

**ASSESSMENT OF INFORMATION LITERACY SKILLS OF
UNDERGRADUATE MEDICAL STUDENTS IN TWO SELECTED PUBLIC
UNIVERSITIES IN KENYA**

BY

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INFORMATION SCIENCES,**

**MOI UNIVERSITY
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2024

DECLARATION

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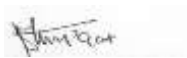
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ABSTRACT

With the growing size and complexity of library collections coupled with the explosion of medical information in diverse formats, medical students require competencies in identifying, locating, retrieving, evaluating, synthesizing, and effectively utilizing information. There is a need, therefore, for medical students to acquire information literacy skills (ILS) to master content, extend their investigations, and become more self-directed and life-long learners. This study aimed to assess the ILS of medical undergraduate students in two public universities in Kenya and to propose an ILS framework to enhance the adequacy of ILS among the medical undergraduates. The objectives of the study were to: assess the status of ILS among medical undergraduate students at Moi University and University of Nairobi; examine the ILS curricula and policies supporting delivery of ILS to medical undergraduate students; examine the ILS understanding of medical undergraduate students; analyze the knowledge and skills possessed by staff engaged in facilitating ILS; explore the role of ICT in facilitating and promoting ILS among medical undergraduate students; The study was informed by the Sauce Model and the Six Frames of Information Literacy Education Model. A pragmatic research paradigm with a Concurrent triangulation mixed-method approach was employed in the study. The study adopted a descriptive survey design applied within a multiple-case study, combining concurrent triangulation in data collection and analysis. The target population was 685 students, comprising 6th-year medicine, 5th-year dentistry, and 4th-year nursing students; 182 lecturers 2 university librarians; 2 heads of medical librarians; and 6 heads of departments. A combination of stratified random sampling was employed to obtain 353 medical undergraduate students and 62 lecturers in medicine, dentistry, and nursing specializations. While purposive sampling technique was used to select 2 university librarians, 2 heads of medical librarians, and 6 heads of departments. Data was collected using questionnaires and interview schedules. Quantitative data was analyzed using descriptive statistics and presented using frequency distribution tables and bar charts, while qualitative data was analyzed thematically based on the objectives and research questions and presented as a narrative. The findings revealed that the majority of the students, had limited ILS competencies and were unable to utilize and maximize various search techniques while others had challenges in using information ethically and lawfully. Although the ILS curriculum and policy were available, there was little implementation and accountability, indicating that the ILS curriculum and policy had not been reviewed to incorporate contemporary ILS. The students had a negative understanding on ILS, and they displayed a casual, disinterested attitude. The knowledge and skills possessed by staff were inadequate in line with contemporary ILS competencies and abilities. Students are yet to acquire the fourth ICT revolution skills that are essential for ILS learning. The study concluded that students had not acquired sufficient ILS competencies due to a combination of factors such as poor ILS understanding, low pedagogical expertise among ILS trainers, and the absence of sustainable ICT infrastructure to facilitate the acquisition and utilization of the fourth ICT revolution's competencies. The study recommends an 8-step ILS Framework to enhance the delivery of information literacy skills, ILS advocacy and improvement in pedagogy, and continuous reskilling and upskilling among staff engaged in information provision and ILS delivery.

DEDICATION

This thesis is dedicated to my late father Mr. John Oseko Momanyi whose inspiration, prayers, and wisdom I deeply miss. My mum Wilter Maswari Kwamboka, may God bless you with life and strength to share in the fruits of this qualification, and, Charity, Tasha, Talia and Taji

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It always seems impossible until it's done

– Nelson Rolihlahla Mandela

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LIST OF ABBREVIATIONS

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AAHE	-	American Association for Higher Education
AASL	-	American Association of School Librarians
ACRL	-	Association of College and Research Libraries
ALA	-	American Library Association
CORIL	-	Cooperative Online Repository for Information Literacy
ACRL	-	Association of College and Research Libraries
ALAPCIL	-	The American Library Association Presidential Committee on Information Literacy
ANZIL	-	Australian and New Zealand Institute for Information Literacy
CAUL	-	Council of Australian University Librarians
CC	-	Conventional Curricula
CHS	-	College of Health Sciences
CILIP	-	Chartered Institute of Library and Information Professionals
CIPDE	-	Centre for Intellectual Property in the Digital Environment)
COBES	-	Community-Based Education and Service
CONUL	-	Consortium of National and University Libraries
CORIL	-	Cooperative Online Repository for Information Literacy
<u>CORIL</u>	-	<u>Cooperative Online Repository for Information Literacy</u>
CUE	-	Commission for University Education
DelpHE	-	Development Partnerships in Higher Education
IBAL	-	the Institute of Beijing Academic Libraries
IBMI	-	Institute of Biomedical Informatics
ICTs	-	Information Communication Technologies
IFLA	-	International Federation of Library Associations
IL	-	Information Literacy
ILCSHEC	-	the Information Literacy Competency Standards for Higher Education in China
ILS	-	Information Literacy Skills
INFUL	-	Information Literacy Network of Finnish University Libraries

IT	-	Information Technology,
KLISC	-	Kenya Libraries and Information Services Consortium
KMPDB	-	Kenya Medical Practitioners and Dentist Board
KSU	-	Kentucky State University
MDGs	-	Millennium Development Goals
MU	-	Moi University
NZIIL	-	New Zealand Institute for Information Literacy
OPAC	-	Online Public Access Catalog
PBLC	-	Problem-Based Learning Curriculum
SCECSAL	-	Standing Conference of Eastern, Central, and Southern Africa Library and Information Associations
SCONUL	-	Society of College, National and University Libraries
UCT	-	University of Cape Town
UNESCO	-	United Nations Educational Scientific and Cultural Organization
UON	-	University of Nairobi
UP	-	University of Pretoria
US	-	United States
VPBL	-	Variant Project-Based Learning
MU	-	MOI University

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

This study aimed to assess the information literacy skills (ILS) of undergraduate medical students at Moi University and the University of Nairobi, Kenya and to provide a framework to enhance ILS adequacy among undergraduate medical students. This chapter presents the background information, the aim of the study, statement of the problem, the objectives of the study, research questions of the study, the significance, and scope of the study, and the conceptual and contextual framework for the investigation.

People in all aspects of life need information. Information is a crucial resource that is characterized as processed material that aids in decision-making, broadens one's knowledge and mental capacity, and alters a society's overall status (Madden, 2000). Similarly, Badween (2001) describes information as the resolution of ambiguity that responds to the query "What is an entity?" and so identifies the qualities and essence of the object. Merrium-Webster, (2019) argues that information is crucial for decision-making and effective operation at all levels of any undertaking. In addition, for an individual to effectively utilize information one requires ILS competencies (Baro, 2009)

According to Bruce (2004), ILS is the ability to locate, obtain, analyze, and utilize information. Similarly, the American Library Association (ALA) (1972) defined ILS as having the capability to identify when information is wanted as well as to find, assess, and apply it appropriately. ILS is viewed as a tool for community and individual empowerment in the twenty-first century. Additionally, the ability to recognize when information is needed has been defined as ILS by Hall (2010) and Diehm & Lupton (2014). Being aware of when

information is required enables one to locate, retrieve, evaluate, and use it efficiently to either carry out further study or address the issue for which it was intended. The foundation of lifelong learning is ILS, which permeates all academic levels, learning contexts, and disciplines. Furthermore, ILS aids students in developing greater self-direction, greater control over their education, topic comprehension, and study breadth (Hall, 2010). The success of information literacy in an individual is determined by the individual's agility and how well they utilize learned ILS (Baro, 2010).

Moreover, researchers like Kavulya (2003), Gui (2007), Gatero (2010), Mudave (2016), and Diehm & Lupton (2014), (ACRL, 2000) assert that ILS enables students to obtain and utilize information to address specific issues in their study discipline which calls for the know-how to recognize, find, assess, and manipulate information ethically and for lifelong learning. From these definitions, ILS can depict to mean the prowess to recognize when one is deprived of information. In a rejoinder to the deprived state, one locates, critically analyses it, and uses it for research and long-life learning.

1.1.1 Information Literate

Zurkowski (1974) defined information literate as someone who has been trained to use information resources in their work and who has mastered the use of a variety of information tools and primary sources to create information-based remedies for their problems. Additionally, ALAPCIL, (1989) argues that individuals deemed to be information literate have perfected the art of learning. They understand how information is arranged, how to locate, and utilize information so that others might learn from them. Thus, those who possess the ability to identify when they need information and the ability to find, assess, arrange, and effectively

apply that information to address and resolve particular work-related issues, as well, as broader societal issues are considered information literate (Bundy, 2004).

There is a flood of information in medical discipline and ingress to this complex information necessitates ILS. Medical practitioners as well as students actively participate in information literacy skills lessons and inquiry-based learning to build these skills (Tunde, 2018). They must learn how to effectively use and seek out information if they are to properly navigate their surroundings and gain skills in the medical research process. Consequently, information literacy abilities are unquestionably important predictors of active and goal-driven involvement in the medical research process.

According to Krupat et al. (2012) and Zurayk (2010), medical faculties play key roles in patient care, biomedical education, research development, and promotion. Similarly, Tunde (2018) believes that the function of a medical faculty member requires considerable information literacy skills to support these academic responsibilities and browse vast amounts of medical data. In this regard, Bhutta (2010); Cohen (2009); Zurayk (2010); Fineburg (2011); and Bazrafkan et al (2018) proclaim that medical schools should train medical specialists to utilize the most up-to-date scientific information in medical practice through instruction, investigation, and the treatment of patients. According to Bazrafkan et al. (2018), medical practice demands students to update their information over time to practice evidence-based medicine.

Furthermore, to realize their job responsibilities and navigate the intricacies of many medical specializations, students in medical schools need access to a wide range of information resources. Medical students must possess ILS to better make use of the information resources at their disposal by developing their information search, retrieval, and evaluation abilities.

These abilities will make it easier to implement evidence-based learning. The efficiency and effectiveness of ILS are founded on sound components, as posited by Bundy (2004) which include:

- Information skills, such as information utilization, information searching, and technological fluency;
- Generic skills, such as solving problems, working with others, cooperation, interpersonal skills, and analytical thinking;
- Values and beliefs, such as participating in society and using information responsibly and ethically.

Therefore, with the information explosion and technological development, ILS is important to medical students, because the skills enable students to master how to identify when they need information, where to find it, and how to use it most effectively.

1.1.2 ILS and Medical Training

The rapidly expanding body of medical information necessitates the integration of ILS into medical practice and basic sciences to help medical students determine, find, assess, arrange, and utilize medical information efficiently for their training and upcoming medical assignments. (Barrows 1996; Boud and Feletti 1997; & Vainiomäki 1995).

According to Khalid (2023) medical professionals' expert judgment in the management of medications, requires trustworthy and evidence-based information for patient care, education, and research. Healthcare providers must acquire relevant and trustworthy information to meet their academic and work duties. In addition, Booth and Meijman (2011) observed that

healthcare professionals require fast access to information that can assist them in solving medical difficulties.

There are two types of curricula used in medical school training worldwide (Tunde, 2018; Eskola, 2005). These are the Problem-Based Learning Curriculum (PBL) and Conventional Curricula (CC). Eskola (2005) states that in PBL, students' study by engaging in resolving issues as compared to just idly taking in data. Eskola continues by saying that PBL starts students' learning with a problem. Contrarily, Tunde (2018) explains that in tutor-centered CC, learners passively assimilate knowledge through regular accomplishment exams, structured laboratory experiences, big group lectures, and tutorials. Furthermore, Tunde (2018) alludes that those students in CC passively assimilate knowledge rather than actively acquiring it. CC is characterized by a first- and second-year rudimentary science section comprising formal study units selected from different basic science disciplines. According to research done at McGill University in Canada (2014) on the impact of curriculum on students' retention rate revealed that those students who took the conventional curriculum had a "forward-directed" style of reasoning which was/is tedious and required cramming. Similarly, Moore et al. (2000), assert that students who followed the standard curriculum seemed more inclined to characterize their preclinical experience as "non-relevant, passive, and boring." This illustrates their inability to use and interpret information utilizing ILS.

Medical educators have been increasingly worried over the years that traditional teaching methods (lecture-based curriculum) don't foster the correct traits in students or instill an appreciation for learning that lasts a lifetime. Therefore, Osler (1899) suggested doing away with the lecture method of teaching and allowing students to study independently because he felt that the medical field is very complicated and advanced beyond the capacity of the

lecturers to expound all that students are required to know. Osler (1899) emphasized the significance of teachers in assisting students in observing and making sense of the world. These skills will empower medical students to carry on with their learning for the rest of their lives. This can only be accomplished by lowering classroom overcrowding, releasing some of the current rigidity and homogeneity in medical education, and modifying health studies to better match the instructional demands of students, hence the need for a problem-based learning curriculum.

Problem-based learning curricula prioritize meaning (understanding) over memorization and cramming (Tunde, 2018). In addition, Moore et al. (2000) note that students studying under the PBLC curricula focus on journals and online databases as information sources, utilize the library more frequently, and use self-learning information materials more frequently, all of which require strong ILS. Otherwise, students may experience information overload if they lack the necessary ILS to discover and utilize information efficiently (Andretta, 2005). Therefore, ILS competencies are essential for the development of autonomous learners in any academic setting, including PBLC students (Peters et al., 2007).

Santharooban (2016) further argues that in PBLC students are given triggers or tests that have been developed based on actual case studies, and they collaborate in teams through a structured procedure to solve and learn background information about a particular topic. Further, Santharooban (2016) notes that self-regulating and self-directed learning are at the core of the PBLC process, hence the demand for ILS among students participating in PBLC. The ILS competencies will guide them to search, retrieve, and use information in medical studies. Additionally, Santharooban (2016) asserts that the PBLC process consists of eight steps, and these processes are as follows:

- Introduction of a trigger question
- Keyword research,
- brainstorming,
- learning requirements analysis,
- debate,
- self-directed learning,
- presentation,
- and review are all cyclical processes that are repeated.

