual machine (VM) allocation, aim to optimize resource usage, improve system performance, and minimize response time (Buyya et al., 2009). However, the unique computational requirements of homomorphic encryption demand more specialized approaches to resource management.

Dynamic resource allocation, which allows the system to adapt resource usage based on workload changes, has been identified as a potential solution for addressing the computational challenges posed by homomorphic encryption. These techniques aim to improve the performance of homomorphic encryption tasks by allocating resources such as CPU cores, memory, and storage dynamically, based on encryption scheme, data characteristics, and workload distribution (Wang et al., 2020).

Key strategies for dynamic resource allocation include load balancing, adaptive resource provisioning, and security-aware scheduling. Load balancing evenly distributes tasks across available resources to prevent bottlenecks, ensuring that homomorphic encryption operations do not overwhelm the system. Adaptive resource provisioning monitors system demands in real-time and adjusts resource allocation accordingly, optimizing system performance and minimizing resource waste during periods of low demand. Security-aware scheduling takes into account the need for data isolation and access controls, ensuring that sensitive computations are handled securely.

Despite its advantages, private cloud computing presents several security challenges, particularly when combined with homomorphic encryption. Some of the most significant concerns include:

- ❖ **Data Privacy:** The sensitive nature of the data stored in private clouds makes them attractive targets for attackers. Unauthorized access, data breaches, and insider threats can compromise the confidentiality and integrity of private cloud environments.
- ❖ **Computation Overhead:** The computational complexity introduced by homomorphic encryption is a significant concern. The encryption schemes require intensive operations that can result in performance bottlenecks and increased resource consumption.





Given these challenges, researchers have focused on developing resource allocation strategies that optimize the performance and security of homomorphic encryption in private cloud environments. Solutions range from load balancing techniques that evenly distribute encryption tasks across multiple resources to machine learning algorithms that predict resource requirements and adjust allocations in real-time. Other approaches have explored the use of containerization and virtualization to isolate encryption tasks and enhance efficiency.

To address the computational overhead associated with homomorphic encryption, researchers have proposed several strategies. One promising approach involves the use of dynamic resource allocation techniques tailored specifically to the unique requirements of homomorphic encryption. These methods ensure that computational resources are distributed in a way that maximizes performance while minimizing resource waste.

- ❖ **Load Balancing:** Distributing homomorphic encryption tasks across multiple resources ensures that no single resource becomes a bottleneck, improving overall system performance.
- ❖ **Adaptive Resource Provisioning:** By monitoring workload demands in real-time, adaptive provisioning allows for the dynamic allocation of additional resources during high-demand periods and the reallocation of resources during low-demand periods. This approach helps optimize resource utilization without sacrificing security.
- ❖ **Security-Aware Scheduling:** This strategy ensures that homomorphic encryption operations are assigned to resources that meet strict security requirements, reducing potential vulnerabilities and enhancing data privacy.

## 2. Problem Statement

Existing approaches to implementing homomorphic encryption in private cloud computing have not fully addressed the challenges of computational overhead and security vulnerabilities. There is a research gap in developing dynamic resource allocation strategies that optimize the performance of homomorphic encryption algorithms while enhancing the security of private cloud environments. Such strategies should consider load balancing, resource provisioning, and scheduling techniques to effectively allocate resources and ensure the secure execution of homomorphic encryption operations. By investigating load balancing, adaptive resource provisioning, and security-aware scheduling techniques, the study aims to provide a comprehensive solution that enables efficient and secure execution of homomorphic encryption operations in private cloud computing environments.

## 3. Research objectives

1. To analyze the different load balancing techniques associated with homomorphic encryption in private cloud computing and identify their impact on the performance of homomorphic encryption algorithms.
2. To investigate the adaptive resource provision that can be implemented to monitor the workload demands and resource utilization in real time.
3. To identify the correlation between the implementation of security-aware scheduling techniques and their impact on meeting security requirements, during the scheduling of computational tasks in homomorphic encryption operations.

## 4. Research Methodology

This study utilized a descriptive research design to provide a detailed account of the effectiveness of dynamic resource allocation techniques in improving the performance and security of secure homomorphic encryption in private cloud computing. The research will focus on describing various resource allocation algorithms and evaluating their impact on homomorphic encryption schemes.

The research was carried out in Microsoft Company in Nairobi-Kenya which has several involvements with homomorphic encryption for securing cloud computing. Moreover, it has strong expertise in Cloud Computing offering the Azure cloud platform. They possess extensive knowledge and experience in developing and managing private cloud environments, making them well-suited for conducting research in this domain. Their expertise can ensure the creation of a robust experimental setup that accurately reflects real-world private cloud scenarios.

The study targeted a total number of 200 individuals in the various departments of the company; private cloud providers and cloud security professionals in the company as they are involved in cloud security management and implementation, including security architects, engineers, and administrators. Their expertise and experience in implementing and maintaining secure cloud environments can provide valuable insights and feedback on the research findings. A sample size of 87 individuals was used for the study.

The study used self-administered questionnaires designed with structured questions to collect relevant data without bias. The questions will be less time-consuming and less expensive to collect the data. Descriptive statistics such as means, standard deviations, frequencies, and percentages were used to summarize and present participants' responses to the questionnaire items. This provided an overview of their perceptions, experiences, and opinions regarding the algorithm's effectiveness and security enhancements.

## 5. Findings and Discussion

During the research process, a questionnaire was distributed to 87 individuals, and 63 responses were received and analyzed, resulting in a high return rate of 80%. The majority of respondents were educated to the Bachelor's degree level, indicating a relatively high level of academic attainment. Knowledge levels of homomorphic encryption and private cloud computing varied, with some respondents expressing little to no understanding, while others indicated expert knowledge. This diversity highlights a wide spectrum of familiarity with the technologies in question. Despite these knowledge gaps, there was a generally positive perception of dynamic resource allocation techniques for improving aspects of private cloud computing, with 54.2% of respondents agreeing and 20.8% strongly agreeing that dynamic resource allocation could enhance the security of homomorphic encryption. Similarly, respondents showed optimism about the potential for dynamic resource allocation to improve efficiency, with 50% agreeing and 25% strongly agreeing that these strategies could enhance private cloud computing performance, particularly in the context of Microsoft Company-Kenya.

The survey responses also shed light on specific dynamic resource allocation strategies such as security-aware scheduling, which garnered considerable support from respondents. Notably, 20.8% strongly agreed and 54.2% agreed that security-aware scheduling could significantly enhance the performance of homomorphic encryption systems. However, 25% of respondents maintained a neutral stance, indicating a degree of uncertainty regarding the effectiveness of this technique. This neutrality might stem from limited familiarity or practical experience with security-aware scheduling.



Nevertheless, the predominance of positive responses suggests that most respondents perceive this strategy as effective in improving the performance of homomorphic encryption, emphasizing the growing importance of tailored scheduling techniques in cloud computing environments.

A similar pattern emerged in the respondents' perception of adaptive resource provisioning, where a significant portion (25%) strongly agreed and 50% agreed that it could enhance homomorphic encryption performance. However, 20.8% of respondents expressed a neutral opinion, and a small fraction (4.2%) strongly disagreed, reflecting some skepticism about its potential benefits. This mixed response suggests that while there is considerable optimism about adaptive resource provisioning, concerns about its practical implementation, performance overhead, or compatibility with existing systems persist. Nonetheless, the general trend toward positivity underscores the growing recognition of adaptive resource provisioning as a key mechanism for optimizing performance in cloud environments, especially when dealing with computationally heavy encryption tasks.

The research also identified load-balancing techniques as another promising approach for enhancing the performance of homomorphic encryption. Half of the respondents (50%) agreed, and 20.8% strongly agreed, that load balancing could improve encryption performance, particularly in the context of data security at Microsoft Company-Kenya. However, 29.2% of respondents remained neutral, indicating uncertainty or limited understanding of the potential benefits of load balancing. Despite this, the majority of respondents saw the value in load balancing as a critical component for optimizing resource distribution in cloud environments. Coupled with the insights from correlation analysis showing strong positive relationships between these resource allocation strategies and homomorphic encryption performance, the findings suggest that dynamic resource allocation, especially through load balancing, adaptive provisioning, and security-aware scheduling, holds significant promise for enhancing security and efficiency in private cloud computing systems.

## 6. Conclusion and Recommendations

The findings indicate a growing recognition of the critical role dynamic resource allocation plays in enhancing both security and efficiency in cloud computing environments, particularly concerning data protection. Positive perceptions and strong correlations found between dynamic resource allocation techniques and system performance suggest that these strategies can effectively address security concerns while improving the overall performance of cloud systems. However, the research also highlights the need for ongoing efforts to overcome implementation challenges, especially in relation to complex technologies like homomorphic encryption. Raising awareness and deepening the understanding of these advanced technologies is essential for maximizing their potential and addressing concerns around performance overhead and complexity.

Several recommendations arise from these conclusions. First, organizations should prioritize investments in dynamic resource allocation technologies, integrating them into their cloud infrastructures to strengthen security and operational efficiency. It is essential for further research and development efforts to focus on advancing homomorphic encryption and related security technologies within cloud systems. In parallel, organizations should implement training and awareness programs to educate stakeholders on the advantages and effective use of dynamic resource allocation and encryption tools. Finally, fostering collaboration between industry stakeholders, academia, and government agencies is critical for driving innovation and addressing emerging challenges in cloud security. This collaborative approach will help accelerate the adoption of advanced security measures and promote best practices across sectors.

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# Assessment of the Undergraduate Search Habits for use of Information in Academic Libraries: A Case of Greta University Library, Kenya

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## Abstract

Academic libraries are extremely vital in any institution because they serve as a repository for diverse information, necessary to the undergraduate students. Despite previous studies assuming that undergraduate students can use library resources explicitly with minimal intervention from the library departments, this is false based on the current outcomes that emphasize that students face many challenges in information seeking. Similarly, undergraduate students experience several difficulties as library services are ever-evolving through the integration of technology. Therefore, the observations and gaps from such investigations help improve library services. This study was done at Greta University library. The aim was to gather critical information about undergraduate user information needs and priorities and how it impacts their study. The paper used descriptive statistics. Data collection was through questionnaires, and analysis was done using descriptive statistics. It established that undergraduate student use library mainly for research, but they face many challenges, including outdated library materials. Also, library programs such as orientation enhanced user's search habits. However, many students did not utilize the library well despite the librarians efforts to avail and distribute resources. The study further identified that technological devices helped students within the campus network access library materials. However, the distance learners were unable to access such crucial resources due to the limited network. The study recommended off-campus library access since many students own technological devices, including laptops and smartphones which can enable them access information from anywhere. Additionally, the library should adopt continuous user-awareness information literacy programs to the undergraduate users.

**Key Words:** Academic libraries, information needs.

## 1. Introduction

Information is a crucial resource that human beings have relied on throughout human history in every aspect of life. Societies have also existed into what we see today due to information. Moreover, scholars have observed time and again that information wealth is the bedrock of a nation's prosperity, without which it would be hard to trace and explain our existence.

Since information is critical to both the illiterate and literate societies, people sought ways to manage information and ensure resourceful aspects of the society, such as doctrines, and laws, among others, are available to the forthcoming generation (Didiharyono & Qur'ani, 2019). From the availability aspect, libraries act as storage and source of information in most literate societies. Given the importance of information, libraries must keep resourceful information, especially for the ever-growing literate world, to facilitate knowledge synthesis. The library concept started a long time ago with a systematically organized library structure dating back to the 7<sup>th</sup> century in Iraq (Koizumi & Widdersheim, 2018). Many resources in this library included archival documents, works of literature, scholarly texts, etcetera.



Libraries in any nation serve as a repository for diverse information. Librarians must, as such, ensure that libraries have the necessary information that the users seek and how users can obtain the information. Besides the availability of information, the current information age requires librarians to examine the quality of information and the information's ability to continue adapting to fit the consumer's shifting needs and expectations (Koizumi & Widdersheim, 2018). Quality and adaptability are the fundamental drives of a library's survival. Libraries as service organizations have undergone significant developments in the dynamic environments to improve service delivery. However, it is hard to meet all user demands of libraries.

The fundamental role of the traditional library, which extensively applies to the present libraries, involves collecting knowledge in a central location, availing knowledge, learning it, and using it to enhance people's lives (Bowen, 2018). Therefore, educational institutions such as primary schools, secondary schools, colleges, and universities are where libraries are common in our society and should always align with the primary goals of establishing libraries. Apparently, university libraries should adhere to the values and principles upon which experts have used Ranganathan's five library science laws to determine library success. Briefly, Ranganathan's law stipulates that library resources should be aligned with user needs, resources should be organized to allow identification and accessibility to meet user needs efficiently, regularly engage users by promoting and exposing resources to identify the dynamic user needs, and respond to technological as well as social trends affecting higher education (Bowen, 2018).

The Greta University Library is committed to acknowledging challenges and adopting practices that enhance the quality of services to meet the crucial user needs by selecting and adopting updated information resources in diverse formats relevant to the university community's information needs. In addition, the university organizes all its resources using international standards to facilitate real-time retrieval and consumption (Greta University, 2019).

Greta University library currently has many academic programs ranging from certificate programs to post undergraduate. Hence, the library department has been implementing and maintaining different services to support all the programs and cultivate a culture of optimum exploitation and utilization of the library materials. The approaches by the library include adopting information dissemination and promotion such as ongoing awareness and selective information dissemination to expand usage of the resources.

The university library has qualified, passionate, experienced, and flexible librarians who serve the users by frequently building information literacy skills. Besides, the library staff has worked at the university for more than five years, allowing them to understand the community well. With their understanding of the pivotal role of information literacy, the librarians have always yearned to address it to improve the functioning of the library adequately. The library also uses technological techniques to provide adequate and timely information service to different physical and online users (e-library). These approaches enable the community, comprising of full-time, part-time, school-based, and distance learning students, to access quality resources in an exceptional manner.

The Greta Library has an ample reading space, up-to-date information, computers, internet access, and highly trained librarians. Furthermore, Greta Library has key functions, including creating an environment that fosters creativity and encourages learning. The library is crucial in learning processes because users access the right information resources making students complete research projects and assignments. Lecturers also obtain information from the library upon which they develop class lectures. Besides information dissemination, library users' network and interact with one another, eventually contributing to a cohesive society.





### **1.1 Statement of the Problem**

The role of academic libraries, is crucial in supporting the research and learning activities of undergraduate students. By repackaging information into the most suitable formats and equipping students with necessary literacy skills, the library ideally enhances the research capabilities of its users. However, despite being central to the university's academic programs and serving a diverse population of undergraduate students across various disciplines, the current library services have faced challenges in adequately meeting the diverse information needs of its users. According to the 2021 library user statistics, the majority of library users are undergraduate students enrolled in Certificate, Diploma, and Degree programs, yet the self-service model adopted by the library, while promoting autonomy, has exposed gaps in accessing appropriate and timely resources.

Given the diversity of the undergraduate population and their varying academic needs, the library has struggled to provide quality information resources that are relevant, accessible, and convenient for users. This research, therefore, seeks to investigate the challenges faced by undergraduate students at Greta University in accessing and utilizing library resources. It will explore the specific information needs of these students, assess the effectiveness of current library services and resources in addressing these needs, and identify how library services can be improved to better support the academic success of undergraduates.

## **2. Research Methodology**

The study adopted a descriptive survey research design to examine and explain the information needs of undergraduate students at Greta University and the challenges they face in accessing library resources. A descriptive survey design was found appropriate for this study as it allows for the collection of data that accurately reflects the current status of the problem under investigation. Additionally, the design helped identify the specific ways the university library responds to the challenges faced by its undergraduate users. Through this approach, the study was able to generate insights into both the demand for information resources and the sufficiency of current library services in meeting those needs.

The target population for the study consisted of 2,400 undergraduate students enrolled at Greta University in the academic year 2023, including those pursuing their studies on both full-time and part-time bases. From this population, a sample size of 384 students were selected using stratified and random sampling technique to ensure fair representation of the diverse student body. This sample size was determined based on standard sampling formulas to ensure that the results were statistically relevant.

Data was collected using structured questionnaires distributed to the sampled students. The questionnaire contained closed questions to capture quantitative data. The questions focused on the specific information needs of students, their access to library resources, and the challenges they encounter. Once the data was collected, descriptive statistics, such as frequencies, percentages, means, and standard deviations, were used to analyze the data. This will enabled the researcher to summarize and interpret the results effectively, providing clear insights into the information needs of Greta University's undergraduate students and the library's role in meeting these needs.

## **3. Research Findings and Discussions**

The study aimed to assess the information needs of undergraduate students at Greta University and their usage patterns of library resources. Out of the 384 questionnaires distributed, 377 were returned, yielding a high response rate of 96.7%. This strong participation rate provided a reliable



dataset for analysis. Descriptive statistics were used to analyze the data, and it was found that 65% of the respondents reported ease in locating books and other library resources. This suggests that the library has a fairly effective classification system in place for organizing materials, although further analysis indicates that the ability to locate resources was linked to the library's orientation program. An overwhelming 95% of the respondents found the orientation useful, though they noted that it focused more on physical access rather than digital resources, which affects their ability to efficiently navigate online databases.

Most of the library users (68.96%) were Bachelor's degree students, reflecting the diverse academic programs offered at Gretsá University. Interestingly, 70% of the respondents visited the library weekly, suggesting regular engagement with the library services. However, despite frequent usage, the study found significant variation in the types of resources accessed. While 75.86% of respondents used printed books, only 24.13% accessed online journals or eBooks. This indicates that students still favor traditional print resources over digital ones, which could be due to limited digital literacy or inadequate orientation on how to access and utilize electronic databases.

Despite the high usage of physical books, there is a notable underutilization of other library resources such as printed journals and the university's electronic databases. Only 5% of respondents reported using printed journals, and 51% did not use the university repository at all. This finding suggests a disconnect between the availability of diverse resources and the students' awareness or ability to use them effectively. It points to a potential gap in promoting the use of these resources or a need for more thorough and continuous training to enhance students' digital literacy and search strategies.

Another key finding from the study is that 60% of respondents found the library products and services relevant, while 49% considered the services up-to-date. This indicates that while the library is meeting the needs of a significant proportion of students, there is room for improvement, particularly in keeping resources updated and aligning them with the rapidly changing information needs of students. The dissatisfaction expressed by a portion of respondents may be tied to the inadequate focus on digital literacy training. The study highlighted that although 95% of students received an initial library orientation, it was insufficient for fostering ongoing engagement with the library's digital resources. Continuous training would improve the students' ability to perform research using modern tools, particularly for online research and databases.

Finally, the study revealed that most respondents accessed the library's digital services via smartphones and tablets (60%) or through university computers with internet access (40%). However, access to online resources was largely limited to the university's network, with 68% of respondents unable to access online journals outside the university premises. This suggests a need to extend digital services beyond the campus network, enabling students to access library resources remotely. Additionally, while 72% of respondents acknowledged being informed about library programs, many did not actively participate, with 40% never attending and 25% rarely attending. This indicates that while the library's communication efforts are effective, they need to improve engagement strategies to encourage higher attendance and participation in library programs.

#### **4. Conclusion**

This study sought to investigate the information needs and usage patterns of undergraduate students at Gretsá University, with a focus on the challenges they face in accessing library resources. The findings revealed that while the majority of students found it easy to locate physical resources, there is a significant gap in the usage and awareness of digital resources such as online journals and the university's repository. Most undergraduate students depend heavily on printed books, with only



a small percentage utilizing electronic databases or printed journals. This underutilization points to a need for continuous and more robust training in digital literacy, as well as better promotion of the library's online resources.

Moreover, while students generally found the library's services and resources relevant and satisfactory, the limited access to online materials outside the university's network and the lack of engagement with library programs indicate areas where improvements can be made. The study concludes that enhancing digital literacy through ongoing orientation and training, expanding off-campus access to digital resources, and fostering higher participation in library programs will be essential to better meeting the diverse information needs of Greta University's undergraduate students. Addressing these gaps will ensure that the library remains a central and effective resource in supporting student learning and academic success.

## **5. Recommendations**

Greta University Library should implement ongoing digital literacy training programs beyond the initial orientation. While the first-time orientation provides students with basic library navigation skills, there is a need for continuous, in-depth training focusing on online research, effective use of electronic databases, and advanced search techniques. This will enable students to fully utilize the library's digital resources, including eBooks, online journals, and the institutional repository, improving their overall academic research capabilities.

To address the limited access to digital resources outside the university network, the library should invest in infrastructure that allows students to access online materials remotely. This could include implementing virtual private networks (VPNs) or adopting remote authentication systems that provide secure, off-campus access to the university's online databases and journals. Such initiatives will support part-time students and those who need to study off-campus, ensuring they can access library resources anytime and anywhere.

The library should develop more engaging strategies to encourage student participation in its programs. This could involve introducing interactive workshops, webinars, or promotional campaigns that highlight the importance of utilizing both physical and digital resources. Additionally, integrating feedback mechanisms, such as regular surveys or focus groups, can help the library tailor its services to better meet the evolving needs of undergraduate users and boost attendance at library programs.

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**CLUSTER 2:**

**Sub-Theme 3: Hospitality and  
Tourism Management**

**SUB-THEME 5: Business**



# Inclusivity in Urbanization and Entrepreneurial Intentions Among People Living With Disability Within Nairobi County

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## Abstract

*This study looks into how perceived urbanization inclusivity affects entrepreneurial inclinations among people with disabilities (PWDs) in Nairobi County, Kenya. Cities are becoming economic growth hubs as urbanization accelerates, however there are worries about the inclusion of PWDs in this development. Despite global movements pushing for inclusion, urbanization present obstacles for people with disabilities. The study supports the United Nation's emphasis on including disability concerns into long-term development policies, as exclusion is predicted to cost 7% of global GDP. African countries, especially Kenya, continue to face economic inequalities as a result of a lack of inclusivity in their urbanization programs. The study focuses on Nairobi, where over 5,400 people with disabilities live. These individuals, however, confront economic exclusivity, particularly in major cities. In particular, the study focuses on the how perceived inclusivity in the city organization, transport systems, and buildings and other structures play a role in influencing entrepreneurial behaviour among the disabled. The study draws from the tenets in Shapero's Theory of Entrepreneurial Event and the Theory of Planned Behaviour to describe entrepreneurial intentions among PWDs in Nairobi. Data was collected with the help of online questionnaires and respondents reached out through snowballing. The collected data were analyzed quantitatively using both descriptive and inferential analysis. As per the study findings, whereas 31.73% of respondents perceive some inclusivity, 23.84% believe urbanization is not at all inclusive, which in return discourages their entrepreneurial thought behaviour. According to the regression findings, there is a statistically significant and positive relation between inclusivity and entrepreneurial intentions ( $R = 0.54 > 0.50$ ;  $p = 0.00$ ). To improve inclusivity for PWDs and encourage business prospects in urban settings, the study suggests policy adherence, diverse scholarly research, and awareness activities. Finally, the study emphasizes the significance of inclusive urbanization for PWDs' entrepreneurial endeavours, underlining the necessity for comprehensive policies, research, and education to bridge the economic divide and promote sustainable development for all.*

**Key Words:** Inclusivity, Entrepreneurial Intentions, People Living with Disability

## 1. Introduction

### 1.1 Background of the Study

In the recent years, Kenya has experienced vastness in the growth of its cities. Currently, Kenya has four cities namely Nairobi (the capital city), Mombasa, Kisumu, and Nakuru. Such growth is a highly celebrated phenomena, which triggers the perception that the country is on a promising economic trajectory. However, this growth does not fail to attract reservations, especially, when the position of the disabled persons is considered. Incidentally, urbanization is considered as highly non-inclusive, offering only limited opportunities to people living with disability-PWD in Kenya (Oranga, 2022). This study aimed at dissipating the effect of perceived inclusivity in urban development on entrepreneurial intentions among PWDs in Nairobi County in Kenya.





The United Nations (UN) estimates that that at least 15% of the total of 6.25 billion people with disabilities will be living in cities by the year 2050 (UN Secretariat on Rights of People with Disabilities, 2014). However, despite the potential of urbanization in creating e for the physically disabled to entrepreneurial opportunities for PWDs to participate in the economy, most cities are offering a hindrance to this agenda. Excluding people with disability is estimated to be as costly as 7% of the global GDP (UN Secretariat on Rights of People with Disabilities, 2016). As such, nations are challenged to be highly considerate of the disabled as part of their urbanization agenda. The 2006 Convention on the Rights of Persons with Disabilities enhanced the global framework for promoting the rights and socioeconomic progress of individuals with disabilities (UN Secretariat on Rights of People with Disabilities, 2014). The Convention's preamble underscores the significance of integrating disability concerns into sustainable development strategies. Jones et al., (2020) notes a significant gap in the implementation of national disability rights policies at the local level in the USA. Park and Chowdhury (2022) explore the challenges faced by individuals with disabilities who rely on public transport, emphasizing the significance of independent and barrier-free travel for their overall well-being. The study investigates commonalities and differences in perceived obstacles among various disability types, evaluates the impact and limitations of universal design, and addresses issues related to data collection procedures in the USA.

A study carried out in South Sudan indicates that 14.4% of respondents had a disability. Cities in Nigeria, such as Lagos and Abuja, are in high level confrontation with accessibility issues among the disabled (Smith, 2011). According to a World Bank study from over 25 million Nigerians have disabilities, and many of them encounter hurdles to public amenities, transportation, and work possibilities in urban areas (World Bank, 2020). Notably, Ghana's capital Accra still experiences high cases of exclusivity due to a lack of accessible infrastructure and transport choices (Odame, 2022). It is however notable that accessibility efforts are underway, but progress is gradual (Odame, 2022). Many people with disabilities face social stigma and prejudice in Dar es Salaam, Tanzania's largest city, due to limited access to public spaces and transportation, despite the existence of various legislations such as the Employment and Labour Relations Act, 2004 (No 6) that prohibits any form of discrimination in employment including discrimination on account of disability (International Labour Organization-ILO, 2009). The National Strategy for Growth and Reduction of Poverty-MKUKUTA, 2005-2010, notes a high correlation between disability and poverty in Tanzania (as cited in ILO, 2009). Conclusively, African countries still experience a wide economic gap that is occasioned by a lack of inclusivity of PWDs in their urbanization and development agenda.

As documented by the State of Kenyan Population Report (2020), there were more than 900, 000 individuals living with disability in Kenya. This accounted for about 1.95% of the Kenyan population. According to Hunt et al. (2021), it is notable that households with a disabled persons in Kenya are prone to high levels of poverty compared to those without. It is observable that this population is highly concentrated in the urban centres as these are seemingly the only places with promising economic opportunities when compared to the rural areas. In the words of Oranga (2022), the disabled are among the groups termed as the “urban invisibles,” meaning people whose visibility and accessibility has been masked with the urban development. In a study by Zulu et al. (2021), urbanization is a key ingredient to the growth of slums in Nairobi, with a worsening impact on the lives of the disabled.

## **1.2 Statement of the Problem**

Urbanization is expected to be a key contributor to the economic development, while factoring in the contribution of people living with disability. According to the UN Habitat (2019), 27% of the current population is living in cities in Kenya, which is experiencing a rapid rate of urbanization at a 43% per annum. The development of cities however occasions high levels of exclusivity among Kenyans



living with disability, a highly overshadowing factor towards their entrepreneurial participation. Exclusivity is highly notable in major cities such as Nairobi, Mombasa, and Kisumu, where PWDs find it hard to follow their entrepreneurial ideas.

Onsomu, Mose, and Munene (2022) observe that a majority of people living with disability in Kenya experience high levels of economic exclusivity. Low participation rates are costly to individuals in terms of economic and psychological well-being, to governments in terms of lost revenues, and to society in terms of the impact of social exclusion and discrimination on civic participation and public life. It is also observable that a majority of the disabled fear the lack of serenity in major cities in Kenya which is key to generation of business ideas. For instance, more often than not, most urban centres are prone to commotions, which make it unsafe for people living with disability to venture into businesses. Apart from that, the spaces available for the disabled, such as stalls and shops are hardly accommodative to such individuals, hence a hindrance to nurturing any meaningful entrepreneurial ideas. According to *InBusiness Kenya* (2019) only 4.3% of small and medium-size businesses in Kenya were owned by people living with disability. Such a figure indicates that most of the persons living with disability are missing out on business opportunities.

A report by Kisia (2023) shows that there was a worrying influx of beggars living with disabilities within major cities in Kenya as beggars. In July 2022, at least 78 PWD were arrested for being engaged by scammers as commercial beggars, which was summountable to human trafficking (Kisia, 2023). Street begging among PWDs is a manifestation of a lost opportunity in entrepreneurship. According to Ayodi (2022), a high percentage of the buildings within the city of Nairobi are inaccessible to PWDs. Yet, the same buildings are mostly the highly strategically positioned for businesses purposes when compared to rural parts of the country which is detterent to the development of business ideas. Despite various legislative restrictions such as Section 23 of the Persons with Disabilities Act (2002) that requires accessibility upgrades on Nairobi buildings, many property developers and owners are yet to comply, resulting in inaccessible constructions.

The problem is further aggravated by a knowledge gap on the relationship between urbanization inclusivity and entrepreneurial intentions of PWDs. A majority of existing scholarly and policy related sources are devoid of the most current state of the PWDs as far as their entrepreneurial endeavours are concerned. For instance, a study by Kabare (2018) on social protection and disability in Kenya hardly articulates entrepreneurial related challenges among the PWDs. Another study by Pérez-Macías et al. (2022) on resilience and entrepreneurial intentions of people with disabilities rarely brings in the challenges associated with the growth and development of major cities in the country. The current study endeavors to bring out the correlation between perceived urban inclusivity and entrepreneurial intentions while dissipating the challenges that PWDs attempting to address their economic problems through entrepreneurship.

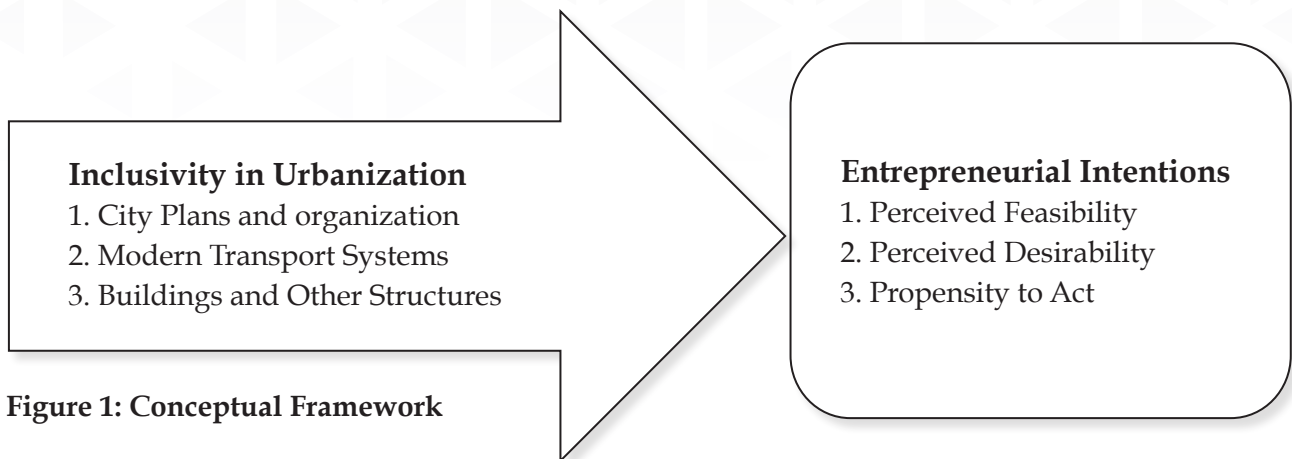
### **1.3 Objective of the Study**

The objective of this research was to evaluate the impact of urbanization inclusivity on entrepreneurial intentions among PWDs in Nairobi County in Kenya.