Additionally, Santharooban and Premadasa (2015) aver that every phase requires a diversity of information literacy skills, including analytical, locating, comprehension, generating, presenting, and assessing skills. The student cannot perform effectively in PBLC if they have no training in ILS. Additionally, ILS is regarded as an essential component for successful independent learning in PBLC, according to Oker-Blom (1998).

Similarly, Furuya et al (2017), assert that medical students' ILS on PBLC enhance their discerning abilities, which is a crucial ingredient of the successful application of evidence-based medicine. Medical practice greatly benefits from the capacity to competently find, evaluate, and integrate vast amounts of relevant medical literature, along with analyzing, integrating, and translating that information for application in clinical settings. Fossen (2018) concurs that ILS solidifies the correlation between a physician's clinical competence and the independent clinical evidence from the literature for decision-making that could mean a distinction between life and mortality for patients in potentially time-dependent

circumstances. Additionally, Fossen (2018) contends that ILS understates the significance of developing research skills and their effect on the teaching and practice of evidence-based medicine.

This discussion indicates that students who have developed ILS can discover and critically evaluate several medical information materials—both printed and digital—to interpret the information contained and apply it in clinical settings and medical practice.

1.1.3 Global Perspective of ILS in Medical Education

Since the founding of the Library Instruction Round Table by ACRL in 1977, ILS has been recognized as a learning objective in US higher education institutions (Goff, 2007). As a consequence, state university systems have been instrumental in helping to incorporate ILS into US educational courses.

According to Markham, Larmer, and Ravitz, (2003), ILS is crucial for the implementation of a PBL training program that is used in US medical schools. Additionally, Markham, Larmer, and Ravitz (2003) note that PBL has been embraced by many medical schools as an active-learning strategy that fosters students' logical reasoning and skills for solving problems, these are key tenets of ILS. Moreover, in the US, the Association of College and Research Libraries (ACRL) under the guidance of ALA in the year 2000 developed information literacy competency standards for higher education (ACRL, 2000). The upshot is that the medical curriculum in the US now follows the ILS framework of the Association of College and Research Libraries (ACRL), which emphasizes meta-literacy and the capacity of students to become not only information consumers but also creators and active participants (ACRL, 2016; Wenger, 2014).

Relatively, higher education institutions in Canada have elected to follow the ACRL, 2016nn guidelines for their ILS instruction and implementation in their education institutions, because of the absence of in-house ILS innovation (Goff, 2007). Medical schools in Canadian universities have made ILS training in line with ACRL's fundamental tenets in the teaching of medical students. According to Pines, Julien, and Boon (2015), individual skills gain is the most direct and commonly acknowledged advantage of a high degree of ILS among students in Canada because they can search for information in various databases of scholarly work, and write correct citations of sources. Correia, (2012) asserts that medical students are better equipped to handle the evolving information requirements occurring within the medical discipline of study thanks to lifelong ILS learned.

In the United Kingdom, according to the ACRL, (1977), ILS has been practiced as user education at universities. Additionally, according to Johnson and Webber (2003), ILS has been included in information technology skills throughout the history of university education. Furthermore, the Seven Pillars of Information Skills for Higher Education framework that was advanced by Standing Conference of National and University Libraries (SCONUL) in 2011 has been adopted as guidelines for ILS training by medical schools in universities in Britain and Ireland. (SCONUL, 2011),

In Australia, the information literacy skills are widely recognized, comprehended, and used in universities. The successful adoption of ILS in medical schools has been attributed to several strategies, according to Cock (2012). These include coordinated partnerships at the policy and planning levels, as well as the application, testing, and estimation of strategies that support ILS and its integration into medical program curricula at universities. Moreover, Information experts in Australia have linked the idea of lifelong learning in ILS training with medical

curricula, this has, in effect, nurtured the partnership between librarians and medical schools by enhancing ILS adequacy (Rader, 2002).

In China, Zeng et al. (2008) state that ILS in medical training institutions has been advocated by librarians. In addition, ILS seminars, ILS credit-bearing units, and ILS webinars have been introduced to facilitate ILS adequacy among students in Chinese universities (Zeng et al., 2008). Additionally, national ILS events and symposia have been used to raise awareness of the importance of ILS among medical professionals across China (Rader, 2002).

In Africa, educational institutions in many nations have launched ILS programs designed to give students adequate ILS competencies to effectively utilize information (Kanguha, 2016). Nevertheless, according to Lwehabura and Stilwell, (2008), ILS initiatives are yet to be taken seriously or put into practice in many African nations. Among all African nations, South Africa is ranked number one for ILS training in medical schools in higher education institutions. After the establishment of the Unity Government in South Africa in 1994, improving the literacy levels of citizens was seen as a priority. As a consequence, information literacy skills were recognized as a key to low literacy levels among South Africans (Nassimbeni & De Jager, 2002). To raise the level of literacy among the populace, several initiatives aimed at developing ILS levels were launched. Consequently, the higher-education institution's ILS policy framework was adopted. The strategy was founded on three policy areas that have been authorized and synchronized in higher education institutions to train ILS personnel which are policies for education, ICT, and libraries and information services.

For example, at the Durban University of Technology and Cape Town University, health science faculties teach ILS as chapter topics in various modules. The integrated ILS topics are computer skills, information ethics, information retrieval, and information repackaging.

According to Petrova et al (2007), these ILS instructional programs provided by libraries don't, however, result in any kind of official certification/qualification. For instance, the faculties of health sciences at the Universities of Cape Town (UCT) and Pretoria (UP) have chosen to provide ILS using the train-the-trainer method. Whereby, UCT trains students in medicine who are required to share their newly gained knowledge and abilities with the society in which they will practice after completing their medical studies. On the other hand, UP identifies and trains a small number of students enrolled in medicine who will provide ILS programs to other students enrolled in the medical programs.

In Niger, according to Baro, Endouware, and Ubogu (2011), there is a lack of any formal ILS training initiatives, which is why students at Niger Delta University's College of Health Sciences lacked the ILS necessary to effectively use information resources, hence, need for the creation and implementation of ILS training programs to provide medical students with the ILS they need to effectively utilize information, especially in the digital age.

In Ghana, several initiatives to train ILS in medical schools in the form of computer skills, library user education, communication skills, and media skills have been enacted according to Dadzie, (2009). However, Dadzie (2009 & and Dennis (2003) state that inadequate qualified staff to train ILS, absence of collaboration, inadequate ILS curriculum and policy guidelines, insufficient technological support/infrastructure, and inadequate time allocated to the ILS training, continue to impede the full realization of ILS potentialities in Ghana's medical schools.

In Kenya, there is no existence of a national policy on ILS, hence activities linked to information literacy skills are handled by individual institutions. Both private and public institutions of higher learning provide ILS to fresh students through the Communication Skills

unit (Kavulya, 2003; Amunga, 2010 & Mugambi, 2013). The communication skills unit is designed and taught by instructors from the departments of Languages, or any other department that the university administration believes is best suited to develop and handle it. Additionally, the Kenya Medical Practitioners and Dentist Board (KMPDB) ensures that ILS is integrated into the medical training curriculum. KMPDB is a statutory body formed by Kenyan statute Cap 253 of the laws of Kenya to oversight medical education training. KMPDB is tasked by the Act with ensuring that medical students complete their training with the requisite knowledge and skills. ILS has been named by the Act as a key ingredient in educating qualified medical professionals in Kenya (KMPDB, 2019).

1.2 Background to the Study

Khalid (2023) argue that for healthcare providers to exercise expert judgment when administering medications to patients, they need trustworthy, evidence-based information sources for their work in patient care, instruction, and research. It is critical to support medical staff and students in meeting their professional and occupational obligations by providing accurate medical information. The complex and dynamic medical environment that practitioners work in has led to an increase in the breadth and complexity of the information demands of health workers. Booth and Meijman (2011) observed that healthcare providers require quick access to information that can assist in immediately resolving their clinical concerns.

In Kenya, the primary goal of Kenya's tertiary health institutions is to deliver the highest quality health-care healthcare possible (Nyawira, 2021). The delivery of healthcare is anticipated to be in line with existing expertise, specialized knowledge, cutting-edge

technology, and teaching hospitals are intended to act as manpower development and training hubs, as well as referral hospitals (Kenya Health Sector Survey, 2018).

In addition, medical training in Kenya is intertwined with that of medical education in East Africa through the Makerere Medical College, Uganda. The subsequent evolution of the Makerere Medical College saw the founding of the University of East Africa in June 1963 with its constituent university colleges in Tanzania, Kenya, and Uganda (Makerere University, 2017). Later, the University of Nairobi was established by the University College of Nairobi, and established the faculty of medicine as part of the University College of Nairobi on the 8th of March 1967 and the Kenyatta National Hospital (KNH) was the teaching hospital for the medical school, a situation that exists to this day (Chege et al, 2017). The following academic programs are offered by the College of Health Sciences: clinical research, HIV prevention & research center, nursing sciences, medicine, pharmacy, dentistry sciences, nephropathy, and public health (Chege et al, 2017). The second university to offer medical training in Kenya is Moi University. At Moi University all medical courses are managed under the College of Health Sciences (CHS). The College was formed in 2011 and has four schools; medicine, nursing, public health and dentistry, and the recently established Institute of Biomedical Informatics (IBMI) in line with the University's strategic plan of 2005-2015 (Chege et al, 2017).

Progressively over the years, eleven universities have been registered by the regulator KMPDB, to offer medical training and related courses. All these universities have their medical training schools affiliated with different referral hospitals where teaching and research take place (Qureshi, & Oluoch-Olunya, 2010)).

In the meantime, Kenyan universities offering medical training have adopted two curricula modes mentioned earlier namely PBLC and CC. The two selected universities namely University of Nairobi and Moi University adopted for this study have espoused curricula based on Conventional Curriculum (CC) and Problem-Based Learning Curriculum (PBLC) hence best placed to give information on how to effectively enhance and deliver ILS to medical undergraduate students. Additionally, the University of Nairobi and Moi University were chosen for this study because they are the first universities to offer medical training in Kenya and hence, overtime they have learnt the best practices in medical training. In addition, they serve as benchmark for the institutions of higher learning that have stated or want to start training medical doctors in Kenya.

1.2.1 University of Nairobi College of Health Sciences (CHS)

The mission of the University of Nairobi's CHS is to provide high-quality medical education and instruction by fostering the development, safeguarding, integration, transfer, and use of health knowledge with the vision of becoming a globally renowned center committed to the highest standards of academic and professional healthcare (Ojuka, 2021). The college strives to foster principles that are essential to fulfilling its mission to accomplish the stated vision and goal (Ojuka, 2021).

University of Nairobi College of Health Sciences uses a blended curriculum that is early patient contact and early community exposure (Gatero, 2011). Program objectives include exposing students to the work of practitioners and patient care during the initial stages of their education, teaching them interpersonal skills, inspiring them to pursue fundamental scientific courses, and integrating theory and practice (Gatero, 2011). Given the huge amount of information available in the field of medical sciences (Bazrafkan and Pakravan, 2017), ILS is

essential among undergraduate medical students to enable them to retrieve essential information from the mass of available material. Hence, it is critical for medical training institutions that have embraced the blended curriculum to incorporate ILS into their training for students to recognize, analyze, and apply relevant information correctly.

1.2.2 Moi University College of Health Sciences

Moi University's CHS adopted the Problem-Based Learning Curriculum (PBLC) since its inception. The PBLC ensures that students learn basic sciences by solving problems through analyzing typical cases. Also, students' curiosity and initiative are core to learning, with the lecturer acting as a resource, facilitator, and guide (Amalba, et al, 2016).

The adoption of a learning initiative known as COBES (Community-Based Education and Service) has served as the cornerstone of this PBLC program's success. The COBES program exposes students to the public and primary healthcare requirements of rural areas by using the community as a learning environment (Amalba, et al, 2016). In the delivery of healthcare, COBES supports the roles played by physicians, healthcare providers, government, and civil society. Learners are assigned to a community for four (4) weeks during the COBES program, with predetermined goals that are by the objectives of Moi University's school of Health Science.

The experience element and the service component are the two main components of COBES. Students must reside in the designated communities for the hands-on component, research sociocultural, socioeconomic, and health issues, and offer workable, affordable solutions and interventions that advance community development and health. Students must do tangible, short- to medium-term services that enhance gender, health, socioeconomic, and sociocultural inequities, environmental sanitation, and behavior changes towards health and education

(Amalba, et al, 2016). As a result, the students identify problems that the community is experiencing, create a study plan, collaborate with district health management teams, and carry out activities. They carry out monitoring, keep track of diseases, and are expected to act swiftly in the event of an epidemic.

The discussion on COBES has demonstrated that its primary goal is to help medical students become lifelong learners by teaching them how to be independent learners and assist them engage in self-directed learning. Medical students must develop a set of competencies to quickly and effectively extract pertinent information, from varieties of information sources, and critically assess the accuracy, validity, and authenticity of information if they are to complete independent learning in an environment of abundant information. These key skills are anchored by proficiency in ILS because ILS are the foundational components of independent self-directed learning and life-long learning.