### **1.4 Conceptual Framework**

The conceptual framework of the study was as shown in Figure 1 below. The framework consisted of Inclusivity in urbanization as the independent variable and Entrepreneurial Intentions and PWDs as the Dependent Variable.





**Figure 1: Conceptual Framework**

## 2. Literature Review

There exists different pieces of theoretical and empirical literature with emphasis on both inclusivity and entrepreneurial intentions among PWDs.

### 2.1 Theories of Entrepreneurial Intention

Various theories have been established to explain reasons why people get involved in entrepreneurship. Among such theories is Shapero and Shokol's Theory of Entrepreneurial Event which was established in 1982 after a revision of the earlier 1967 version. The theory is crucial in understanding the motivation behind entrepreneurship, and it comprises three essential components: Perceived Desirability, Perceived Feasibility, and Propensity to Act (Ranga et al., 2019).

Perceived desirability offers an analysis on whether the business opportunity the person's interests and aspirations, highlighting the significance of consumer demand analysis and market research (Ranga et al., 2019). Perceived Feasibility evaluates the viability of a business opportunity by taking into account one's resources, skills, and competitive environment. On the other hand, the ability to recognize the psychological obstacles that may prevent action and be willing and prepared to take decisive action in the direction of capturing the opportunity is known as the propensity to act (Ranga et al., 2019).

Shapero's model acknowledges that starting a business calls for conquering worries, overcoming risk aversion, and developing self-confidence. This theory was found to be highly applicable in this study as it underscores most of the meditative processes that PWD undergo before deciding on establishing or expanding their businesses.

Apart from Shapero's theory of entrepreneurial intention, there are yet other theories that have received recognition from scholars. For instance, the Social Cognitive Profession Theory, (SCCT) established by Robert Lent, Steven Brown, and Gail Hackett not only examines entrepreneurial aspirations but also investigates the process of professional choice (as cited in Wang et al., 2022). According to SCCT, environmental influences have an immediate impact on how learning experiences are formed and how a person's career develops (Wang et al., 2022). In addition, Aldrich and Martinez (2001) look at Entrepreneurship as a process of selection and adaptation, which is evolutionary in nature. According to the theorists, outside influences and life events, including education, family history, employment history, and exposure to successful entrepreneurs, can shape an individual's intention to be an entrepreneur.

## 2.2 Empirical Review

The welfare of the people living with disability is an attraction to many scholars as articulated in various existing sources. However, the entrepreneurial intentions of PWDs in light of the level of inclusivity offered within the modernization framework has not received adequate attention yet. This is evidenced by various research gaps that are notable in the existing literature. Noemí-Pérez et al. (2022) investigated the nexus between resilience and entrepreneurial intentions among individuals with disabilities, aiming to contribute to the realization of Sustainable Development Goals (SDGs). The findings reveal a statistically significantly positive correlation between resilience and entrepreneurial intentions in this demographic circle.

Similarly, Karani and Pido (2019), did a study on Universal Design (UD) awareness among urban planners and its impact on public transport systems in Nairobi. The study revealed significant gaps in UD knowledge and implementation. The research indicates that urban planners in Nairobi generally lack the awareness of UD principles, particularly in the context of public transport infrastructure. This knowledge gap has tangible consequences for the inclusivity and accessibility of transportation systems, potentially leading to exclusionary practices that neglect the diverse needs of commuters, including those with disabilities. Another study by Mang'eni (2021) notes that more males than females with disabilities are involved in small and medium enterprises in the study area. The study does not however focus on the realms of entrepreneurial intentions as may be triggered by different factors such as the urban setup.

The article by Oncasey et al. (2023) investigates the role of commercial drivers in ensuring efficient and accessible public transport for individuals with visual impairment, particularly on university campuses with a high number of such individuals. A significant majority (85.6%) of the drivers reported adopting the practice of stopping for pedestrians with visual impairment to facilitate road crossings. The study however reveals a lack of knowledge among participants regarding the specific sections of the disability act related to the provision of transport services for individuals with visual impairment. In addition, the study explores co-creation frameworks in transportation and emphasizes the importance of involving PWD in the design process of urban transport services. Successful design of urban transportation experiences is contingent on effective communication. The study involved 37 participants, and the representativeness of this sample may be a limitation, particularly if certain perspectives within the PWD community are underrepresented. Baker (2020) identifies new challenges related to virtual participation, particularly for individuals with disabilities. Accessibility, usability, and equity are emphasized as key considerations in this context. To address the challenges identified, the article proposes a framework for a "smart participation future." This involves the concept of smarter communities that leverage universal design, blended bottom-up approaches, and virtual communities of practice (VCoP) to enhance the inclusion of citizens with disabilities in smart cities.

## 3. Research Methodology

The study involved a descriptive research design, whose purpose was elucidating how inclusivity in urbanization influences the entrepreneurial intentions of PWD. The study targeted a population of about 5400 people living with disability in Nairobi City (Development Initiative, 2020), out of which a sample size of 372 was drawn, using Yamane's (1967) formula. Data was collected using questionnaires through snowballing. Snowballing was a preferred method of data collection as it allowed for establishing referrals to the respondents given the lack of any other structured way of tracing the respondents. Of the 372 targeted respondents, the researcher managed to reach out to 255. This gave a response rate of 68%. As documented by Fincham (2015) a response rate of about 60% is generally acceptable for a social science research. The targeted respondents were those with





different types of disabilities such as mobility, hearing, seeing, among others, that could generally pose difficulties in moving around and operating a business within Nairobi County. Means were employed to calculate the central tendency while standard deviations were utilized to measure data dispersion from the mean. Frequencies were used to describe the data. A Bivariate Linear Regression model was used for hypothesis testing. The Model  $R^2$ , ANOVA statistics (F Statistic and related p-value), and regression coefficients (Beta and associated p-value) were determined and explained. The equation adopted for the study was  $Y=a+ bX +\epsilon$ , where Y (Entrepreneurial Intentions) was the dependent variable and X (inclusivity in urbanization) was the independent variable.

#### 4. Results and Discussions

The results of the analysis were as discussed in the sections that follow:

##### 4.1 Perceived Urban Inclusivity

The study sought to establish the perception of the respondents regarding the inclusivity of the organization, transport systems, and the buildings as far as the inclusivity of PWDs is concerned.

The results were as as summarized in Table 1:

**Table 1: Perceived Urban Inclusivity of PWDs**

	Perceived Urban Inclusivity Statements	Very Much (%)	Much (%)	Somehow (%)	Neutral (%)	Not at All (%)	Mean	Standard Deviation
<b>A. Inclusivity of the Organization of the City</b>								
	Sidewalks Allow Easy Movement	5.50	13.80	31.10	18.9	30.70	2.44	1.21
	Inclusivity of crosswalks and traffic Signals Effectiveness	7.90	24.80	29.50	21.30	16.50	2.86	1.19
	Accessibility to public services	5.10	16.5	42.5	22.8	13.0	2.78	1.04
	Access to emergency services	5.10	20.80	39.00	21.70	13.80	2.82	1.07
	<b>Average</b>	5.90	18.98	35.53	21.18	18.50		
<b>B. Inclusivity of the Transport System</b>								
	Inclusivity of Transport Infrastructure	6.30	19.30	30.70	23.60	20.10	2.68	1.18
	Inclusivity within the standards of the vehicles	3.90	17.30	23.20	24.40	31.10	2.39	1.20
	Cost of Public Transport	6.70	13.80	46.90	21.30	11.40	2.83	1.02
	Implementation of Traffic Laws	5.90	24.40	29.90	23.20	16.50	2.80	1.16
	Cordial Interaction of Transport Staff with PWDs	5.50	13.80	27.60	23.20	29.90	2.42	1.41
	<b>Average</b>	5.66	17.72	31.66	23.14	21.8		
<b>C. Inclusivity of Buildings and Other Structures</b>								
	Inclusivity of Building Entrances	4.70	13.40	30.70	21.30	29.90	2.42	1.18
	Designated Parking Spaces	5.10	15.40	28.00	21.70	29.90	2.44	1.21
	Availability of Ramps and Lifts in Storied Buildings	4.30	13.40	27.60	22.00	32.70	2.35	1.19
	Ease of movement on Corridors and Doorways	4.30	17.70	28.00	18.10	31.90	2.44	1.23
	Inclusivity of Public Spaces	3.90	19.30	29.50	20.90	26.40	2.54	1.18
	<b>Overall Average</b>	<b>4.46</b>	<b>15.84</b>	<b>28.76</b>	<b>20.8</b>	<b>30.16</b>		
	<b>Overall Standard Deviation</b>							<b>0.20</b>

On average, a majority of the respondents (31.73%) felt the city organization, transport systems, and constructions were somehow inclusive to PWD. This could be a reflection of the achievements realized through the deliberate efforts made by the governmental and non-governmental organizations towards the welfare of the PWDs, such as the implementation and enforcement of Persons with Disability Act, 2003. However, the respondents who felt that the city is not inclusive at all were 23.84%. Such feedback is a major cause of concern since the percentage is so high, compared to only 5.30% of the respondents that felt that Nairobi City was very much inclusive. The standard deviation was 0.20; being less than 1, the implication is that the responses echoed a normal non-exaggerated situation when responding to such questions as the deviation from the mean was not high (Rubin, 2009).

The results are reflective of the foregone opportunities which could otherwise help in steering the culture of entrepreneurship among the disabled persons through strategic urbanization plans that demonstrate a high sense of inclusivity. In essence, a high number of PWDs are discouraged from pursuing their entrepreneurial dreams given their fear of getting injuries, discrimination, slow mobility, low levels of competitiveness, among others. Such a trend is notable in the works of Oranga (2022), Kisia (2023), and Ayodo (2022) who have a general conclusion that the city organization, transport, and buildings are not adequately inclusive to attract an entrepreneurial mindset among PWDs in Nairobi.

#### 4.1 Entrepreneurial Intentions of PWDs

The study also sought to determine the extent to which the respondents were inclined towards either starting or growing their businesses within the Nairobi County. The questions asked were guided by Shapero's (1982) Intentionality-Based Process Model of the Entrepreneurial Event. The results were as shown in Table 2:

**Table 2: Entrepreneurial Intentions of PWDs**

	Statements on Entrepreneurial Intentions	Very Much (%)	Much (%)	Somehow (%)	Neutral (%)	Not at All (%)	Mean	Standard Deviation
<b>A. Perceived Desirability</b>								
	Engagement in research for any business idea	17.7	21.7	30.7	23.6	6.3	3.20	1.17
	Willingness to create a business plan for business idea based in the city.	29.9	16.1	29.1	20.9	3.1	3.49	1.21
	Evaluation of the value proposition of my business	29.1	23.6	27.2	15.0	5.1	3.57	1.20
	Exposure and connection with entrepreneurial mentors	10.2	37.4	29.9	18.1	4.3	3.31	1.02
	Passion to Business than Employment	32.7	23.2	26.0	15.0	3.1	3.67	1.17
<b>B. Perceived Feasibility</b>								
	Engagement in Training and Upskilling	9.8	39.4	30.3	17.7	2.8	3.36	.97
	Knowledge and Understanding of my Business	10.6	40.2	31.5	13.4	4.3	3.39	.99





	<b>Statements on Entrepreneurial Intentions</b>	<b>Very Much (%)</b>	<b>Much (%)</b>	<b>Somehow (%)</b>	<b>Neutral (%)</b>	<b>Not at All (%)</b>	<b>Mean</b>	<b>Standard Deviation</b>
	Knowledge of Target Market and Industry Needs	14.2	39.4	26.0	15.4	5.1	3.42	1.07
	Positive reference from previous collaborators, mentors, or industry experts	15.7	38.2	25.2	18.1	2.8	3.46	1.05
	Willingness to create a strong brand	22.8	35.0	25.6	14.6	2.0	3.62	1.05
<b>C. Propensity to Act</b>								
	Willingness to overcome City Related Barriers	31.1	28.0	25.2	13.8	2.0	3.72	1.10
	Ability to make business decisions independently	18.9	24.0	25.2	11.0	20.5	3.09	1.39
	Continuous skills and knowledge Improvement.	21.7	38.2	26.4	9.8	3.9	3.64	1.05
	Good understanding of market including customer needs, competitors, and industry trends.	17.7	37.4	31.5	11.0	2.4	3.57	0.98
<b>Overall Average</b>		<b>20.15</b>	<b>31.56</b>	<b>27.84</b>	<b>15.53</b>	<b>4.84</b>		
<b>Overall Standard Deviation</b>								<b>0.18</b>

From the summary, 20.15% of the respondents showed the highest level of entrepreneurial intention while 4.84% the least. The standard deviation was 0.18 which indicated that the responses were not so much deviated from the mean, hence construed as a more natural way of responding to such questions by the respondents (Rubin, 2009). The challenge in having a higher percentage of PWDs nurture more interest and intentions in entrepreneurship could be attributed to low levels of inclusivity in the city's organization, constructions, and the transport systems. A lack of full commitment towards entrepreneurial endeavors could also be demonstrated by those who gave a 'somehow' and 'neutral' rating at a total of 43.37%. This is a worrying trend, which implies that most of PWD were yet to be fully inspired to effectively pursue the entrepreneurial journey within Nairobi City as a way of addressing their economic needs. Such sentiments are supported by lobbyists such as *InBusiness Kenya* (2019) and United Disabled Persons of Kenya-UNDPK (n.d) who identify a number of urban related exclusivity as a major hindrance towards entrepreneurial development among PWDs.

#### 4.2 Inferential Results

To determine the relationship between inclusivity and entrepreneurial intentions, a regression analysis was carried out. The independent variable was perceived inclusivity in urbanization while the dependent variable was entrepreneurial intentions. The analysis involved the generation of a Model Summary, Analysis of Variance (ANOVA) and establishment of Regression Coefficients.

**Table 3: Model Summary of the Relationship between Urban Inclusivity and Entrepreneurial Intention among PWDs**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.540 <sup>a</sup>	.292	.289	.62601
a. Predictors: (Constant), Inclusivity in Urbanization				

From the results of the model summary shown in Table 3, the R-value of 0.54 indicates that the model could be used to predict the relationship between perceived urban development inclusivity and up to 54%. The adjusted R Square value of 0.289 indicates that changes in entrepreneurial intentions among PWD within Nairobi County could be explained by at least 28.90% of changes in inclusivity in urban development. As such, an improvement by one unit in inclusivity could result in an improvement in entrepreneurial intentions 28.9 times.

Apart from the above test, an Analysis of Variance was carried out to determine whether the relationship between inclusivity in urban development and entrepreneurial intention among PWD was statistically significant. The results were as shown in Table 4:

**Table 4: Analysis of Variance**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1   Regression	40.670	1	40.670	103.780	.000 <sup>b</sup>
Residual	98.755	252	.392		
Total	139.425	253			
a. Dependent Variable: Entrepreneurial Intention					
b. Predictors: (Constant), Inclusivity in Urban Development					

From the results, the F-statistic of 40.670 indicated that the model was significant because it exceeded the critical value of 3.879 with a 1 and 252 degrees of freedom at a p-value of 0.05. With a significance level of 0.05, it was established that the relationship between inclusion in urban development and entrepreneurial intention was statistically significant.

In essence, the findings show that there is a significant and relevant association between inclusion in urban development and entrepreneurial intent. This is not a coincidental correlation, but rather a statistically significant relationship that advises on the need to have a more inclusive entrepreneurial space for the PWD in Nairobi and other cities around the world.



To establish the model showing the relationship between inclusivity in urbanization and entrepreneurial intentions among PWDs, a regression of coefficients was established and the results were as shown in Table 5:

Table 5: Regression Coefficients						
Model	B	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		Std. Error	Beta			
1	(Constant)	2.104	.155		13.551	.000
	Urban Inclusivity	.464	.046	.540	10.187	.000
a. Dependent Variable: Entrepreneurial Intention						

Considering the constant term, when inclusivity in city development among PWD were at zero, entrepreneurial intentions would be at 2.104. On the other hand, an improvement by one unit in inclusivity in urban development would lead to an improvement in entrepreneurial intentions by 0.464 units. The coefficients were thus used to derive the model of the study as  $Y = 2.104 + 0.464X$ , where,

Y=Entrepreneurial Intentions

X=Inclusivity in Urban Development.

The positive coefficient emphasizes the need of supporting urban inclusivity to increase entrepreneurship motivation among people with disabilities. These findings have practical implications on policy makers, urban planners, and disability inclusion activists to outperform the current state of affairs as far as inclusivity is concerned. Creating more accessible urban development environments can help to promote entrepreneurial activities among people with disabilities. This not only adheres to social justice ideas, but also helps to economic empowerment and diversity in the entrepreneurial scene.

## 5. Conclusions and Recommendations

This study sought to evaluate the relationship between perceived inclusivity in urbanization and entrepreneurial intentions among PWDs in Nairobi City. The study focused on three elements of inclusivity namely organization of the city, the transport system, and buildings and other constructions.

Data on entrepreneurial intentions was based on the theory of planned behavior and entrepreneurial event in which three study parameters (Perceived Desirability, Perceived Feasibility, and Propensity to Act) were considered. In the findings, a majority of the respondents had the view that the city is yet to achieve the desired levels of inclusivity to the extent of triggering entrepreneurial intentions among persons with disability. This conclusion was drawn from more than 23.84% of the respondents who felt that the urbanization was not inclusive at all for the PWDs.

The relationship between perceived inclusivity and entrepreneurial intention among the PWDs was determined through inferential analysis. The results show that there was a strong ( $R=0.54 > 0.50$ ), positive, with an R Square value of 0.289, meaning that 28.90% of changes in entrepreneurial intentions could be explained by one unit of improvement in inclusivity of PWD in Nairobi City. The relationship was also established to be highly statistically significant relationship between the two variables ( $p=0.00 < 0.05$ ). The implication of this level of significance is that the relationship is not merely as a result of chance but a possibility of some coherence in the relationship between the two variables under in this study.



Based the above findings, the study made the following recommendations:

1. To policy makers, there is a need to ensure that existing policies are followed through to proper implementation standards. This is a notable suggestion given the observation that despite the existence of different laws such as Persons with Disability Act 14 of 2003, which is meant to create an obstruction free environment for PWDs, a majority of the affected individuals still find accessibility and utilization of the city space for entrepreneurial engagements a challenge. In addition, Article 54 of the Kenyan Constitution 2010 stipulates rights of the disabled persons such as the right to ease of access to all places, seamless utilization of the public transport, and information, among others. Considering the findings of this study in line with the existing literature, the workability of such a law is still shaky in enhancing an entrepreneurial thought among the disabled not only in Nairobi County but in other cities and towns across the country.
2. To scholars, there is a need to intensify and diversify research based on people living with disability as far as their entrepreneurial pursuits are concerned. Entrepreneurial life among PWDs is highly dynamic and sometimes adverse as it is affected by a myriad of factors. Other than the factors studied in this research, scholars can leverage on other dimensions such as attitudinal barriers, financing models, technological support, among others, that are key towards entrepreneurial stimulation.
3. To practitioners, the study suggests that more awareness and sensitization need to be created specifically with regard to inclusivity of city environment as a stimulant towards entrepreneurial thinking and decisions among PWDs. Among the challenges at hand that most sources have noted is a lack of up-to-date statistics on the numbers and status of PWDs. This calls for a need for invigorated efforts in profiling the demographics of PWDs in order to ensure that their inclusivity and entrepreneurial challenges are effectively addressed.



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# Effects of Motivation on Employee Productivity at Anglican Church of Kenya (Thika Diocese), Kiambu County, Kenya

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## Abstract

*The purpose of the study was to research on the effects of motivation on employee's productivity in an organization. The study was guided by the following objective: To establish if communication influence motivation at ACK Thika Diocese, to determine the financial rewards used and how they influence motivation at ACK Thika Diocese, to determine the non- financial rewards at ACK Thika Diocese and to investigate the Off Job Training on Employee Productivity at ACK Thika Diocese. The study was be conducted at ACK Thika Diocese where questionnaires were issued for data collection. Descriptive research design was used in the research; respondents were all the clergy members participated in the study. The data collected was analyzed using Spss and Inferential statistics. Theoretical framework is philosophical basis in which the actual research takes place. From this therefore, it creates the link between the theoretical orientations and actual components the investigation is taken. Mertens (1998) stated that theoretical framework has a significant implication on research methodology decisions. It is clear from the two researches that theories on the area of research play a great role on setting the base on what direction the study will take. According to Mackay (1993), it is relevant to establish a method compatible with the nature of problem under investigation for research to be successful. From the study, we can conclude that motivation has a direct impact on employees' productivity. There are several factors that should be strongly considered if the organization want to increase employee's productivity. Some of the key factors include monetary compensation in terms of salary and remuneration, bonuses, allowances, access to credit facilities etc. Other important aspects would be recognition and appreciation, providing a warm work environment, treating staff fairly and with equity, and also encouraging healthy working relationships with co-workers. It is also good to have staff trained to sharpen their skill sets and make them more equipped to perform their various jobs.*

**Key Words:** Motivation, Employee's Productivity

## 1. Introduction

Motivation enhanced organizational cohesion or integration consequently giving rise to synchronization of efforts among the employed resulting in higher productivity. Organizational culture, Job description, Job satisfaction, skills and qualifications of employees together with the organizational structure helped in the achieving of the objectives of the organization. Higgs (2020). A simple definition of Motivation is a force that makes people act, set goals, and achieve them. Currently many organizational disciplines have adopted motivation as essential in achieving success and their mission statements routinely elude to the importance of motivation, utilizing such words as cooperation, appreciating, coordination, collaboration, and Communication as key components. A study conducted among churches (Julius, 2019) revealed that motivation helps employees to cooperate, enhance employees' skills, provide feedback and reduce individual conflicts. Employees may therefore be portrayed as effective work groups whose effectiveness rests on the degree of motivation, coordination and purpose and whose synergy produces an energy/creativity which is beyond them as individuals, hence, teams must possess a definable membership, group consciousness and a sense of shared purpose (Adair, 2021).

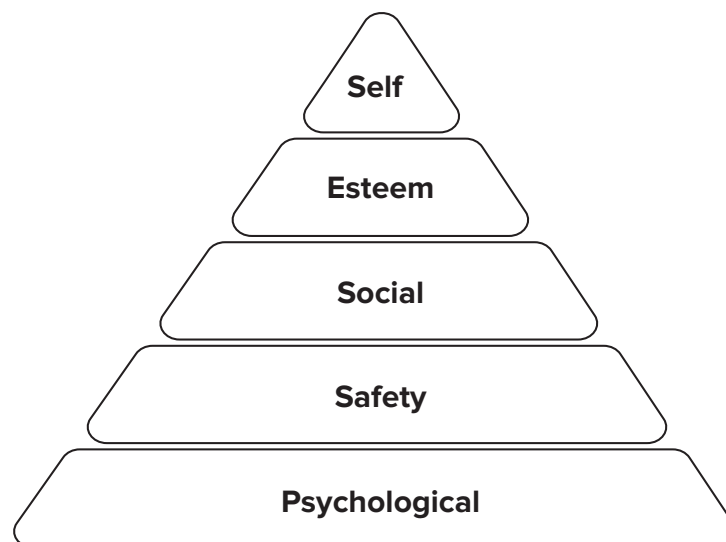


In order for employees to feel motivated, work environment must be conducive, mutual trust and respect from all the employees must be very key. For motivation to be thrived well among the staff members, effective communication, resolving conflicts and resolutions becomes a key across the whole organization which on the return helps improve the organization productivity. An employee who is motivated is expected to have certain qualities like intelligence, effective communication skills, problem analysis to be solved and willing to work with the other staff in getting solved solution. (Conti *et al.*, 2020) in argued that in overall organizational productivity is as a result of employees being motivated. ACK is one of the growing churches where by it motivates its employee's i.e., the clergy, the evangelist and all the employees that works in church. Some of the motivations are financial, some are non- financial and others are encouraging them to go back to school and even sponsoring their higher education and more so giving them humble time to study.

## 2. Literature Review

### Maslow's Hierarchy Theory

Maslow's hierarchy of needs is a theory of motivation. It indicates five categories, these are: 1. Basic needs: These are the basic needs of human for survival. They include food, water, shelter, clothing etc. Maslow states that you cannot proceed to the next level of fulfillment before these needs being addressed. 2. Safety needs: These includes, protection from violence and theft, financial security and health security. 3. Social needs: These needs are: friendships, family bonds (both with biological and chosen). Maslow states that it's a feeling of entitlement and belonging, whether at the work place or in any union. 4: Esteem needs: These are ego-driven needs. These are elements like, self-respect, self-confidence ets. 5. Self-actualization needs: These describes fulfillment of one's potential. These include education, skills development, redefining of talents, caring for others etc. According to Abraham Maslow (1943), most people are motivated by unsatisfied needs. As each of these needs to significantly satisfied, it drives and forces the next to emerge. The hierarchy is illustrated by the figure below:



Maslow's hierarchy Theory was useful in this research project as the new entry level of the clergy that is the evangelist were only satisfied with the basic needs only as compared to an experienced clergy who were even educated and have had different clergy titles like canon or administrative secretary who are in the level of fulfillment.

## 1.1 THEORY x & THEORY y

This theory suggests two aspects of human behavior at work that is according to Douglas McGregor (1960). This related well at ACK Diocese of Thika of how some employees (clergy) take the pastoral work negatively and the others take positively. Some of the clergy have the ambition for work while others don't. Some are resistant for change when it comes to transfer while others are not, some can perceive their job as relaxing and normal because they believe it's a call while others take their work more seriously. When the work is rewarding and satisfying, it results to recognition of responsibilities. In short, the creativity, resourcefulness and innovative potentiality of the employees can be utilized to solve organizational problems. Thus, we can say that Theory X presents a pessimistic view of employees' nature and behavior at work, while Theory Y presents an optimistic view of the employees' nature and behavior at work.

When there is high productivity in the Diocese, the clergy were able to pay the quota and through paying, they were motivated by financial rewards like bonus or non-financial rewards like rebate tickets or on job training. Theory X and Y was used in this research project as the hardworking clergy and the evangelist were identified. Those who when taken to remote areas were known on their performance and their zeal to bring souls to Christ and whether they work for money or not.

## 3. Research Methodology

The study employed a descriptive research design. This design enabled an accurate examination of the current state of employee motivation and productivity within the diocese. The target population consisted all 135 employees across various departments, including the pastoral team, human resources, and finance, given their roles in both implementing and experiencing organizational motivation policies. A census approach was used, gathering data from all accessible staff to ensure comprehensive coverage and minimal sampling error. Data collection involved structured questionnaires that captured quantitative data. This design allowed for a detailed understanding of the motivation-productivity relationship within the church context, forming a basis for potential improvements in organizational practices.

## 4. Results and Discussion

### 4.1 Response Rate

All the 135 administered questionnaires were fully answered and were available and utilized for the study. This is equivalent to 100%. This value is significant for the study as recommended by Kithinji (2015). Mugenda and Mugenda (2003) suggest that a response rate of 50% is sufficient for analysis and reporting, while a rate of 60% is considered good, and a response rate of 70% or higher is deemed excellent. Considering this guideline, the obtained response rate was categorized as excellent for the study.



## 4.2 Descriptive statistics

### 4.2.1 Financial Rewards and Employee's Productivity

The Study Sought to determine the effect of financial rewards on employee's productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya. The results are given in table 1.

**Table1: Financial Rewards**

FINANCIAL REWARDS					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	51	37.8	37.8	37.8
	3	5	3.7	3.7	41.5
	4	28	20.7	20.7	62.2
	5	51	37.8	37.8	100.0
	Total	135	100.0	100.0	

Among the participants, 51 which accounts for 37.8% of the total disagreed that financial rewards affect employee's productivity. Moving Further 5 individuals constituting 3.7% were neutral on whether financial rewards affect employee's productivity. Furthermore, participants comprising 20.7 % of the total agreed that financial rewards affect employee's productivity. Moving further, a significant number of participants 51 individuals accounting to 37.8 % of the total Strongly agreed that financial rewards affect employee's productivity.

### 4.2.2 Non- Financial Rewards

The Study Sought to determine the effect of non-financial rewards on employee's productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya. The results are given in table 2.

**Table 2: Non-Financial Rewards**

NON FINANCIAL REWARDS					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	52	38.5	38.5	38.5
	2	2	1.5	1.5	40.0
	3	29	21.5	21.5	61.5
	4	1	.7	.7	62.2
	5	51	37.8	37.8	100.0
Total		135	100.0	100.0	

Among the participants, 52 which accounts for 38.5% of the total strongly disagreed that non- financial rewards affect employee's productivity. Moving Further 2 individuals constituting 1.5% disagreed on non-financial rewards affect employee's productivity. Furthermore 29 participants comprising 21.5% of the total were neutral on whether non-financial rewards affect employee's productivity. Moving further, 1 individual accounting to 0.7% of the total agreed that financial rewards affect employee's productivity. Lastly, a significant number of respondents 51 constituting 37.8% strongly agreed that non-financial rewards affect employee's productivity.

### 4.2.3 Off Job Training

The Study Sought to determine the effect of off job training on employee's productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya. The results are given in table 3.

**Table 3: Off the Job Training**

#### OFF JOB TRAINING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	1.5	1.5	1.5
	2	26	19.3	19.3	20.7
	3	54	40.0	40.0	60.7
	4	26	19.3	19.3	80.0
	5	27	20.0	20.0	100.0
	Total	135	100.0	100.0	

Among the participants, 2 which accounts for 1.5% of the total strongly disagreed off job training affect employee's productivity. Moving Further 26 individuals constituting 19.3% disagreed on off job training affect employee's productivity. Furthermore 54 participants comprising 40.0% of the total were neutral on whether off job training affect employee's productivity. Moving further, 26 individuals accounting to 19.3% of the total agreed that off job training affect employee's productivity. Lastly, a good number of respondents 27 constituting 20.0% strongly agreed that off job training affect employee's productivity.

### 4.3 Regression Analysis

To establish the relationship between the independent and dependent variable, regression analysis was carried out. A multiple linear regression analysis was used to determine the relationship between financial rewards, non- financial rewards, off job training and employee's productivity. R-squared measures the extent to which one independent variable explains the observed pattern in another dependent variable; a bigger R-squared indicates a significant effect. The outcomes of the analysis were as shown table 4.

**Table 4: Regression coefficients**

#### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.899 <sup>a</sup>	.809	.804	.454	.809	184.560	3	131	.020	2.013

a. Predictors: (Constant), OFF JOB TRAINING , FINANCIAL REWARDS , NON FINANCIAL REWARDS

b. Dependent Variable: EMPLOYEE PRODUCTMTY

The Results showed an R-squared of 0.804 between motivational factors and employee's productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya. The results indicates that independent variables explained for 80.4% of the variations in the dependent variable (employee's productivity) While the remaining 19.4% could be explained by other factors that influence employee's productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya.

To test whether regression model fits the data well, an ANOVA was performed. The outcome were presented in the table 5.





**Table 5: Anova analysis**

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	113.969	3	37.990	184.560	.000 <sup>b</sup>
	Residual	26.965	131	.206		
	Total	140.933	134			

a. Dependent Variable: EMPLOYEE PRODUCTIVITY

b. Predictors: (Constant), OFF JOB TRAINING , FINANCIAL REWARDS , NON FINANCIAL REWARDS

Table 5 revealed that, the model is statistically acceptable with a p-value of less than 0.05 for the F ratio, making it highly significant

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF	
1	(Constant)	-.947	.270		-3.501	.001	-1.481	-.412						
	FINANCIAL REWARDS	.592	.053	.768	11.139	.000	.487	.698	.566	.697	.426	.307	3.253	
	NON FINANCIAL REWARDS	-.035	.050	-.060	-.691	.491	-.134	.065	-.167	-.060	-.026	.196	5.092	
	OFF JOB TRAINING	.743	.054	.765	13.741	.000	.636	.850	.476	.768	.525	.471	2.123	

a. Dependent Variable: EMPLOYEE PRODUCTIVITY

Using the table’s unstandardized beta coefficients, the overall multi linear equation was attained as proposed by the research framework. Where beta coefficients are substituted in the equation, the model becomes

$$Y = -0.947 + (0.592X_1) + (-0.035X_2) + (0.743X_3)$$

Whereby;

Y= Employee’s productivity X1= Financial rewards

X2= Non-financial rewards X3= Off job training

However, since non-financial rewards is not significant, the model could be optimally reduced to;

$$Y = -0.947 + (0.592X_1) + (0.743X_3)$$

The study findings provided in Table 6 indicate that variables that had significant coefficients and those that were not significant. From the results variables with a p-values below 0.05 were significant.

## 5. Discussion on Findings

### Financial Rewards and Employee’s Productivity

Financial rewards has a direct and significant effect on employee’s productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya ( $\beta = 0.592, P = 0.00$ ). This donates that enhancement in financial rewards would increase employee’s productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya. These results support previous studies by (Yousaf, et al, 2014) where they found out that financial rewards are significant factors that affect employee motivation thus their productivity.

### Non-Financial Rewards and Employee’s Productivity

Further, the results the results donate that non-financial rewards has an inverse and insignificant effect on employee’s productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya ( $\beta = -0.035, P = 0.491$ ). This donates that enhancements in non-financial rewards would decrease employee’s productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya but with an insignificant effect. These findings contradict studies by (Yousaf et al., 2014) which found out



that Besides the financial rewards, the employee expects recognition and appreciation for his efforts and other no financial rewards.

### **Off Job Training and Employee's Productivity**

Lastly, the results donate that off job training has a direct and significant effect on employee's productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya ( $\beta = 0.743$ ,  $P = 0.000$ ). This shows that enhancement in off job training would increase employee's productivity at Anglican church of Kenya (Thika Diocese), Kiambu County, Kenya. These findings align with previous studies by (Selvi et al., 2019), which found concluded that the employees do give importance to the off the job training methods and hence tend to focus more on their on-the-job work and provide their fullest possible attention in having a hands-on experience on their own company with same equipment's and to get trained in the allotted time. Also, it was noted that the off the job training to the personal do not take into consideration while increasing the productivity. Hence, it can be concluded all organizations should follow some kind of on-the-job training method to improve the productivity of the employees and the organization.

## **6. Conclusion**

The research was concerned in investigating the effect of motivation on employee's productivity at ACK Thika Diocese of Thika. The variables for the study were financial rewards, non-financial rewards and off job training as independent variables and employee's productivity as the dependent variable. The research employed a descriptive cross-sectional research design. **Financial Rewards:** A positive and statistically significant correlation exists between financial rewards and employee productivity. This suggests that employees who receive higher financial compensation tend to be more productive.

**Non-Financial Rewards:** The study did not find a statistically significant association between non-financial rewards and employee productivity. This implies that non- financial rewards alone may not directly influence employee productivity in this context.

**Off-Job Training:** The analysis revealed a positive and statistically significant association between off-job training and employee productivity. Employees who participate in off-job training programs demonstrate higher levels of productivity.

These findings emphasize the importance of financial rewards and off-job training in motivating employees and improving their productivity within the Anglican Church of Kenya (Thika Diocese). While non-financial rewards may not have a direct effect, they may still contribute to employee morale and satisfaction, which can indirectly influence productivity.

## **7. Recommendations**

Based on these results, the Anglican Church of Kenya (Thika Diocese) may consider:

- ❖ Implementing or enhancing financial reward programs to incentivize employee performance.
- ❖ Investing in off-job training and development opportunities for employees to enhance their skills and knowledge.
- ❖ While the impact of non-financial rewards wasn't statistically significant in this study, exploring other motivational strategies such as recognition programs or a positive work environment could be beneficial.
- ❖ Further research could explore the specific types of non-financial rewards that might be more relevant or motivating for employees in the context of the Anglican Church.



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# Unpacking the Value Equation: Cost-Quality Nexus in Kenyan Private Universities (A Critical Review)

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## Abstract

*Kenyan private universities play a crucial role in expanding access to higher education. However, ensuring quality while maintaining financial sustainability can be financially burdensome. This research delves into the nexus between cost and quality in Kenyan private universities, aiming to elucidate how these institutions balance financial sustainability with the delivery of high-quality education. By unpacking the value equation, this research not only sheds light on the current state of private higher education in Kenya but also provides a nuanced understanding of the cost-quality trade-off in Kenyan private universities and a foundation for future studies aimed at optimizing the cost-quality balance in similar contexts. The study employs a mixed-methods approach, combining quantitative data analysis with qualitative insights. Quantitative data may involve analysing financial records and quality assurance metrics. Qualitative data collection will involve interviews with key stakeholders, including quality assurance officers and senior academic section heads from various Kenyan private universities.*

**Keywords:** Value Equation, Cost-Quality Nexus, Private Universities, Quality Assurance

## 1. Introduction

The competitive landscape of higher education necessitates a strong focus on quality. Maintaining high quality standards is essential for private universities to attract students, secure funding, and remain competitive. Quality assurance processes play a vital role in achieving this goal. However, implementing and maintaining these processes can be financially demanding (World Bank, 2023). Private universities, especially in resource-limited settings, face unique challenges in maintaining and improving quality assurance practices. This review delves into the nexus between cost and quality in Kenyan private universities, aiming to elucidate how these institutions can balance financial sustainability with the delivery of high-quality education (Otieno & Ouma, 2022).

By unpacking the value equation, the review provides a nuanced understanding of the cost-quality trade-off in Kenyan private universities and a foundation for future empirical studies aimed at optimizing the cost-quality balance in similar contexts (OECD, 2021).

### 1.1 Background

It is feared that universities across the African continent have experienced a decline in the provision of quality education. Several factors have been identified as contributors to this decline, including the reduction in per-unit funding amidst rapidly increasing enrolments and a shortage of qualified academic staff in higher education institutions (Teferra & Altbach, 2004). The situation is exacerbated by insufficient infrastructure and outdated learning resources, further straining the ability of these institutions to maintain high academic standards (Materu, 2007).

In Kenya, the expansion of private universities over the past few decades has significantly increased access to higher education. However, this rapid growth has raised concerns regarding the balance between cost and quality. While private universities offer an alternative to public institutions,





many struggle with financial constraints that challenge their ability to sustain quality education. These challenges often stem from limited resources, which affect the recruitment and retention of qualified staff, investment in infrastructure, and the ability to provide essential academic resources (Odhiambo, 2011).

## 1.2 Research Questions

- ❖ How does resource availability affect the implementation of quality assurance practices in Kenyan private universities?
- ❖ How do students and faculty perceive the cost-quality relationship in Kenyan private universities?
- ❖ What strategies can improve the value equation without sacrificing financial stability of Kenyan in private universities?

## 2. Literature Review

### 2.1 The Concept of Quality Assurance

The concept of quality is hard to define precisely especially in the context of tertiary education where institutions have a broad autonomy to decide on their own visions and missions. Any statement about quality implies a certain relative measure against a common standard. In tertiary education, such a common standard doesn't exist. Various concepts have evolved to suit different contexts ranging from quality as a measure for excellence to quality as perfection, quality as value for money, quality as customer satisfaction, quality as fitness for purpose, and quality as transformation in the learner (SAUVCA, 2002). Depending on the definition chosen, quality implies a relative measure of inputs, processes, outputs or learning outcomes. Institutions, funders, and the general public need some method for obtaining assurance that the institution is keeping its promises to its stakeholders. This is the primary goal of quality assurance. Quality assurance is concerned with consistently meeting product specification or simply getting things right, first time and every time. Quality assurance in the university system implies the ability of the institutions to meet the expectations of the users of manpower in relation to quality of skills acquired by their outputs (Ajayi and Akindutire, 2007). Furthermore, quality assurance in university education can be said to be the ability of the universities to meet certain criteria relating to academic matters, staff-student ratio, staff mix by rank, staff development, physical facilities, funding, and adequate library services.

### 2.2 Quality Assurance in Kenyan Private Universities

Quality assurance (QA) refers to the systematic processes and practices adopted by educational institutions to ensure that their programs meet established standards of quality. In Kenya, QA frameworks are guided by the Commission for University Education (CUE), which sets accreditation standards for private universities. Effective QA practices involve continuous evaluation and improvement of academic programs, faculty development, infrastructure, and student support services. (Wanzala, 2017).

Studies have shown that private universities in Kenya have implemented various QA mechanisms to align with CUE standards and international benchmarks. These mechanisms include regular curriculum reviews, faculty training programs, student feedback systems, and internal quality audits. According to Nganga and Wesonga (2023), the adoption of these practices has contributed to the growing reputation of some private universities for academic excellence. However, the effectiveness of QA practices largely depends on the availability of resources and institutional commitment to quality. (Ng'ethe & Katwalo, 2020).





### **2.3 Barriers to Quality Assurance in Kenyan Private Universities**

Despite the efforts to maintain high standards, several barriers hinder the implementation of effective QA practices in Kenyan private universities. Financial constraints are among the most significant challenges, as many private universities rely heavily on tuition fees as their primary source of revenue. This dependency limits their ability to invest in quality-enhancing initiatives, such as hiring qualified faculty, upgrading infrastructure, and expanding research capabilities. (World Bank, 2023)...

Kiamba (2018) highlighted that inadequate funding is a major obstacle to quality assurance, as it restricts universities' capacity to provide adequate learning resources and support services. Moreover, regulatory hurdles, such as compliance with CUE standards, can be burdensome for smaller institutions with limited administrative capacity. Human resource challenges, including high faculty turnover and insufficient training opportunities, further exacerbate the difficulties in maintaining consistent quality.

Jowi and Oanda (2019) pointed out that regulatory challenges and inconsistent QA practices contribute to varying educational quality across private institutions.

### **2.4 Strategies for Improving the Value Equation**

Improving the value equation in private universities involves finding ways to enhance quality without disproportionately increasing costs. Several strategies have been proposed in the literature, including the use of technology, faculty development programs, strategic partnerships, and efficient resource management. Koech (2021) suggested that integrating digital technologies into teaching and learning can help reduce operational costs while improving educational delivery. For instance, the adoption of blended learning models allows universities to offer more flexible and cost-effective education options. Strategic partnerships with industry and other educational institutions can provide additional funding and resources, as well as opportunities for curriculum development and research collaboration (Mwangi, 2020) suggested that strategic partnerships and collaborations can provide cost-effective solutions for quality enhancement.

### **2.5 Strategies for Improving the Value Equation**

Human capital theory suggests that private universities should focus on enhancing the employability of graduates to justify their fees (Cloete, Maassen, & Bailey, 2015). Strategies such as leveraging technology, forming industry partnerships, and focusing on skills-based education can improve the value proposition of private universities. Additionally, signalling theory implies that transparent communication of the value offered can help align student expectations with institutional offerings.

### **2.6 Quality Commitment without Sacrificing Financial Stability**

Maintaining a commitment to quality while ensuring financial stability requires a strategic approach to resource management. Universities must prioritize cost-effective quality improvement initiatives, explore alternative revenue sources, and implement robust financial planning. Kinyanjui (2022) emphasized the need for diversified funding models, such as endowments, grants, and partnerships, to reduce reliance on tuition fees and enhance financial sustainability. Universities should also consider cost-sharing mechanisms, such as work-study programs, to provide financial support to students while minimizing tuition fee increases. Ouma (2017) discussed sustainable quality assurance models that can be implemented to balance cost and quality.

### **2.7 Theoretical Framework**

The study was anchored in relevant educational and economic theories, such as the cost-benefit analysis theory, theory of human capital, Resource-Based View (RBV) Theory and Balanced Scorecard Approach.



### **2.7.1 The Cost-Benefit Analysis Theory**

The Cost-Benefit Analysis (CBA) Theory is an economic framework used to assess the trade-offs between the costs and benefits of a particular investment or decision. Originating from welfare economics, CBA aims to quantify the financial and non-financial outcomes of a decision to determine whether the benefits outweigh the costs. This theory is particularly valuable in scenarios involving significant expenditures, where stakeholders must evaluate the potential returns on investment (ROI). When applied to education, the Cost-Benefit Analysis Theory becomes a tool for students, families, and policymakers to evaluate whether paying higher tuition fees results in a proportionate increase in the quality of education and, consequently, better long-term outcomes, such as career advancement and earning potential. The theory posits that education should not only be viewed as an immediate financial cost but also as a long-term investment in human capital. (Psacharopoulos, G., & Patrinos, H. A. 2018).

### **2.7.2 The Theory of Human Capital**

The Theory of Human Capital emphasizes the importance of education in enhancing individuals' skills, knowledge, and productivity, thereby increasing their economic value in the labour market. This theory justifies investments in quality education, as it suggests that higher levels of education lead to greater employability and higher earning potential over a lifetime. Human capital theory is often used to explain why individuals, families, and even governments are willing to invest substantial resources into education, anticipating that the benefits will outweigh the costs in the form of improved job prospects and economic outcomes (Gordon & Hubble, 2020).

### **2.7.3 Resource-Based View (RBV) Theory**

The Resource-Based View (RBV) Theory posits that an organization's ability to achieve competitive advantage lies in its resources. For private universities, these resources include financial capital, qualified faculty, infrastructure, and technology. The RBV theory emphasizes that resource limitations can impede a university's ability to develop and sustain high-quality education programs. Kenyan private universities often struggle with financial constraints that limit their ability to invest in crucial areas such as faculty development, research, and infrastructure (Materu, 2007).

Studies have shown that Kenyan private universities face significant resource challenges that hinder their capacity to maintain educational quality. For example, Onyango (2014) highlights that many private institutions operate on tight budgets, leading to insufficient investment in quality assurance processes. This often results in suboptimal learning environments, inadequate staffing, and limited research opportunities, which collectively undermine the quality of education offered.

## **2.8 Balanced Scorecard Approach**

The Balanced Scorecard Approach, developed by Kaplan and Norton (1996), is a strategic management tool that enables organizations to align their financial goals with other objectives, including quality assurance. For private universities, this approach helps balance the need for financial sustainability with the commitment to maintaining high educational standards. The Balanced Scorecard measures performance across multiple domains, such as financial health, student satisfaction, internal processes, and learning and growth (Kaplan & Norton, 1996; Kaplan & Norton, 2021). This holistic view allows institutions to track progress toward their goals and make informed decisions that enhance overall effectiveness and quality.

## **2.9 Knowledge gap**

With some Universities facing cash crisis and not able to meet their obligations as and when they fall due, then there was need to undertake research in the way financial management practices are undertaken in the Private Universities in Kenya. The study therefore intended to fill the knowledge



gap in literature by analysing the effect of financial management practices on quality of education in private universities in Kenya. (Citation).

### **3. Research Methodology**

The study employed a critical review methodology to synthesize existing literature on the cost-quality nexus in private universities. A systematic search was conducted across multiple academic databases, including JSTOR, Google Scholar, and Wiley Online Library. Keywords such as "cost-quality nexus," "private universities," "Kenya," and "quality assurance" were used to identify relevant literature. The search focused on publications between 2000 and 2023, ensuring the inclusion of both recent and foundational studies. Thematic analysis was employed to categorize the literature based on the study's objectives. The analysis focused on identifying patterns and relationships between cost, quality, and resource allocation in private universities, guided by theoretical frameworks such as resource-based theory, institutional theory, and the balanced scorecard approach. The results were then synthesized to provide a comprehensive understanding of the cost-quality dynamics in Kenyan private universities.

### **4. Results and Discussions**

The initial search found 177 articles, with 121 meeting the inclusion criteria after screening and full-text assessment.

#### **4.1 Distribution of Articles by Year**

The review found that most articles on the cost-quality nexus in Kenyan private universities were published between 2010 and 2020. This period coincides with significant policy changes in higher education and the rapid expansion of private universities in Kenya.

#### **4.2 Distribution of Articles by Outlet**

Most articles on this topic are published in various educational management and economic policy outlets, including education-focused journals, highlighting the relevance of the cost-quality relationship to higher education administration. From a total of 121 articles, 95 (78.51%) were in journals and only 26 (21.49%) were conference publications. Most articles (72, 31%) came from 12 outlets and were published in education-focused journals.

#### **4.3 Distribution of Articles by Category**

The majority of the literature focuses on quality assurance, with studies examining the effectiveness of QA frameworks, accreditation processes, and institutional practices. Fewer studies have explored the perceptions of students and faculty regarding the cost-quality relationship or investigated the financial sustainability of private universities.

#### **4.4 Resource Availability and Quality Assurance**

The review found that the availability of resources significantly influences the implementation of quality assurance practices. Universities with robust financial resources are better positioned to invest in quality-enhancing initiatives, such as hiring highly qualified faculty, upgrading learning facilities, and providing comprehensive student support services. In contrast, institutions with limited resources face challenges in maintaining consistent quality standards, often resulting from inadequate infrastructure, high faculty turnover, and limited research opportunities.

Financial constraints have a significant impact on the quality of education provided by many institutions. These constraints often result in understaffing, insufficient facilities, and a lack of



research opportunities, which all undermine the overall quality of education (Materu, 2007). A major contributing factor to these financial challenges is the heavy reliance on tuition fees as the primary source of income. Many universities do not have diversified sources of funding, and the available income streams are insufficient to meet their operational needs. Moreover, the rate of student enrolment has not been increasing as expected, leading to serious cash flow problems (Supplee, 2014).

Financial limitations also create human resource challenges, particularly in recruiting and retaining qualified staff. Many universities are unable to offer competitive salaries, resulting in high faculty turnover and excessive workloads for the few staff members on board. This has left universities not only understaffed but also struggling to attract and retain the talent necessary to uphold academic standards. Furthermore, a significant number of institutions reported having outdated infrastructure, particularly in laboratories and libraries, which hampers the delivery of practical courses and overall learning experiences (Munene, 2020).

Another issue is the reliance on part-time lecturers due to financial constraints. This reliance often compromises the quality of teaching, as part-time faculty may not be as committed to the institution's long-term goals and quality standards (Wangenge-Ouma & Langa, 2021). Additionally, financial constraints affect essential quality assurance mechanisms, such as regular curriculum reviews, internal audits, and accreditation processes, which are often compromised due to insufficient funding. This undermines the capacity of universities to consistently meet high-quality standards.

The study also highlighted the challenges universities face in complying with government regulations, particularly those set by the Commission for University Education (CUE). These regulations, which include program approval requirements, impose significant financial burdens on institutions. For instance, universities are required to hire qualified lecturers and purchase physical books to meet CUE's criteria, yet the financial outlay required to comply is often beyond their means. Respondents suggested that CUE should allow universities to use online resources, such as e-books and journals, as an alternative to physical books, given the advancement in digital technology. This would help reduce costs while still ensuring students have access to the necessary learning materials.

Resource-based theory suggests that without sufficient resources, universities struggle to develop a sustainable competitive advantage in educational quality. Government regulations can also pose challenges for universities with limited resources. For example, the Commission for University Education (CUE) regulations and requirements for program approval can be demanding in terms of labour, human resources, and facilities (CUE 2014).

While most universities reported compliance with CUE's requirements, the need for highly qualified program leaders and the full-time to part-time faculty ratio also posed significant financial challenges (CUE, 2014). Furthermore, government policies that led to the rapid expansion of universities in Kenya have resulted in a shrinking pool of eligible students, making it difficult for all these institutions to attract sufficient enrolment numbers. Policies like the Kenya Universities and Colleges Central Placement Service (KUCCPS), which places students in universities of their choice, have further intensified competition among institutions, forcing universities to invest more in marketing, adding to their financial strain.

In summary, the availability of resources is directly linked to the ability of universities to implement effective quality assurance practices. Without adequate financial, human, and infrastructural resources, many institutions struggle to meet the growing demands of quality education, which ultimately compromises their ability to compete in the higher education sector.





#### **4.5 The Perceptions of Students and Faculty Regarding the Cost-Quality Relationship in Kenyan Private Universities**

Survey responses indicate that both students and faculty generally perceive a positive relationship between tuition fees and educational quality.

#### **4.6 Students Perceptions:**

The review revealed diverse student perceptions regarding the relationship between tuition fees and the quality of education. Generally, students tend to associate higher tuition fees with better quality education. This perception stems from the belief that increased fees lead to improvements in the learning environment, more personalized attention from faculty, and access to better resources (Chirikov, 2016). Students often express appreciation for these enhancements, which they feel justify the cost of education. However, this perception is not absolute.

In elite private universities, where tuition fees are significantly higher, students tend to have elevated expectations of the quality of education and services provided. Despite this, the review found that these expectations were not always met. Many students voiced concerns that the quality of facilities and academic support did not align with the high fees they were paying (Wilkins et al., 2012). This gap between expectation and reality often leads to dissatisfaction.

Moreover, students, especially those transitioning from high schools, enter universities with high expectations regarding learning facilities, accommodation, and recreational amenities. When universities fail to meet these expectations, it negatively impacts student satisfaction. This dissatisfaction not only affects their overall academic experience but also influences their willingness to promote the institution to potential students. A poor student experience can harm student retention rates, as dissatisfied students are less likely to remain enrolled (Chen et al., 2017).

Additionally, while students recognize the benefits that come with higher tuition fees, such as improved facilities and resources, there is growing concern about the rising cost of education. Many students feel that tuition fees are becoming increasingly unaffordable, raising concerns about inclusivity and equal access to higher education (Altbach, Reisberg, & Rumbley, 2009). As fees continue to rise, there is a fear that education is becoming a privilege for the few, excluding students from lower-income backgrounds and potentially deepening social inequality within the university system.

In summary, while students appreciate the improvements that higher tuition fees bring, there is a clear demand for institutions to deliver on the promises of quality. Additionally, the rising cost of education is leading to growing concerns about affordability and inclusivity, which could have long-term implications for access to higher education.

#### **4.7 Faculty Perceptions:**

Faculty members at private universities in Kenya recognize that adequate funding is essential for attracting and retaining qualified staff, as well as providing opportunities for professional development. However, they express concerns that tuition fees do not always translate into better academic resources or working conditions. Balancing the demands for quality with the need to maintain affordability poses significant challenges for private universities. Faculty members often cite resource constraints and administrative pressures as barriers to quality improvement (Nganga, 2010).

While financial aspects are important, faculty at both high- and low-cost institutions emphasize the importance of academic freedom, research opportunities, and professional development as key





drivers of quality education (Kinyanjui, 2022). These factors are crucial for fostering a stimulating and intellectually enriching learning environment.

#### **4.8 Strategies for Improving the Value Equation without Sacrificing Financial Stability**

Interviews with university administrators and quality assurance officers highlight several strategies for balancing quality and financial stability. These strategies include diversifying revenue streams through partnerships, grants, and endowments; implementing cost-effective quality improvement initiatives; and optimizing resource utilization. The use of technology, such as e-learning platforms, is also identified as a viable approach to reducing costs while maintaining high-quality education. Administrators advocate for the adoption of blended learning models, which combine online and face-to-face instruction, as a cost-effective way to expand access to quality education and optimize the use of physical infrastructure.

#### **4.9 Improving the value equation without sacrificing financial stability**

The review suggests that private universities can ensure long-term commitment to quality standards by adopting a balanced scorecard approach, which integrates financial management with academic quality metrics (Kaplan & Norton, 1996). This approach helps universities align their financial goals with educational objectives, ensuring that cost-cutting measures do not compromise quality.

To prioritize critical investments, universities should focus on key areas that directly impact educational quality, such as faculty development, curriculum enhancement, and student support services (Wangenge-Ouma & Langa, 2021). Implementing cost-effective technological solutions, such as online learning platforms, can reduce the need for physical infrastructure while maintaining or enhancing the quality of education (Ngolovoi, 2018).

Transparent decision-making processes involving stakeholders can ensure that resources are allocated efficiently and in alignment with quality goals (Wangenge-Ouma & Langa, 2021). Finally, regular quality audits are essential for verifying that academic standards are maintained (Kinyanjui, 2022).

## **5. Conclusions and Recommendations**

Quality assurance processes are essential to the academic and operational success of private universities, but they come with substantial costs. The review concludes that resource limitations significantly affect the ability of Kenyan private universities to implement and sustain robust quality assurance practices. The challenges to quality assurance are multifaceted, requiring a comprehensive approach that balances financial sustainability with educational excellence.

Theoretical frameworks such as the Resource-Based View and the Balanced Scorecard offer valuable insights into how private universities can navigate these challenges. To ensure long-term commitment to quality standards, strategic planning, resource diversification, and investment in faculty development are crucial components.

### **5.1 Recommendations**

**For University Administrators:** Focus on cost-effective quality improvement initiatives, such as faculty development programs, technology integration, and efficient resource management. Explore alternative funding sources to reduce reliance on tuition fees and enhance financial sustainability.

**For Policymakers:** Develop supportive policies that facilitate access to funding and resources for private universities, particularly those that prioritize quality improvement. Encourage collaboration



between private universities and industry to enhance the relevance and quality of academic programs.

**For Students and Parents:** Make informed decisions based on quality indicators, such as faculty qualifications, student support services, and infrastructure, rather than solely on tuition costs. Consider the long-term value of investing in quality education.

**For Future Research:** Conduct longitudinal studies to assess the impact of various quality improvement strategies on student outcomes and institutional sustainability. Further research should also explore the experiences of students from diverse socioeconomic backgrounds to understand the impact of tuition fees on access to private higher education.



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# Analysis of Visa Liberalisation in Kenya: Opportunities and Challenges

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## Abstract

The research paper explores the complexities of visa liberalization in Kenya, analyzing its potential benefits and challenges from both economic and security perspectives. Visa policies serve as crucial tools for managing international mobility while balancing national security and economic growth objectives. The research paper provides an overview of Kenya's visa system, which includes various categories such as Single Entry, Multiple Entry, and Transit Visas. It also discusses visa exemptions and the global trend toward visa liberalization, which aims to reduce barriers to travel and promote international collaboration. The core argument emphasizes how visa policies, while essential for security, can simultaneously enhance tourism, trade, and foreign investment. Using Kenya as a case study, the research paper employs a qualitative research methodology to examine the broader impacts of visa liberalization. The research draws on both primary and secondary sources, including government documents, official statements, and academic literature. The findings highlight a significant increase in tourist arrivals due to relaxed visa regulations, contributing to economic growth in sectors such as hospitality and transportation. However, the article also identifies challenges, including a decline in Foreign Direct Investment (FDI) and rising tensions in the labor market as foreign workers compete with locals for jobs. Moreover, an increase in cyber threats underscores the need for enhanced digital security as international connectivity grows. The research paper concludes by recommending that Kenya adopt adaptive visa policies, continuously monitored through data collection on tourism, FDI, labor market trends, and security risks. Such an approach would allow for more informed policy decisions, ensuring that visa liberalization fosters economic benefits while mitigating potential threats to national security. The research also calls for further research into the relationship between visa policies, mobility, and economic development, particularly in the context of emerging security risks such as cybercrime.

**Key words:** visa liberalization, Kenya

## 1. Introduction

A visa is an essential authorization that permits foreign nationals to enter a country for a variety of purposes, such as tourism, business, or relocation. In Kenya, the visa section is responsible for developing and implementing policies related to visa management, processing visa applications, and handling exemptions for individuals enjoying diplomatic privileges and immunities. Various types of visas are issued depending on the visitor's purpose, including the Single Entry Visa, Multiple Entry Visa, and Transit Visa, each with distinct regulations governing the duration of stay and conditions of entry (Kenya Department of Immigration, 2024).

For example, the Single-Entry Visa allows entry for specific purposes such as business or medical visits, while the Transit Visa applies to travelers passing through Kenya en-route to other destinations for a period not exceeding 72 hours. Nationals from specific countries, like the United States, may also qualify for the 5-year Multiple Entry Visa, offering greater flexibility for frequent travelers (Kenya Department of Immigration, 2024). Additionally, diplomatic and official travelers may receive Courtesy Visas.





Visa policies are divided into three categories based on the visa requirement status of individuals. Nationals who do not require visas to enter Kenya fall under Category One, while others may obtain visas upon application or may require approval from the Director General of Immigration Services (Kenya Department of Immigration, 2024.). The easing of visa restrictions, often referred to as "visa liberalization," has become a global trend, aimed at reducing barriers to travel and promoting international mobility.

Nicolosi (2020) contends that as centralized national governments emerged and consolidated power in the nineteenth century, they began asserting control over the movement of their citizens. This control was primarily exercised through the administration of identity documents, such as passports, which granted or denied individuals the right to leave the country. The increased administrative capacity of modern states, particularly their ability to maintain extensive records of their populations, has significantly enhanced their ability to regulate movement (Pauwelyn et al., 2020). By centralizing these records and formalizing procedures for granting passports, states have institutionalized their control over citizens' mobility, effectively controlling citizens mobility.

Despite this growing state control, visa-free travel has become increasingly desirable in the modern world (Recica, 2024). The convenience and efficiency it offers are appealing, particularly in a globalized economy where international business, tourism, and cultural exchange thrive. Visa-free regimes reduce the bureaucratic hurdles and waiting times typically associated with travel, facilitating a more seamless movement across borders (Shingal, 2020). As a result, visa-free travel is seen not only as a privilege but also as a competitive advantage for countries aiming to attract tourists, investors, and global talent.