1.3 Statement of the Problem

ILS are crucial for facilitating lifelong learning, and personal and economic growth (Tewell, 2015). Similarly, ILS are essential in higher education institutions because they help students learn more efficiently, foster creative thinking, and produce excellent academic materials for their courses of study (Salleh et al, 2011). ILS is utilized by all academic fields, including the humanities, social sciences, engineering, and technology, among others. A successful ILS initiative enables a learner to elucidate the problem, formulate a plan for gathering information, locate and make use of resources, apply and combine information, and carry out specific information assessment tasks for lifelong learning (Ojedokun, 2014; Gatero, 2011 & Mugambi, 2017). A successful ILS initiative among students is dependent upon the enactment and implementation of an ILS policy and

Commented [A2]: Reconsider the sentiments of examiner 2 (policy, knowledge, skill and training of staff, etc)

curriculum (Kamau & Kanyengo, 2020). The Commission for University Education (CUE) in 2014 developed standards and guidelines for academic libraries, which indicated that ILS should be integrated into the curriculum and should be instructed by a librarian (CUE, 2014). However, a study conducted by Kamau & Kanyengo (2020) on ILS policies and practices in health sciences and medical libraries in Kenya found that medical training institutions like Moi University's College of Health Sciences and the University of Nairobi's College of Health Sciences, among others, have not fully integrated ILS into their curricula, and they are yet to develop a comprehensive ILS policy to guide the development of an ILS curriculum and structure for its implementation. Save for the Communication Skills Unit taught to first-year students.

Furthermore, successful delivery and enhancement of ILS among medical undergraduate students is dependent on the collaborative partnerships between librarians and faculty, librarians' advocacy initiatives, and students' eagerness to learn and understand ILS (Gatero, 2011). Moreover, Ondari-Okemwa's (2016) study on developing digital information literacy at institutions of higher learning in Sub-Saharan Africa revealed that many learners in the medical field fail to gain sufficient ILS because of a negative attitude towards ILS instruction and learning. Similarly, many students at the University of Nairobi have been found to lack the sophisticated skills that are needed to exploit the university libraries information resources, both print and online, because of a negative attitude towards ILS and the misguided assumption that since they can Google, they will have sufficient ILS (Kanyengo & Kamau, 2020; Gatero, 2011; and Kavulya, 2003). In addition, literature indicate that attitude and understanding is one of the most important

characteristics that has not been well addressed in many related ILS research, particularly in the African environment and Kenya in particular (Adigun and Tella, 2021).

Moreover, medical training and practice require students to update their information continuously for evidence-based medicine (Gatero, 2011). However, the growing size and complexity of library collections coupled with the information explosion and with the rapid pace of developments in ICT pose a challenge to medical trainees in University of Nairobi and Moi University. Additionally, despite the critical role that ILS plays in student learning, Momanyi, Toroitich & Onderi (2018) study on the utilization of ILS among undergraduate, points out that among the barriers to the efficient utilization of information especially in developing countries is the relatively low level of information literacy skills. Without the ability to manipulate and use information effectively, investments in both print and electronic-based resources may be a waste. Similarly, Kavulya, 2003; Mutula, 2006; Amunga, 2011; Lwehabura, 2018; Gatero, 2011; and Mugambi, 2017; & Horo (2016) corroborate this claim by stating that even though lots of information resources and services are available in Kenya, they are not fully utilized due to absence of information literacy skills.

Interestingly, Mugambi (2013) in his study on the assessment of information literacy competencies of practicing nurses at Kenyatta National Hospital, Kenya, revealed that practicing nurses at Kenyatta National Hospital had four professional information needs namely; patient care, in-house presentation, presentation at a professional meeting/seminar and scholarship application/career development, in this regard the nurses preferred using human sources instead of online databases or print sources that were readily available. This can arguably be attributed to inadequate information literacy skills which comprise searching, retrieving, evaluating, and utilization of both print and online medical databases. Sutton (2011)

echo these sentiments by asserting that most medical students are unable to refine search strategies, criteria for selecting search terms, and appropriate information used to avoid plagiarizing published scientific works. They cannot also apply their acquired information literacy skills to assess the reliability of online information sources.

Additionally, the ILS of undergraduate students pursuing medical-related courses is dependent on their capability to think critically and their analytical problem-solving competencies. Kanguha (2016) asserts that students studying medicine require critical discerning skills because medicine is an inquiry-based discipline. Critical thinking and problem-solving are key tenets of ILS. Additionally, a critical scrutiny of the available literature [Kanguha \(2016\)](#) ~~(reference the literature)~~ divulges that while there is an increasing push for ILS in Kenya's universities, there are only meager attempts to understand how undergraduate medical students in their final year of study are utilizing learned ILS to complete their coursework independently and develop into lifelong learners (Momanyi, Toroitich, & Onderi, 2018). This study, therefore, assessed the ILS among the medical undergraduate students at the University of Nairobi and Moi University. It envisages to come up with a framework to enhance the adequacy of ILS among undergraduate medical students.

1.4 Aim of the Study

This study aimed to assess the information literacy skills of medical undergraduate students in selected public universities in Kenya and to propose an ILS framework to enhance the adequacy of ILS among undergraduate medical students.

1.5 Objectives of the Study

The study was guided by the following objectives:

1. To assess the status of information literacy skills of medical undergraduate students at Moi University and the University of Nairobi.
2. To examine the information literacy skills policies and curricula supporting the adequacy of ILS among medical undergraduate students at the two universities
3. To explore the ILS understanding among medical undergraduate students
4. To analyze the knowledge and skills possessed by staff engaged in facilitating ILS among medical undergraduate students
5. To examine the role of ICT in facilitating and promoting information literacy skills among medical undergraduate students at the two universities
6. To propose a framework to enhance ILS among medical undergraduate students in the selected universities in Kenya

1.6 Research Questions

The research questions for the study were:

1. What is the status of ILS among medical undergraduate students at the University of Nairobi and Moi University?
2. How does information literacy skills policy and curriculum guide in imparting ILS to medical, undergraduate students?
3. How is the understanding of ILS among medical undergraduate students?
4. What are the knowledge and skills possessed by staff facilitating ILS among medical undergraduate students?

5. How is ICT facilitating learning of ILS among medical undergraduate students?
6. What ILS framework should be implemented to enhance ILS among medical undergraduate students in the selected universities in Kenya?

1.7 Assumptions of the Study

1. Medical undergraduate students have inadequate ILS hence they are unable to effectively utilize medical information materials legally and lawfully to enhance their learning process and become lifelong learners.
2. ICT is not properly utilized to enhance the delivery and learning of ILS because of the absence of adequate ICT infrastructure in institutions of higher learning.
3. The ILS policy and curriculum available are inadequate in facilitating ILS learning and instruction because implementation and updating is not properly carried out.

1.8 Significance of the Study

Application

The findings of this study offer a more practical approach for incorporating and implementing ILS in medical training curricula and help to create efficient pedagogic ways for teaching ILS to undergraduate medical students at Kenyan higher education institutions. Additionally, it is anticipated that the study's recommendations will significantly aid universities in re-engineering ILS training in terms of course design, content development, pedagogical delivery techniques, and assessment procedures ([Momanyi, Toroitich, & Onderi, 2018](#)).

Implication

The outcomes of this study provide the basis for guiding university management and government efforts in designing a national information literacy skills policy to aid thrust the country into an information society ([Momanyi, Toroitich, & Onderi, 2018](#)).

Contribution to knowledge

This study has facilitated the understanding of the ILS competencies of undergraduate medical students; the significance of routine reviews and updates of ILS policy and curricula to foster the transfer of contemporary information literacy skills; the necessity of retraining and reskilling of information literacy skills among instructors and information service providers; and the significance of ICT in ILS utilization and instructions. It also brings to the forefront their patterns of information search, utilization, sharing, and use to improve patient confidence in health care delivery services in Kenya ([Kanyengo & Kamau \(2020\)](#)).

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1.9 Scope and Limitations of the Study

1.9.1 Scope of the study

The scope forms the boundaries that mark the breadth of the research. The emphasis of the study was to assess how medical undergraduate students at the University of Nairobi and Moi University are utilizing information literacy skills in their medical training and practice. Medicine study is an information intensive course which requires students to have top notch information literacy skills so that they can be able to filter relevant information in an information explosion environment and ever- changing information technologies. The study sought to get insights on the type of ILS possessed by these students, the ILS policy and curriculum in place to foster adequacy of ILS among, and the ILS understanding of medical undergraduate students towards ILS acquisition and training. Additionally, the

study investigated the gaps that exist in the enhancement of ILS among medical undergraduate students at Nairobi University and Moi University.

The study purposely targeted two public universities, namely the University of Nairobi (College of Health Sciences) and Moi University (College of Health Sciences). The University of Nairobi is located in Nairobi County in the middle of Nairobi central Business district, which is purely an urban centre and Moi University is located in Eldoret town, Uasin Gichu County. The two institutions were selected because they were the first universities to offer medicine and related courses in Kenya (Gatero, 2011); hence, they serve as role models for other universities that have started or are starting to offer medical courses in Kenya. Furthermore, the two universities were selected because they were among the first universities to be chartered in Kenya, and they too have a sizeable student enrollment rate.

The study population comprised heads of departments of medicine, dentistry, and nursing, university librarians, head medical librarians from the two universities, course unit lecturers teaching in medicine, dentistry, and nursing departments, and final year students from medicine, dentistry, and nursing programs in the said universities. The reason for choosing these cadre of population was that, firstly, head of departments and lecturers teach students on how to search, use, disseminate and apply information learnt. Therefore, they helped the study understand students' skills, knowledge, attitudes, perception, and experience towards ILS. Secondly, the final year students were at advanced/ final levels in their studies hence understood how ILS affect their studies and can best describe ILS experiences, perception, attitudes and notions. Thirdly University Librarians and head medical librarians serve,

assist, train students on information issues and they are knowledge ambassadors in a university. Hence very critical in providing information on ILS training, utilization and its effectiveness among the students.

1.9.2 Limitations of the Study

This study relied on the perceptions and self-reported behaviours of undergraduate medical students. While the survey questions themselves were widely tested and used, any self-reported data raises questions of reliability and validity. Either intentionally or unintentionally, the students may not have precisely revealed how they utilise information literacy skills in their answers. In addition, it's possible that they weren't able to recollect their acts precisely or that they chose the "correct" response even though it didn't accurately reflect their actual behavior. For example, because they reason that they shouldn't use tools like Google or Wikipedia, pupils may underreport their use of them. Therefore, the researcher used face and content validities to ascertain the correctness of the data given.

Finally, the scantiness of related literature on ILS among medical schools and students in developing countries impeded the study. Thus, a lot of time and effort was expended looking for information from various sources namely electronic journals, online magazines, conference papers, electronic theses among others. In addition, this limitation was addressed by examining literature in the developed nations and customizing to the African context. Additionally, literature on closely related studies done in Africa like psychology was examined complement that which was available.

While conducting the study, the researcher encountered difficulties in gathering data, particularly from lecturers, many of whom doubled as medical doctors, with tight schedule

and a number of patients in their list, this meant that in some cases they had to be traced outside their normal university stations or after normal working hours. However, the researcher utilised research assistants drawn from the individual universities who were well versed with the academic teaching schedule and in some cases were known to the staff members and could therefore follow them up to provide the information required.

1.10 Operationalization of Terms Used in the Study

Communication skills - “Communication skills” is a common undergraduate program taught to first years in universities in Kenya. It comprises information skills, reading skills, public/oral presentation skills, library skills, listening skills, speaking skills, critical thinking skills, problem-solving skills, writing skills, examination skills, research skills, and functional writing skills.

Curriculum: The intentional engagement of students with educational content, resources, and systems for assessing academic achievement.

Education - The aggregate of all the processes through which a person develops abilities, attitudes, skills and other forms of positive behavior that are valuable to society.

Electronic Information Resource- Any information source in digital format that the library provides.

Information – Knowledge acquired through study or experience; knowledge of specific events or situations (Florida, 2010).

Information and Communication Technology- refers to technologies that allow information access via telecommunications. It is related to information technology (IT), but it emphasizes

the technologies for communication, that is the Internet, wireless networks, cell phones, and other forms of communication.

Information literacy- Information Literacy constitutes the ability to recognize when information is needed and to find, assess, effectively use, and communicate information in its various formats

Information literacy program- The training program undertaken by librarians to their users to enhance them learning ILS for example orientation, information skills, or other library user education activities that enhance users to utilize information resources accordingly.

Information literacy skills- as having the capability to identify when information is wanted as well as to find, assess, and apply it appropriately. ILS is viewed as a tool for community and individual empowerment in the twenty-first century.

Information skills / Library Skills-Information skills or library skills is a component of the communication skills course. Its main objective is to equip learners with the necessary skills necessary for effective identification, location, selection, and application/utilization of information sources. The two terms are used interchangeably.

Information Professional/ Specialists- An information professional or information specialist is someone who collects, records, organizes, stores, preserves, retrieves and disseminates printed or digital information

Information Sources- An individual, object, or place from whom information emerges, arises, or is received is referred to as an information source. Primary and secondary information sources exist. That source may then inform or share information about something with another individual.

Instruction- An outline or manual of technical procedure

Literacy- The ability to Read and Write Locate, Access and Utilize Electronic Information Resources

Private Universities – universities that are set up and run by private individual groups or companies and accredited by the Commission for University Education (CUE) in Kenya.

Public universities – Universities established through an Act of Parliament and which partly rely on public funds for their operations.

Student – Both regular and full-time students who are government-sponsored and part-time students who are self-sponsored. In some cases, the two categories are integrated into the same classroom.

Teaching staff – lecturers and librarians involved in teaching communication skills courses and other Information Literacy related courses.

Medical Students- Means an individual participating in a nationally accredited academic program leading to the medical doctor or doctor of osteopathy degree

Medicine- Is a substance or preparation used in treating disease

Public University- A public university is an academic institution that is funded by the government and owned by the state. Public universities are subject to government rules and regulations

1.11 Structure of the Thesis

This thesis is organized into seven chapters as follows:

Chapter One: Introduction and Background to the study

This chapter covers the background of the study, statement of the problem, aim of the study, research objectives, research questions, assumptions of the study, significance of the study, study scope, and limitations.

Chapter Two: Theoretical Framework

This chapter presents the theories that guided the study.

Chapter Three: Literature Review

The chapter provides a detailed review of both theoretical and empirical literature in textbooks, e-journal articles, online databases, and other sources. The literature identified the gaps and the contribution of this study in addressing them adduced.