Visas often act as mobility barriers for tourists and investors, hindering the ease of international travel and potentially leading to economic losses (Andreevna, 2021). For tourists, the need to navigate complex visa processes can deter travel plans, leading them to choose destinations with more relaxed or visa-free entry requirements. Similarly, investors may view stringent visa policies as a barrier to exploring business opportunities or attending critical meetings abroad. The inconvenience and costs associated with obtaining visas can dissuade both groups from engaging with certain markets, thereby reducing the economic benefits these travelers bring.

To address these challenges, visa relaxation policies have emerged as powerful tools for governments to boost their tourism sectors and attract foreign investment. By offering visa concessions, such as exemptions or simplified application processes, countries can make themselves more attractive to international visitors. Many tourists, particularly those on short-term holidays, are likely to divert their trips to nations that offer easier entry (Recica, 2024).. This strategy not only encourages more tourism but also increases direct foreign investment by making it easier for investors to visit and explore opportunities. In a competitive global environment, the ability to offer flexible visa policies can provide a distinct economic advantage, driving growth and fostering international collaboration (Shingal, 2020).

While visa liberalization policies aim to stimulate economic growth by boosting tourism and attracting foreign investment, as evidenced by several studies (Czaika & Neumayer, 2017; Pauwelyn et al., 2020; Nicolosi, 2020), they can also have unintended consequences. The removal of visa requirements can result in economic costs for the domestic economy, particularly through the loss of government revenue from visa fees. Furthermore, the potential influx of visitors may strain resources and infrastructure in the destination country, leading to economic disruptions. Typically, visa exemptions are extended to allied nations or key trading partners, yet even within these arrangements, countries must carefully weigh the risks associated with open borders.



Visa liberalization raises significant concerns about national security, social welfare, and the preservation of national identity (Demiryontar, 2021). Without strict visa controls, countries may face an increase in illegal activities, such as human trafficking, unauthorized employment, and overstaying. Foreign visitors may exploit visa exemptions for purposes beyond tourism or business, including seeking asylum, engaging in illegal trade, or working unlawfully. The challenge for destination countries lies in the lack of sufficient data on the true intentions of these visitors, making it difficult to effectively monitor and regulate their activities (Andreevna, 2021). This gap in oversight can pose serious risks, as the ability to track and manage the behavior of foreign entrants becomes more limited, potentially compromising national security and stability.

### **1.1 Problem Statement**

Visa policies serve as a critical tool for governments to balance the dual objectives of national security and economic growth. Restrictive visa measures are often implemented to mitigate potential risks, including illegal immigration, terrorism, and criminal activities. However, relaxing visa requirements can foster economic benefits, such as increased international trade, tourism, foreign investment, and strengthened diplomatic relations. While governments typically make visa policy decisions based on a cost-benefit analysis, the broader impact of visa policies on economic outcomes remains underexplored. This gap in academic research presents a challenge for policymakers seeking to make informed decisions. Despite the importance of visa policies in shaping national security and economic outcomes, there is limited academic attention to their broader socio-economic impacts. Current studies tend to focus on isolated aspects such as migration or security without providing a comprehensive analysis of how visa policies affect economic growth, trade, tourism, foreign investments, and diplomatic relations. This research seeks to bridge the gap by exploring the multi-faceted impacts of visa policies, offering insights into how nations can balance security concerns with economic opportunities.

### **1.2 Research Question**

What are the opportunities and challenges of visa liberalisation in Kenya?

### **1.3 Research Objectives**

- ❖ Explore the Potential Opportunities of Visa Liberalization in Kenya
- ❖ Identify and Analyze the Challenges of Visa Liberalization in Kenya

## **2. Research Methodology**

The research employed a qualitative research approach to explore the broader impacts of visa policies, particularly how Kenya's visa regulations and liberalization efforts affect national security and economic growth. This study used a case study design, focusing on Kenya as the case to examine the impacts of visa policies and liberalization. The case study approach was appropriate because it allows for an in-depth exploration of visa policy implications within a specific national context (Andreevna, 2021). Kenya's visa policy changes served as the focal point for understanding the broader trends in balancing security and economic objectives. The study relied on both primary and secondary sources to ensure a comprehensive exploration of the research problem. Data was collected from key government documents and official statements to understand the rationale behind Kenya's visa regulations and any recent liberalization efforts.

Key primary sources included, Government policy documents, visa regulations, policies on immigration, and national security strategy documents from the Ministry of Interior and Coordination of National Government. Official statements and press releases, these were gathered from the

Kenyan government, particularly from ministries such as Foreign Affairs, Interior, and Tourism, to gain insights into the government's perspective on visa liberalization and its intended effects.

Secondary sources included, academic articles and research papers, literature on visa policies, immigration, national security, and economic growth were reviewed to identify relevant theories and frameworks. This helped understand the academic discourse surrounding visa liberalization. News articles and media reports, local and international media reports provided insights into public opinion and observable effects of visa liberalization in Kenya, such as trends in tourism, foreign investment, and any reported security incidents. Reports from NGOs and international organizations like the United Nations (UN), International Organization for Migration (IOM), and other relevant NGOs will offer a broader perspective on visa policies and their socio-economic impacts in Kenya and globally.

The primary method for data collection was systematic review of government documents, policy papers, official statements, and secondary sources. These documents were critically analyzed to identify the underlying goals of Kenya's visa policies and the perceived trade-offs between security and economic growth. News articles, media reports, and NGO reports were analyzed using qualitative content analysis to extract key themes related to the impact of visa liberalization on Kenya's economy and security. Thematic analysis helped identify recurring patterns and significant themes related to the dual objectives of visa policies in Kenya.

### **3. Findings and Discussions**

The liberalization of visa policies in Kenya has resulted in a remarkable surge in tourist arrivals, with the number of visitors increasing from 2 million to 3 million. This 50% increase demonstrates the positive impact of relaxed visa regulations on the tourism sector, which plays a crucial role in Kenya's economy. The tourism influx has boosted revenues from hotels, transportation, and other related industries, contributing to economic growth. Furthermore, by making it easier for international tourists to visit, Kenya has strengthened its position as a leading travel destination in Africa, attracting visitors from new markets. However, this rapid increase also presents challenges in managing the infrastructure and environmental sustainability of popular tourist regions.

Despite the positive effects on tourism, Kenya has seen a decline in Foreign Direct Investment (FDI) inflows, which dropped by \$93 million (about Sh12 billion). This decline in FDI could be attributed to various factors, such as global economic conditions, security concerns, or competitiveness issues. The drop raises questions about the effectiveness of visa liberalization in attracting foreign investors. While visa policies may encourage short-term tourism, they appear to have had a limited impact on long-term investments, suggesting that Kenya may need to focus on improving the overall business environment, including regulatory frameworks, political stability, and infrastructure development, to enhance FDI.

The liberalized visa policies have also affected Kenya's labor market, particularly with an influx of foreign workers competing for jobs, especially in low-skilled sectors. This increased competition has led to tensions within the local workforce, as foreign workers are often perceived to be displacing Kenyan citizens from available jobs. This pressure on the labor market highlights the need for comprehensive immigration and employment policies to balance the economic benefits of foreign workers with protecting local employment opportunities. The challenge lies in ensuring that visa liberalization supports economic growth without exacerbating inequality or unemployment, particularly in vulnerable segments of the population.



Alongside economic changes, the security landscape in Kenya has also been impacted. Visa liberalization has coincided with a 24.83% increase in cyber threats, with over 900 million cyber threat events recorded during the same period. This rise in cyber threats highlights the vulnerabilities that come with increased international connectivity and digital infrastructure. The heightened security risks emphasize the need for robust cybersecurity measures and coordinated international efforts to address potential threats. While easing visa requirements can promote economic growth, it is crucial to ensure that national security is not compromised in the process, particularly in areas such as digital security and terrorism prevention.

#### **4. Recommendations**

The Directorate of Immigration Services in Kenya could benefit from implementing a robust system for continuously monitoring and assessing the economic and security impacts of visa policies. Regular evaluation of data on tourism inflows, foreign direct investment, labor market dynamics, and security risks—such as cyber threats and border security incidents—would allow policymakers to make evidence-based decisions on whether to relax or tighten visa restrictions. This proactive approach would enable Kenya to strike a balance between promoting economic growth through tourism and investment while mitigating potential risks to national security. Adaptive visa policies, informed by real-time data, could help Kenya respond effectively to evolving global trends and challenges, ensuring that its visa regulations remain aligned with both domestic needs and international opportunities.

Future researchers could delve deeper into the multifaceted effects of Kenya's visa regulations on mobility, economic development, and security outcomes. Studies could explore how different visa policies have impacted the movement of people, particularly tourists, skilled professionals, and foreign workers, and how these movements have influenced Kenya's economic sectors, including tourism, agriculture, and technology. In addition, research could investigate the link between visa liberalization and security outcomes, examining not only traditional security threats but also emerging risks like cybercrime. Such studies would contribute to a nuanced understanding of how visa policies intersect with national development goals and provide valuable insights for optimizing immigration frameworks in Kenya and other similar economies.

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# Exploring the Relevance of BRI Projects to Sustainable Socioeconomic Development in Low Developed Countries

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## Abstract

*This paper analyses the relevance of BRI Projects to Sustainable Socioeconomic Development in Low Developed Countries (LDCs). LDCs continue to grapple with low levels of socioeconomic development and severe structural obstacles to realizing global sustainable development goals. They are highly vulnerable to economic and environmental shocks and generally have low levels of human capital and poor standards of living. There are currently 45 LDCs whose exclusive access to international support has attracted developed countries like China which has joined in with the Belt and Road Initiative (BRI) to foster socioeconomic development. Consequently, this conceptual study explores the contribution of China's BRI projects to sustainable socioeconomic development in LDCs to offer useful insights into China's aid and suggest workable recommendations for improvement. This adds to the already existing literature on efforts to address low levels of socioeconomic development in LDCs. Relevant literature was located to offer useful insights about BRI projects in LDCs and guide conclusions and recommendations. Consequently, much as there is evidence that BRI projects have contributed to socioeconomic development in LDCs, this paper reiterates that BRI projects should improve in efforts to address issues of environmental impact, Western propaganda, land conflicts, debt-trap diplomacy and economic dependence. Emphasis should be placed on empowerment of LDCs such that they can still independently realise sustainable socioeconomic development after the closure of BRI projects.*

**Key words:** BRI projects, Socioeconomic development, Low Developed Countries

## 1. Introduction

LDCs have the lowest levels of socioeconomic development in the world, with severe and widespread poverty, high levels of economic and environmental vulnerability, and low human capital levels. These countries are also on the low end of human development as measured by the Human Development Index (HDI) and lose the most development gains which will affect their future sustainable development paths (Pasanen & Assa, 2021). The situation is worsened by the widening gap between LDCs and Developed Countries (DCs) which all hinders global efforts towards achieving sustainable development for all. For example, there is a difference of 0.587 HDI score between Switzerland the most developed country with an HDI score of 0.967 and Somalia, the least developed country with an HDI score of 0.380 (UNDP, 2022). This means that LDCs score poorly in areas of life expectancy, literacy rate, rural populations' access to electricity, GDP per capita, exports and imports, income inequality, internet availability but high in multidimensional poverty index, homicide, structural impediments to development and many more which should worry everyone.

The LDC category was established in 1971 by UN to allow special focus on these countries in both monitoring and special measures such as trade preferences, aid and concessional financing which attracted many DCs including China that has since joined with the Belt and Road Initiative. The BRI projects are supposed to improve connectivity and cooperation on a transcontinental scale through the development of highways, maritime ports, railways, oil and gas, power grids, and other



concern multi-purpose projects. This is intended to increase economic cooperation and sustainable socioeconomic development (Bharti, 2023). Much as many countries LDCs have benefited from BRI since its launch in 2013 in areas of trade, investment, debt, procurement, environment, poverty reduction and infrastructure (World Bank, 2018), much is still desired as the situation has become worse in some of the countries. For instance, UN has documented a shrinking fiscal space in LDCs evident in areas such as their debt-to-GDP ratio, which grew from 48.5% in 2019 to 55.4% in 2022 (the highest since 2005). Such a situation limits the ability of LDCs to implement development policies and forces tough choices, such as choosing between paying their external debt or investing in health, education and climate action (Bandiera & Tsiropoulos, 2019; United Nations, 2023; Horn et al, 2023). Many of the challenges still stifling progress in LDCs relate to overdependence, corruption, diversion or misappropriation of funds by the local leaders, the environmental challenge/impact, and misguided investment among others (Hamza & Kordas, 2018).

This paper explores the contribution of China's BRI projects to sustainable socioeconomic development in LDCs to offer useful insights into China's aid and suggest workable recommendations for improving the situation in LDCs. Consequently, much as there is evidence that BRI projects have immensely contributed to socioeconomic development in LDCs, this paper reiterates that BRI projects should improve in efforts to address issues of environmental impact, debt-trap diplomacy, corruption of LDC leaders, misallocation of funds and economic dependence (Hamza & Kordas, 2018). This is with a hope that emphasis can in future be placed on empowerment of LDCs such that they can still independently realise sustainable socioeconomic development in the event where they do not get any foreign aid. This paper might inform the public debates surrounding BRI and LDCs, and can help policy makers in LDCs to maximize the benefits and minimize the risks from BRI projects.

## **2. BRI Projects and Socioeconomic Development in Low Developed Countries**

The Belt and Road Initiative also known as One Belt One Road or the New Silk Road, is a global infrastructure development strategy adopted by China in 2013 to invest internationally in countries and organisations so as to increase international development and cooperation. Infrastructure projects include ports, railways, highways, power stations, aviation and telecommunications among others, all of which are steered towards causing SDGs across the globe (Kuo & Kommenda, 2018). Currently, there are more than 150 countries and over 30 international organisations formally affiliated with BRI. These are spread across the globe in Asia, Europe, America, Africa and Australia.

For over 10 years, BRI has been a pivotal force in infrastructure development for the developing world, especially the emerging economies, stimulating development and improving lives. With over 1 trillion USD in investment, BRI is one of the world's most ambitious and debated development initiatives in traditional infrastructure, including transport and energy, helping Least Developing Countries to plan for socioeconomic growth and development (Mohsin, 2023). Already, some estimates list the Belt and Road Initiative as one of the largest infrastructure and investment projects in history, covering more than 68 countries, including 65% of the world's population and 40% of the global gross domestic product as of 2017 (Griffiths, 2018). BRI has also extended support to LDCs to steer these to development (Kuo & Kommenda, 2018). According to United Nations (2024), there are 45 Least Developed Countries most of which are in Africa (33), followed by Asia (8), the Pacific (3) and Caribbean (1). Many of these countries had registered significant progress in consolidating the benefits of BRI projects.

In Asia, BRI has stimulated economic growth, infrastructural development, trade, industrialization, mobility of labour, employment, goods and services and energy among others (Curtis & Klaus,



2024; Ramachandran, 2016). While in Bangladesh alone, BRI projects are visible in the energy and transportation sectors, with infrastructure investment needs projected to reach 1.5 per cent of GDP by 2040. Key infrastructure under BRI investments include Padma Bridge, Metrorail, Karnaphuli Tunnel and several other interests in seaport access, expressways, water utility, e-governance, military, and solar energy increasing the visibility of China's funds, technology, and expertise in Bangladesh. In the last 10 years, China has released \$4.45 billion or more for 35 projects under BRI and attracted several Chinese companies and investments which have generated about 550,000 employments in Bangladesh. Given the trajectory, China is likely to surpass the US and become the largest investor in Bangladesh soon (Mohsin, 2023).

The Belt and Road Initiative has successfully mobilized Chinese construction and investment in LDCs in Africa with Ethiopia its Africa's model BRI country, due to China's elaborate infrastructure financing and building many manufacturing enterprises (Yan & Sautman, 2024). In Africa, BRI projects are in the areas of international rail and expressways, seaports, hydropower to carbon-based power, water supply and sanitation, and many other programs (Stephen, 2021; Curtis & Klaus, 2024; Yan & Sautman, 2024). BRI has heavily invested in power funding several hydroelectric power stations in Ethiopia, Uganda, Mozambique and many more LDCs. Investment in power reduces overreliance on the environment for rudimentary energy sources such as trees, and stimulates industrialization and the service sector. This is necessary in expanding economies, creating jobs and developing nations. The Chinese government still wants to surpass the other economic global powers in the African continent. The United States (US), France, India, Britain, and Japan are investing in many African countries but now China is ahead of these countries (Githaiga et al, 2029).

In the case of Ethiopia, some significant projects are spotlighted in the country, for example, the first the Sub-Saharan modern light tram system in Addis Ababa. With the continued support from BRI, Ethiopia has been able to push forward its development agenda. In fact, BRI has enabled Ethiopia build resilience responses to COVID-19 and the civil war. As a result, the country has been able to move forward despite these challenges (Yan & Sautman, 2024). Today, Ethiopia has the largest GDP in East Africa and is fifth in Africa (IMF, 2024; Statista, 2024; Galal; 2024; Luu, 2024). The BRI is successfully pioneering transport systems, roads, railways, small industries, automotive sectors, and health development programs in Ethiopia which is attaining socioeconomic changes and development.

A study by Bharti (2023) indicates that BRI is engaged in multi-purposes with Ethiopia to facilitate socio-economic growth and development. There is no doubt that Ethiopia benefits from China's extensive economic engagement in the context of BRI projects. Thus, the Ethiopian public and private sectors benefitted from these Chinese projects. The younger generation of Ethiopian society is getting multiple aid and job opportunities (Mukwaya & Mold, 2018). China is constructing road and rail connectivity towards the Gulf of Aden which would become the lifeline of landlocked Ethiopia expected to improve petroleum cargo services. The Chinese government and its various companies have been pioneering the real estate business in Addis Ababa, Ethiopia establishing several industrial parks. For example, Eastern Industrial Zone (EIZ) founded in Ethiopia in 2007 by the Chinese Lu brothers is home to more than 95 small and medium factories and employs over 20,000 people. Chinese companies are also economically developing the agricultural sector which the largest sector in Ethiopia employing over 60% of the population. Other sectors following suit are information and communication technology services, and real estate business, opening the range of sustainable development in the country. (Calabrese, Huang & Nadin, 2021).

A study by Abb, Swain & Ilya (2021) posits that BRI projects in Uganda have helped the country plug the infrastructure gap; created new and better business opportunities such as in wood production,



ecotourism and health; boost local agricultural output and increase in the value of Uganda's exports such as hides, oils and seeds. Uganda has also been able to generate more energy, open access to tourist sites, build roads to ease movement of goods and services and connect to the outside world for international trade and cooperation. No wonder Uganda's economy grew Uganda's economy rose by 6.6% in the first quarter of 2024 and is projected to hit 7.3% by the end of 2024. Poverty levels in Uganda have also reduced to 30% (Uganda Bureau of Statistics, 2024; World Bank, 2024). It is estimated that the total sum of BRI investments and Chinese contracts in Uganda amount to roughly more than 1.8 billion USD (Scissors, 2019), including the expansion of Entebbe airport, the toll road between the airport and Kampala; two large scale hydropower plants at Karuma and Isimba, and a number of rail, road and other construction projects (Wingo, 2019).

Studies reviewed indicate that across LDCs, BRI has demonstrated that it has significant potential to contribute to the 2030 Agenda for Sustainable Development through diplomacy; trade and investment and financial cooperation; infrastructure and connectivity; regional governance; and people-to-people bonds (Gu, Corbett & Leach, 2019). As a result, socio-economic improvement and human development have increased in many of these countries. Modern railway lines, industries and other infrastructure have been built hence creating many employment opportunities eventually improving the economic position of people in LDCs. Thus, BRI is helpful in reducing poverty, and in improving infrastructure across these countries. In fact, the World Bank has stated that in over 40 years, China has pulled 800 million people from poverty, some of these being in Least Developed Countries. Though BRI has been around for only 10 years, it is part of these efforts. Other investments by BRI have helped in boosting tourism, mutual cooperation, peaceful coexistence, sustainable development, and mutual benefit. BRI has focused on free trade, policy coordination, people-to-people connection, and regional development with deep connectivity. There are also several instances of educational exchange programs providing training and innovation to researchers and professors in Chinese higher educational institutes which builds the capacity of the personnel in LDCs in regard to contributing sustainably to socioeconomic development. (Gyamerah et al, 2021; Githaiga, Burimaso, Bing & Ahmed, 2019; Lee & Shen, 2020; Bharti, 2023)

### **3. Challenges Associated with BRI Involvements in LDCs**

Much as there are many challenges associated with BRI projects both on the side of China and the recipient countries, the most outstanding is the brainwashing from the West. While speaking at the Heritage Foundation in 2018, then US National Security Adviser John Bolton, who seemed to have a popular opinion of most Western powers, attacked China for dishonest aid to African countries, stating that China was attempting to colonise Africa through using debts to hold countries at ransom. He criticized China for using corruption and unclear agreements to force its global dominance. According to Mehari (2019), Western powers such as US, UK, and France accuse China of spoiling peace in some LDCs such as Sudan and South Sudan, incompetence, environmental degradation, exploitation and opportunism. Such attacks are intended to brainwash LDCs and turn them away from BRI projects and China relations, making them more West-leaning. This also highlights the issue of competition with the West that China has to grapple with. Therefore, attacks on BRI projects in LDCs by the West should be of concern to China.

Much as Komakech, Agwot, & Ombati (2023) notes that indeed there are some implementation challenges in BRI projects, including labor violations, procurement challenges, environmental hazards, lack of stakeholder involvement, criticisms for debt burdens, and high compensation prices, the same study still acknowledges that despite these challenges, BRI projects have the potential to significantly improve infrastructure and promote economic growth in LDCs. Indeed, Abb, Ilya & Swine (2021) points to some challenges associated with BRI projects in Uganda, stating that the





construction of the Isimba and Karuma dams reportedly increased erosion and flooding along the river Nile. Other areas of concern raised by the same researcher include labor violations such as forced labor, physical abuse, and low wages in countries. There is also lack of transparent procurement processes in some countries can lead to inflated project costs, poor-quality infrastructure, and delays in project implementation. BRI projects have also led to displacement of communities, forceful evictions, loss of livelihoods, high costs of compensation and resettlement (Saferworld, 2021; Abb, Ilya & Swine).

However, it is also worth noting that according to the World Bank (2018), there are potential environmental, social, and corruption risks associated with any large infrastructure project. These could include, for example, biodiversity loss, environmental degradation, or elite capture.

#### **4. Conclusion**

Despite attacks from the West, BRI projects continue to receive a good reception in LDCs who see BRI and a saviour. For example, it can be argued that African heads of state see BRI and China as saviors not predators, contrary to West suggestions. Mehari (2019) posits that Africa loves China and continues to regard China as a trustworthy ally of Africa, a partner that provides much-needed funding without any strings attached, and a partner that understands and respects Africa's priorities, cultures and states. Therefore, all considered, BRI has played a vital role in addressing the global infrastructures gap through the construction of modern highways, airports, high-speed railways, bridges, power generation (hydropower), and industrial parks (Komakech, Agwot & Ombati, 2023). As a result, this has enhanced connectivity and socioeconomic growth and development in LDCs. This continues to push LDCs out of poverty and lead them to realizing other SDGs. BRI's influence also extends to other nations outside LDCs, positioning itself as the largest global investment. World Bank (2018) remarked that when completed, BRI transport projects could reduce travel times along economic corridors by 12%, increase trade between 2.7% and 9.7%, increase income by up to 3.4% and lift 7.6 million people from extreme poverty, which is admirable. Therefore, BRI has offered LDCs solutions and options, saving them from the pressure and stringent conditions related to social, political and economic reforms from the other global powers such as IMF, World Bank and the entire West. BRI comes in with unconditional cooperation.

#### **5. Recommendations**

China should make deliberate efforts to address concerns raised (whether true or not) to clear her image. Therefore, much as BRI has the potential to substantially improve trade, foreign investment, and living conditions for citizens in LDCs, China needs to adopt deeper policy reforms that increase transparency, expand trade, improve debt sustainability and mitigate environmental degradation, social and corruption risks. Making BRI projects more transparent, profitable, and emphasizing quality services and products need to be a key focus. China should fund research that can develop realistic frameworks to guide reforms in contemporary situations. There is also need to fund environmental protection initiatives in LDCs. China needs to stick to her approach and not bow down to pressure and adopt a West approach. China should invest in comprehensive media campaigns, research and publications to capture the truth about BRI on the ground and counter Western media propaganda. China also needs to counter competition from other global investors such as Russia and the West and this means always providing the best products and services. Therefore, there is need to invest in quality assurance to remain on top. Invest more in upholding labor laws and regulations that protect workers' rights, active involvement and participation of local stakeholders to address challenges, and upholding environmental regulations that protect nature should be given priority. Emphasis should also be placed on empowerment of LDCs such that they can still independently realise sustainable socioeconomic development after the closure of BRI projects.





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**SUBTHEME 5: Education**

**SUBTHEME 6: Community Development**

**SUBTHEME 7: Communication**

**SUBTHEME 8: Health Sciences**

# Online Learning Platforms and Accessibility in Secondary Schools in Kenya

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## Abstract

*In the rapidly evolving landscape of education, online learning platforms have emerged as crucial tools for education, where uncertainties abound. This article seeks to investigate the accessibility of online learning platforms in secondary schools in Kenya, by choosing Thika Sub-County in Kiambu County as a study area. Amidst challenges such as infrastructural limitations, socioeconomic disparities, and unforeseen disruptions like pandemics and natural disasters, ensuring equitable access to online learning is paramount. By employing a mixed-methods approach of descriptive research design, this article examines the current state of online learning accessibility in secondary schools in Kenya, identifying barriers faced by students, teachers, and administrators. Drawing from Educational Technology Adoption Theory by Fred Davis (1987), this article contributes to the understanding of how schools can navigate uncertainties by leveraging online platforms for educational advancement. Through empirical analysis, this article provides insights into the intersection of technology, accessibility, and resilience in secondary education. The findings reveal that there is limited access to the internet, few necessary infrastructure, and inadequate digital skills in most secondary schools in Kenya. The findings inform practical recommendations for policymakers, educators, and technology providers to enhance the accessibility and effectiveness of online learning platforms in Kiambu County and similar contexts, thereby advancing educational equity and preparedness in the face of emerging uncertainties in Kenya.*

**Keywords:** Online learning, education, uncertainty, technology

## 1. Introduction

The popularity of online learning platforms has soared in recent years due to their numerous advantages, such as flexibility and convenience. According to research by Bezovski & Poorani (2016), these platforms have revolutionized the learning experience by introducing new trends and significantly enhancing access to education. However, when it comes to secondary schools in Kenya, concerns arise regarding the accessibility of these platforms. While Kenya has made commendable progress in increasing access to education through traditional classrooms, the secondary level still presents challenges. Uncertainties, such as current times with climate change leading to floods, hinder students from interacting with their teachers in a physical environment, exacerbating existing obstacles. Among these barriers are geographical distance, lack of resources, and limited availability of qualified teachers (Mutua et al., 2016). In such circumstances, online learning platforms have the potential to bridge this gap and provide equal educational opportunities for all students, regardless of their location or background.

According to Collazos et al., online learning platforms have gained significant popularity worldwide, especially in the field of education. These platforms offer numerous benefits such as flexibility, convenience, and enhanced access to educational resources. Anyonje et al. (2022) on the other hand report that in Kenya, the use of online learning platforms has not been fully embraced in secondary schools due to limited resources. Online learning platforms can help students access high-quality educational resources regardless of their geographical location. Ongwae and Duncombe (2021) confirm this by suggesting that online learning platforms can offer a wide range



of subjects, interactive content, and self-paced learning opportunities. Moreover, online platforms can also facilitate collaboration and communication among students and teachers, fostering a more interactive and engaging learning experience. Despite the potential benefits of online learning platforms, accessibility remains a significant concern in Kenya's secondary schools. Lack of access can prevent many students from fully benefiting from these platforms due to ineffective use of online learning platforms. To address these challenges and enhance the accessibility of online learning platforms in Kenyan secondary schools, it is crucial to understand the current state of these platforms and the barriers faced by students. By researching this topic, policymakers, educators, and stakeholders can gain insights into the specific challenges hindering accessibility and, subsequently, develop strategies and initiatives to address them. Palmera et al. (2023) describe accessibility as the ability of all students, regardless of their background or abilities, to access and effectively utilize online learning platforms. Unfortunately, many students in Kenya experience barriers that hinder their access to these platforms.

According to a study conducted by Wambui et al. (2022), the use of online learning platforms in Kenyan secondary schools is still in its infancy. The study reveals that only a small percentage of secondary schools in Kenya have adopted online learning platforms. In the analysis of data, the study does not specifically address the issue of access, still, it can be inferred that if only a small percentage of schools have adopted these platforms, there may be limited access to online learning resources for many students. In another study, Redempta and Elizabeth (2012) focus on online learning platforms in rural secondary schools in Kenya. The study reveals that the lack of reliable electricity supply, limited internet connectivity, and a shortage of computers or smartphones are major barriers to accessing online learning platforms in rural areas. However, the study only focuses on rural areas which does not give an account of the situation of accessibility to other secondary schools in Kenya as the current research seeks to address. Kafwa et al. (2015) also investigate the preparedness of teachers in Kenyan secondary schools to access online learning platforms. The findings reveal that there are limited digital skills in the ability to effectively utilize these platforms in teaching. However, the analysis does not show the state of access for the learners. Consequently, the literature review emphasizes the need for further research on the accessibility of online learning platforms in secondary schools in Kenya. Initiatives such as the Digital Literacy Program and teacher training programs play a vital role in promoting the effective use of online learning platforms and enhancing accessibility in Kenyan secondary schools.

### **1.1 Statement of the Problem**

The rapid advancement of technology has led to the emergence of online learning platforms as an alternative to traditional classroom teaching in secondary schools. However, there are concerns regarding the accessibility of these platforms in Kenyan secondary schools which have attracted little research. This research aims to explore the current state of online learning platforms in secondary schools in Kenya and investigate the level of accessibility for students. It assesses the availability and quality of internet connectivity, access to devices, and the barriers faced by students in utilizing these platforms effectively. Further, the research examines the level of digital literacy among students and teachers and identifies strategies to enhance their skills. The findings of this research provide valuable insights into the barriers and opportunities surrounding online learning platforms in Kenyan secondary schools. Moreover, it informs policymakers, educators, and stakeholders about the necessary steps to improve accessibility and promote equitable education opportunities for all students. By addressing the challenges and working towards enhancing accessibility, we can ensure that online learning platforms effectively contribute to the achievement of quality education in Kenya's secondary schools.



## 1.2 Theoretical Framework

This article employs the Educational Technology Adoption Theory by Fred Davis (1987). This theory is also known as the Technology Acceptance Model (TAM). It is a theoretical framework that explains the process of how individuals adopt and use educational technologies. The theory has since been extended and applied in various educational settings. The main premise of the theory is that the adoption and use of technology are influenced by perceived usefulness and perceived ease of use. Perceived usefulness refers to the belief that using a particular technology will provide benefits and make tasks easier or more efficient. Perceived ease of use refers to the belief that using a particular technology is not complicated. The theory also identifies key factors that influence an individual's intention to adopt and use educational technology. Two tenets are used as analytic tools. The first one is the social influence tenet which envisages educational context on an individual's adoption and use of technology. The second one is the facilitating conditions which focuses on the availability of necessary resources, such as access to technology, technical support, and training, that enable individuals to use educational technology effectively. This theory is used to examine the adoption and use of online learning platforms and identify the barriers faced by students, teachers, and administrators in accessing and utilizing these platforms.

## 2. Research Methodology

This being a qualitative and quantitative research, it adopted a mixed approach method of descriptive research design. The mixed approach method of descriptive research design combines both qualitative and quantitative approaches to gather a comprehensive understanding of the research topic. Qualitative data was collected through semi-structured interviews with principals and teachers. The interviews focused on gathering in-depth insights into their experiences and perceptions of online learning platforms in secondary schools. The interviews were recorded and transcribed for analysis. Quantitative data was also collected through semi-structured interviews with the form four students. The used questions consisted of multiple-choice and Likert scale questions to gather information on their usage and experience of online learning platforms. In this case, the research focused on secondary schools in Thika Sub-County. The target population for this study included all the secondary schools in Thika Sub-County. The informants were categorized into three groups: principals, teachers, and form four students. The sample size for this study was determined using a purposive sampling technique. A total of 230 informants were included in the study from the 10 selected secondary schools. The distribution of the sample size was as follows: 10 principals, 20 teachers, and 200 form four students (10 students from each school). By including representatives from different stakeholder groups (administrators, teachers, and students) and using both qualitative and quantitative data collection methods, this mixed approach method of descriptive research design aimed to provide a comprehensive understanding of the research topic in the context of Thika Sub-County secondary schools.

## 3. Results and Discussion

The subsequent section presents the analysis and findings of the collected data. It reports the data and results based on the applied methodology. This is followed by a discussion section that interprets the significance of these findings, explaining their relevance and how they align with existing knowledge. The implications of the findings are also explored, highlighting their practical applications and potential benefits.





**Table 1***Demographic characteristics of participants*

Gender	Frequency	Age/Years 13-18	Age/ Years 19-24	Age/ Years 25-29	Age/ Years 30-35	Age/Years Over 36
<b>Principles</b>	10 (4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	10 (4%)
<b>Teachers</b>	20(9%)	0(0%)	0(0%)	3(15%)	10(50%)	7(35%)
<b>Students</b>	200 (87%)	156 (78%)	44 (36%)	0(0%)	0 (0%)	0 (2%)
<b>Total</b>	<b>230(100%)</b>	<b>156 (68%)</b>	<b>44 (19%)</b>	<b>3 (1%)</b>	<b>10 (4%)</b>	<b>17 (7%)</b>

The table displays the demographic characteristics of the participants involved in the interview on online learning platform accessibility in secondary schools in Kenya. In terms of gender, the majority of participants were students, accounting for 87% of the total respondents. Teachers comprised 9% of the participants, while principals made up only 4% of the participants. In terms of age, the majority of students (78%) fell within the age range of 13-18 years, reflecting the typical age range of students in secondary schools. Only a small percentage of students (36%) were between the ages of 19-24, and there were no students aged 25 or above. Among the teachers, there was a more even distribution in terms of age. The highest percentage of teachers (50%) fell into the age group of 30-35 years, followed by 35% who were over 36 years old. Only 15% were between the ages of 25-29, and none were in the age range of 19-24. In terms of principals, all of them were over the age of 36, representing the experience and seniority expected in that position.

**Table 2***state of online learning Platform accessibility*

State	Frequency	Percentage
Awareness of learning platforms	140	70%
Accessibility at school	30	15%
Frequently used at home	10	5%
Occasionally use at home	90	45%
Don't use it at all	70	35%
<b>TOTAL</b>	<b>50</b>	<b>100%</b>

Based on the table, it can be concluded that there is a high awareness of online learning platforms, with 70% of the participants reporting knowledge of these platforms. However, their accessibility and usage are limited, particularly at home. Only 15% of the participants mentioned that these platforms are accessible at school, and even fewer (5%) reported frequent usage at home. On the other hand, 45% of the participants mentioned occasional usage at home, indicating some level of accessibility. Surprisingly, 35% of the participants stated that they do not use online learning platforms at all. These findings suggest that there may be challenges or barriers preventing widespread usage and accessibility of online learning platforms outside of the school environment. This is in line with Ouma et al. (2013) who discuss the e-learning readiness of secondary school students in Kenya. The two authors argue that students from lower socio-economic backgrounds face more difficulties accessing necessary technology and internet services. Consequently, further investigation is needed

to find out the reasons behind the low usage and accessibility rates, which could include factors such as lack of access to the internet or devices, limited familiarity with technology, or other logistical issues.

### ***Barriers to Accessibility of Online Learning Platforms***

The informants' responses reveal that the school curriculum is identified as a major barrier to the accessibility of online learning platforms. Many traditional learning activities and assessments are designed for in-person, physical learning in the classroom. This means that online learning platforms may not align with the curriculum, making it difficult for teachers to incorporate them into their lessons. This finding supports Ongwae and Duncombe (2021) who explore the preparedness and readiness of secondary schools in Kenya to adopt online learning during and during the post-COVID-19 pandemic. The findings show that there is a general lack of preparedness among teachers, as many are not sufficiently trained to deliver online instruction. This lack of training hinders the teacher's ability to effectively use digital platforms for teaching. Additionally, the lack of support and integration of online learning platforms into the curriculum can create a perception that these platforms are optional or not as important as traditional learning methods. This could lead to a lack of motivation or interest in utilizing online learning platforms among both students and teachers as reported by Itani and Sinno (2021), who explore the relationship between teachers' ICT Knowledge and students' motivation in Online Learning.

Further, teachers reported that there is little accessibility to online learning platforms since there is limited availability of resources and materials, specifically designed for online learning. This can also be a barrier since the teachers may struggle to find appropriate and engaging content to use on these platforms, making it challenging to effectively deliver lessons and engage students. This can make it challenging for them to effectively deliver lessons and engage students. As a result, students do not have access to quality education and are at a disadvantage. This is in agreement with Nugroho et al. (2020), who investigated teachers' challenges and insights of online teaching amidst the global pandemic. Their findings show that maintaining student engagement in a virtual classroom is a major challenge. The authors also report that teachers have difficulties in keeping students motivated and involved during online lessons. Distractions at home and the impersonal nature of online interactions were identified as potential reasons for this lack of engagement. To address this challenge, it is important to provide teachers with training and support on how to effectively use online learning platforms and create engaging content for students. Additionally, efforts should be made to develop and provide accessible, quality resources that are specifically designed for online learning. This will not only enhance the learning experience for students but also enable teachers to deliver high-quality instruction in a virtual setting.

Another significant challenge faced by schools is unreliable or limited internet connectivity. Principals interviewed from many schools reported frequent power outages and slow internet speeds. This makes it difficult for students to participate in online learning platforms and access learning materials fully. Teachers have to constantly adapt and find alternative ways to deliver instruction, such as creating offline activities. This supports Shapiro et al. (2017), who investigated massive open online courses and student experience. The findings reveal that poor connectivity hinders students' ability to stream videos and download course materials efficiently. This often results in frustration, reduced engagement, and negative learning experiences. Schools find it hard to implement various strategies. Teachers are not at ease in utilizing technology tools and platforms to make lessons more interactive and engaging. Most schools have not been identified by local internet service providers to provide internet hotspots to students in need. There were also no explored options for improving this infrastructure and increasing bandwidth to support the demands of online learning.



Adherently, both students and teachers expressed the need for training and support in using online learning platforms which has not been factored in their schools. Many teachers reported feeling underprepared to use technology in their teaching due to a lack of training. This is in line with the findings of Smerdon et al. (2000), who investigated teachers' tools for the 21st century. The authors report that Teachers' use of technology for instruction varies significantly across schools and districts. The findings show that factors such as school resources, teacher training, and administrative support contribute to this variability. Therefore, it is crucial for schools to provide adequate training and support to teachers in using online learning platforms effectively. This can include workshops, webinars, and ongoing professional development opportunities to help teachers build their technological skills and understand how to use these platforms to deliver engaging and effective instruction. Additionally, schools should allocate resources to ensure that teachers have access to the necessary technology and tools to implement online learning successfully. By addressing these factors and providing the necessary training, resources, and support to teachers, schools can bridge the gap in online learning and create a more effective and engaging learning experience for students. This will help ensure that all students have equal opportunities to access quality education, regardless of their learning environment.

By and large, limited access to technological devices was identified as another barrier to accessing online learning platforms. A significant barrier reported by both students and teachers was the lack of personal devices, such as laptops or smartphones. For many students, especially those from disadvantaged backgrounds, owning a personal device capable of accessing online learning platforms was simply not an option. This created an inequitable situation where some students had the necessary tools to engage in online learning, while others were left behind. The limited number of devices further exacerbated the problem. Students had to share devices with siblings, parents, or other family members, resulting in a fragmented learning experience at home. This not only impeded their ability to fully engage in accessing online learning platforms but also affected their productivity in attaining the learning content on these platforms. Teachers faced similar challenges. Without personal devices, it became difficult for educators to effectively communicate with their students and deliver instruction. They had to rely on limited resources provided by schools or local education authorities, which often proved insufficient to meet the demands of online teaching. This is in agreement with Gikas & Grant (2013) who examined mobile computing devices in higher education. The study focused on student perspectives on learning with cell phones. In the findings, students reported that mobile devices provided greater access to educational resources, allowing for flexible and personalized learning experiences.

Even if students had access to personal devices, they often encountered other barriers. In some cases, the lack of an internet connection or slow internet speeds made accessing online platforms virtually impossible. This was particularly prevalent in low-income neighborhoods where internet infrastructure was underdeveloped. In some schools, this is addressed by implementing various initiatives to provide students with the necessary devices and internet access. Some schools loaned out laptops or tablets to students for online platform learning, while others partnered with internet service providers to provide subsidized or free internet access to students in need. Despite these efforts, the lack of access to technological devices remains a significant hurdle for many students and teachers. It highlights the deep-rooted inequalities within education systems and the need for more comprehensive measures to bridge the digital divide.

#### **4. Conclusions**

The study findings indicate that while secondary schools in Kenya have made progress in adopting online learning platforms, there are still significant challenges to ensuring accessibility for all



students. By addressing issues related to technology access, infrastructure, training, and cultural factors, policymakers and educators can work towards providing equitable access to online learning opportunities. Continued efforts in this area are crucial for promoting inclusive and quality education for all secondary school students in Kenya. One key challenge is the limited access to technology devices and reliable internet connectivity, which prevents many students from fully participating in online learning activities. To overcome this barrier, policymakers and educators should prioritize efforts to provide technological resources and improve internet infrastructure in schools and communities. Another barrier is the lack of digital literacy and training among students and teachers. Many are not familiar with how to effectively use online learning platforms, which hampers their ability to engage in online education. To address this, it is essential to invest in training programs and resources that support the development of digital skills for both students and teachers.

## 5. Recommendations

Ongoing technical support and assistance should be provided to schools and teachers to ensure the smooth operation of online learning platforms. This can involve training teachers on how to effectively use the platforms, troubleshoot technical issues, and provide ongoing support. Technical support teams can be established to address any technical challenges that may arise and ensure that the platforms are functioning properly. Additionally, community engagement is crucial to address cultural barriers and promote acceptance of online learning. Parents, community leaders, and other stakeholders should be involved in the decision-making process and kept informed about the benefits and advantages of online learning. Community meetings can be organized to discuss the importance of digital skills and the potential that online learning platforms have to enhance educational opportunities. Consequently, awareness campaigns can be conducted to educate the community about the benefits of online learning. These campaigns can include information sessions, workshops, and seminars to help dispel myths and misconceptions surrounding online learning. Highlighting success stories of students who have benefited from online learning in similar cultural contexts can also help promote acceptance and encourage participation.

Advertently, curriculum integration is essential to ensure that online learning platforms are effectively integrated into the school curriculum. This requires collaboration between curriculum developers and online platform providers to develop appropriate content and resources. The curriculum should be designed in such a way that it utilizes the features and capabilities of online learning platforms to enhance teaching and learning experiences. This may involve developing interactive multimedia materials, assessments, and activities that align with the academic goals and learning outcomes. Regular monitoring and evaluation of the effectiveness of online learning platforms is crucial to identify any shortcomings and make necessary improvements. This can involve gathering feedback from students, teachers, and parents through surveys or focus group discussions. Tracking student performance and engagement can also provide valuable insights into the effectiveness of the platforms. This data can be used to inform decisions on modifications and enhancements to the online learning platforms and ensure that they are meeting the needs of the students and schools.





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# An Analysis of the Factors Affecting the Mastery of English Language Skills among English as a Foreign Language University Students: Strategies for Improvement

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## Abstract

English is the most extensively used international language, spoken by almost 1.5 billion people worldwide. Many countries in Europe, Asia, Africa and America have accepted it as a national or official language for usage in educational institutions and offices. As a result, these countries teach English as a foreign language/second language from primary to university, much as they continue to largely speak their local languages. Regardless, majority of university students in these countries like Somalia, China, South Korea and Saudi Arabia among others still display poor mastery of basic English language abilities such as speaking, writing, listening, and reading. As a result, a complete assessment of studies on the factors influencing the mastery of English language skills in educational institutions in these countries was required in order to shed light on the issue and discover missing links. The researcher looked up relevant existing literature using search engines like Semantic Scholar, Google Scholar, PubMed, ProQuest, and Connected Papers. While plenty of quantitative studies were accessed, the evaluation highlighted the most significant gap as the lack of extensive purely qualitative studies on the factors influencing mastery of English language skills from the perspective of university students. As a result, the review's key recommendation is that, in order to get a more in-depth and thorough understanding of the situation, more substantial purely qualitative studies be widely conducted in these areas to address the issue through the judgements and experiences of students. This could help to strengthen present efforts to find a long-term solution to the English language deficit in these countries. Other interventions such as embracing English literature, international benchmarking, refresher courses for teachers and clear policies on language of instruction in schools be adopted.

**Key words:** English Language Skills, Education, Proficiency, Teaching

## 1. Introduction

English is an old language that took off with the invasion of Britain in the 5th century (Baugh & Cable, 2002). Over the years, English has spread to very many countries, becoming the most widely spoken language in the world today. A report by Entnologue (2023) reveals that over 1.46 billion people speak English around the World, amounting to an incredible 18.07% of the global population, or almost 1 in 5 people. Therefore, today, more people speak English than any other language and by 2050, the total number of English speakers is anticipated to grow to 2 billion people or more. English has become so spread that it is taught in over 118 countries, holding immense value as a language to learn (Pareeshti, 2023; Raj, 2023; Dean, 2023; Entnologue, 2023; Zuzhi & Gengsheng, 2022). Due to such statistics that make English an important global language, many countries have rushed to associate themselves with it, either making it an official language, a subject in school or a language of instruction. Some of these countries are in Africa such as Somalia whose association with English dates back to the British colonial days, while others are everywhere in Asia such as Saudi Arabia, Kuwait, Indonesia, Vietnam, China and Qatar, and others are spread all over in other continents.



Just like many of these countries, language policies in Somalia have since favoured English as a subject or Language of Instruction from primary up to university though English faces competition from Somali and Arabic (Unicef, 2016; DCG, 2021; Altai Consulting, 2018; MOECHE, 2017). Such a background of English has attracted the attention of researchers from a global to the national perspective (Zahra, 2024).

Therefore, much as many university students in most of the EFL countries are exposed to English right away from primary school, they still demonstrate low mastery of the basic English skills – writing, reading, listening and speaking (Ali, 2020; Mohamed, 2018; Zahra, 2024). Much as universities in these countries, in a desperate attempt to fix the English language gap, have established language centers to equip students with the necessary language skills, majority of the students struggle to participate in academics due to the language barrier where English is used as a language of instruction. Such students quickly switch back to their local/national languages for easy participation and understanding (Zahra, 2024). Such trends undermine efforts to make English a Language of Instruction in universities, affects the academic performance, limits participation in academic activities and has a long-term impact on career growth of the students (Zahra, 2024; Abdishakur, 2020; Abakunda, Kule, Ugwu, Turyamureeba & Kamaami, 2023). As part of the result, Somalia registers miserable rankings relating to English usage. According to the EF English Proficiency Report (2023), an EFL country like Somalia is among the countries posting a very low proficiency index while the World Population Review (2024) ranks Somalia in position 8 from the bottom of the literacy table, only posting 41% literacy, yet it is important to mention that many studies have found a positive relationship between literacy and career success (Achmad, 2021; Schmeiser, 2009); and English proficiency and career opportunities and growth (Dodo et al, 2023). Many of the other EFL countries in Africa and Asia take similar trends (Achmad, 2021; Dodo et al, 2023).

With English widely taught in schools and is the Language of Instruction at many universities and a working language of many workplaces in many EFL countries (Ibrahim, 2022; Ahmed, 2022), the poor English language skills of most students in these countries should worry all stakeholders in their education. There is also sufficient evidence of the global importance of English. English serves as the primary language of instruction in many universities worldwide. By possessing a strong command of English, students can fully engage in lectures, actively participate in discussions, and comprehend complex academic materials. English is not only extremely important for academic pursuits but also for future career prospects. In today's globalized job market, employers value candidates who possess strong communication skills and can effectively interact with colleagues, clients, and stakeholders from diverse backgrounds. For aspiring researchers, a strong command of English is indispensable. The majority of scientific papers, journals, and conferences are conducted in English. Proficiency in the language enables students to conduct literature reviews, comprehend cutting-edge research, and contribute to scholarly discussions. It also facilitates the publication of research findings in reputable international journals, widening the scope of their work and increasing their academic visibility. English proficiency ensures that students can access the vast array of educational resources available, ranging from research papers and textbooks to online databases and scholarly journals. It enables them to contribute to classroom discussions, collaborate with peers, and fully comprehend course content, enhancing their overall learning experience. A high level of English proficiency allows graduates to pursue job opportunities globally, broaden their career options, and compete in an increasingly interconnected world (Pareeshti, 2023).

Consequently, studying the factors affecting mastery of English language skills among university students is necessary and a contribution to already existing literature on the issue, and the efforts addressing the poor English language skills among university students to pave a clear career path for them. The study therefore sought to identify the factors affecting the mastery of English language



skills from the students' perspective and suggest possible and sustainable solutions so as to contribute to the improvement of the English proficiency programs, the overall quality of education in EFL countries and success of students after university. Findings of the study are necessary to empower English language centers in EFL countries to make a significant contribution to English language development.

## 2. Research Methodology

The researcher employed search engines such as Semantic Scholar, Google Scholar, PubMed, ProQuest, and Connected Papers to look for literature on prior studies, journal articles, and dissertations on factors influencing English language proficiency. The key term parameters influencing English language mastery were representative of the search undertaken. Initially, 57 papers were obtained; however, following screening, 36 articles were used in this work. In arriving at the 36 articles, many articles older than nine years were dropped, while those that were not from ESL countries or not strictly conforming to the key words of the search phrase were all dropped.

## 3. Findings and Discussions

The researcher acknowledges that there are many studies from a global perspective that have delved into the issue of poor English language skills among university students. Most of these have studied English proficiency in relation to one or two factors affecting it. The already existing literature therefore served as a basis for conclusions and recommendations.

Bazimaziki (2019) did a qualitative study on university students' perceptions of using literary genres to enhance language proficiency among university students in Rwanda with a view that Language and Literature are taught to equip students with not only communication skills like listening, reading, writing and speaking but also ethical values, critical thinking and analytical skills. The study found out that despite efforts to teaching English, proficiency issues were still rampant across the key skills. At tertiary level, crosscutting courses such as English for Academic Purposes and English for Specific Purposes had been emphasised but were not enough for students to be well equipped with enough communication skills in English. However, it was found that most of the students who had been exposed to Literary genres underwent increase of language proficiency at various level each in the four language skills namely listening, speaking, writing and reading. Therefore, Literature was used to enhance language communication skills, critical thinking and creativity in language learning as they expose learners to contexts that can enable them to use language in describing various things and situations, hence developing their communication competences. The view is supported by many other researchers (Padmavat, 2022; Chen, 2022). Chen (2022) asserts that adopting the teaching method that focuses on the development of communicative competence in English Language and Literature is helpful to students in China and enhances their comprehensive English skill. The study by Bazimaziki (2019) that is only done in the context of Rwanda, and other similar studies (Chen, 2022; Padmavat; 2022) offer interesting insights about other EFL countries like Somalia where English language foundation programs in universities do not cover Literature yet there are many proficiency challenges among students, including finalist.

Salamuddin, Nazriani & Yunsnita (2022) used a quantitative approach to explore the factors affecting Indonesian English as a Foreign Language (EFL) students' reading skill through extensive reading activities. While the study acknowledged that extensive reading in EFL context improved English language skills, and language sub-skills such as vocabulary mastery, reading speed rate, the results showed that Indonesian EFL students find the difficulties to improve reading skill. Students also believed that Extensive Reading (ER) activities would help them improve their English skill levels.



Therefore, the absence of ER activities created a gap in language teaching and skills development. The view that reading activities enhance English language skills is supported by many researchers in Ethiopia (Wendaferew & Berlie, 2024; Mulatu & Regassa, 2022; Raqqad, Ismail & Raqqad, 2019), in Indonesia (Alfifah, 2021; Rintaningrum, 2019) and in Uzbekistan (Sapaeva & Xujaniyazova, 2019). However, these studies focused on only the reading skill, leaving the other three skills redundant. This makes a comprehensive study of all the skills needed.

In a study by Aduwa-Ogiegbaen and Iyamu (2006) on the factors responsible for the poor quality of the teaching of English as a second language in public secondary schools in Nigeria, it was found out that English language teachers do not frequently use modern instructional technologies and variety of teaching techniques in their English language lessons. It was also found that students learn under harsh environment, which is often rowdy, congested and noisy. These factors were found responsible for the poor English language skills among students (Scott, Alison, Lorena & Okhee, 2022; Reiser, Novak, McGill & Penuel, 2021). However, the study by Aduwa-Ogiegbaen and Iyamu (2006) was carried out in Nigeria among secondary school students. If a similar study is done in other EFL countries, it could produce different results due to the different contexts.

Ping (2009) did a case study of the factors affecting Chinese students' English communication performance and revealed that not enough emphasis is put on verbal communication as a yardstick of language mastery in Chinese universities teaching ESL. The study that employed a quantitative analysis also found out that poor motivation (Ryan & Deci, 2000), poor learning approaches (Entwistle, 1990), and inappropriate learning strategies (Biggs, Kember, & Leung, 2001) were hampering effective development of English language skills. However, the study focused much on performance and not skills acquisition.

Related studies have also been done in Somalia, an emerging country in EFL teaching. Somalia has lately concentrated on EFL teaching as part of efforts to completely switch to English as the official language. Zahra (2024) investigated the factors that contribute to the enhancement of English language skills among undergraduate students at universities in Mogadishu, Somalia and found out that English language programs significantly improved students' proficiency in speaking, listening, reading, and writing, as well as their vocabulary and grammar. Zahra (2024) acknowledges that there are various support materials such as technology that enhance learners' skills but scantily explains the persistence of poor language skills among some students even after being exposed to the factors favouring learning. The study also majorly focuses on a quantitative approach, thus leaving chances that a qualitative approach could produce different results. Mohamed (2018) also studied the challenges associated with teaching English in Mogadishu from a teacher's perspective and highlighted vital issues about pedagogy, the civil war and anarchy, economic and social hardships, low pay, lack of specialized training, inconsideration for professional development programs as leading to the diminishing of the worth of teaching, consequently affecting the quality of students produced. Therefore, Mohamed (2018) leaves a gap for studying the quality of students produced from the student's perspective. Whereas Mohamed (2018) highlights attitudes of teachers affecting students' learning outcomes, Mohamed (2022) posits that negative attitudes of students also limit English learning outcomes relating to skills acquisition. Abdishakur (2020) also notes challenges such as limited school resources, uncertainty, ineffective service delivery, lack of effective regulation in the education sector and coordination challenges as limiting learning outcomes and student capacities. However, Abdishakur (2020) spreads his study across the different regions of Somalia which raises concerns on the dynamics in the education sector that could vary across regions. Therefore, regarding language outcomes and capacities, a much modest scope unique to a region or district could produce varying results. Amina and Guled (2019) highlighted social-cultural gender issues as limiting effective access to education and participation in lessons among female students





in Puntland, Somalia hence limiting acquisition of English language skills. The study was done in Puntland therefore, a similar study done in other states could give different results due to the different contexts.

Other related studies on factors affecting English language proficiency among students studying in foreign countries shade light on critical issues such as slow adjustment to foreign culture (social, academic, and psychological), language barrier, different education systems, the influence of L1 (bilingualism) and unfamiliarity to resources in host environments that affect acquisition of language skills (Ahmed, 2021; Ali, 2020; Aderi et al, 2013; Rienties, 2012; Gebhard, 2012; Mesidor & Sly, 2016; Bulhan, 2020). However, it is important to note that these researchers study local students in foreign environments. Therefore, the factors at play could be different if students were studied from their country.

#### **4. Conclusion**

Based on a study of the available literature on factors influencing mastery of English language abilities among university students, it is possible to infer that more research on the subject is needed in many EFL countries like Somalia and many Asian countries because the English gap still exists in these countries. Many students still grapple with low mastery of English language skills. Much as academics have delved into the issues affecting mastery of English language abilities, major research gaps remain that must be addressed by additional empirical examination. For most countries like Somalia, many of the studies were conducted outside of these countries, and even inside these countries, some were conducted in different states or regions, leaving some areas unstudied hence a need to exhaustively study these areas making as it is important in resolving such gaps and curving a more comprehensive strategy for improvement. In Somalia, for example, Benadir district is home to the bulk of Mogadishu's universities, therefore a study conducted there would be both specific and representative. Furthermore, many of the research evaluated relied heavily on quantitative methods, whilst others used instructors as their target group. This creates a gap that can be filled by conducting a qualitative study using students as key respondents to learn about their perspectives of the challenges restricting their mastery of language skills. This may provide in-depth insight into the problem.

#### **Recommendations**

A number of strategies and policies for improvement should be adopted by EFL countries to address the situation of lack of mastery of English Skills among university students. In order to get a more in-depth and thorough understanding of the situation, more substantial purely qualitative studies be widely conducted in EFL countries to address the issue through the judgements and experiences of students. This could help to strengthen present efforts to find a long-term solution to the English language deficit in these countries. Other interventions and strategies such as embracing English literature, international benchmarking, refresher courses for teachers and clear policies on language of instruction in schools should be adopted.





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# Women and Cattle Rustling: A case Study of Pokot Women in North Western Kenya

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## Abstract

*This paper is about the participation of pastoralist Pokot women in cattle raiding in north western Kenya. The paper presents that the subject of women participation in cattle raiding has long been ignored by eminent writers on the subject, and was not a priority research area.. It identifies four key studies on pastoralism and cattle raiding in eastern Africa which ignored women's role in it. Very recent studies on the topic have not been systematic. This paper transacts cattle raiding and women using social cubism theory, a framework that is found appropriate given its dynamic and multi-dimensional nature. The paper concludes that Pokot women are active participants in cattle raiding.*

**Key Words:** Pokot, Kenya, women, cattle, rustling, conflict, social, cubism.

## 1. Introduction

Some studies greatly defined subsequent areas of research in pastoralism in Kenya and the entire Eastern Africa region. The definition of priority areas for research led to some areas being favorite while other deserving topics were ignored. Four studies particularly stand out in this. I will briefly present each of them. In 1980 the publication of *"The Future of Pastoral Peoples"*, proceedings of an international conference defined the subsequent studies on pastoralism for much of the 1980s, 1990s and even further into the 2000s. The conference brought together a constellation of the world's reknown anthropologists, researchers on pastoralism and policy advisers. A total of thirty one papers were presented out of which only one was on women. Papers focused on the following themes: the role of anthropology in pastoral development; the political economy of pastoralism; the economics of pastoralism; the role of government in pastoral development; and the research process, strategies, goals and methods. The conference was actually women-blind. As observed by Vigdis Broch-Due, et. al (1980),

*"In the past women's roles have been neglected by development planners and social science researchers. Women were not mentioned at this conference until a special request was made. This has serious implications for research priorities. The critical role of women in the household economy is neglected. Women have been considered as passive participants in their social world. This bias has made researchers to be preoccupied with the formal power structure of pastoral societies yet there are important areas of decision making for women as well as ways they have of influencing male decisions."*

In the section of research priorities gleaned from the thirty one papers and floor discussions of the conference, the following were set to guide subsequent research for decades to come: influence of the state on pastoralism, pastoralism in a regional perspective, the market for products of pastoralism, the household economy of the pastoralist, and pastoralist resources. The role of women in pastoralism was not considered a priority research area, and for decades ahead.



The second publication was the edited volume “*Warfare among East African Herders*” (Fukui and Turton, eds 1979). The publication had nine contributors out of whom five concentrated on the warfare between pastoralist communities living in the lower Omo valley in South West Ethiopia. They principally tackled themes including the military role of age-sets, pastoralist’s aggression and the nature of expansion. The other three authors were more inspired to write on the Maasai (Jacobs), Maasai and Samburu (Fratkin) and Tatoga (Tomikawa). Jacobs (ibid) argued that the aggressive notion of the Maasai was more historical than contemporary. Other writers in this publication particularly Almagor, Baxter and Tornay all presented that centralization of authority was a key impetus for warfare among pastoralists.

The five papers were focused on the communities living in the south Omo Valley (or north of Lake Turkana). They discussed inter-group warfare. Tornay concentrated on the warfare between the Nyangatom, Dassanech, Mursi, Hamara and Kara communities. Almagor wrote on warfare among the Dassanech while Fukui concentrated on the Bodi, Dime and Mursi warfare. Todd investigated the aggression between the Dime and Bodi. In the papers of the southern Ethiopian communities there is concurrence that territorial expansion was not the main persuasion in the warfare because conquered territory was not occupied by the victorious participant group. Rather the motivation for warfare was,

*The cultural value of killing enemies, the acquisition of livestock, retaliation and revenge (Galaty, 1983).*

In a book review, Berntsen (1980) noted that the nine papers in the trend-setting publication were focused on the age-graded pastoralist groups of Kenya and southern Ethiopia. The writers specifically were: P.T.W. Baxter (Oromo); Alan Jacobs (Maasai); Horimichi Tomikawa (Datoga); Eliot Fratkin (Samburu); Serge Tornay (Nyangatom); Uri Almagor (Dassanetch); Katsuyoshi Fukui (Bodi); David Turton (Mursi) and Dave Todd (Dime). The southern Ethiopian studies were undertaken between 1968-1976, a time of intense pastoralist conflict hence readers are treated to the live accounts of both victims and raiders. The salient features common in all the papers were: interrelationship among age-organizations and warfare, technology, strategy, causes and effects (Berntsen, 1980). One noticeable absence was the focus on women in the fighting communities. The papers presented, and, the book review by Berntsen (*op.cit*) provide a key conclusion on studies of warfare among pastoralists. Orthodox literature on warfare among pastoralists tends to conclude that they raid or fight each other for one thing- acquisition of cattle, an obvious over-simplification of pastoralist warfare. In the case of southern Ethiopia, acquisition of cattle was not the immediate concern in the inter-pastoralist warfare. Instead it was desire to occupy agricultural land of the other group for cultivation or the harvest of mature crops.