Chapter Four: Research Methodology

This chapter presents the research paradigm, research approach, research design, study population, sampling technique, sample size, data collection methods, validity and reliability, ethical issues, and data analysis.

Chapter Five: Data Analysis and presentation of the study

Analyzes and presents data collected from the sample following the sequence set out by the study's objectives.

Chapter Six: Discussion of the findings

Discusses the study's findings following the order of the study objectives.

Chapter Seven: Summary of the findings, conclusion, and recommendations

Provides a summary findings and conclusions. The recommendations provided target various players including the government, medical schools, lecturers, librarians and universities'

management boards. In addition, the researcher proposed an 8-step framework to enhance ILS delivery to medical undergraduate students.

1.12 Chapter Summary

In this chapter, the researcher covered several areas that formed the introduction to the study. The first part dealt with the background of the study consisting of the four areas. The statement of the problem was an explanation of the problem or challenge that prompted the researcher to investigate the study area, while both the aim of the study and the specific objectives and research questions were used to give further clarification, direction, and focus to the research. Other facets that are encompassed in this chapter are the assumptions of the study, the significance of the study, and the study's scope and limitations.

CHAPTER TWO

THEORETICAL FRAMEWORK

2.1 Introduction

A theoretical framework in a research study is the organization that embraces and supports the theory of a research work (Biesta et al, 2019). Further, Biesta et al (2019) argue that any type of research must have a theory or theories which provide a framework for the interpretation of the study findings since interpretation is an essential component of the research study. Biesta et al (2019) further state that making things visible and understandable that might not be observed is a crucial and enduring property of a theory. In an empirical setting, theory is crucial to help deduce causality and causal mechanisms, to come up with explanations, and to give those explanations credence. As a result, theory combines all the disparate empirical evidence into a unified conceptual framework with broader relevance.

Furthermore, Cohen and Manion (2018) identify the following qualities of an ideal theory: a theoretical system must facilitate empirically testable inferences; theory ought to be consistent with both observation and previously verified theories; and theories must be described using straightforward words.

The discussion above makes it clear that theory is itself a potential source of new knowledge and discoveries, a stream of new hypotheses and unanswered questions; it identifies crucial areas for additional research, reveals knowledge gaps, and enables researchers to postulate the existence of previously overlooked or ignored phenomena.

2.2 Theories Underpinning the Study

This study sought to assess the information literacy skills of medical undergraduate students at Moi University and the University of Nairobi and proposed a framework to enhance the ILS

adequacy of higher learning. The theoretical framework of the study was anchored on the following objectives:

1. To assess the status of ILS of medical undergraduate students at Moi University and the University of Nairobi.
2. To examine the ILS policies and curricula enhancing ILS adequacy among medical undergraduate students at the two universities
3. To explore the ILS understanding among medical undergraduate students
4. To analyze the knowledge and skills possessed by staff engaged in facilitating ILS among medical undergraduate students
5. To examine the role of ICT in facilitating and promoting information literacy skills among medical undergraduate students at the two universities
6. To propose a framework to enhance ILS among medical undergraduate students in the selected universities in Kenya

Several theories, for example, the Information Literacy Standards Model, the Bloom Taxonomy, the Sauce Model, the Five-Part Model of Instruction, Six Frames Information Education Theory, Kuhlthau's Theory of Information Search Process, and Eisenberg and Berkowitz's (1988) Big6 Skills Model for Information Problem-Solving, are pertinent to the study of information literacy skills. This study adopted The Six Frames of Information Literacy Education Model (Bruce, Edwards, and Lupton, 2015) and the Sauce Model (Bond, 2011) as the main foundation for this study. The motivation for using the two theories was that the Sauce Model guided research questions [one](#) (1), two (2) four (4) and five (5),

~~1, 2, 4 and 5~~that is:-; What is the status of ILS among medical undergraduate students at the University of Nairobi and Moi University? How does information literacy skills policy and curriculum guide in imparting ILS to medical, undergraduate students? What are the knowledge and skills possessed by staff facilitating ILS among medical undergraduate students? and How is ICT facilitating learning of ILS among medical undergraduate students? while the Six Frames of Information Literacy Education Model guided research questions 2, and 3 that is:- How does information literacy skills policy and curriculum guide in imparting ILS to medical, undergraduate students? and How is the understanding of ILS among medical undergraduate students? in a complementary manner.

2.2.1 Sauce Model

Bond introduced the sauce model in 2001, and it was later updated in 2011 (Bond, 2011). It is a procedure for conducting inquiries and seeking solutions to problems that aims at equipping students with ILS to help them succeed in their academic endeavors (Bond, 2011). The Sauce model has six basic facets/variables: literacy abilities, collaborative and individual learning, required talents, higher thinking abilities, problem-solving abilities, and ICT integration. Furthermore, Bond (2011) states that the six elements of the Sauce Model may be exercised in a five-step process that includes task setup, information acquisition, information usage, information communication, and information assessment. The Sauce model addressed research questions, one (1), two (2) four (4) and five (5), that is ; What is the status of ILS among medical undergraduate students at the University of Nairobi and Moi University? How does information literacy skills policy and curriculum guide in imparting ILS to medical, undergraduate students? What are the knowledge and skills possessed by staff facilitating ILS among medical undergraduate students? and How is ICT facilitating learning of ILS among medical undergraduate students?

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Figure 2.1: Sauce Model Diagram (Source: Bond, 2011)

2.2.1.1 The Key Variables of the Sauce Model and their Relevancy to this Study

a) The information literacy variable

The technical and analytical abilities are emphasized in the information literacy variable (Bond, 2011). Technical skills include the ability to locate, acquire, and store information, whereas critical skills include the ability to identify a need for information, fully understand the information, dispose of irrelevant information, verify pertinent information, appropriately communicate the outcome, and explain decisions with rationality and creativity. The initial stage of the Sauce Model is scene setting, which acts as the anchor for this variable. Bond (2009) alludes that in setting the scene step, the success and failure of the task depend on the usage of relevant keywords or phrases from the probable information sources. Therefore, for it to be successful it requires prior knowledge. The task involves using suitable cognitive verbs (Buzzetto-More (2015). Additionally, Buzzetto-More (2015) suggests that the verbs should be connected to Bloom's revised taxonomy to be able to help users and learners do information cross-over while conducting information searches through the information-seeking question(s).

This facet informed the study in understanding the status of ILS among medical undergraduate students. That is the level of technical and critical information skills that students possess to manipulate accessed information to meet their academic needs. Furthermore, it helped the study understand whether medical undergraduate students were able to define their exact information requirements, conduct proper information searches, recognize accurate and complete information, use the retrieved information to undertake everyday tasks and build individual perceptions/viewpoints through critical review and analysis of assimilated information.

b) Essential skills variable

Essential skills facet of the Source Model offers seven critical skills for ILS adequacy that is, communication, numeracy, information, problem-solving, self-management and competitive, social and co-operative, as well as labor and learning skills. The third step process of the Source model is applied to inform this facet. Bond (2011) asserts that to be information literate is to have the ability to locate, access, acquire, comprehend, analyze, and critique relevant information, then utilize it to make valid, informed decisions and also communicate those decisions appropriately with validation where necessary. The focus is on the application of information.

In principle, the researcher was able to identify students' abilities to utilize the arrays of various sources of information to meet their information needs using the learned ILS. Through this facet, the researcher was able to understand whether the medical undergraduate students had acquired numeracy skills, communication skills, information search and retrieval skills, problem-solving skills, self-management skills, social and cooperative skills, and ethical information use skills.

c) The higher thinking skills

The higher thinking skills facet encompasses the capability to understand, scrutinize, refine, and assess information for problem-solving and decision-making. This facet focuses on training students on higher thinking skills which are crucial and relevant in problem-solving engagements. This facet enabled the study to establish whether students were able to appropriately use library catalogs, use information search techniques/ strategies, scrutinize accessed information from the viewpoints of relevance, and apply critical thinking skills in

solving academic-related problems. This step focuses on applying the higher thinking skills to solve problems.

According to Bond (2011), an information-literate student can locate, access, acquire, comprehend, analyze, and critique relevant information, then utilize it to make valid, informed decisions and also communicate those decisions appropriately with validation where necessary. The focus of this stage is the usage of information. The learner should utilize the information to solve problems; this should be done by just conveying the final solution of the problem. This facet guided the study in finding out the knowledge and skills possessed by staff facilitating students to acquire ILS to enable the students to solve their academic information needs/ problems. Gatero, (2011) asserts that if trainers are well equipped with relevant ILS competencies, then they be able to train students who could easily apply ILS learned in solving their information needs effectively and efficiently.

d) ICT integration variable

The last facet is ICT integration which supports the application and exploitation of various ICT technologies for enhancing ILS adequacy. The ICT integration facet facilitated the researcher in conceptualizing the duty of ICT technologies in fostering ILS utilization, communication, teaching, and learning among undergraduate students in the two universities. The ICT integration facet was informed by the communication and evaluation processes. The communication process is the fourth stage while the evaluation process is the fifth stage in the Sauce Model. The communication process places prominence on appropriate, intelligible, error-free, and intelligent means of passing- across results or ideas. On the other hand, the evaluation process, which is dependent on product and process, focuses on the communicated solution which should be as a result of information search and utilization.

The application of ICT in ILS teaching provides new avenues for transferring ILS to students. This facet enabled the researcher to know the ICT prowess of instructors and students; and how various ICT revolutions have impacted on enhancing ILS adequacy among students in institutions of higher learning. According to Kumar et al (2009), literacy in ICT helps information professionals to find, assess, organize, and transmit the information as and when it is necessary for solving issues and arriving at decisions, thus fulfilling their business's exact information requirements. The construct addresses research question five (5).

2.2.1.2 Justification for using Sauce Model

The Sauce model gave a framework that covered research questions [one \(1\), two \(2\) four \(4\) and five \(5\)](#), ~~one (1)~~: How does information literacy skills policy and curriculum guide in imparting ILS to medical, undergraduate students? and how is the understanding of ILS among medical undergraduate students? Furthermore, Sauce model is based on the idea of expanding and guiding learners to higher-order thinking skills and hence become independent information-literate people (Bond, 2011). The model helped in the attainment of the aim of the study, which was, to assess the ILS of medical undergraduate students at Moi University and the University of Nairobi and propose a framework to enhance ILS adequacy, among medical undergraduate students. In addition, the model's focus on the application of critical reasoning makes it the most appropriate theory in aiding the study to understand the critical thinking skills required in information search and usage.

Additionally, the Sauce model was appropriate for this study because it is a tool that develops the ILS of information users and guides users/learners in every step of research and in finding relevant information to solve a problem at hand (Bond, 2011). Correspondingly, the model

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serves as a tool for teachers/trainers to guide their students on how to search for relevant information to solve problems at hand. Finally, the model stresses the role of ICT in enhancing the adequacy of ILS among learners, which is another focus point for this study.

2.2.1.3 Gaps in the use of the Sauce Model

The model supports learning, training, and usage of ILS in helping users/learners research and solve problems through information search and use. However, the Sauce model is developed to teach ILS rather than to find a solution to a research question or a solution to a problem at hand. The model has a major weakness in that it focuses less on the end product and more on the process. Therefore, there is less or no concern about the final results (whether faulty or not) as long as the process laid down by the model is followed. Another weak point of the Sauce Model is that it does not explain how the ILS curriculum and policy should be developed or enhanced. However, the six frames for the information literacy education model (Bruce, Edwards & Lupton, 2015) were utilized to bridge the identified gaps

2.2.2 Six Frames for Information Literacy Education Model

The six frames for the information literacy education model were developed by Christine Bruce in 1997 as a learning-oriented approach to ILS (Bruce, Edwards & Lupton, 2015). Six frames for the Information Literacy Education model addressed ~~research questions~~ research questions two (2) and three (3): How does information literacy skills policy and curriculum guide in imparting ILS to medical, undergraduate students? and how is the understanding of ILS among medical undergraduate students?

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The six frames for the information literacy education model were created as a theoretical tool to assist participants in the ILS education arena in reflecting on and analyzing the many implicit and explicit theoretical impacts on their settings. The frames have resulted in a paradigm change in ILS teaching, learning, and curriculum development (Secker & Coonan, 2011). The six frames of information literacy education are:

1. The Content Frame
2. The Competency Frame
3. The Learning to Learn Frame
4. The Personal Relevance Frame
5. The Social Impact Frame and
6. The Relational Frame.

Each frame represents a distinct perspective on ILS, information, curricular emphasis, learning and teaching, content, and assessment. Some frame components apply to both substantive content and ILS components when both are taught concurrently.

Frame one: Content Frame- The content frame is discipline-centered, which means that the emphasis is on what learners should know about ILS. In addition, the ILS evaluation often assesses the amount of information a learner has learned. The content frame advocates for teaching ILS sessions inside a discipline-based subject, as well as presenting lectures with a critical set of information tools and strategies.



CONTENT FRAME	
View of IL	IL is knowledge about the world of information
View of Information	Information exists apart from the user; can be transmitted
Curriculum focus	What should learners know about the subject, about IL?
View of learning and teaching	Teacher is an expert- transmits knowledge. Learning is a change in how much is known
View of content	What needs to be known has primacy. All relevant content must be covered
View of Assessment	Assessment is objective. Measures how much has been learned, ranks student via exams

Figure 2.2: Content Frame-Six Frames for Information Literacy Education Model
(Source: Bruce et al., 2006)

Frame Two: The Competency Frame- The competence frame is often behavioral or performance oriented. This frame is concerned with the question of what learners should be able to perform and at what degree of competence. The framework recommends for the construction of an instruction program that would allow students to acquire the necessary competencies.



COMPETENCY FRAME	
View of IL	IL is a set of competencies or skills
View of Information	Information contributes to the performance of the relevant capability
Curriculum focus	What should learners be able to do?
View of learning and teaching	Teachers analyse tasks into knowledge and skills; learners become competent by following predetermined pathways
View of content	Content is derived from observation of skilful practitioners
View of assessment	Assessment determines what level of skill has been achieved

Figure 2.3: Competency Frame-Six Frames for Information Literacy Education Model
(Source: Bruce et al., 2006)

Frame Three: The learning-to-learn frame- The frame is constructivist in nature. It seeks to know what it is like to think like an information literate expert, such as an information scientist, accountant, surveyor, journalist, or landscape designer. The framework is also concerned with what will assist learners in effectively constructing knowledge and developing methodologies for learning that encourage the development of professional thinking patterns. The goal of assessing ILS is to understand how processes of information have influenced learning or learners' approaches to the topic at hand.



LEARNING TO LEARN FRAME	
View of IL	IL is a way of learning
View of Information	Information is subjective – internalised and constructed by learners
Curriculum focus	What does it mean to think like an (IL) professional in the relevant field?
View of teaching and learning	Teachers facilitate collaborative learning; learners develop conceptual structure and ways of thinking and reasoning
View of content	Content is chosen for mastering important concepts and fostering reflective practice
View of assessment	Complex, contextual problems are proposed. Self or peer assessment is encouraged

Figure 2.4: Learning to Learn Frame-Six Frames for Information Literacy Education Model (Source: Bruce et al., 2006)

Frame Four: The Personal Relevance Frame- This frame promotes the use of an experienced approach. In connection to ILS education, the framework requires learners to gain an understanding of what ILS can accomplish for them as well as the specific experiences necessary to make it possible for learners to interact with the topic at hand.



PERSONAL RELEVANCE FRAME	
View of IL	IL is learned in context and is different for different people/groups
View of Information	Valuable information is useful to the learners
Curriculum focus	What good is IL to me?
View of teaching and learning	Teaching focuses on helping learners find motivation. Learning is about finding personal relevance and meaning
View of content	Problems, cases, scenarios selected to reveal relevance and meaning
View of assessment	Typically portfolio based – learners self assess

Figure 2.5: Personal Relevance Frame-Six Frames For Information Literacy Education Model (Source: Bruce *et al.*, 2006)

Frame Five: Social Impact Frame- It embraces a social reform focus, which is how ILS affects society and how it may assist communities inform/solve key problems. Learners would be tested based on their grasp of how IL could impact the social issue at hand.



SOCIAL IMPACT FRAME	
View of IL	IL issues are important to society
View of Information	Information is viewed within social contexts
Curriculum focus	How does IL impact society?
View of teaching and learning	Teachers role is to challenge the status quo. Learning is about adopting perspectives that will encourage social change.
View of content	Reveals how IL can inform widespread or important social issues or problems
View of assessment	Designed to encourage experience of the impact of IL

Figure 2.6: Social Impact Frame-Six Frames for Information Literacy Education Model (Source: Bruce *et al.*, 2006)

Frame Six: The Relational Frame- The frame is focused on how learners are aware of ILS or certain relevant phenomena related to ILS. The framework focuses on creating experiences

that assist learners in discerning more powerful ways of viewing the phenomenon under consideration. Furthermore, this frame incorporates reflection as one of the strategies for encouraging learners to understand complicated variations of phenomena.



RELATIONAL FRAME	
View of IL	IL is a complex of different ways of interacting with information
View of Information	Information may be experienced as objective, subjective or transformational
Curriculum focus	Bringing about awareness of the critical ways of seeing or experiencing
View of teaching and learning	Teachers bring about particular ways of seeing specific phenomena; learning is coming to see the world differently
View of content	Examples selected to help students discover new ways of seeing. Critical phenomena for learning must be identified.
Assessment	Designed to reveal ways of experiencing

Figure 2.7: Relational Frame-Six Frames for Information Literacy Education Model (Source: Bruce et al., 2006)

The relational frame mediates the content, learning to learn, and experiential frames to guide in the designing of an ILS policy and curriculum. The relational frame in this study was concerned with how ILS policy and curriculum are developed and delivered to medical undergraduate students of the University of Nairobi and Moi University to enhance their ILS adequacy.

2.2.2.1 Relevancy of the Theory to this Study

This study adopted the relational frame of the six frames for information instruction education model to guide the researcher answer research questions two (2) and three (3) of this study.

The six-frame theory helped the study understand the ILS policy and curriculum tenets that guide the drafting, implementation, and delivery of the ILS curriculum to improve or develop

ILS adequacy among medical undergraduate students of the University of Nairobi and Moi University. According to Bruce, et al (2006), Six frames theory is interested in ILS content and how that content is delivered, seen or experienced by learners. Further, the theory enabled the researcher to discern the ILS understanding among undergraduate medical students. Tilvawala et al (2019) attests that ILS learning guide and motivate learners to seek for solutions by combining existing and newly acquired information and simplifying knowledge. This way, students develop an efficacious attitude towards ILS learning and training because they (the learners) are the driving force behind learning, hence take effective participation and establish broader applications for skills learned through activities that encourage risks, problem-solving, and probing.

Consequently, the researcher attempted to search for theories that have been developed in Africa for African ILS concerns and context. The researcher did not find any theory that had been developed for the African ILS context or by Africans. However, the Sauce Model and the six frames for information instruction education model have been adopted by various researchers in Africa for African context studies notably, Lwehabura and Stilwell (2008) Dadzie, 2007, Akakandelwa & Walubita (2018) and Kanguha (2016)

2.2.3 Justification of using the two theories

This study adopts two theories namely Sauce Model (Bond, 2009) and The six-frame theory (Bruce et al 2006) as theoretical lens in addressing the research questions. Additionally, there is an element of pragmatism ontology in adapting ideas from a range of theories as Creswell (2009) alludes that mixed methods research may both test and generate theories thus the study as adapted mixed method epistemology resulting in the use of two theories.

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The study is underpinned by the Sauce model and the Six Frames of Information theory. The Sauce model helped in the attainment of the aim of the study, which was, to assess the ILS of medical undergraduate students at Moi University and the University of Nairobi and propose a framework to enhance ILS adequacy, among medical undergraduate students. In addition, the model's focus on the application of critical reasoning makes it the most appropriate theory in aiding the study to understand the critical thinking skills required in information search and usage. Consequently, according to Bruce, et al (2006), Six frames theory is interested in ILS content and how that content is delivered, seen or experienced by learners. Further, the theory enabled the researcher to discern the ILS understanding among undergraduate medical students. [Furthermore, Bruce et al \(2006\) model also suggest directions for educators on curriculum development and may be of use in community settings. Finally, the Sauce model more explicitly than other models uses cognitive conditions \(knowledge and understanding\) to describe information literacy situations which are attributes closely related to medical training.](#)

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Table 2.1: Mapping of Research Questions to Key Variables of the Sauce Theory

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Research Question	Theory	Key Variables from the Theory
What is the status of information literacy skills among medical undergraduate students in the University of Nairobi and Moi University?	Sauce model (Essential skills variable/facet)	Information need, technical skills, Critical skills, information validation, Lasting retention
What ILS policy and curriculum are used to impart ILS to medical undergraduate students at the the University of Nairobi and Moi University?	Six Frames for Information literacy Education model (Relational Frame)	Curriculum focus; teaching and learning; learners' views; assessment procedures and methods
What is the perception of medical undergraduate students towards ILS?	Six Frames for Information literacy Education model (Relational Frame)	teaching and learning; learners' views; assessment procedures and methods
What knowledge and skills are possessed by staff of the University of Nairobi and Moi University in facilitating ILS among medical undergraduate students?	Sauce model (higher thinking skills facet)	Comprehend, Analyze, and synthesize. Opinions, Problem-solving, Decision making, teaching ILS
What is the role of ICT in facilitating and promoting the learning of information literacy skills among medical undergraduate students?	Sauce model (ICT integration)	Teaching and learning, Technologies, Information retrieval, Quality learning

2.3 Other Theories Relevant to the Study but not Applicable

The other theories that were considered but not adopted because of their inherent weaknesses, were the Big6 Skills Model advanced by Eisenberg and Berkowitz, and the Theory of Discovery Learning by Jerome Seymour Bruner among others.

2.3.1 Big 6 Skills Model information Literacy Model by Eisenberg and Berkowitz

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Eisenberg and Berkowitz (2010) developed the Big6 skills model, which is a six-step research paradigm for information problem-solving or process. The paradigm combines information search and use abilities with technological tools in a systematic process for finding, using, applying, and evaluating information for specific requirements and activities (Eisenberg & Berkowitz, 2010). The Big6 skills model has the following steps: task definition, information-seeking strategies, location out access, use of information, synthesis and evaluation (Eisenberg & Berkowitz, 2010). This theory was not selected for this study because it put more emphasis on the level of ILS in the utilization of e-resources, which was not the focus of this study. In addition, the theory cannot be applicable among learners to determine the full range of its value for giving the student greater confidence and understanding of the complexities involved in information problem-solving. Furthermore, the Big6 information literacy skills Model cannot be used to inculcate knowledge as well as encourage self-assessment among university students because it was developed for kindergarten through twelfth grade level (elementary school level). Again, this theory focuses only on problem solving aspects of ILS and leaves out other important tenets of ILS like collaboration, critical thinking, community service among others.

2.3.2 Jerome Seymour Bruner's Theory of Discovery Learning

The theory of discovery learning was advanced by Jerome Seymour Bruner in 1961. The theory is also known as the constructivist approach to learning. It alludes that learners should develop their knowledge, by organizing and categorizing material using a coding system (Bruner, 1961). The theory further urges that the most efficient approach for learners to build a coding system is for them to find it on their own rather than being taught explicitly by a teacher/instructor/trainer. However, this theory was not chosen for this study because of a number of reasons. Firstly, ~~the discovery learning can be detrimental to learning, especially for beginners, because it can cause a heavy working memory load hence inefficient, especially for beginners.~~ Secondly, the theory overlooks the fact that students have prior knowledge that they build upon with new knowledge. Thirdly, Bruner's theory can be too time-consuming for academic activities because it requires teachers to be ready to make too many corrections. Finally, the theory leads to learners' continual roaming and quest for solutions, which can be confusing, and it rejects the premise that there are significant abilities and information that all learners should learn.

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2.4 Chapter Summary

Chapter Two outlines the main models s that was applied in this study namely ~~Sauce model and the six frames for the information literacy education model.~~ ~~were the theories that underpinned this study.~~ In a nutshell, the majority of the models highlighted focus on similar facets of information literacy skills, such as the capability to define an information problem, critical thinking, problem-solving, exploring various information sources, and how to access and critically evaluate accessed information for knowledge development.

The key themes emerging from this chapter are that collaborative learning, individual learning, and higher thinking skills are the basis for enhancing the adequacy of ILS in lifelong learning

and workplace success among lecturers and students because it enables them to understand concepts in their domains of practice. The theory articulated in this chapter lays the ground for the next chapter, an in-depth discussion of the literature review. Variables from the theoretical framework will form the basis of the literature review namely information literacy skills' programs, collaborative learning, higher thinking skills, ICT integration in learning ILS, ILS infrastructure, ILS policy, and regulations governing the teaching and learning of information literacy skills in a university setting.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

A review of the literature is an extensive synthesis of the acknowledged information and facts found in scholarly works on a certain topic. It is also an overview of the advancements made in a certain field of study during a specified time frame. It might be as simple as a list of references or a bibliography, or it can be as comprehensive as a critical analysis of an original work that addresses the topic as it has been explained. Different scholars such as Cohen & Manion (2018); Snyder (2019) and Van Lange Paul (2015) argue that a literature review aids in highlighting the significance of the issue, incorporating it into a conceptual framework, and preventing effort repetition. Van Lange Paul (2015) observes that the review of literature helps to explore aspects of the central phenomenon of the topical tenets of the problems being investigated. According to Van Lange Paul (2015) and Snyder (2019), the motivation for reviewing literature includes:

- To determine what is currently understood in the field of interest for the research.
- To reveal missing links to the current theories or reveal gaps that remain in the problem areas.
- To establish methodological issues applied by other researchers in the research area.
- To avoid duplication and also form the basis upon which the study findings will be interpreted.
- To reveal other strategies, procedures, or measuring instruments useful in investigating the problem.

- To act as a curtain-raiser to the researcher by drawing attention to the previous studies including debates on the previous findings.
- To address new approaches so as to avoid repeating previous mistakes;
- To get ideas from suggestions and recommendations from previous researchers in similar studies (Ishtiaq, 2019).

There are categories of literature review as advanced by Torraco (2016). First are the historical reviews which break down the literature into stages or phases and take into account the literature's historical progression. Second is the integrated reviews which are organized according to various concepts or viewpoints and highlight agreement and disagreement in debates on a given subject. Thirdly are the hypothetical reviews which demonstrate how empirical data support a theory and lastly, the methodological or empirical reviews which are summaries of empirical research findings on various methodologies. In this study, only historical and thematic types of literature were reviewed.

This chapter is arranged according to thematic areas derived from the research objectives, theoretical framework variables, and far-reaching concepts that touch on the research problem. The concepts are: the meaning of ILS, ILS status; ILS curriculum and policy; ILS understanding; ILS competencies of staff; and ICTs integration with ILS.

3.2 Information Literacy Skills

Scholars in ILS like Kavulya (2003); Freeman, (2010); American Library Association (2020) & Sample (2020) agree that ILS is a generic terminology that covers concepts like digital, visual, knowledge of appropriate communication channels, academic literacy, information manipulation and management. Scholars Kavulya, (2003); Freeman (2010); Foo et al, (2019);

& Klomsri and Tedre, (2016) agree that ILS is the capacity to comprehend text, write it down, and use information and communication technologies to successfully deal with online content that is correlated with electronic, visual, and multimedia literacies

Furthermore, according to Freeman (2010), data management, data selection, information processing, and information skills are all strongly associated with ILS competences. The methods pertain to how an individual engages and converses with information. It blends the mental and physical processes involved in using information with information searching. Additionally, Freeman, (2010) gave the following diagram on the ILS landscape.