For instance the Mursi raided the Bodi to lay claim over agricultural land they had quietly infiltrated before. Dassanetch raids were a response to decline in food production occasioned by intense and persistent flooding of their territory. The incessant Nyangatom attacks on the Kara community forced them to abandon ripe fields of grain which the Nyangatom harvested. The Bodi were more motivated with the murder of an enemy than acquisition of cattle. For the Oromo, the prestige associated with killing an enemy ranked as high as that of acquiring cattle, although for the Oromo and Maasai raiding for cattle remained supreme. As noted in Baxter’s report on Oromo,

*A young man who did not acquire at least one trophy was not welcomed as a son-in-law. A successful warrior received cattle, sexual favors and great prestige.*

*Jacobs reporting on the Maasai showed the high motivation for cattle in raids as he wrote, Maasai elders complained that the British ban on raiding would mean that the poorer young men would have difficulty acquiring wealth in order to marry and settle as elders*





The lacunae in this publication was the lack of mention of the role women play in the warfare. The women perspective in the warfare that tore communities apart for decades was not documented, hence this influence on later studies was apparent.

Three decades later, Carol R. Ember *et.al* released a new publication in 2015 titled, “*Rain and Raids Revisited: Disaggregating Ethnic Group Livestock Raiding in the Ethiopian-Kenyan Border Region*”. The focus of the paper was on the relationship between weather (rainfall) and intensity of raiding among Borana, Dassanech, Gabbra, Garre and Samburu pastoralist communities. The report presented detailed weather and raids data across the pastoralist groups. It concluded that there was more livestock-related raids when one group moved closer to other ethnic groups whether in the wet or dry season. Women and raids was not mentioned.

One of the most consolidated and elaborate collection on pastoralism across the world was written by Blench (2006). The report is divided into thirteen chapters with wonderful precision. He acknowledges the romanticism associated with cattle raiding as initially presented by Fukui and Turton (*ibid*) but preferred to discuss cattle theft and its urban tentacles. In the section on role of women in pastoral society the focus is on the household tasks allocated to women. Women are presented as a homogeneous group in all pastoralist societies. They are considered as subjects of patriarchy. The role of women in cattle raiding is tacitly absent.

### **1.1 Women in Pastoralist Conflict and Cattle**

According to Ninsiima (2006) in reference to the Karamojong of eastern Uganda a married woman is free to abandon her husband for another one if he does not have enough cattle and cannot raid to acquire them. Watakila (2014) in a study of Nilotic communities found that women in pursuit of recognition often encourage warriors to stage cattle raids. Odary, Komba and Nyamato (2020) in reference to Pokot observed that young women decorate new initiates with products of their own labour. In return the initiates promise acquisition of cattle for appeasement into marriage. Pastoralist women mock men who fear to raid for livestock among the Pokot. Instead the brave men are celebrated (Tulel, 2013).

In reference to the Somali of the greater Mandera area the role of women in raids was laid bare. *Women are said to encourage men and boys to take up arms. If a woman shakes her hair loose, it is worse than being hit by a spear. Women cajole those who are reluctant, sometimes by humiliating them in public or private* (an undocumented Somali respondent).

Women push men and boys with words meant to gender-shame and humiliate them such as accusing them of being women (Odary, Komba and Nyamato, 2020).

Among the Dassanech, women push their sons to raid in order to obtain cattle for bride wealth. They prepare meals and amulets for them after a successful raid (Watakila, 2014). Generally women are described as spoilers of good inter-ethnic relations for gain.

The primary target in the raids is cattle that often finds way into the formal market and to a lesser extent into restocking (Mburu, 2002).

The livestock raids have been on increase (Mkutu, 2008; UNDP, 2011). The raiders are mainly young men below 30 years. The cattle raids are hierarchical in character. The first are the mass raids which may involve hundreds, even thousands of raiders attacking a neighbouring community. The second level are the “*adakar*” (cluster of related families) involving up to one hundred youth raid a neighbouring kraal of another community. The lowest in hierarchy is a handful of often about 10-





20 warriors target small, isolated and unprotected kraal of the neighbouring community. There has been a general decline in mass raids (TUPADO 2011). The widespread mobile phone network has reduced the attractiveness of large raids and as well improved the ability of the administration and victim community to prepare thereby diminishing the motivation of the attackers (Wamuyu, 2014). In a study by Kimani, Okemwa and Masiga (2021) they report that in terms of participation in cattle raids the Pokot respondents said that men only 71.5%, men and women 27.7% and women only 0.8% participate in the various aspects of cattle raiding. This affirms that cattle raids are not a male-only affair. In addition women were found to be key in sanctioning of cattle raids. Women involvement in cattle raids has also been reported by Cheserek, Odenyo and Omondi (2012) and Kaprom (2013).

Livestock raids are a gendered experience. However the role played, nature, extent and level of involvement remains a grey area of research on women in pastoralism.

The four publications referred to above have one thing in common-the role of women either as perpetrators, facilitators or victims was not investigated or even implied in any of them. Studies on pastoralism, women and cattle raiding only began to emerge in the after the turn of the century. Hence the study of the participation of women in warfare among East African pastoralists apart from being too recent, still remains a lacuna.

Further the existing theoretical frameworks used to study the role of women in the recent studies failed to capture it comprehensively and I therefore utilize a new theoretical framework of social cubism to demonstrate better how it captures the multi-dimensional nature of the role of women in cattle rustling.

This paper is designed to investigate and contribute to debate on this topical, but often ignored area of social research.

## 1.2 Ethnographic Profile of the Pokot People

GOK (1950) reported the *Pokot* as the *Suk* and were about 60% pastoral (*pipatich*) and 40% agricultural (*pipagha*). Their language is similar to Nandi in vocabulary and structure. *Suk* was a nickname given to them by the Maasai – a reference to ignorant people living in the hills and cultivating.

Later on they adopted cattle keeping. Initially they lived in the territory towards the western end of Cherengani hills at Mt. Sekerr. After many years of close interaction with the Karamojong and Turkana they acquired many of their customs including singing, baboon dance and *sapana* rite of passage before they descended to the lowlands to practice pastoralism. Beech (1911) described them as a people who were suspicious of one's motives, selfish and without affection.

The pastoralist Pokot are rich in cattle and look with contempt at their agricultural brethren for being poor. Their mode of life is simple and befits a people who are constantly moving with herds and families. GoK (1951) reported that the East Pokot cattle wealth made them rank among the top two cattle keeping communities in East Africa.

Their interests outside cattle are minimal. They have elaborate cultural ceremonies which encompass an individual all through life. The most prominent cultural ceremony in *sapana* (Peristiany, 1951).

## 1.3 Theoretical Framework

In order to transact this paper, a social cubism theory is utilized as a framework for analyzing the role of Pokot women in cattle raiding. The multi-faceted nature of social cubism theory is found to be a richer body of knowledge for analyzing the dynamism embedded in women and cattle raiding.

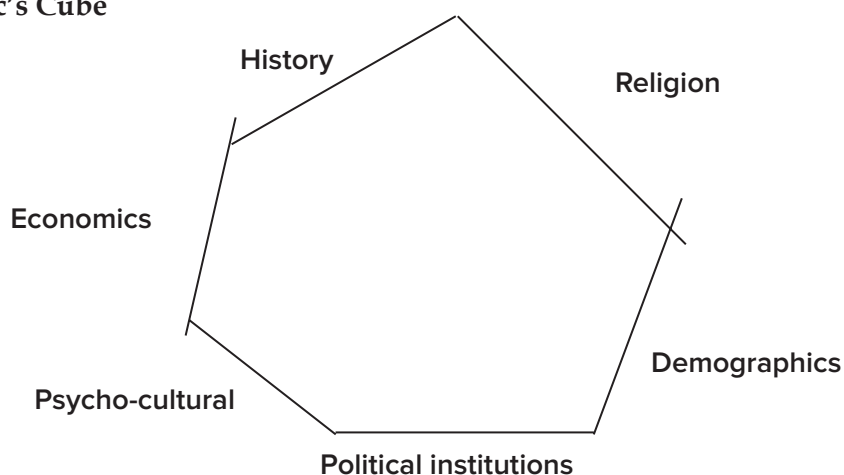


## Social Cubism Theory

Initially designed for analysis of international ethno territorial conflict, but it can also be used to analyze micro-conflicts in other settings such cattle raiding and the consequences that follow. The relevance of social cubism is entrenched in the following:

- ❖ It enables the researcher to look at Pokot women and raiding for livestock from many corners. It also makes one to acknowledge that sometimes, under different conditions, in different contexts the factors about women and cattle raiding can be interconnected in unique ways.
- ❖ In a geographical setting inhabited by members of different pastoralist communities, such as north-western Kenya, social cubism theory gives the researcher the luxury to take stock of and put into account several factors in a dynamic pastoral environment.
- ❖ The use of social cubism to understand the participation of Pokot women in cattle raiding on neighbouring Turkana, Marakwet, Samburu, Il Chamus and Tugen communities will shed light on the forms of participation and motivation, and contribute to resolving the problem of cattle raiding in northwestern part of Kenya.
- ❖ In north-western Kenya, most communities struggle with the problem of inter-ethnic conflict whose causes can very easily be related to cattle raiding. Some of the conflicts that arise out of Pokot cattle raiding are managed or addressed using other local or government approaches. In other cases some communities have a fatalistic view that there is nothing to do about it. However, social cubism can be used to examine and analyze the problem of Pokot women in cattle raids.
- ❖ In north-western Kenya there are several ethnic groups hence this presents issues of cultural differences and how different communities perceive cultural practices, participate in them or react to them. In some communities cattle raiding by women has played a significant role in their socialization.
- ❖ The theory draws its inspiration from Rubic's Cube hence the theory uses "a social cube of conflict as having six interrelated components: history, religion, demographics, political institutions and non-institutional behaviour, economics and psycho cultural (Mc Kay, 2002).

Figure 1: Rubic's Cube



The six factors are dynamic, they interact with each other simultaneously or not, in whole or in part. The social cube may be understood or drawn in a particular way depending on the factors e.g. participants, circumstances, situation in this case of Pokot women in cattle raiding. The social cube is dynamic and new information may be added on any side to assist in better understanding of women in cattle raiding. Given its reproductive nature (ability to accept new ideas, facts as the situation unfolds, to change) remains its strength to understand the motivation of Pokot women in cattle raiding.

The dynamism in social cubism allows it to consider or add new information hence leading to social change. Social cubism is the opposite of functionalism given its ability to accept social change. Social cubism theory is itself designed to analyze conflict. Conflict theory in its original form is confined to macro structures and macro interests. In this context conflict theory can be used to explain the social interests of Pokot women in their entirety in cattle raiding, but not as individuals.

The participation of Pokot women in aspects of cattle raiding has baffled many scholars interested in pastoralism, culture, gender and conflict. The theoretical bases presented here attempt in a small way to explain this phenomenon to varying degrees of success. Social cubism theory was originally designed to aid in analysis of macro level conflict particularly international ethno-territorial conflict. However, it is also applicable to micro level (as conflict between two ethnic groups in a local environment) conflict analysis (Byrne and Carter, 1996). The theory presents an opportunity to consider several factors that motivate women to participate in cattle raiding. Equally useful is that it presents possibilities to consider in resolving conflict emanating from cattle rustling between Pokot and other neighboring communities. In addition, the theory offers another option to researchers to look at other related factors such as poverty, cultural expectations, scheming by other communities, livestock markets among others in understanding cattle raiding and women. Using a cube which has four sides, a social cube is presented as having six interrelated sides: history, religion, demographics, political institutions, non-institutionalized behavior, economics and psych cultural factors. All the factors interact at different times, levels and within changing forces. (Herzberger, 1996). All the interacting sides are dynamic just as the practice of cattle raiding is dynamic, different styles, forms, times, magnitude for instance are used with different consequences each time. Of the six sides this paper rallies with three of them which are relevant for this paper- history, religion and psycho cultural all which attempt to elucidate Pokot women participation in cattle raiding. History makes us aware that the practice of cattle raiding has been part of Pokot culture from the time they descended from the hills on abandoning the tedious and unprestigious task of cultivating, and adopted cattle keeping (Lamphear,1992; Peristiany,1951; Beech, 1911). Therefore, Pokot women participation in cattle raiding is tied to the history of the Pokot as a people. With the dynamism implied, social cubism attempts to overcome the most arching weakness found in structural functionalism-its inability to account for social change as noted from its Comtean and Durkheimian origins (Ritzer and Stepnisky, 2017). At another level social cubism appears to focus on general conflict and conflict resolution, while this paper is retained at group behavior in cattle rustling. Hence the theory largely remains deficient in giving an adequate account of what motivates Pokot women to so actively participate in cattle raiding. On the religious front, the story of human creation as narrated in Genesis, woman is presented as inferior to man, having been created as an after-thought on God realizing that man was lonely and/or overworked and needed a helper (Crouch, 2010). The theory of woman creation which portrays woman as weak and subject to man does not apply in the context of Pokot women and cattle raiding. In cattle raiding women play a key role, they are the engine behind the practice. Women condition men in terms of when to stage the raids in this risky enterprise. Pokot women are not passive in cattle raiding. The psychocultural lens is more elucidating in my attempt to understand Pokot women and cattle raiding. Culture is the frame of life, it conditions how people perceive and define events in their life. In the eyes of Pokot women, cattle raiding is the in-thing that men must do if they are to win women favor for marriage. It is rational, right and a cultural obligation. The tying and fastening of *leketio* cultural practice to protect their sons and husbands affirms the centrality of Pokot women in cattle rustling. Even feminist theory (Davis, 2017) with its traditional focus on patriarchy as the universal cause of women subjection in all societies falls short in accounting for cases where women play a leading role.



## 2. Research Methodology

The study used a sample size of 137 adult male and female residents of the border areas of Mukutani (Baringo), Yatia (Baringo), Loruk (Baringo), Masol (West Pokot), Nasolot (West Pokot) and Ameyan. The residents of these locations were purposively sampled because cattle raiding is most prominent in these border areas. Similarly all adult members in these field sites have direct and indirect experience of cattle raiding therefore they have the knowledge necessary to answer the inquiry.

The data used to write this paper was collected over a three year period 2018-2021 in West Pokot and Baringo counties. In particular data collection was done in Tiaty East sub county of Baringo and in Pokot Central and Pokot North Sub counties of West Pokot County. The two regions are occupied by the pastoralist section of the Pokot (*pipatich*). Their agricultural brethren live in the higher sections ideal for crop farming. The sections selected were ideal for a study of cattle raiding since the practice takes place in the drier sections that border the Turkana, Marakwet, Samburu, Tugen and Il Chamus communities all who have been victims, at different levels of the incessant Pokot cattle raids. (d) Description of the Study Area.

In Baringo County the Pokot pastoralists live in Tiaty Sub County which has 24 administration locations. The area is lowland and receives an average of 600mm of rain per annum. The average temperature is 35°C. The human population is 131,984 (County population is 754,014) living in 28,896 (County 150,174) households (KNBS, 2018). The poverty incidence is 72.9% compared to 45.2% nationally (GoK, (2018a).

In West Pokot County, the pastoralists live in the northern and north eastern plains with a lower altitude of 900m above sea level. The low altitude areas occupied by pastoralists are Alale, Kacheliba, Kongelai, Masol and Parts of Sigor. Administratively these areas are in West Pokot, Pokot Central and Pokot North sub counties (GoK, 2018b). The lower altitude areas receive 600mm average rainfall annually and 30°C of temperature. In 2018 the population density was 63 persons per km square compared to 164 persons per km square in the highland agricultural areas (GoK, 2018b).

### 2.1 Data Collection and Analysis

In this study an explanatory research design was adopted to help explain the role of Pokot women in cattle raiding. The aim was to understand the Pokot pastoralists and raiding over a period of time, pastoralism and the role of women in the dynamics of pastoralism. The study used secondary and primary data sources.

The secondary data sources were academic literature, research reports and government reports were particularly found useful in understanding the dimensions of the Pokot pastoralists, Pokot women and cattle raiding.

Primary data sources were: Focused Group Discussions (FGDs) with Pokot men, women and youth. All the discussions centered on the topic of cattle keeping, cattle raiding and the role each section of society played. In sum twelve FGDs were held, six in Baringo County and an equal number in West Pokot County. Each FGD was planned, organized and held on an independent day. Each FGD had between 10-12 members who were carefully selected from the population following a criteria that had been developed. The assistance of the village elders and women leaders was particularly useful in identifying the appropriate participants. Only those who freely consented to the discussion were allowed to participate. No identifies of the participants were taken in order to maintain anonymity of the responses and safety of the participants.



Key Informant Interviews for in-depth discussions were held with: chiefs, heads of the *Kokwo* (Pokot council of elders), youth leaders and the heads of Maendeleo Ya Wanawake Organization at location levels. Out of this method more detailed information was obtained on Pokot aspects of Pokot history, cultural practices and the role of women. The combination of the methods helped to corroborate and yield reliable data.

A short structured questionnaire was administered to 137 adult male and female respondents in the study area. The aim was to obtain particular quantitative information and position on certain aspects of cattle raiding and the role women play. The method yielded useful information that was used to tie the loose nodes in the study. Through this method I established that women were at the core of cattle raids.

Descriptive statistics were generated and used for primary quantitative data. Content and thematic analysis were used to analyze qualitative data to identify key themes. In particular thematic analysis were completed using NVIVO 12 version.

### 3. Findings and Discussions

#### Applying Social Cubism theory to Results

Based on the information obtained from the diverse respondents there is strong consensus that cattle raiding is a gendered process. It involves all people in the community contrary to the innuendos and assumptions held by commoners, administrators and some scholars of pastoralism in eastern Africa. Another point that emerges strong is that cattle raiding is a process, it is not an instant event. It goes through several prior stages. The action of going on a raid is among the last sections of the process. In addition it was also apparent that the female at different ages (unmarried, married, elderly) play different roles in the cattle raiding process.

#### The Six Sides of Social Cubism theory and Pokot women in cattle raids

##### 3.1 History and the history of cattle keeping

For a deeper understanding of Pokot women in cattle raiding the history of the cultural practice is necessary. Readers deserve to know the history behind the cultural practice. Cattle raiding is not a recent creation. From the time the *Suk* (original name of present Pokot) descended from the hills and abandoned agriculture to adopt cattle keeping in the plains coincided with their emphasis on cattle. They first acquired cattle culture from the Karamojong (Stewart, 1950). Oral history has that Pokot people regard all cattle to belong to them and it this knowledge forms a great part of their world view (Pierli, et. al. 2006). Recorded history of the Pokot is a history of cattle after they acquired it from the Karamojong and later surpassed them in appropriation and accumulation. A Pokot person's life is all tied around cattle and their history is a history of cattle. As reported by Peristiany (1951) the *sapana* rite of passage, the most important event in the life of a Pokot man begins and ends with cattle, and the discussions and blessings by elders are about how to acquire and keep cattle. The merry making and the *adong'a* dance in which both men and women partake has cattle as the key subject. Therefore Pokot women's dalliance with cattle raiding is understood in this perspective.

##### 3.2 Religion and Acquisition of Cattle

Pokot life is so engrained with religion. From childbirth, initiation, marriage, rites of passage and death, *tororot* (God) is at the centre. Possession of cattle and doing all it can to bring home cattle and to protect its tenders is interpreted as a favour from *tororot*. The cattle are conceived in the image of *tororot*. Pokot worship cattle. To them cattle is *tororot* because it gives them everything in life- food, dress, bride wealth, a means of social exchange, licence to perform *sapana*, fame and social





recognition. *Tororot* is placed so high that only a cow can be sacrificed to appease him (Mutsotso, 2010). Eastern Africa's pastoralist's obsession with cattle was long reported in the cattle complex (Herskovits, 1923). Therefore Pokot religion has a strong influence on the people's view of cattle and any action including women participation in cattle raiding is justified on this premise. Pokot culture from birth, initiation, marriage and death invoke cattle (Mutsotso, 2010). *Sapana* rite of passage only assumes significance if cattle is involved (Peristiany, 1951; KNCHR, 2016). Since religion is at the core of every Pokot aspect it makes it difficult to address or change the women participation in cattle raiding. When Pokot women partake in cattle raiding they are fulfilling *tororot's* wish. When the cattle raid mission succeeds it is a blessing by *tororot*. Before going on a raid an animal is sacrificed and its intestines examined by the *p'kwanian* (the very religious respected religious old man known for his knowledge of interpreting intestines). He examines them for omens indicating the status of the impending cattle raid. Black spots in the intestines show crows and birds of prey coming for carcasses of the dead cows due to disease. A long white line ending in a red spot shows a line of enemies coming to attack. A large round spot is a grave and sign of sickness among people. The interpretations of the intestines make people decide whether to raid for cattle or not and the chances of success.

### 3.3 Psychocultural, Planning for Cattle Raids and Women Sanctions

Culture being the totality of the socially acquired ways of life is key in how people perceive themselves and what they are expected to do. It defines how Pokot women view themselves in the context of the most prime resource-cattle. Culture determines what is considered normal behaviour. A normal way of being, a true Pokot woman in spirit and deeds requires one to participate in cattle raiding, but in another community it will be considered unacceptable or even a criminal offence. The social boundary of the Pokot women is drawn according to the values and myths they have been socialized into. Hence any attempts to address the overall problem of cattle raiding should be considered in view of the cultural map in which it takes place. A Pokot woman, just like all Pokot men is wired into the totality of Pokot culture surrounding cattle. Her frame of mind and socialization is geared towards playing her part in the acquisition of cattle ever since Merkol, the legendary Pokot leader showed them how to acquire and keep cattle wealth. Therefore Pokot women are part and parcel of the preparatory stages and actual cattle raids.

In the sample (N=137) a total of 35% respondents showed that planning for cattle raids was the sole responsibility of men, 52.5% men and women, 10.3% women only and 2.2% elders. Therefore the data demonstrates that women take part in the process of cattle raids although at a relatively lower scale compared to men. What is however more revealing is that planning for cattle raids is a collective enterprise involving men and women, hence far removed from the over-simplification apparent in existing literature and knowledge that it is an entirely male social enterprise. Female respondents (n=65) most of them 89.1% agreed that women play a role in cattle raiding, and that they are part of it before and after the raid take place.

It was observed that women play more background roles in cattle raiding. These roles include preparing for food 88.9%, spying 76.2%, encouraging men 94.1%, singing praise songs 93.4% and accompanying male warriors 2.2%. Therefore women play more motivating and inciting roles in the cattle raiding enterprise. The dramaturgy of women involvement is more in the subtle back-stage activities and far less in the front-stage, and this probably informed existing knowledge that effectively blanks women out of cattle raiding according to popular view. In an earlier comparative study it was found that Pokot women were 7.7 times more involved in concealing information about cattle raids than their Marakwet counterparts (Kimaiyo, 2016).



In an interview with a male Pokot key informant in Loruk area he said,  
*there cannot be cattle raiding in this community without the concurrence of women. Women are at the centre of it*

Women are great influencers. Women exert pressure on men or their sons in anticipation of what lies ahead. Women deploy several sanctions towards men and boys. This pushes the men to do something lest they are branded useless or at the worst christened women. The sanctioning puts great pressure on men to demonstrate otherwise against the reductionist labels. Results show that the shaming as cowards 86.8%, demeaning those without cattle 94.3%, and contempt of those without cattle 64%, decline to dance with the cowards during *adong'a* 57.2%, prevent cowards from attending certain ceremonies 22.1% and denial of food 29.2% are some of the sanctions that men and boys hardly withstand. Therefore women unleash a plethora of sanctions that push men to go on cattle raids. An elder from Masol, very familiar with cattle raiding remarked,

*to a large extent there would be no cattle raiding without women. Most cattle raids are done to satisfy them personally and fulfill societal expectations that strongly revolve around women and cattle. When women interests are low the rate of raiding reduces. Women are the energy behind cattle raiding. Women are like the ants in an anthill. You don't see them building but you see the results*

### Tying *Leketio*

Every married woman has a waistband (*leketio*). *Leketio* plays a key role during a cattle raid. Every woman whose husband or son has gone for a cattle raid must tighten *leketio* to protect them from harm. The tighter the *leketio* the more the protection. If there is an injury or death on the husband or son the woman is blamed for having loosened her *leketio*. The success of the cattle raid is therefore dependent on how diligently women play their role back at home.

Women blame following unsuccessful cattle raid can also be extensive. They are accused of not having played their role well. The men blame women 82.6%, women blame themselves 18.0% and women blamed by raiders 4.0%. In the event that a raider killed an enemy in the raiding activity he does not, on return, enter his house or mother's house until he is cleansed by elders and medicine men. Following the increased reliance and use of guns all raiders are cleansed on return since it is difficult to tell the one who fired the fatal shot.

In all circumstances, however, the warriors display all their prowess in order to ensure that they do not elicit the condemnation of women. Being humiliated in public, especially for the unmarried young men can be particularly daunting in several ways. In the first place he will attract no girl, potential in-laws or potential suitors will be taken over by other more promising men, they will have no cattle with which to pay bride-wealth and will not dance with the girls at night. Therefore the expectations of girls puts a great responsibility on young men to undertake cattle raids. Besides this young men are expected to show initiative. A female respondent in Turkwel village of West Pokot said as follows:

*Every boy is expected to use his initiative to obtain cattle to pay his bride wealth. Whose son will be looked at by a girl yet he has no cattle to start with. A boy cannot expect to be given cattle to start with. A boy cannot expect to be given cattle by his father. He must look for his own to pay for his own wife just like his father did not depend on anybody to pay his bride wealth*

### Women as Spies

Besides playing the advisory role to raiders, women also undertake spying which is key to undertaking a successful raid. This finding is not however in tandem with the previously held knowledge that spying and gathering of information was the sole responsibility of men (Pkalya, et.al. 2003). Therefore to 53.2% of the respondents cattle raids would not go on if the women were not involved or opposed it hence strengthening the thesis that women play a role in cattle raids.



### 3.4 Political Institutions and the Evolving Role of Pokot Women

Laws and policies introduced in Kenya reflects the shift in public policy that had reigned since the early 1900s. The Constitution of Kenya 2010 (GoK, 2010) makes supreme the law and subjugates any aspects of cultural practice, whatsoever. The Penal Code (Section 278 on stealing of stock and Section 295 on using force to acquire another's property criminalize cattle raiding as cattle theft involving dangerous weapons with violence. The East African Police Chiefs Cooperation Organization (EAPCCO) in a 2008 memorandum declared cattle raiding as a serious criminal offence in the respective national laws of the member countries. The new laws in the member countries that now criminalize cattle raiding has led to changes in the practice.

Drawing from Anderson (1997) policy entails purposeful behaviour in addressing an issue or problem. He identifies six criteria to consider: policy being deliberate and purposeful; action taken by government officials; policy emerges as a response to calls for action or inaction regarding a specific issue(s) by citizens or other groups; policy deals with action, what government does but not merely intention; specific action whether positive or negative; and public policy is authoritative, based on law, legitimate and with enforcement capabilities.

Therefore with the new laws and policies in response to cattle raiding the challenge to the old paradigm is imminent. With the new realities the new generation of Pokot women will have completely different expectations compared to those of their mothers or grandmothers or any other previous generations in Pokot history. It will also impact the new generation of men whose own expectations will begin to shift given the new law and policy which have explicitly stated that cattle raiding whether directly or indirectly, including aiding the process would no longer be condoned and was illegal. In addition to the law and policy, organized civil society groups have continued to address the issue of cattle raiding among the Pokot community (World Vision, 2013). Therefore political institutions is applicable to the understanding of Pokot women and cattle raiding in the face of law and other regional control measures. They have changed the culture of cattle raiding. The changes in cattle raiding due to laws and policies demonstrates the superiority of social cubism over other social frameworks in understanding cattle raiding.

The role of women in cattle raids has not remained traditional or conservative, it has kept evolving in response to changes in the wider environment. The Only 16.3% of the respondents said women still perform the traditional roles compared to 83.7% who were confident that roles had kept changing. The roles have changed in line with changes in the wider environment.

Table 1: *Evolving roles of women*

New Role	%
Participate in peace keeping	78.9
Discourage cattle raiders/warriors	64.1
Help raiders hide stolen cattle	23.3
Assist in identifying cattle raiders to police	44.5
Arrange marketing of stolen cattle	16.0
Incite men/boys to raid	21.5

Given the changes in the wider environment including the dwindling cattle herds, increased policing, punitive laws, widespread use of mobile phones, increased use of guns, heightened vigilance and increased importance of education for youth, women participation in cattle raids appears to wane. The most plausible explanation is that the benefits are low and more difficult to come by while the risks have increased. In fact only 16.3% of all the women who were part of the sample indicated they had directly benefitted from cattle raids. Most women 76.4% strongly agreed that cattle raids had



brought more suffering to women and society and would not support it today. The forms of suffering included: death or injury of spouses and sons, high possibility of arrest and imprisonment, loss of livestock in retaliation, disruption of livelihoods and frequent construction of house dwellings. In the present circumstances there is higher women disapproval of cattle raiding.

### **3.5 Demographics**

The magnitude of cattle raiding in north-western Kenya is underestimated and what is reported is only a fraction. The practice has decimated households, livelihoods and made large territories a no-go-zone. The victims more often resort to famine relief donations while others abandon cattle keeping completely to concentrate on non-cattle sources of livelihood, while others migrate to the southern settled parts of the country. Even though, the magnitude of the impact of cattle raiding on neighbouring communities has never been fully documented and/or estimated. What is not in doubt however, is that the impact is monumental in terms of population movements. Social cubism theory makes it possible to assess the impact of cattle raids on the numbers and victim communities of north- western Kenya. It provides opportunity to assess the magnitude of the cattle raiding on the victims and how they respond in terms of demographic changes. The demographic component of the theory provides a framework through which population movements and changes occasioned by cattle raiding can be assessed. However for this paper this was not assessed but this component of the theory is relevant.

### **3.6 Economics**

The economics domain is hinged on the notion that women have less control and/or access to economic resources therefore subject. In the context of Pokot women participation in cattle raiding the economics domain of the theory is not helpful in diagnosing the involvement of women in cattle raiding since they do not participate as subservients

## **4. Conclusion**

The problem of cattle raiding is an old practice and women involvement in it has been as old as the practice itself. Cattle raiding is a gendered practice, it involves all members of society playing or contributing different roles at different stages of the process. The role women play is explicit to the extent that without their involvement the practice would not go on. The motivation to undertake it would be lacking among the men and boys. Women play more backstage roles that are key to cattle raiding. Social cubism theory has proved a useful frame work for analyzing the role of Pokot women in cattle raiding. The authors of the theory did not themselves imply or prescribe that every form of conflict or conflict resolution events must be analyzed using all the six attributes of the theory. Far from it they recognized that different situations and actors in conflict involve factors which interrelate differently. Applying the theory on women in cattle rustling helped to ensure that the problem of study was dissected from the six sides and the results showed some of the sides were more plausible than others.