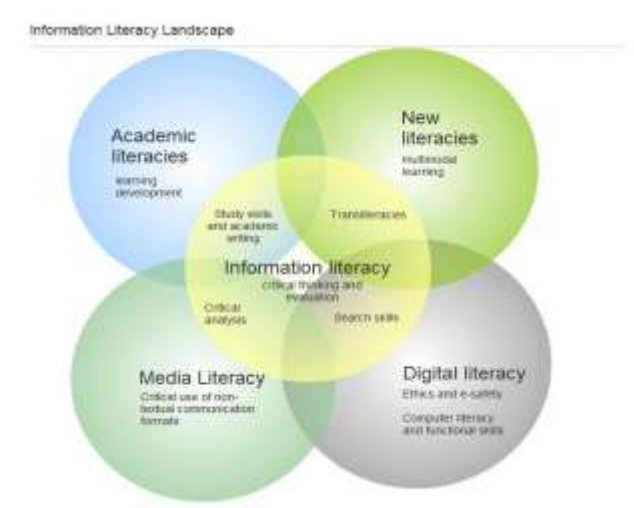


Figure 3.1: Information Literacy Landscape (Source: Virkus, 2003)

3.3 History of Information Literacy Skills

ILS was developed from antecedents like library training, bibliographic teaching, and library user education (Bruce, 2001; Kavulya, 2003; Nyamboga, 2002 and Virkus, 2003). In the 1970s and 1980s, libraries across the globe notably in Europe and the Americas rolled out library

training programs like user-education training, library orientation, referencing, and bibliographic writing among others. Scholars like Kavulya (2003); Mbaabu et al, (2012) and Lwoga, (2014) agree that the history of ILS in Africa is related with that of the European countries. According to these scholars, ILS in African nations began in the 1980s through library user-education programs, which were taught to incoming first-year students at universities.

Mbaabu et al (2012), Lwoga (2014) & ACRL (2016) opine that the term ILS has evolved. That is the idea, which originated as a method of library education, has been expanded to encompass a more thorough endeavor of ILS instruction and learning in the academic setting. Shenton (2009) asserts that ILS has expanded to include literacy skills, bibliographic teaching, library instruction skills library skills, library user skills, user education, and library information technology skills.

The term ILS was coined in 1974 by Paul Zurkowski when he advocated for people to become information literate to thrive and sustain themselves in the rapidly developing information society (Kavulya (2003), Nyamboga (2004), Gatero (2011), Kanguha (2016), Mbabu et al (2012) Lwoga (2014) & ACRL (2016)). Zurkowski (1974) described ILS as “the ability to use techniques and skills for the wide range of information tools as well as primary sources in molding information solution to a problem”.

In an attempt to provide an internationally accepted definition of ILS, the ACRL (2020) outlined ILS as a series of skills needing people to understand when information is needed and have the capacity to discover, evaluate, and utilize the necessary information. Furthermore, an international conference on the value of ILS worldwide was held in Prague in 2003 which was sponsored by the National Commission on Libraries and Information Science; the United

Nations Educational, Scientific and Cultural Organization (UNESCO); and the National Forum on Information Literacy (NFIL) came up with The Prague Declaration of 2003. The Prague Declaration of 2003 stated that ILS is essential to the cultural, social, and economic growth of societies, nations, organizations, and people. The forum went on to proclaim that obtaining ILS is an essential human right (Webber & Johnston, 2017). Similarly, a conference held in Alexandria, Egypt in 2015 about the role of ILS in the information age, gave birth to The Alexandria Proclamation that linked ILS with lifelong learning and established ILS as a fundamental human right that encourages international social inclusion (Daniel, Meho, & Moran, 2015).

Competencies that will improve research quality and increase job opportunities; search techniques that make use of the Boolean logic operators AND, OR, and NOT in order to find and retrieve pertinent information; the ability to objectively assess and interpret research results; the ability to use knowledge that has been collected lawfully and morally; and the ability to reference and cite sources correctly, appreciating the contributions of others.

Therefore, based on the explanation above, ILS includes awareness of a person's information requirements and concerns as well as the capacity to recognize, find, assess, organize, use, and communicate information to solve current challenges or issues.

3.4 Status of Information Literacy Skills in Universities

An assessment of the status of a phenomenon assists in delving into details on the current status, effectiveness of implementation strategies, and prospects and provides a pathway of mitigation procedures or areas of further improvement on the phenomenon under consideration (Taylor, 2008). Lwehabura (2008) states that librarians are chief instructional

partners in universities hence should work closely with lecturers and other stakeholders to identify learners' information requirements. This is doable because librarians are change agents, leaders, pedagogical innovators, and risk-takers (Kingori, 2015). Additionally, Taylor (2008) avers that most ILS initiatives and programs have been introduced by universities under the influence of librarians.

Kavulya (2003) and Adeogun, (2016) agree that the focus of libraries is to ensure patrons utilize information materials optimally regardless of the format. Therefore, there is an urgent need to train library patrons on ILS to enable them to recognize and choose appropriate information, use relevant information search techniques, and be in a position to gauge, establish, and synthesize information. Hence, a need for ILS adequacy. Additionally, Dorvlo & Dadzie (2016) in their study on Information Literacy among Post Graduate Students of the University of Ghana, state that establishing ILS as part of university activity is the surest way of winning "hearts and minds" towards legitimating ILS in institutions of learning. This is true especially in Africa where according to scholars Kavulya (2003), Njuguna (2004), and Ojedokun and Lumande (2005) in a study on cooperative electronic networks of academic libraries in southern Africa established that ILS is a less important aspect in many African universities and often plays second fiddle, hence not included in the curriculum.

In a study titled ILS use of information resources in the university of Illorin done by Uwakwe et al (2016) noted that all library resources should be used efficiently and this is possible if students are taught ILS. Furthermore, according to these researchers, ILS may be taught through seminars, workshops, orientation/training programs, and occasional "know your library" events hosted by library staff for both first-time and seasoned patrons.

In the same breath, Parker (2003), Ojedokun ~~&and~~ Lumande (2005) and Uwakwe et al (2016) contend that the development of computer systems and the introduction and progress of technology have led to an unparalleled rise in the number of published materials, both in print and non-print formats. This has forced contemporary libraries and the field of librarianship to seek out and implement cutting-edge instruments and procedures in the course of carrying out their duties. These sentiments are echoed by Baro 2010 study on effects of user education on law students' use of the library using descriptive research design state that the development of ICT facilities has led to the development of technologies for information storage, retrieval, and distribution, which presents issues for library users to a higher level. It is thus necessary to teach students how to effectively use these technologies for them to obtain pertinent information.

Additionally, Uwakwe et al (2016) state that libraries are embracing the digital era and have incorporated several technological tools and techniques into their service delivery. These consist of, among other things, email devices used for library registration and surfing, connections to the internet for information searching and browsing, and the Online Public Access Catalogue (OPAC) for online cataloging and searching. The adoption and deployment of these cutting-edge information tools and technologies places a responsibility on library service providers to develop high-quality ILS programs, to enable library patrons to gain proficiency in how to make the best use of library services as well as accessibility. In addition, any library's usage rate is determined by among other factors, the quality of its ILS programs, which also actualizes the most sustained level of satisfaction among users. The implication of this is that low rates of usage of the library's resources and services may be a result of the absence or poorly packed ILS (Uwakwe et al, 2016).

The degree to which a library's materials and services are utilized determines how effective it is. This validates all the work librarians do to arrange resources in the library so that they are optimally used. One of these initiatives is enhancing the adequacy of ILS to library users so that the patrons/users familiarize themselves with the library, its resources, and services so that they can easily get the information they need. According to Onyeneke (2017), several ILS surveys on ILS competencies among undergraduate students in Africa, highlight the fact that a large number of students do not utilize the library and are unaware of the resources available there. Furthermore, he claims that because they don't know much about the search tools, library users have trouble finding the resources they need. Consequently, there is underutilization of information materials, which may be the reason behind students' incapacity to do significant research, leading to subpar academic outcomes.

Further, Edom (2007) and Nyamboga (2002) state that the objective of ILS is to help the learner reap the most from library services and resources. The objectives of ILS are literacy skills; advance skills to facilitate retrieval of the required materials; creating an understanding of information materials available about the readers' subject area; enabling appropriate referencing and bibliographic writing; and inculcating a positive perception towards information search and retrieval. However, Anunobi ~~&and~~ Ukwoma (2016) state that despite the widespread adoption of ILS, the skills taught in educational institutions of higher learning in Nigeria, have been unable to help learners progress from elementary library literacy to a more advanced level. As a result, many students at Nigerian Universities are unable to use information legally and ethically, students still don't know how to consult multiple information sources and they are unable to utilize high-level information search strategies to be able to retrieve authentic information.

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Dadzie (2004), Odini (2000), Kavulya (2003) and Kanguha (2016) concur that the orientation given to first-year students in the first week of reporting to university is not well structured. Also, the library skills component in the communication skills unit and sometimes lecturers arranging for sessions with librarians to teach students how to search for information are inadequate (Asafe, 2014).

In addition, Wanyingi (2018) asserts that several undergraduate students lack knowledge on how to use search engines to retrieve information, don't know the various information sources, and don't understand information search strategies. This points to a lack of ILS. Furthermore, Milton et al (2018) in his study observed that healthcare providers in Garissa County, Kenya did not have skills for information search in health information databases, could not analyze and comprehend digital data, and there was an absence of supportive policies and programs that promoted a culture of enhanced information seeking behavior among health professionals. This demonstrates an apparent absence of ILS among medical experts. Similarly, Oketch et al. (2010) declare that healthcare professionals seek information only when it is required and that a big fraction of it is not available/reliable. Furthermore, Oketch et al (2010) state that healthcare professionals rely on observation, advice from peers, and empirical experience gained from treatment success and failure. As a result, according to Osei (2017), many fatalities may have been averted if healthcare professionals had sufficient ILS to enable them to access relevant and trustworthy health information.

Odini (2000) alludes that many students joining higher education institutions from secondary schools, often have limited information skills because of poorly run and developed school libraries. These students don't have the prerequisite ILS required to enable them to utilize information material available at institutions of higher learning. Additionally, Gatero (2009)

in his study on the utilization of e-resources among nurses at the Kenyatta National Hospital, Kenya, found out that many nurses were unaware of how to search e-databases and as such they relied on their colleagues to help them carry out assigned duties. Similarly, Ogburn (2020); Nyamboga (2002); Kavulya (2003); Odero (2009); and Kanguha (2016); aver that many students at universities rely on lecture notes because they don't have competencies to access and retrieve relevant information about their pertinent information requirements. This points to the absence of ILS. The Sauce Model under the essential skills variable/ facet posits that to be information literate, one must be able to find, access, gather, understand, evaluate, and critique pertinent information. One must also be able to use this knowledge to make sound decisions and, when needed, to communicate those decisions with the appropriate validation (Bond, 2011).

From the literature Cornwall (2011); Nyamboga (2002); Kimani (2014); Kavulya (2003); Steinert (2014); Kanguha (2016); Shabi, Shabi, Akewukereke, ~~&and~~ Udofia (2011) study on utilization of internet medical databases endorse for more research to fully understand the ILS that students possess because most of them struggle to obtain, utilize and reference knowledge resources appropriately. Additionally, from the literature, Kanguha (2016) recommended that a study should be undertaken to ascertain the status of ILS among medical students because their program is problem- based and students are supposed to apply practically all the information learned when attending to patients, hence requiring sufficient ILS. This study therefore sought to fill this gap by determining the current status regarding ILS by asking specific questions on whether students are capable of finding, retrieving, storing, and sharing information; do the learners know how to search the electronic databases; do the patrons have sufficient access to material and equipment necessary to retrieve information; do learners have

the know-how to use retrieved information ethically and legally; do students know how to use ILS for critical thinking and problem-solving; and are the learners engaging in collaborative learning with peers among others.

3.5 ILS Policy and Curricula Facilitating ILS in Universities

Sharma & Upadhyay (2021) asserts that higher education in the 21st century requires strong components of ILS in their curricula to produce ILS-competent graduates. He further states that the level of ILS competency in a student is determined to a greater extent by the ILS policy and curriculum in place that guide in crafting the ILS curriculum, ILS content delivery, facilitation on ILS evaluation, application of ICT to enhance and deliver ILS to students and the collaboration mechanisms between librarians and lecturers (ACRL, 2010).

3.5.1 Policy and Regulatory Framework available to Facilitate ILS in Universities

To support ILS in universities, IFLA developed an exhaustive paper in 2014 outlining the legal and policy framework to guide and facilitate ILS in educational institutions. The paper covers guidelines and standards established for ILS instruction and implementation. Moreover, Gitonga (2015) acknowledges that information literacy standards are broad student outcomes that describe an information-literate student. Similarly, Kingori (2015) alludes that performance indicators, levels of efficiency, and examples are provided by the IFLA standards to enable library specialists to measure students' competencies at various levels.

Universities across the world have adopted a variety of ILS standards and guidelines, that recommend the several ILS that students need to possess and demonstrate (Mokhtar [and](#) Majid, 2008).

In Kenya, The Universities Act No. 42 of 2012 and the Universities Standards and Guidelines (2014) are two documents that emphasize how crucial it is for undergraduates to possess the

right ILS to organize and utilize information efficiently. The Commission for University Education (CUE) in 2007, published standards and guidelines for university libraries in Kenya. The fourth section of the guidelines stated that universities should “motivate lifelong learning through the integration of the best conventional resources with innovative methods and technologies, and also facilitate academic success.”