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# Influence of Smartphones on Academic Performance of University Students in Thika Subcounty Kiambu County, Kenya

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## Abstract

*This research investigates the impact of smartphone usage on the academic performance of university students in Kenya, focusing on how the time spent on smartphones influences academic engagement. A total response rate of 81.67% was achieved, comprising an equal distribution of male and female respondents, with the majority aged between 18 and 22 years and primarily in their third year of study at the School of Education. The findings indicate that students spend an average of four to six hours daily on smartphones, predominantly engaging in non-academic activities such as social media, messaging, and gaming, which are reported to hinder concentration during lectures. Despite the potential distractions posed by smartphones, the research highlights their role as valuable educational tools. Approximately 78% of respondents acknowledged that smartphones assist them in accessing course materials, e-books, and e-journals, enhancing their academic experience. This duality of smartphones, as both a source of distraction and a beneficial resource, illustrates the complexity of their influence on students' academic performance. The results align with existing literature, indicating that while smartphones can facilitate academic engagement, excessive use for entertainment can adversely affect academic outcomes. Overall, the study emphasizes the need for a balanced approach to smartphone usage among university students. By understanding the patterns and effects of smartphone engagement, educational institutions can develop strategies to mitigate distractions and promote responsible use. This research contributes to the ongoing discourse on technology's role in education, highlighting the importance of harnessing smartphones' educational potential while addressing the challenges they present to academic success.*

## 1. Introduction

The rising proliferation of cellphones has led to what is commonly referred to as the "mobile revolution," where smartphones now hold a central role in consumers' lives. This shift is especially evident among the younger generation, who spend significant amounts of time using smartphones, often surpassing the time spent on other portable electronic devices. With smartphones becoming an ever-present part of modern life, especially for young adults, they have fundamentally changed the way people communicate, access information, and interact with the world. As noted by the Kenya Communications Authority (2023), 66.2% of Kenyans own smartphones, with about 90% of millennials being active users. This widespread use has given rise to new opportunities and challenges, particularly within the educational sphere, where smartphones are increasingly shaping how students learn and engage with academic content.

Higher education institutions have been directly impacted by the rise in smartphone usage, both positively and negatively. On one hand, smartphones provide students with unprecedented access to academic resources, enabling them to access e-books, research papers, online lectures, and collaborative tools. On the other hand, there is growing concern that excessive smartphone use may negatively affect students' academic performance. The ease of access to entertainment, social



media, and other non-academic content on smartphones can lead to distractions that undermine the focus required for successful academic achievement. A study by Sapci et al. (2021) highlights the detrimental impact of smartphone use on the academic performance of university students, emphasizing the need for deeper understanding of this phenomenon.

In Kenya, the smartphone penetration rate continues to rise, bringing with it complex social and academic dynamics. According to the Internet Foundation (2024), 66% of young people between the ages of 18 and 24 report using the internet "almost continuously," a significant increase from just 24% a few years prior. This constant connectivity can have severe repercussions on students' mental health and academic success, as excessive smartphone use has been linked to lower exam scores and higher levels of distraction. The availability of smartphones has, in effect, blurred the boundaries between academic and non-academic activities, making it more difficult for students to manage their time effectively.

Proponents of smartphone usage argue that these devices have also facilitated greater academic engagement among students. With smartphones, students can easily communicate with peers, exchange notes, and collaborate on assignments, making them a valuable tool in the academic environment. Amez and Baert (2020) support this view, suggesting that smartphones can enhance learning when used properly, allowing students to access academic content anytime and anywhere. In this context, smartphones represent a double-edged sword, capable of improving academic performance when used responsibly, but also posing risks of distraction and academic underachievement when overused.

However, technology's role in education is not inherently positive or negative, it largely depends on how it is used. While mobile devices offer unprecedented access to information, problematic or excessive smartphone use can disrupt the academic habits of students. Alotaibi et al. (2022) define "excessive smartphone use" as a level of engagement with the device that begins to interfere with an individual's daily life, including their academic activities. As smartphones become more ingrained in students' daily routines, managing their use becomes a critical issue for both students and educators alike.

Smartphone addiction, now recognized as a global concern, has been classified as a behavioral addiction. This phenomenon has been described using various terms, including "smartphone overuse," "mobile phone addiction," and "problematic mobile phone use" (Tafesse, 2022). While the exact terminology may vary, the core issue remains consistent: students who spend excessive amounts of time on their smartphones are at risk of negative academic and social outcomes. As universities increasingly rely on digital platforms for learning, the boundary between beneficial smartphone use and addiction becomes ever thinner.

In light of these considerations, this research seeks to explore the correlation between smartphone usage and academic performance among university students in Kenya. Specifically, it aims to investigate whether excessive smartphone use contributes to lower academic achievement or if the positive uses of smartphones can offset the potential downsides. This study will also examine students' perceptions of their own smartphone usage and how it affects their academic performance. By focusing on university students in Kenya, this research will provide insights into how smartphones are affecting the academic landscape in a rapidly developing country. Given the high smartphone penetration rates in Kenya and the growing reliance on digital tools in education, understanding the impact of smartphone usage on students' academic success is essential for designing interventions that maximize the benefits while minimizing the risks associated with smartphone overuse.



## 1.1 Research objective

The aim of the study was to investigate the influence of smartphones on the academic performance of university students in Thika subcounty, Kiambu county, Kenya

## 2. Literature Review

Time spent on smartphone can refer to the amount of time an individual dedicates to using their smartphone for various activities such as browsing the internet, using apps, texting, making or engaging on social media. This is often measured in hours or minutes a day and is an important metric for understanding how much of one's day occupied by smartphone related activities. The time spent can vary from one person to another and can affect one's daily life either positively or negatively depending on the activities prioritized.

According to Putnam, (2000), Turkle, (2011), Bell et al (2015) and Odgers, (2015) Children's use of digital technology has increased rapidly over the past decades, raising important questions around how time spent on digitality mediated activities may affect children's in positive and negative ways. Lepp et al (2015) conducted research on the measurement of smartphone usage and GPA of college students, the analysis shows that there is significant inverse association that exists between high usage of smartphones and students' GPAs. Students who spent their time on smartphones more have poor GPA as compared to those who spent more time on studies.

Mendoza et al (2018) argues that evidence shows that smartphone overuse affects students' learning process, thereby yielding an advance effect on their academic performance. He found that smartphone overuse may distract students' attention in classroom and decrease their efforts put in their learning. Gupto et al, (2019) argues that night time usage of mobile phone is associated with difficulty in waking up, wake time tiredness, decline in study habits, difficulty in concentration, increase in missed classes and therefore all these factors cause the performance of a student being low.

Ifeanyi, (2018) this researcher argued that the use of smartphones by students deprives them of sleeping time and this can be quite detrimental to their study or learning and not having enough sleep can affect on the academic performance which can be caused by things like frequent smartphone alerts and notifications. According to Yildiz and Alkan, (2019) the overuse of smartphones brings the negative concepts such as smartphone addiction, associations and social escape which indirectly influences the academic performance of students.

In this context or any educational context, student attention refers to the level of focus and concentration that students are able to maintain during their academic activities, studying, or completing assignments. It's a critical factor in the learning process as a student's ability to pay attention directly affects their and understanding and retention of information hence student academic performance.

According to Ifeanyi and Chukwuere (2018) most undergraduate students receive calls while in classroom on their smartphone and this can be a distraction to their attention. The same undergraduate students do reply text messages while in classroom and as a matter of fact this is a distractive thing to them and influences their academic performance.

McCoy, (2016) argued in his studies that the non- educational use of smartphones during the lecture is possible on distracting the students' engagement with the lesson. The non-educational activities with a smartphone may include like playing games on phones, streaming listening to music, news



and entertainment among other activities. Buck et al, (2013) argues that students happen to be interested in ways they can learn and the same time have their attention captivated. They may be provided with autonomy over their educational experience and access to standard learning contents and opportunities, (Day and Erturk,2017).

Research studies indicate smartphones addiction in young students. Excessive use of smartphones brings negative effects on educational performance including physical and mental health (Amez & Baert, 2020). Though smartphones offer many positive contributions to studies, like speedy communication, access to information and unlimited data however so far literature indicate unregulated problematic use of smartphones for you students (Wang et al., 2015). This also suggests that smartphone addiction becomes a vicious cycle in students. As indicated by Amez & Baert (2020), excessive smartphone usage leads to low academic motivation and boredom with studies, and students might find more smartphone usage as an escape route to enhance their mood, consequently finding themselves in an endless loop. Interestingly, we found this phenomenon more prominent in male students when compared to females.

A smartphone plays a vital role in today's lives in the access of any information regarding anything in life. Smartphones have become powerful gadgets to enable individuals to gather, analyze and disseminate information conveniently and efficiently. In this context, access to information refers to the ease with which individuals can obtain, understand, and use education related materials using smartphones. It encompasses various factors that impact a person's ability to access information using a smartphone and comprehend the information, including physical, technological, and cognitive barriers.

Article Al-Daihani, (2018) did a study involving undergraduate students at the university of USA and found out that students commonly use smartphones for academic purposes; like fetching information from a search engine like Google, gain access to libraries, online dictionaries and student portal of their respective university or colleges. All these activities help students to improve their academic performance. Safdar, (2020) argued that different researchers try to find out the different sources that students use to extract information by using smartphones; e.g. What percent from online search engines, articles, blogs, E-library etc. the findings was that most students use it to connect with social media applications and websites to interact with authors to validate the perception of a given information present in their research.

According to Lepp et al (2014) smartphones could-when used properly-lead to better educational performance. Smartphones mobility allows students to access to the same services as a computer almost anywhere, almost anytime. This study concluded that proper utilization of smartphones improves students' academic performance. Zhang et al (2014) argued that easy accessibility to these functionalities offers the students a chance to search continuously for the study related information. Thus, smartphones provide a multi-media platform to facilitate learning which cannot be replaced by reading textbooks.

According to Kljunic and Dijan (2015), in the last two decades a great number of educational materials such as books, scientific researches, presentations, video tutorials, educational games etc. have become available via internet and with the emergence of social networks, online interaction among individuals and groups has been increased facilitating the learners to communicate and engage in educational institutions. The electronic books offer students, teachers and schools an additional medium or tool of instruction that can support or enhance the learning process, (Embong et al 2012). According to Ifeanyi and Chukwuere, (2018) the application including WhatsApp, Twitter and Facebook and some learning systems have emerged over the years and involve ubiquitous learning,





which is learning, which is powered by smartphone capabilities in the learning environment. According to Oyele and Suhonen (2016), argues that having course materials such as lecture slides and notes on a mobile device makes learning easier for the students as they can use their device to study at anytime, anywhere and further it enables students engage in learning activities even when they are outside their classrooms and improves flexibility for self-efficacy

### **3. Research Methodolog**

Kothari (2018) defined a research design as the structure, outline written within which research will be carried out in order to discover solutions of the problem under investigation. The research employed quantitative research design and specifically use cross-sectional survey research. The study targeted 2,400 undergraduate students at Gretsua university in Thika sub county in Kiambu county. A sample size of 384 students was used for the study. The study employed close ended questionnaires in the collection of data.

### **4. Research findings and discussions**

The findings from this research provide valuable insights into the smartphone usage patterns among university students in Kenya and their implications for academic performance. With a response rate of 81.67%, which Berg (2016) considers sufficient for robust analysis, the data reflects a representative sample of the student population. The gender distribution was equal, indicating a balanced perspective from both male and female students. The majority of respondents were aged between 18 and 22 years, primarily in their third year of study, and most hailed from the School of Education.

The results reveal that students spend, on average, between four and six hours per day on their smartphones. The majority of this time is dedicated to non-academic activities such as social media interactions, voice calls, messaging, live streaming, and gaming. This heavy reliance on smartphones for entertainment and social engagement raises concerns about its impact on students' academic focus. Notably, 67% of respondents reported that having smartphones nearby made it difficult for them to concentrate during lectures. This finding underscores the potential distraction that smartphones present in academic settings, which may hinder students' ability to absorb and engage with course material effectively.

Despite the challenges posed by smartphone distractions, the research also highlights the positive contributions of smartphones to students' academic experiences. Approximately 78% of respondents agreed that smartphones facilitate course updates and support their learning by providing access to e-books and e-journals. This dual role of smartphones, acting both as a distraction and a learning tool emphasizes the need for balanced smartphone use among students. The ability to access educational resources through smartphones can enhance learning, but excessive use for non-academic purposes can detract from their academic performance.

The findings align with previous literature, such as the work of Al-Daihani (2018), which indicated that students frequently use smartphones for academic purposes, including retrieving information from search engines and accessing library resources. This trend suggests that smartphones can serve as valuable educational tools when used judiciously. However, the findings also resonate with the research conducted by Alotaibi et al. (2022), which found that excessive smartphone use negatively impacts students' academic performance. This discrepancy highlights the complex relationship between smartphone usage and academic outcomes, suggesting that while smartphones can enhance learning, they also pose significant risks when overused.



Furthermore, the results indicate that the entertainment aspect of smartphone usage often overshadows its academic benefits. Many students engage in non-academic activities during lecture times, which can lead to decreased retention of information and lower overall academic performance. The challenge lies in managing smartphone use to minimize distractions while maximizing their educational potential. Institutions may need to consider strategies to promote responsible smartphone use, ensuring that students can harness the advantages of technology without falling prey to its pitfalls.

The implications of these findings are significant for educators and administrators in higher education. Understanding the patterns of smartphone use can inform the development of interventions aimed at mitigating distractions while enhancing the academic benefits of smartphone technology. For example, universities could implement workshops that teach students effective time management strategies and encourage them to set boundaries on smartphone use during lectures. Additionally, integrating smartphone-based educational tools into the curriculum could further engage students and reinforce the positive aspects of smartphone usage.

## **5. Conclusion**

The study underscores the complex interplay between smartphone usage and academic performance among university students in Kenya. While smartphones offer opportunities for enhanced learning, they also present challenges that can detract from students' academic experiences. The findings highlight the importance of fostering a balanced approach to smartphone use, enabling students to leverage technology as a valuable educational resource while minimizing the potential for distraction. Future research should continue to explore this dynamic, particularly in different educational contexts, to develop comprehensive strategies that optimize smartphone use for academic success.



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# Lived Experiences of Junior Secondary School Learners Learning to Swim in Ndege Primary, Nakuru, Kenya

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## Abstract

*This study explores the challenges and opportunities associated with teaching swimming and water safety skills in rural junior secondary schools. With the inclusion of physical education as a core component of the Competency-Based Education (CBE) curriculum, the need for practical swimming lessons has gained prominence. However, rural schools face significant obstacles, including a lack of access to swimming pools, trained instructors, and appropriate infrastructure. Additionally, cultural factors, such as traditional gender norms and concerns about modesty, particularly for girls, further hinder participation. This research aims to investigate how these challenges affect students' ability to learn swimming in a rural setting and identify strategies to enhance swimming education in these environments. A qualitative research design was employed, focusing on the lived experiences of 30 junior secondary school students and their physical education teacher at Ndege Primary School in Nakuru County. Data was collected through a focus group interview, allowing students to express their feelings, challenges, and successes related to learning swimming. Key findings revealed that many students lacked basic swimming skills due to limited practical lessons, while some students who had learned to swim informally in local rivers expressed nervousness during structured lessons. Cultural issues, including discomfort with swimming attire and gendered expectations, also emerged as significant barriers, particularly for female students. The study concludes that while swimming is a vital life skill, rural schools require additional resources, culturally sensitive programming, and improved access to swimming facilities to fully implement effective swimming education. Recommendations include increasing access to pools and trained instructors, developing weather-appropriate swimming programs, and creating inclusive, culturally appropriate spaces for girls. Addressing these challenges will ensure equitable access to swimming education, contributing to students' physical development, safety, and overall well-being.*

**Key words:** Swimming, Rural, Physical education, Competency-Based Education

## 1. Introduction

The inclusion of Physical Education (PE) in the curriculum has become the new norm within Competency-Based Education (CBE). This shift underscores the recognition that learning extends beyond theoretical knowledge to the development of physical and life skills that enhance student well-being (Timmerberg et al., 2023). While the ultimate goal of education remains the successful learning of students, understanding how they learn through various modalities is essential for providing a holistic and quality education experience. In the traditional theory-based classroom, learners primarily acquire information constructed from past knowledge. However, physical education, specifically swimming, presents a more dynamic and experiential learning process that integrates both physical and cognitive development (Demchenko, et. al., 2021).

Swimming, as a vital component of PE, has been shown to contribute positively to the overall learning process by promoting physical health through the strengthening of bones and muscles and enhancing flexibility (Ward & Scott, 2020). Moreover, swimming is recognized for reducing



stress and tension while fostering self-confidence and essential life skills as students achieve new swimming milestones.

From a social perspective, swimming offers significant benefits to learners, such as fostering respect for others and promoting body positivity. It also provides students with fun and enjoyment, which are important for stress relief and emotional well-being (Nepangue & Ibanez, 2022). These social and emotional benefits are crucial, especially for students in junior secondary school settings, where the pressures of academic success and limited recreational activities may contribute to heightened stress levels. By learning swimming, students can engage in a productive and healthy form of recreation, enriching their overall school experience.

Recent research has also highlighted the role of swimming in enhancing cognitive functions critical to the learning process. Lee, et. al., (2022) emphasize the importance of swimming in supporting neuroplasticity, which enables the brain to form new neural connections essential for learning and memory. This evidence positions swimming not only as a physical activity but also as a cognitive enhancer, making it a valuable part of the curriculum for junior secondary students. In contrast to traditional classroom learning, physical education encourages learners to construct their own meanings and interpretations through concrete, hands-on experiences. These experiences promote self-awareness, independence, and cooperation among students, facilitating the development of skills that extend beyond the classroom.

Physical education, particularly swimming, also encourages students to accept responsibility, express ideas, and build meaningful relationships (Sherman, & Teemant, 2023). These aspects of personal and social development are crucial as students transition into more complex social environments. Moreover, regular participation in physical activities like swimming is linked to improved cardiovascular health and cognitive function, which further enhances academic performance and overall well-being. This is particularly significant for students in rural areas, where access to medical and recreational facilities may be more limited, making school-based physical activities essential for promoting health.

In addition to these general benefits, swimming has been shown to support learners with special needs, such as those with autism. Research by Moura et. al., (2021) highlights the positive impact of swimming on physical movements and sensory stimulation for students with autism spectrum disorders. The inclusive nature of swimming programs allows these students to engage in physical activities that accommodate their needs while promoting their physical and cognitive development. This makes swimming a critical component of PE in fostering an inclusive learning environment that supports all learners, regardless of their abilities.

Beyond the educational setting, swimming is considered an essential life skill, especially in regions where access to bodies of water is prevalent. The dangers associated with drowning remain a concern, particularly for children between the ages of 8 to 14, who are at the second highest risk of drowning (Lieberman et al. 2024). This underscores the importance of teaching swimming as a survival skill, alongside its benefits for physical and cognitive development. By equipping students with the ability to swim, schools not only fulfill educational mandates but also address critical safety issues in rural communities.

This study aims to explore how junior secondary school students learn to swim in real rural settings, where challenges such as limited infrastructure, cultural perceptions, and access to trained instructors may influence the learning process. The study seeks to examine the experiences of students, the availability of resources, and the strategies employed by schools to provide effective swimming





education. The findings will contribute to a better understanding of how physical education programs can be adapted to meet the unique needs of students in rural areas, ensuring that they receive the full benefits of learning to swim both for their academic and personal development.

## **2. Research Methodology**

This study employed a qualitative research design. According to Tracy (2024), qualitative methods are particularly well-suited for investigating phenomena that involve complex human experiences, such as how students perceive and engage with swimming education. The use of qualitative research allowed the researcher to capture the rich, complex, and subjective experiences of students, providing a deeper understanding of their learning processes and challenges in swimming. This approach also facilitated the collection of detailed, context-specific insights that quantitative methods may not have captured, offering a comprehensive view of the students' lived experiences.

Data for the study was collected through a focus group interview with 30 junior secondary school students and their physical education teacher from Ndege Primary School in Nakuru County. This method was chosen to encourage open discussions and interactions among participants, fostering a collaborative environment where students could share their thoughts and perceptions freely. The focus group interview provided valuable insights into how students experienced learning swimming in a rural setting, including their challenges, successes, and overall attitudes toward swimming. The physical education teacher's input also offered a professional perspective on the teaching process and the effectiveness of the swimming program in achieving learning objectives. The data collected through these interviews was then carefully interpreted by the researcher to uncover recurring themes and patterns related to swimming education in rural schools.

## **3. Research Findings and Discussions**

One of the key findings from the focus group interview was that several students lacked swimming ability. Participants 2, 7, 8, 11, 12, 13, 17, 18, 23, 24, and 29 admitted that they could not swim, reflecting a general lack of swimming experience prior to the lessons. The primary challenge for these students was the limited number of practical swimming lessons, with many having only participated in a single session during a class trip. This lack of consistent exposure contributed to their inability to acquire basic swimming skills. Many students expressed anxiety, noting that it was their first time in the water, which heightened their fear and unease during the lessons.

In contrast, a small group of students, including participants 1, 10, 21, and 25, reported having basic swimming skills prior to attending the formal swimming classes. These students mentioned that they had learned to swim in local rivers as part of growing up in the area, which gave them a level of confidence in the water. For them, the formal swimming lessons were less intimidating, and they felt more prepared to engage in the activities. Their previous experience with swimming, however, often differed from structured lessons, which focused on specific techniques and water safety measures that they had not encountered in informal settings.

Despite their ability to swim, some participants who were already familiar with the water still expressed feelings of nervousness during the swimming sessions. Participants 3, 9, and 14 noted that the large crowd of students, the unfamiliar setting, and the structured time frame of the lessons made them anxious. While they were comfortable in water on their own terms, the pressure of performing in front of others and adhering to the instructor's guidelines made the experience more stressful. This suggests that even for students with prior swimming skills, the organized nature of the lessons introduced challenges they had not anticipated.



Finally, issues related to comfort and confidence in the swimming environment were raised by participants 22, 27, and 30, who felt uncomfortable undressing in front of their peers because they did not have swimsuits. The lack of appropriate swimwear made these students self-conscious and uneasy about participating fully in the lessons. This highlights the social and economic barriers that can influence students' participation in swimming programs, particularly in rural areas where access to swimsuits and other swimming gear may be limited. The discomfort of these students points to the need for better provisions and inclusivity in swimming education to ensure that all students can participate comfortably and without embarrassment.

The physical education trainer highlighted several significant challenges that rural schools face in implementing swimming programs. One of the primary obstacles is the lack of access to swimming pools. Unlike urban areas where swimming facilities may be more readily available, rural schools often lack the necessary infrastructure for practical swimming lessons. This shortage not only affects the frequency of lessons but also the quality of instruction, as students have fewer opportunities to practice and refine their skills. Moreover, even when swimming pools are accessible, the scarcity of trained instructors further complicates the situation. Without qualified professionals to teach swimming techniques and water safety, schools struggle to offer comprehensive swimming education, leaving many students without the necessary skills.

Another issue raised by the trainer is the impact of extreme weather conditions, particularly in areas that experience cold temperatures. Rural schools in colder regions face additional limitations on when and how swimming lessons can be conducted. Cold weather reduces the availability of outdoor swimming lessons, and in many cases, the lack of heated indoor pools exacerbates this issue. As a result, students in these regions may have fewer opportunities to learn to swim compared to their counterparts in more temperate climates, further widening the gap in swimming proficiency.

Cultural considerations, particularly around traditional gender norms, also present significant barriers to swimming education in rural areas. The trainer noted that modesty is a key concern, especially for girls, as societal expectations around appropriate behavior and attire make it difficult for them to feel comfortable in a swimming environment. Traditional norms often discourage girls from wearing swimsuits or participating in mixed-gender swimming classes, leading to feelings of discomfort and exclusion. The lack of inclusive spaces where girls can swim without fear of judgment, along with broader issues such as swimming attire and body confidence, are substantial challenges that need to be addressed. Addressing these cultural and logistical barriers requires both time and resources, including the development of culturally sensitive programs and the expansion of swimming facilities to create more equitable access for all students.

## **4. Conclusion and Recommendations**

### **4.1 Conclusion**

This study highlights the critical role of swimming education within rural schools, while also revealing the significant challenges that hinder its effective implementation. A lack of infrastructure, such as swimming pools, and a shortage of trained instructors limit students' ability to consistently engage in practical swimming lessons. Cultural factors, including traditional gender norms and modesty concerns, particularly for girls, further complicate participation in swimming activities. Additionally, extreme weather conditions in some regions exacerbate the difficulty of providing year-round swimming education. These barriers collectively contribute to a disparity in swimming proficiency between students in rural and urban settings.



Addressing these challenges requires a multifaceted approach that includes investment in physical infrastructure, culturally sensitive program design, and the provision of inclusive, affordable resources for all students. With adequate support, rural schools can provide students with the opportunity to learn essential swimming and water safety skills, which are not only important for physical health but also for overall development and life safety. Through increased awareness, resource allocation, and community engagement, rural schools can overcome these barriers and ensure that swimming education becomes accessible and beneficial for all students, regardless of their geographic or socio-economic background.

#### **4.2 Recommendations**

Rural schools should prioritize partnerships with local governments and private organizations to develop more swimming facilities in underserved areas. Additionally, schools should invest in training more physical education instructors in swimming techniques and water safety. This will ensure that students receive quality instruction and have sufficient opportunities to practice swimming regularly. Mobile swimming pools or temporary facilities could be considered as interim solutions in areas where permanent infrastructure is not immediately feasible.

To address the challenges posed by extreme cold weather in some rural areas, schools should develop weather-appropriate swimming programs. This could include building heated indoor pools where possible or adjusting the school calendar to focus swimming lessons during warmer months. Schools could also explore partnerships with community centers or institutions in nearby urban areas that have indoor pools, enabling students to continue their swimming education during colder seasons.

Culturally sensitive approaches to swimming education, particularly for girls, should be developed to address issues related to traditional gender norms and modesty. This could involve creating separate swimming times or classes for girls, ensuring privacy and comfort. Schools should also provide inclusive swimwear options that align with cultural expectations while enabling full participation. Engaging community leaders and parents in discussions about the importance of swimming as a life skill may help reduce cultural barriers and encourage greater female participation.

Schools and policymakers should work towards creating inclusive spaces that accommodate all students, regardless of their socio-economic background. Providing free or subsidized swimsuits and swimming equipment can ensure that students from low-income families are not excluded from lessons due to lack of resources. Timetabling for shared swimming pools should be managed to ensure equal access for all schools, while additional funding could be allocated to rural schools to support these initiatives.



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# Impact of Academic Stress on Mental Health among University Students in Kenya: A Case of Gretsia University

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## Abstract

*University, a crucible of intellectual growth and supposed springboard to a bright future, can also be a breeding ground for mental health struggles. This research delves into the intricate tango between academic stress and mental well-being in university students. The study dissects the multifaceted nature of academic stress, encompassing factors like overwhelming workloads, looming deadlines, the pressure to excel, and the ever-present sense of competition. It explores how these stressors orchestrate a detrimental dance with mental health, potentially leading to conditions like anxiety, depression, and languishing, a state marked by a lack of flourishing. Employing a mixed-methods approach, the study combined quantitative data analysis with qualitative methods to gain a deeper understanding of the experiences of students. The findings of this research are expected to contribute valuable insights to the development of improved student support systems, the promotion of effective stress management strategies, and the cultivation of a more positive and holistic university experience.*

**Keywords:** Academic Stress, Mental Health, University Students

## 1. Introduction

Academic stress is a pervasive issue among university students worldwide, often leading to significant negative impacts on mental health. In Kenya, with the rapid expansion of higher education institutions, understanding the nature and consequences of academic stress is crucial. This study focuses on Gretsia University, aiming to determine the relationship between academic stress and mental health among its students, identify primary stressors, and evaluate coping mechanisms.

Mental health, encompassing both the absence of mental disorders and the ability to function effectively, is a vital component of overall well-being. In Kenya, mental health issues, including depression, are on the rise. According to the WHO, 2023, Kenya ranks fourth in Africa for the prevalence of depression, with an estimated 1.9 million individuals affected. The Kenya Mental Health Policy (2015-2030) highlights the increasing rates of mental disorders in the country, with estimates suggesting that 20-25% of outpatients seeking primary healthcare present symptoms of mental illness.

Given the growing burden of mental health issues and the significant impact of academic stress on student well-being, this study aims to contribute to a better understanding of this complex relationship within the Kenyan context. By identifying the primary stressors faced by students at Gretsia University and evaluating their impact on mental health, this research can inform the development of targeted interventions and support systems to promote the well-being of university students in Kenya.





## 1.1 Research Objectives

- ❖ To determine the prevalence of academic stress among students at Greta University.
- ❖ To identify the primary sources of academic stress experienced by students at Greta University.
- ❖ To assess strategies used to manage academic stress by students in Greta University

## 2. Literature Review

Academic stress is defined as the psychological and physiological strain experienced by students when academic demands exceed their perceived coping abilities (Busari, 2014). Common stressors include excessive workloads, tight deadlines, high stakes exams, pressure to achieve high grades, fear of failure, and social isolation (Pascoe et al., 2022). These stressors can have a significant impact on students' mental health, leading to a range of negative consequences.

Mental health refers to a state of emotional, psychological, and social well-being (WHO, 2023). This review will consider various mental health problems prevalent among university students, including anxiety, depression, and sleep disturbances (Breslau et al., 2008). Anxiety, characterized by excessive worry, fear, and physical symptoms, is a common mental health issue among students. Depression, characterized by persistent sadness, loss of interest, and changes in appetite and sleep patterns, can also significantly impact students' academic performance and overall well-being. Sleep disturbances, such as insomnia or excessive sleepiness, are another common mental health problem among university students and can exacerbate existing mental health issues

### 2.1 Prevalence and Severity of Academic Stress

Research indicates that academic stress is a prevalent issue among university students, with significant implications for their mental health and academic performance. Studies have consistently shown that a substantial proportion of students experience moderate to severe levels of stress. Bayram and Bilgel (2008) found that approximately 27% of university students reported experiencing moderate to severe stress. More recent research by Beiter et al., 2015 revealed that 52% of students reported above-average stress levels, with 8% indicating extreme stress. These findings highlight the widespread nature of academic stress and its potential impact on students' well-being. Severity of academic stress can vary across different student populations. Smith and Johnson, 2023 found that first-year students were more likely to report higher levels of academic stress compared to upper-year students. Moreover, factors such as academic major, socioeconomic status and cultural background can also influence the prevalence and severity of academic stress among university students.