Nonetheless, Kanguha 's (2016) research on information literacy learning experiences of fourth year psychology students in Kenyan universities found that a further reason for Kenyan undergraduate students' undeveloped ILS was the lack of an institutional or national ILS policy framework. This is in consistent with the results of a study conducted by Katundu (2004) on information literacy skills in two Tanzanian public universities. She discovered that there was a lack of a policy framework for ILS training. And that attempts to integrate library instruction, orientation, or user education failed to produce a workable policy, that would have allowed for the development of an all-around individual user who could locate, assess, use, create, organize, or share information. Furthermore, researchers like Kavulya (2003), Gitonga (2015), Mathangani, (2019) and Kingori (2015), point out that a major obstacle to ILS training and education in Kenya is the absence of ILS policies and curriculum. As a consequence, Gitonga (2015) study on information literacy education: perceptions, proficiencies and experiences which adopted a mixed method approach assert that the majority of African libraries and educational institutions employ standards created in Western countries that do not represent African requirements and are thus never appropriate for the region.

In the same breath, Kavulya (2003) research study on challenges facing information literacy efforts in Kenya asserts that attempts to incorporate orientation, user instruction, or library training in universities have not been effective in producing an all-around individual patron

who can locate, assess, utilize, produce, arrange, or exchange information. As such, Katundu (2004) study that adopted mixed method approach on mainstreaming information literacy across university curricula in Tanzania found out that before developing an ILS policy and curriculum for ILS delivery, training, and learning in universities it is essential to carry out a user ILS needs survey. Similarly, Kavulya (2003) asserts that ILS instructions are delivered in a theoretical way since the insight gained cannot be applied right away and that library teachings are library-centered rather than information-centered. Therefore, before beginning ILS instruction, it is vital to ascertain the student's degree of competency.

In addition, the Bruce Six frames theory supports these sentiments by stating that the ILS curriculum should be developed and experienced variously in line with the prevailing conditions of the learning environment. Therefore, Bruce's Six frames model through the relational variable states that developers of an ILS curriculum ought to consider ILS as a set of several information-interacting methods which are objective, subjective, or transformational.

In addition, researchers such as Weber (2000) and Washer (2007) have proposed the Key Skills Agenda Initiative as a policy that needs to be adopted in ILS training and learning in institutions for higher learning. Weber (2000) observes that the "key skills" agenda is a recurrent theme in initiatives for UK higher education. According to Washer (2007), the "proponents of the skills agenda in industry and government argue that changes are needed in the focus of university learning and teaching to prepare graduates for employment and lifelong learning in the face of fast-moving changes in knowledge." This agenda aims to make graduates more employable or equip them with the skills that employers want. The National Committee of Inquiry into Higher Education (Washer, 2007), listed the following as "essential

skills in ILS which ought to be incorporated into the ILS policy” that is information technology, communication, numeracy, and learning how to study. Additionally, the report advocated for the promotion of ICT innovation in curriculum design and instruction and essential skills to improve content learning. These are the key tenets in the Sauce Model as advanced in 2011.

Furthermore, Katundu (2004) states that many initiatives at the University of Sokoine and Dar-es-Salaam University have not been successive to develop an all-round lifelong learner because no ILS policy makes ILS training a credit-bearing course. This is a gap that this research sought to fill.

3.5.2 Information Literacy Skills Curriculum

According to Dunn (2002), it has been clear since the beginning of the information age that learners cannot learn what they require for university from the suggested textbooks. They require additional knowledge from different information materials that are available in numerous formats. As a result, for learners to study independently, they need to get instruction in ILS (Baro et al, 2013). Over decades, various kinds of user education programs have been developed around the globe, and the information literacy literature is replete with research on these programs. The overarching subject is on how to make ILS programs better, not whether or not to offer them. According to Lanning (2017), students become information-competent if the right ILS curriculum is in place.

Bruce’s Six Frames model under the relational facet advocates for the design of an information literacy curriculum that helps learners develop imperative competencies that enable them to discern powerful strategies for analyzing an area of study, thereby becoming long-life learners with prudent problem-solving abilities (Bruce, Edwards & Lupton, 2015).

ILS has not received the credit it deserves in African universities' curricula (Ojedokun [and Lumande, 2005](#)). In addition, very few universities have taken it seriously and offer ILS as a credit subject (Bury, 2016; Rasaki, 2008). Furthermore, Dulle (2004) and De Jager & Nassimbeni (2005) study on ILS and quality assurance in African institutions of higher learning, which adopted a concurrent mixed methods approach revealed that most African universities offer user training and library orientation and that the majority of them lack the potential to develop information users with appropriate ILS qualities and there is minimal evidence of institutional devotion to ILS instruction and learning.

In Kenya, Kavulya (2003), Gitonga (2015), Kingori et al (2013) acknowledge that universities have a library user education topic as a component of the communication skills course unit which is imparted along with library reading, information seeking, and writing skills whose overall objective is to enable users to utilize the library information resources effectively. Additionally, Odini (2000) notes that Kenyan educational institutions provide a variety of ILS programs. These include library manuals and guides, personalized instruction, reference services, library instruction courses, and library orientation. However, Kavulya (2003) notes that the time allocated for library orientation and user education is insufficient to teach new university students practical library skills.

Baro (2013) proposes two ways to construct ILS curricula, namely integrated curriculum and compartmentalized curriculum. In the compartmentalized curriculum, ILS is imparted as a separate subject that can be found in the curricula at all academic levels. This model's courses often emphasize the early phases of the ILS paradigm, including recognizing the information required, locating that information and examining the information sources, content assessment, and applying information morally and lawfully for a given endeavor. While the integrated

curriculum covers information skills in multiple fields of study and extracurricular activities. Correspondingly, the relational variable in Bruce's Six Frames Model, alludes that ILS curriculum content should assist students in finding fresh perspectives on a given phenomenon. From the literature, it is clear that there is no formal agreed method for effective ILS assessment and evaluation.

Moreover, Withorn et al (2021) and Anandhalli, (2018) state that institutions of higher learning should conduct ILS assessments to ascertain the adequacy of their ILS curriculum in attaining the objectives set in the curricula. Which is to effectively enhance the ILS of undergraduate students, among other objectives. Withorn et al (2021), defines three kinds of ILS evaluation methodologies based on whether the goal is to examine what learners have learned or their perception of ILS learning. First are the prescriptive or diagnostic methods which are used to test students' knowledge and skills before instruction. Examples include conventional assessments and a review of a student's previous work. The second is the formative evaluation approach which evaluates how well learners perform and gives comments whilst training is taking place. Based on the comments, the trainer can alter methods of instruction as the class develops. Examples include drafting brief reflection/reaction essays in response to a reading task. Third is the summative evaluation approach which is used to assess what has been learned once training has been completed. Some examples involve queries with multiple choices. According to Coulter et al (2017); Gross and Latham (2019); and Hoffmann [and](#) Labonte (2012) ILS assessment and evaluation techniques involve quizzes, questionnaires with multiple choices, evaluation of portfolios, self-evaluation essays, simulations, observation, final grades, group discussions, and courses that require students to synthesize and use their knowledge through essays and reflective thinking.

Furthermore, literature has shown the unavailability of standard assessment techniques to ascertain the effectiveness of the ILS curriculum. Additionally, many learners engage in plagiarism, have inadequate critical thinking skills, have deficient information evaluation techniques, don't know information search strategies, do not understand intellectual property rights, relying heavily on Google as the main source of information. This is a clear indication of absence of ILS competencies hence low utilization of ILS in accessing, evaluating, and of information materials in Kenya hence this study will help bridge this gap. This study therefore sought to find out the adequacy of ILS content covered by the ILS curricula, its relevancy in enhancing ILS among medical undergraduate students, mode of ILS delivery to come up with strategies to solve the challenges revealed in this section.

3.6 ILS Understanding

According to ACRL (2016), every person who wants to prosper in the information age must know and understand the rapidly changing information technologies, and have the necessary ILS. To properly do this, an individual needs, among other things, to improve their understanding of ILS. An individual's mindset affects attitude and every detail in life. It influences how people react to events and impacts choices and behaviors (Ondari-Okemwa, 2016). Understanding, or attitude, encompasses a person's viewpoints, traits, preferences, and beliefs. Amunga,(2011) defines understanding as the behavior you exhibit towards someone or something; this reflects your feelings and your thought process. Tella and Bashorun (2012) define understanding as an interior mental condition that influences conduct that relies on someone's expertise and its application in a new circumstance. According to Gajalakshmi (2013), attitudes towards a certain thing are composed of three primary elements: emotional (our feelings), intellectual (our thinking abilities), and behavior (our actions). Adekunle, Ogie,

~~and~~ Tella (2007) define understanding as dispositions and sentiments, biases or prejudice, predetermined beliefs, thoughts, anxieties, and beliefs regarding a certain issue.

Ondari-Okemwa (2016) emphasizes the relevance of one's own understanding as an impetus for learning experiences. ILS scholars Amunga (2011), Ahmed and Bora (2020), Beetham (2013),—study on digital literacy: bridging the gap with digital tools, concur that comprehending ILS is critical to learners' success. Further, MckeeWaddell (2015) finds positive connections between the mindsets of learners and intellectual advancements, finding that learners who enter a course with more positive understanding are more inclined to make significant learning breakthroughs. Gajalakshmi (2013) concur by stating if learners possess a good understanding regarding a topic, they may accomplish a great deal in that field. As a result, no matter how competent the teacher is, a student cannot succeed in a course if he feels that irrespective of the effort he puts, he will fail (Ogunlana et al.'s (2021)

Additionally, Ogunlana et al.'s (2021) study on qualitative exploration into reasons for delay in seeking medical information, avers that the negative mindsets of students towards ILS might suggest an absence of know-how on tackling information-related assignments. Because the attitude learners have towards ILS training, may ultimately determines the efficacy of the instruction. Veatch (2018) contends that the question of understanding may be understood via the lens of the subject-object connection. The subject establishes several relationships with the object. In these kinds of interactions, the subject matter is not inclined evenly, but rather variously towards a number of items, that is, a few he admires, some he distastes, some entice him, others discourage him, some intrigue him, others he is uninterested in, some he desires, others he declines, etc., affirming that a learner's mindset towards a topic in question affects the performance in a topic in question. Thus, Freeman (2004) finds that if students see library

teaching as unimportant, they will almost definitely neglect taking advantage of the offered library instruction possibilities. Thus, learners are unlikely to gain from an activity that has the potential of improving their research skills.

However, a learner who values knowledge sees ILS as both a method and an end result of learning. According to Pinto et al (2020), ILS learning consists of three educational domains: knowledge, skills, and understanding (KSU). Because each student has a distinct and individual KSU level, their progress in ILS will be determined by their specific KSU. Hence, a student's preferred method of instruction, drive, and confidence influence their knowledge. Besides, the student's preferred method of learning will have a substantial impact on both instruction and the learners' "route to full instruction."

Also, Pinto et al (2020) allude that learners can become knowledgeable if they actively and autonomously opt to take advantage of the chances available in the course of their learning, are properly motivated, and have strong self-confidence in their abilities. This understanding will enable learners to view tough jobs as challenges to be overcome rather than dangers to avoid. As a result, Ondari-Okemwa (2016) contends that disposition is the most potent predictor of student reading skill development and that students' perceptions, attitudes, and experiences are all highly connected to ILS. Moreover, Baro and Zuokemefa (2011) emphasize the need for librarians to take advantage of the possibilities available to lead ILS and address challenges such as students' uninterest, absence of facilities, low acceptance of online delivery, absence of understanding of ILS, and student nonchalance.

Similarly, Adekunle et al. (2019) discovered that, while first-year students are typically nostalgic about the ILS instruction, they occasionally lack an understanding of how research skills could be of benefit to them in the course of their studies, are overconfident, apathetic,

and have limited attention spans, making them unwilling to attend or absorb new training. Furthermore, Adekunle et al. (2019) discovered that the incorrect association of technological literacy with ILS was significantly contributing to students' tepid attitude towards ILS. Additionally, Bashorun ~~and~~ Akinbowale (2021) believe that attitude/understanding is one of the most important characteristics that has not been well addressed in many related ILS research, particularly in the African environment and Kenya in particular. Furthermore, Reetseng (2016) observed that there is less research on assessing students' ILS understanding than on assessing ILS. At best, a hazy mention has been made to students' attitudes towards ILS. This is a research gap that this study sought to bridge among other gaps as identified and discussed in various sections of this chapter.

3.7 ILS Knowledge and Skills Possessed by Staff

Amunga (2011) asserts that librarians have influenced the introduction of ILS programs since they are the specialists in the majority of ILS tasks that are related to their knowledge domain. In addition, the use of information communication technologies (ICTs) in libraries has made it possible for students to access information more quickly than in the past, but they are still unable to recognize authority (authorship), distinguish between fact and opinion, identify bias, adjust the search or topic to suit their needs or assess the resources they have found.

Kingori (2015); Kavulya (2003); Nyamboga (2004); Eisenberg (2008); Freeman & Lynd-Balta (2010); conducted a study on developing information literacy skills and agreed that a library is an epicenter of brilliance in educational entities, and therefore, it ought to play a significant role in training/imparting, preparing and assisting its patrons with the necessary ILS. Library orientation classes for new students should be provided to enable students to compose projects in the course of their studies with limited help from librarians and lecturers;

write research articles; and acquire relevant references from physical and online resources (Gatero, 2011). This is in line with the Sauce model's higher thinking skills facet which encompasses the capability to understand, scrutinize, refine, and assess information for problem-solving and decision-making. This facet focuses on training students on higher thinking skills which are crucial and relevant in problem-solving engagements. Additionally, the content frame in Bruce's six frames for the information literacy education model insists on trainers having the requisite ILS to facilitate learning and instruction of ILS sessions inside discipline-based course units.

According to Freeman and Lynd-Balta (2010), the sessions are usually conducted by skilled librarians who provide information regarding circulation services, reference services, periodicals, catalog search criteria, classification schemes, information services, unique collections, and multimedia content. Furthermore, with ICT overtures and as demand grows and changes occur, both old and contemporary skills must be taught including web surfing, and OPAC access among others as advocated in both the content frame in Bruce's six frames and the Sauce model's higher thinking skills.