### 2.2 Sources of Academic Stress

Several studies have identified various sources of academic stress among university students. Common stressors include academic workload, examinations, deadlines, and the pressure to achieve high grades. Misra and McKean, 2000 highlighted that time management issues and lack of social support further exacerbate stress levels. Students often experience stress due to financial concerns and the need to balance academic responsibilities with part-time work (Nyakato and Musiime, 2022).

### 2.3 Impact of Academic Stress on Mental Health

The relationship between academic stress and mental health has been extensively studied, with recent research emphasizing the strong connection between high academic stress and mental health challenges. Andrews and Wilding, 2004) demonstrated that elevated levels of academic stress are significantly correlated with symptoms of anxiety and depression among students. More recent studies have built upon these findings. Dyrbye et al., 2021 found that medical students experiencing



high stress levels are at a greater risk of burnout, emotional exhaustion, and reduced life satisfaction, highlighting the profound impact of academic pressure on mental well-being. Eisenberg, Lipson, and Leu , 2016 further confirmed that academic stress is a critical predictor of suicidal ideation among university students.

Increased academic pressure often leads to excessive worry, negative self-evaluation, and difficulties in managing emotions, which can manifest in anxiety and depressive symptoms (Castro & Rice, 2020). Academic stress has been shown to disrupt sleep patterns, leading to issues such as insomnia or hypersomnia. Sleep disturbances, in turn, can exacerbate stress levels, creating a detrimental cycle that negatively impacts both academic performance and mental health (Elion, Wang, Slaney, & French, 2020).

The cognitive and emotional effects of academic stress significantly hinder students' ability to concentrate, retain information, and perform well in academic settings. As a result, the interaction between stress and mental health is not only complex but also critical in determining students' overall well-being and academic success.

## **2.4 Coping Strategies**

Numerous coping strategies have been identified to assist students in managing academic stress. Folkman and Lazarus ,1985 originally conceptualized coping strategies as either problem-focused, which involves addressing the source of stress directly, or emotion-focused, which centres on managing the emotional response to stress. Problem-solving, seeking social support, and positive reappraisal were identified as key strategies to effectively manage academic pressures. Carver, Scheier, and Weintraub , 1989 found that students who employed active coping mechanisms, such as taking deliberate steps to solve problems or engage in planning, experienced lower levels of stress. Mindfulness-based techniques, including meditation and relaxation practices, have been shown to significantly reduce stress and enhance mental well-being among university students (Galante et al., 2021). Practices such as cognitive reappraisal, where individuals change their perspective on stress-inducing situations, are increasingly recognized as effective in mitigating the adverse effects of academic stress (Garcia et al., 2018). These strategies not only reduce stress but also contribute to improved psychological resilience and overall mental health outcomes.

## **2.5 Theoretical Frameworks of Academic Stress**

The Stress and Coping Theory provides a foundational framework for understanding how individuals perceive and manage stress, particularly within the context of academic stress in university settings. This theory, developed by Lazarus and Folkman , 1984, emphasizes the role of cognitive appraisal in shaping how individuals interpret potentially stressful situations. According to the theory, academic stress arises when students perceive academic demands, such as exams, workload, and deadlines, as exceeding their personal resources or coping abilities. Nyaga and Kamau , 2020 highlighted that students often experience heightened academic stress due to financial constraints, overcrowded learning environments and limited access to academic resources, all of which intensify the cognitive appraisal of stress.

Otieno and Wamuyu ,2018 demonstrated that the cultural expectations surrounding academic success in Kenya also contribute to students' appraisal of academic stress. Approaches that enhance problem-focused coping, such as time management training and academic counselling, are widely recommended to reduce the adverse effects of academic stress (Garcia et al., 2018). In contrast, emotion-focused coping strategies, like relaxation techniques and cognitive reappraisal, are increasingly recognized for their role in mitigating the emotional impacts of stress on mental health (Galante et al., 2021).



## 2.6 Gaps in the Literature and Areas for Further Research

While the link between academic stress and mental health is well-established, there are areas for further exploration: Academic stress is a significant concern for university students and can negatively impact their mental health. Understanding the sources of stress and the factors that moderate its effects is crucial for developing effective interventions and promoting student well-being. This review highlights the need for continued research in this area to create a more supportive learning environment for university students.

## 3. Research Methodology

A cross-sectional survey design was selected to capture a snapshot of the current academic stress situation at Greta University. The survey was conducted on a simple random sample of 296 students, drawn from the estimated population of 1,300 students across five faculties. The primary instruments used in the study were the Academic Stress Questionnaire (ASQ) and the Coping Strategies Questionnaire (CSQ). Additionally, one focus group discussion was conducted to gain deeper insights into their experiences with academic stress and its impact on their mental health. Quantitative data were analysed using descriptive statistics, while qualitative data from the FGD were analysed through thematic analysis to identify key patterns and themes in students' experiences.

## 4. Research Findings and Discussions

### Demographic Characteristics (N=296)

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	148	50
	Female	148	50
Age	18-20	120	40.54
	21-23	100	33.78
	24-25	50	16.90
	25 and above	26	8.78
Schools	Education	121	41
	Business	101	34
	Computing	44	15
	Hospitality	30	10

N = Number of participants

The study's final sample comprised 296 students from various faculties at Greta University. The sample was evenly split by gender, with 148 participants (50%) identifying as female and 148 (50%) as male. The participants' ages ranged from 18 to 25 years, with a mean age of 20.3 years (SD = 1.5). This demographic distribution aligns with typical university student populations, where young adults between 18 and 25 years old constitute the majority of undergraduate students (Wang & Degol, 2017).

Regarding academic school representation, 34% of the participants were from the School of Business, 41% from the School of Education, 10% from the School of Hospitality and 15% from the School of Computing. This distribution reflects the broad range of disciplines offered at Greta University, though it highlights a disproportionate representation of students in the School of Education, which could suggest higher enrolment in this field compared to others. Similar trends have been observed in studies conducted in other university settings, where education faculties often have larger student populations compared to specialized schools like hospitality or computing (Smith & Hill, 2020).



The balanced gender representation in the sample is notable, particularly given that previous research has sometimes reported gender disparities in specific academic programs. For example, studies have found that fields like computing and engineering often have lower female representation, while education-related fields tend to have higher female enrolment (Cheryan et al., 2017). The even distribution of gender in this study suggests that Greta University may have effective gender inclusion policies across its academic programs. This finding is significant in light of global efforts to promote gender parity in higher education, particularly in traditionally male-dominated disciplines like computing and business (UNESCO, 2020). The age distribution in this sample is consistent with similar studies examining student populations. Research has shown that students in this age range often experience similar academic pressures and developmental challenges, such as identity formation and career planning (Arnett, 2016). The relatively young mean age of 20.3 years (SD = 1.5) suggests that the majority of participants were likely in their early study years, which could have implications for how they perceive and manage academic stress, as younger students may have less experience with academic workloads compared to older peers (Pittman & Richmond, 2018).

#### **4.1 Prevalence of academic stress among students in Greta University**

The study revealed that 78% of participants experienced moderate to high levels of academic stress. These findings highlight the significant impact of academic demands on student well-being, with stress levels peaking during exam periods and major project deadlines. The periods identified as particularly stressful for students coincide with times of increased academic pressure, suggesting that the nature and timing of academic tasks are critical factors contributing to stress. These findings are consistent with broader research in academic settings. For instance, a study by Beiter et al., 2015 found that the majority of university students report moderate to high levels of academic stress, with exams, assignments, and time management being the most significant stressors. Similarly, Misra and McKean, 2000 identified that academic overload, time constraints, and pressure to achieve high grades were major contributors to academic stress in university students. The commonality across these studies indicates that the stress experienced by students at Greta University aligns with global trends, where academic demands are consistently recognized as primary stressors in higher education contexts. Exam periods, in particular, have been widely acknowledged as stress peaks for students. According to Cohen et al., 2017, exam-related stress is exacerbated by high expectations, fear of failure, and the consequences of poor academic performance, all of which intensify during assessment periods. In the context of Greta University, the timing of stress peaks during exams and major deadlines reflects the high stakes attached to these academic milestones. These findings are particularly relevant in understanding how academic structures and the timing of assessments can affect student stress levels.

Furthermore, the study underscores the importance of addressing academic stress through institutional interventions, such as providing students with adequate resources and support during critical academic periods. This aligns with recommendations from recent studies suggesting that universities implement stress management programs and provide academic counselling services, particularly during exams and deadlines (Mahmoud et al., 2021). Institutions that adopt proactive measures to alleviate academic stress may contribute to better mental health outcomes and improved academic performance among students.

The high prevalence of academic stress at Greta University also resonates with research emphasizing the detrimental effects of prolonged stress on student well-being. Chronic academic stress has been linked to mental health issues such as anxiety, depression, and burnout (Galante et al., 2021), which can negatively impact students' academic success and overall quality of life. Therefore, the findings from Greta University highlight an urgent need for targeted interventions to help students manage stress more effectively.





#### 4.2 Main sources of academic stress among students in Greta University (N=296)

Characteristics	Category	Frequency	Percentage (%)
Examination Pressure and Assignment deadlines	Male	77	26
	Female	56	19
Time Management Challenges	Male	12	4.2
	Female	32	10.8
High expectations from self and others	Male	6	2
	Female	9	3
Financial Stress	Male	76	25.6
	Female	28	9.4
N = Number of participants			

The findings from the Academic Stress Questionnaire (ASQ) highlighted several key sources of academic stress among the 296 university students surveyed. The most commonly reported stressor was examination pressure and assignment deadlines, with 45% of students identifying these as their primary concern. This result is consistent with previous research, which indicates that the demand for high academic performance and the pressure to meet deadlines significantly contribute to student stress. For instance, Pascoe et al. (2020) found that frequent assessments and strict deadlines often trigger anxiety and negatively affect students' mental health. The data shows that 26% of male students and 19% of female students identified this as a major stress factor. This suggests that while both genders are affected, male students at Greta University experience slightly higher stress levels related to academic assessments. This finding is consistent with broader research, which also indicates that male students tend to report higher stress levels associated with exams (Baker et al., 2018).

Time management challenges were reported by 15% of students, with many citing the difficulty of balancing academic responsibilities with external commitments, such as part-time jobs or family obligations. This reflects the findings of Mahmoud et al., 2021, who noted that students often struggle to manage their academic workload alongside other demands, which can lead to heightened stress levels. Time management issues are particularly prevalent among students who work while studying, as they are forced to allocate their time between competing priorities, often at the expense of their academic performance. The results reveal that 10.8% of female students reported difficulties with managing their time, compared to only 4.2% of male students. This suggests that time management may be a more significant challenge for female students at Greta. Research by Fletcher and Major (2016) supports this finding, noting that female students often juggle multiple roles, such as academic responsibilities and extracurricular or family duties, which may exacerbate their time management challenges.

In terms of high expectations from self and others, the percentage of students reporting stress due to this factor was relatively low, with 2.0% of male and 3.0% of female students expressing concerns. Although the numbers are small, they suggest that females may feel slightly more pressure to meet expectations than males. This might reflect societal pressures that encourage females to excel academically while also balancing personal responsibilities. This finding is consistent with studies that highlight the role of perfectionism and pressure to succeed in contributing to academic stress. According to Curran and Hill, 2019, the rise in academic perfectionism and societal expectations has been linked to increased stress and mental health issues among university students, as they strive to meet unrealistic standards of success. Cognitive Appraisal Theory, as posited by Lazarus and Folkman, 1984, supports this, suggesting that individuals' appraisal of stressors; whether they perceive them as manageable challenges or overwhelming obstacles plays a critical role in shaping their stress responses.





The most striking difference between male and female students emerges in the category of financial stress. A substantial 25.6% of male students reported financial issues as a significant source of stress, compared to 9.4% of female students. This large disparity may stem from varying financial responsibilities, such as males possibly feeling a greater burden to meet financial obligations. Previous studies, like that of Alzahrani et al. (2020), have also identified financial stress as a major factor in student well-being, further supporting the findings at Greta University.

When comparing these results with other research, several patterns emerge. Misra and McKean (2000) similarly found that examination pressures and time management were key stressors among students in other institutions. Likewise, Robotham and Julian (2006) discovered gender differences in stress levels, particularly in time management, where female students often reported higher stress levels.

In conclusion, the study at Greta University reveals that the primary sources of academic stress include a combination of both internal and external pressures. Examination pressure, assignment deadlines, financial difficulties, and high expectations were the most significant contributors to stress, consistent with findings from other academic settings. These stressors align with well-documented global trends, as universities worldwide face increasing pressure to address student well-being amidst rising academic demands and financial burdens. To mitigate the impact of these stressors, institutions may benefit from providing enhanced academic support services, financial aid options, and stress management resources to help students cope effectively with these challenges (Mahmoud et al., 2021).

### 4.3 Strategies used to manage academic stress among University students (N=296)

Characteristics	Category	Frequency	Percentage (%)
Problem-Focused	Time Management and Seeking Academic help	118	40%
Emotion-Focused	Relaxation techniques, Exercise and Social support.	104	35%
Maladaptive Coping	procrastination, substance use or avoidance	74	25%
N = Number of participants			

The study examined the various coping strategies employed by students at Greta University to manage academic stress, revealing a diverse range of approaches with varying degrees of effectiveness. The most common strategy, employed by 40% of students, was problem-focused coping, which includes techniques such as time management and seeking academic assistance. These strategies were associated with better mental health outcomes and more effective stress management. Research consistently supports the effectiveness of problem-focused coping in academic settings. For example, a study by Sharma et al., 2020 found that students who actively engage in time management and seek academic support are more likely to experience reduced stress and enhanced academic performance. Problem-focused coping strategies enable students to address the root causes of their stress, leading to more sustainable mental health outcomes and improved academic success. Another 35% of students reported utilizing emotion-focused coping strategies, including relaxation techniques, exercise, and seeking social support. These strategies, while not directly addressing the source of stress, were effective in improving mental well-being and reducing the emotional burden of stress. This finding aligns with previous studies that highlight the positive impact of relaxation techniques and social support on students' ability to manage stress. For instance, Brougham et al., 2019 observed that students who engage in mindfulness practices or regular physical activity tend to report lower levels of anxiety and depression, suggesting that these strategies play a crucial role in maintaining emotional resilience. Social support, whether from peers,



family, or university staff, also plays a key role in mitigating academic stress (Gallagher et al., 2021). When students have strong social networks, they are better able to cope with academic challenges and maintain emotional well-being.

However, 25% of students reported relying on maladaptive coping strategies, such as procrastination, substance use, and avoidance. These strategies were associated with poorer mental health outcomes, reflecting their ineffectiveness in reducing academic stress and often exacerbating existing stressors. The use of maladaptive strategies has been widely recognized as counterproductive in academic settings. A study by Sirois and Pychyl, 2016 found that procrastination, for example, not only increases stress but also contributes to a cycle of avoidance that can lead to lower academic performance and worsened mental health. Similarly, substance use as a coping mechanism has been linked to heightened stress, depression, and anxiety among students (Hunt et al., 2020). The reliance on these ineffective strategies underscores the importance of interventions aimed at promoting healthier coping mechanisms among students.

These findings also align with Cognitive Appraisal Theory, which emphasizes that how individuals perceive and respond to stressors significantly affects their coping strategies and mental health outcomes. According to Lazarus and Folkman (1984), stress is experienced when individuals appraise a situation as threatening or challenging, and the coping strategies they employ can either alleviate or exacerbate stress. In the case of students at Gretsia University, those who utilized problem-focused and emotion-focused coping strategies were able to manage their stress more effectively, while those who adopted maladaptive strategies experienced worsened mental health. This theoretical framework is critical in understanding why certain coping mechanisms lead to more favourable outcomes than others.

Moreover, the mixed use of coping strategies at Gretsia University reflects broader trends in academic stress research. For instance, Mahmoud et al., 2021 found that students tend to adopt a combination of both adaptive and maladaptive coping strategies, depending on the perceived severity of the stressor and their available resources. This suggests that while most students at Gretsia University demonstrate resilience through effective coping mechanisms, there is a significant minority that could benefit from targeted interventions aimed at reducing their reliance on maladaptive behaviours. University-led initiatives, such as time management workshops, mental health counselling, and peer support programs, could play a crucial role in shifting students towards healthier coping strategies. Overall, the study indicates that while a majority of students at Gretsia University employ adaptive coping mechanisms to manage academic stress, there remain a significant proportion of students who rely on maladaptive strategies, thereby exacerbating their stress and compromising their mental health. These findings are consistent with existing literature on stress and coping, highlighting the need for comprehensive support systems that encourage effective coping strategies and reduce reliance on maladaptive behaviours.

## 5. Conclusion

The study conducted at Gretsia University sheds light on the substantial impact of academic stress on student mental health. Key findings reveal that heavy academic workloads, the pressure of examinations, challenges in time management, and financial difficulties are the primary sources of stress for students. These stressors are closely linked to negative mental health outcomes, including anxiety, depression, and burnout. While some students demonstrate effective coping mechanisms, such as problem-focused and emotion-focused strategies, others rely on maladaptive methods, which can exacerbate their mental health issues. The study underscores the urgent need for universities to implement targeted interventions and support systems to assist students in managing



academic stress and maintaining their overall well-being. The Cognitive Appraisal Theory offers a valuable framework for understanding the dynamics of stress and its impact on mental health. This theory posits that individuals' perceptions and interpretations of stressors play a crucial role in determining their emotional responses. By helping students reframe stressors as manageable challenges, universities can empower them to develop healthier coping strategies and reduce the negative consequences of academic stress.

## 6. Recommendations

To address the significant impact of academic stress on student mental health, Gretsia University should prioritize the following strategies:

- ❖ **Enhance Counselling Services:** The University should expand its mental health support services to make them more accessible and comprehensive. This includes increasing the availability of counsellors, offering a wider range of therapeutic approaches, and providing confidential and supportive environments for students seeking assistance.
- ❖ **Implement Stress Management Programs:** Developing workshops and programs focused on stress management and resilience building can equip students with effective coping strategies. These initiatives should cover techniques such as mindfulness, time management, problem-solving, and relaxation exercises.
- ❖ **Review Academic Policies:** The University should critically examine its academic policies to identify areas where excessive workloads or inflexible requirements contribute to student stress. By revising these policies, the university can create a more balanced and supportive learning environment.
- ❖ **Promote Well-Being Initiatives:** Encouraging activities that promote work-life balance and well-being among students can help mitigate the negative effects of academic stress. This includes organizing wellness workshops, promoting physical activity, and providing resources for healthy eating habits.

### Future Research

- ❖ **Longitudinal Studies:** To track changes in academic stress and mental health over time.
- ❖ **Intervention Studies:** To evaluate the effectiveness of stress reduction programs and mental health interventions.
- ❖ **Comparative Studies:** To compare academic stress levels and coping strategies across different universities and cultural contexts.



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# Knowledge and Practice of Exclusive Breastfeeding among Mothers in Kenya: A Systematic Literature Review

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## Abstract

*Exclusive breastfeeding (EBF) for the first six months as recommended by the World Health Organization improves the chance of survival among children as well as their growth and development. In addition, exclusive breast feeding improves the mother's wellbeing in that these mothers have a lower risk of developing certain diseases such as ovarian cancer, breast cancer and type II diabetes. Mothers' level of knowledge determines the process of exclusive breastfeeding practices to a large extent. In this study, the researcher reports on a systematic review of the literature that aimed to assess the status of mothers' knowledge and practices related to exclusive breastfeeding in Kenya. The study had a goal of generating up-to-date recommendations towards the improvement of exclusive breastfeeding among mothers. A systematic review of peer-reviewed literature was performed. The search for literature was conducted utilizing nine electronic databases: Scopus, Web of Science, CINAHL, ProQuest, Pub med, Google Scholar, Medline, Science Direct, and Cochrane library, for studies published in English from January 2010 to June 2024 and conducted in Kenya. Studies focused on mothers' knowledge and practices related to exclusive breastfeeding. All papers were reviewed using a predesigned data extraction form. thirteen studies were included in the review. This review indicates that almost 95.7% of mothers had ever heard about EBF while 50.1% of them knew that EBF was to run for the first six months of a child's life. Only 43.0% of the mothers exclusively breastfed their children for the first six months. The study indicated that EBF was inadequately practiced as per the recommendations outlined by WHO and hence there was need to enhance health education on EBF among mothers in different settings such as those attending health facilities as well as conduct home visits.*

**Key words:** Exclusive Breastfeeding (EBF), Knowledge, Practice and Kenya.

## 1. Introduction

Exclusive breastfeeding (EBF) entails feeding the child with breast milk only in which no other liquids or solids are given not even water for the first six months of life(WHO,2023). The child should be introduced to complementary foods at the sixth month and continue breastfeeding up to two years or more (UNICEF,2019).

Children who are not exclusively breastfed have increased odds of contracting diseases such as diarrhea, pneumonia, diabetes as well as various developmental diseases (M'liria, 2020). EBF does not only improve the health of the child but also for the mother. It lowers the morbidity and mortality among children by boosting the immunity of the child since antibodies from the mother are passed over to the child through the colostrum in addition to the breast milk being nutritious enough for the health of the baby. Studies also indicate that EBF ensures healthy brain development thereby enhancing the intelligence capacity of the children (Ickes ET AL.,2021 and Onyango et al., 2022).

On the other hand, EBF does also reduce the morbidity and mortality rates among mothers due to diseases and conditions such as endometrial cancer, ovarian cancer, breast cancer, hemorrhages as well as postpartum depression. Other benefits of EBF among mothers include delay in the return of



fertility, more rapid return to pre-pregnancy weight, lower postpartum weight retention, emotional bonding between mother and baby (Ayisi et al., 2013)

Every year, optimal breastfeeding practices can prevent about 1.4 million deaths worldwide among children under five years (Wainaina et al., 2018). Studies show that as of 2019, 50.7% of children below 6 months old are exclusively breastfed worldwide (Nevas et al., 2019). In the African region, Nigeria has the lowest rate of EBF (17%) (Ickes, 2021). The EBF rates of other African countries include Ghana with (53.4%, Benin (43.1%) while Cameroon has (23.5%). (Dudu et al., 2016 and Kitiyo et al., 2020).

Although several studies have been conducted on the knowledge and practice (KP) of EBF in various counties in Kenya, to the researcher's knowledge, no systematic review has been conducted to summarize these findings in Kenya.

## **2. Research Methods**

### **2.1 Searching strategies**

The current systematic review was reported using the Preferred Reporting Items for Systematic Reviews and meta-analysis (PRISMA). Published literature was searched using the Scopus, Web of Science, CINAHL, ProQuest, Pub med, Google Scholar, Medline, Science Direct, and Cochrane library databases. The search was conducted using the following keywords: exclusive breastfeeding, knowledge, practice, and Kenya. The search terms were used separately and in combination. Studies published from 1 January 2010 to 31 June 2024 were included in this study. The reference list of included studies was hand searched and screened.

### **2.2 Inclusion criteria**

This systematic review was based on the following inclusion criteria:

- Study area: the studies exclusively done in any of the 47 counties in Kenya.
- Language: only English publications were considered,
- Study participants: mothers of any age,
- Types of studies: involved any types of study designs reporting the impact of knowledge towards EBF practice,
- Publication requirement: articles published in peer-reviewed journals,
- Form of outcome interests. The research focused on knowledge and practice towards exclusive breastfeeding among mothers.

### **2.3 Exclusion criteria**

The studies focused on health professionals and articles focused on mothers with their partners were excluded. Studies reported on breastfeeding alone and not exclusive breastfeeding were also excluded.

### **2.4 Selection of studies and data extraction**

Titles and abstracts were screened for eligibility. Secondly the full text was then reviewed to confirm an eligibility criteria match. Thirdly by use of a predesigned data extraction form, the following data was extracted from each study:

- Study characteristics including the name of the primary author, publication year, the county where the study was conducted, study design, sample size, aims, methods, and instrument used
- Study assessed mothers' knowledge, and practice about EBF. The researcher continued to read the full text of every study that met the eligibility criteria in order to screen the study.



## 2.5 Data analysis

The pooled total percentage of each variable of interest was generated from included studies. The total percentage was only generated for variables conducted in more than two studies.

## Findings and Discussions

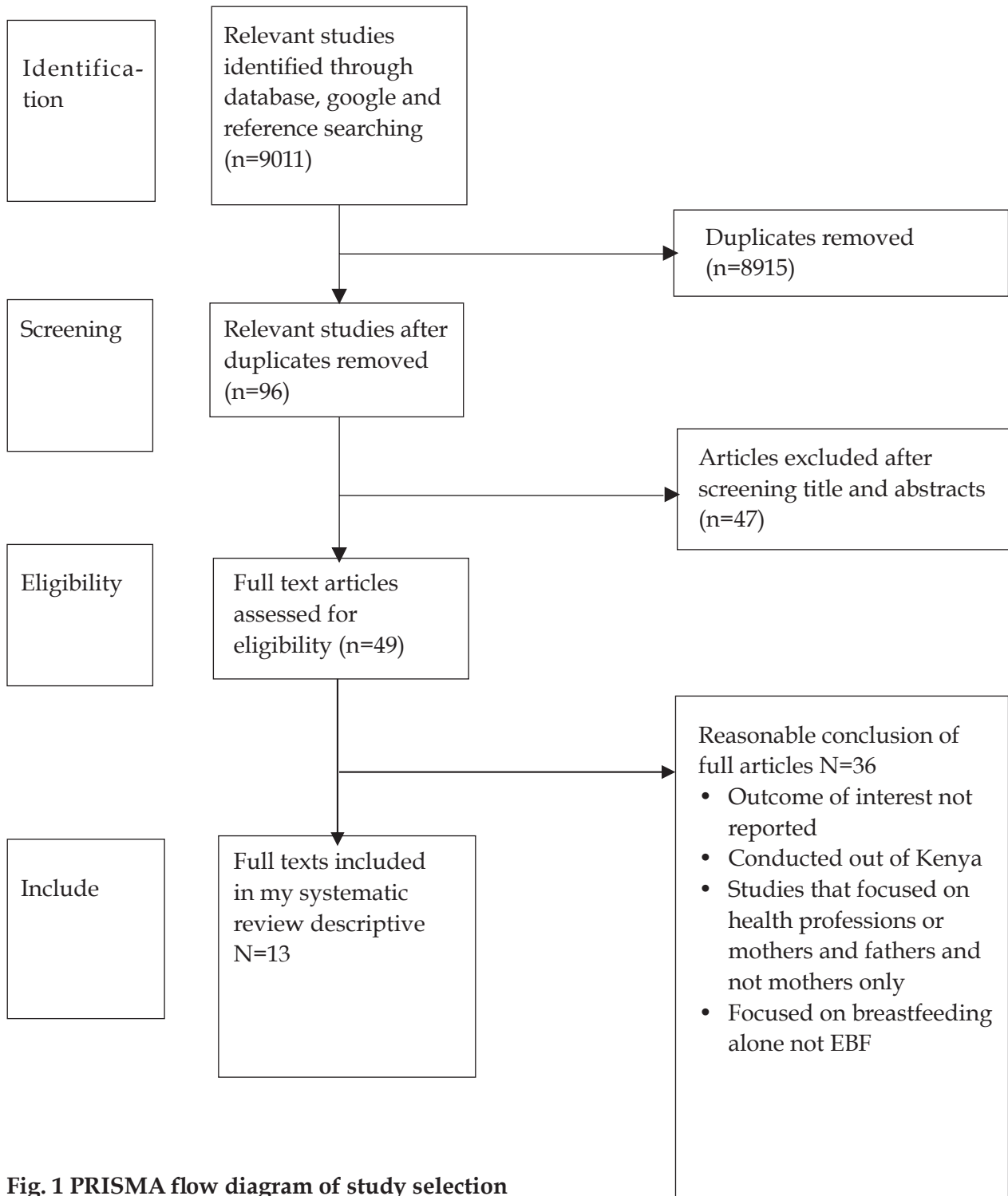


Fig. 1 PRISMA flow diagram of study selection

### 3.1 Study selection

In the first step of the search strategy and terms, 9011 studies were retrieved, from which 8915 were duplicates leaving 96 papers (Fig. 1). The titles and abstracts were screened for relevance and a further 47 papers were eliminated. The full text of the remaining 49 relevant papers was assessed to make further exclusions; 34 papers were excluded because the participants were not mothers, the intervention examined in studies focused on outcomes of health professionals and also not related to mothers, or knowledge about EBF were not reported.

### 3.2 Mothers' knowledge about EBF

The mothers' knowledge about EBF involved ten questions about knowledge of EBF, which mainly focused on knowledge on EBF, importance of breast milk, time of EBF initiation, duration of EBF, frequency of breastfeeding, proper time to commence complimentary foods, benefits to mothers and babies. Most of the mothers 95.7% had heard about exclusive breast feeding while only 50.1 % of them knew that the duration of EBF was the first six months only. In addition, only 37% of the mothers were aware that colostrum protects children against infections. Mothers who breastfed on demand were 56% while the mothers who knew the right time to start the complimentary feeding were 44%.

### 3.3 Mothers' practices about EBF

Six questions about EBF practices that focused on when to start breastfeeding, frequency of breastfeeding, feeding on colostrum, feeding on breast milk alone as well as prelacteal foods were used to assess the mother's practice about EBF. Most of the mothers (71%) had initiated breastfeeding within one hour after delivery. However, only 46% of mothers were breastfeeding on demand. Only 34% of mothers had exclusively breastfed their children for the first six months and the majority 57% of mothers, had given colostrum. Furthermore, only 31.6% had given prelacteal food to their newborn babies.

### 3.4 Discussion

The mothers' knowledge of exclusive breastfeeding was average. Based on the Food and Agriculture Organization (FAO) guidelines thresholds suggestive of nutrition intervention, a knowledge score of  $\leq 70\%$  is considered urgent for nutrition intervention. All mothers who scored  $> 70\%$  in the knowledge test were considered to have a high level of knowledge and those scoring  $\leq 70\%$  were considered to have a low level of knowledge (Kimani et al., 2021). Findings revealed that mothers with an adequate level of knowledge about the importance of exclusive breastfeeding are aware that breastmilk alone is nutritious enough for the first six months, the appropriate time to start breastfeeding is within one hour after birth, mothers should always breastfeed on demand, the proper time to start complementary foods is within the sixth month and that EBF was not only beneficial for the baby but also for the mother since it prevents diseases.

Proper breastfeeding practice is important as it enhances the child's health. Exclusively breastfed children undergo better cognitive development and are less likely to contract diseases unlike those not exclusively breastfed. Proper breastfeeding practices involved starting breastfeeding with one hour after birth, feeding the child breast milk alone within the first six months and feeding the baby the colostrum.



### **3. Conclusions**

The study shows that exclusive breastfeeding is suboptimal when compared to the current WHO recommendations. Both the level of knowledge about EBF as well as practices involved should be. The findings of this study are vital since they address the gap in the area of EBF and clarify the specific segments that need interventions.

### **4. Recommendations**

- Healthcare professionals should focus on maternal education about the benefits of breastfeeding.
- Policymakers of different counties in Kenya should integrate EBF programs in their health systems
- Systems should be put in place to encourage mothers to attend antenatal and postnatal care to improve EBF practice





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