To achieve this, librarians, academic staff, and information workers require comprehensive ILS skills and training to allow and aid them in satisfying their users' information demands. Users must be trained on sources of information (books, publications, and digital media and formats, including internet-based resources). Staff must therefore, be able to: help and facilitate patrons to have access to information materials; embrace change and acclimatize to new situations; be imaginative and innovative; possess excellent interpersonal skills; and stay up to date on current advancements. Similarly, patrons should be able to recognize their information needs, comprehend the types of sources of information that are most suitable to

their needs, and comprehend how to utilize them. This can only be achieved if staff possess the right ILS.

In a study conducted by Lwoga (2014) on the mapping of information literacy outcomes and learning experiences of health sciences among undergraduate students, revealed that students continue to apply learned skills during the ILS course both in class and for non-class activities. However, there was little use of scientific databases and the library catalog for both academic and extra-curricular pursuits. In addition, there was insufficient instruction on information searching techniques and assessment criteria of information materials. These results were corroborated by research on information literacy abilities among undergraduate students by Mbaabu et al. (2012), which found that most undergraduate students rely on Google, Yahoo Search, and social media sites including Facebook, Instagram, and Wikipedia, among others to seek information. This suggests that students are not getting the proper training in ILS development that they need to perform research with reliable and practical methods and resources. This leads students to choose the "fast" or "easy" approach to get information since they are more confident surfing the internet rather than using electronic databases.

In light of this scenario, a study by Bury (2010) found that faculty members believe that students develop ILS on their own or through shared experiences with peers. This indicates that faculty members are not actively engaged in training students on ILS. Equally, Baro ~~and~~ Zuokemefa (2011) and Kanguha (2016) argue that the majority of lecturers and librarians have inadequate ILS competencies, which results in poor ILS teaching because they are not competent enough to teach learners.

3.8 Integration of ICT and ILS

According to Mwita (2017) information and communication technology (ICT) refers to integrated communication and telecommunications computers, as well as the requisite business software, that allows clients to gain, reclaim, share, and exploit information. The 21st century is characterized among other factors by a knowledge-based society where its members have a high level of education and therefore depend on the ILS knowledge of its citizens to drive creativity and entrepreneurial activities. Amunga (2011) asserts that underdeveloped computer literacy among students and instructors is a major inhibition to ILS initiatives in Kenya. The ICT integration variable in the Sauce model supports the application and exploitation of various ICT technologies for ILS application, utilization, instruction, and learning (Bond, 2011). Similarly, Babu (2007) avers those developments in ICTs have greatly affected information delivery use and application. In support, Farrell (2007) asserts that ICT is the backbone of the delivery of quality ILS, it enhances the quality of instruction and learning.

Similarly, Mwita (2017) assert that there is an increasing number of ICT efforts in developing nations. These efforts are often conducted because they are critical for social and economic growth. However, one hurdle to the effective use of ICT in underdeveloped nations is the inadequate degree of ILS (Mwita, 2017)). They argue that investments in ICT-for-development programs may fail if nations cannot efficiently utilize and manage information. Mwita (2017) and Dewan et al (2005), agree that the digital gap between the wealthy and the poor has expanded due to the absence of ILS especially in third-world nations such as Kenya. Pejova, et al (2002) support these sentiments by stating that in the absence of ILS, developing

states may continue to underutilize the technology that is provided and the result is a waste of resources with serious repercussions on their development.

Makori, (2019) asserts that university libraries are presently functioning in a new technology setting and must adapt to technological innovations such as big data, artificial intelligence, and 5G among other innovations to deliver information services to patrons. According to Otiike (2004), one of the most significant issues that libraries and the library profession often confront in the new millennium is coping with digitized and electronic content. According to Odero-Musakali [&and](#) Mutula (2007), the capacity of universities to recognize and utilize the potential benefits of these technological advancements throughout all tiers of their corporate plans and operations is critical to their future. This adoption is only possible if there are dedicated ILS initiatives. Omoniwa (2021) predicted that in the 21st century, information globalization and information technology adoption will be the hallmarks of outstanding libraries and that academic libraries have little choice but to use ICT in their role. Interestingly, Adeleke & Olorunsola (2010) suggests that if libraries are to survive in the present day, traditional methods or approaches must give way to ICTs and computer-driven settings.

While new technologies have improved library services by offering new means of gathering, storing, retrieving, and distributing information, they have also brought up new challenges and made some of the previous concerns that libraries have faced worse (Emmanuel [&and](#) Sife, 2008). Ghuloum (2012) state that there are a variety of problems that might prevent ICT adoption, including budgetary limitations, technological barriers, human traits, and cultural effects. These have encompassed such problems as the absence of adequate funding to enable the procurement of ICT equipment, the absence of competent library professionals, the

absence of desire and need amongst information professionals to integrate ICT in their everyday ILS activities (Ani, 2005; and Starr, 2001).

Ojedokun (2007), asserts that the advancement of technology together with the growth of the information age has necessitated the need for ILS training and instruction. Similarly, Ghavifekr (2021) opines that ILS is imperative in the technology age because learners want to know how to utilize information ethically, and evaluate the authenticity and validness of the information that they are using. In addition, embracing technology helps to pass instructions to learners because it opens many avenues for passing information skills. On the contrary, Sife, 2008; Minishi-Majanja, 2007; Odero-Musakali & Mutula, 2007) have highlighted a shortage of skilled personnel, librarians have minimal technological expertise, and the hostile mindset of university leadership toward ICT as significant obstacles impeding effective ICT implementation in university libraries.

Moreover, Waite (2004) conducted a study on teachers' response to the use of ICT for literacy activities in the UK and discovered that ICTs were utilized to help students participate in innovative reading and writing styles, cooperative reading, e-communication, and improvement in oral presentation. The study further revealed that the convergence of computing technology and telecommunication technology played a key role in how trainers acquired ILS competencies and hence appropriately planned their teaching roles.

Baro & Zuokemefa, (2011) allude that ILS and ICT are inseparable. ILS enables a student to comprehend and master how technology aids in information access and utilization. Similarly, Ghaznavi et al (2011) concur by stating that having appropriate ICT skills and understanding how technology works helps learners to effectively seek, evaluate, and utilize information in a technology-driven environment. These scholars further, assert that ICT skills assist a learner

in using computer application software, operating computers, electronic information resources, internet to achieve work-related endeavors and academic goals.

Furthermore, with the advent of the COVID-19 pandemic institutions of higher learning have shifted to blended learning, which is embracing both online teaching and physical teaching, this has necessitated the need to train learners with abilities to look for and assess information on the internet platforms. In addition, the learners need to be introduced to various aspects of ICTs, the prudent way to utilize it, and the influence that this utilization will have on them and the society they live in

However, Kavulya (2006) avers that ICTs give rise to a variety of problems in the instruction of ILS and LIS education. For starters, it has resulted in "information overload," in which information has grown to be an agent of pollution and dissatisfaction (Mizrachi, 1998). This indicates that, in the middle of this "information overload," a significant portion of the responsibility of information specialists is to help consumers identify what they want and help users get the most appropriate information. Wang (2003) asserts that LIS practitioners should be able to demonstrate to users' ways to develop suitable search techniques that save time, decrease disorientation, and package and display information in a logical, worthwhile, and pertinent manner.

Makori (2013) carried a study on the use of information communication technologies in the education and training of undergraduate library and information science students in two selected Kenyan universities and found out that graduates lacked preferred ICTs knowledge, competencies, and skills important in the modern information environment, as such, they were unable to appropriately search, retrieve, evaluate, use, and apply learned information to advance their learning. Kavulya (2006) examined the training of library and information

science (LIS) professionals in Kenya and discovered that the absence of suitable ICT content in the courses, as well as courses that are unrelated to job markets, have impeded ICT training in Kenyan Universities. From the above discussion, it is apparent that there is an ICT skills gap which this study intended to explore to develop sustainable ICT training strategies to foster ILS training, curriculum development, and utilization.

3.9 Chapter Summary

The evaluation of the literature revealed gaps that this study tries to fill in part. The analysis uncovered data from various research that looked into the status of ILS among students; ILS policy and curriculum; knowledge and skills of information trainers and providers; perception of students towards ILS learning and instruction and utilization of ICTs in instruction and learning of ILS and challenges faced in ILS instruction and learning. The bulk of reported research was conducted in affluent nations, offering a biased picture of ILS by ignoring the issues in third-world countries like Kenya. Furthermore, the majority of these studies were narrow in scope, covering only a few elements of ILS. There is hence, to conduct a study to delve into ILS adequacy, utilization, learning, and instruction among medical students in Kenya.

Table 3.1: Gaps from Literature and how they are addressed through Research Questions

Research Gap	How the gap will be addressed	Research Question

Steinert (2014); Kanguha (2014); Kimani (2014); Shabi, Shabi, Akewukereke, & Udofia (2011); Hurwitz and Slawson (2010); Gatero, (2011); Lwehabura & Stilwell (2008); Ajuwon (2006); Lau, (2006); Kavulya (2003) recommends that further investigation is needed on the ILS possessed by students because several undergraduate students are unable to adequately access, use, cite information resources due to lack of understanding the various information searching strategies and techniques.	The study assessed the status of information literacy skills of medical undergraduate students at Moi University and the University of Nairobi.	What is the status of information literacy skills among medical undergraduate students in Nairobi and Moi Universities?
Carder <i>et al.</i> , (2001); Cooney & Hiris, (2003); Dennis, (2001); Hiscock & Marriott (2003); MacDonald <i>et al.</i> , (2000); Kingori (2015); Kanguha (2015) recommends that there is need for a pedagogic framework for delivering effective information literacy programs to undergraduate students	The study sought to examine the information literacy skills curricula and policies supporting the delivery of ILS to medical undergraduate students at the two universities	What information literacy skills policy and curriculum are used in imparting ILS to medical, undergraduate students?
Baro & Zuokemefa (2011), Tella & Bashorun (2012), Adekunle et al. (2016), Reetseng (2016), Ondari-Okemwa (2016), Kanguha (2016); Baro (2011); Daugherty & Rosso (2011); Mbaabu et al(2012); Lwoga (2014); Kanguha, (2015) & ACRL (2016); states that ILS understanding is one of the most important characteristics that has not been well addressed in many ILS related research, particularly in the	The study examined the understanding of medical undergraduate students toward ILS	What is the perception of medical undergraduate students towards ILS in Nairobi and Moi universities in Kenya?

African environment and Kenya in particular.		
Kavulya (2003); Nyamboga (2004); Mutula et al., (2004); Bury (2010); Baro & Zuokemefa, (2011); Mbabu et al (2012); Lwoga (2014) suggests that there is need to re-look at the knowledge, skills of librarians.	The study analyzed the knowledge and skills possessed by staff engaged in facilitating ILS among medical undergraduate students	What knowledge skills and training are possessed by staff in facilitating ILS among medical undergraduate students of Nairobi and Moi universities?
Pejova et al, (2002); Kavulya, 2003; Amunga, (2011); Adeyoyin, (2006); Farrell, (2007); Ganley, & Kraemer, (2005); Tilvawala and Myers (2009); concur that trainers and learners lack basic computer and ICT skills and this has derailed the utilization and application of information literacy skills in information access, search, evaluate and use in Kenya	The study sought to explore the role of ICT in facilitating and promoting information literacy skills among medical undergraduate students at the two universities	What is the role of ICT in facilitating and promoting the learning of information literacy skills among medical undergraduate students at the University of Nairobi and Moi University?

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This chapter discusses the research methodology for this study and it is organized into the following thematic sections: research paradigm; research approach; research design; population of the study; sampling procedure; data collection procedures; validity and reliability; pre-testing procedure; ethical considerations; and data analysis. Willis (2007) and Creswell (2013), posit that research methodology is the road that researchers must take to conduct their study and the procedure that researchers use to describe, explain, and anticipate events. Kothari (2004); and Cohen [and](#) Manion (2017) describe research methodology as a method of meticulously unravelling the thinking and study questions regarding the steps taken by the investigator in examining the issue under investigation as well as why certain methods or techniques are used while others are not, so that the findings of the study can be assessed by the researcher or others.

4.2 Research Paradigm

The term research paradigm was coined by Thomas Kuhn in 1962 to denote a set of views and demands in any form of scientific inquiry (Creswell et al, 2012). Creswell (2012) states that a research paradigm is the whole conceptual framework under which information is created to better how things are done. A research paradigm enables the investigator to be innovative and imaginative in selecting and adapting approaches that they were unaware of. (Creswell, 2013; and Babbie, 2007).

Kuhn (1970) argues that applying a research paradigm in a scientific inquiry is a sign of scientific maturity. In this regard, Hay (2002) point out the components of research paradigm

to be ontology, epistemology, theory, methodology, methods, and sources. Further explanations of the components are as follows:

- i. **Ontology:** According to Richards (2003) ontology is a description of our beliefs about reality.
- ii. **Epistemology:** Divayana, et al (2021) posits that epistemology is knowledge and the procedure by which knowledge is learned and authenticated
- iii. **A theoretical perspective:** These are realistic conventions that influence the inquiries we seek and the types of replies we receive as a consequence. In this sense, a theoretical viewpoint might be thought of as a lens through which we see, either focusing or distorting what we observe.
- iv. **Methodology:** This is a process strategy for action, or plan, that guides the selection of research methods.
- v. **Methods:** These are particular methods for gathering and analyzing data, such as interviews and surveys.
- vi. **Source:** Defined as an individual, object, or location from which knowledge originates, arises, or is received

Creswell (2003) and Cohen et al (2017) state that the type of paradigm selected stipulates the goal, enthusiasm, and anticipated results of a study. Creswell (2003); Cohen et al (2017); Saunders et al (2010), and Sakyi (2017) concur that research paradigms can be categorized into the following:

- 1) Positivist paradigm: This philosophical epoch is anchored on the belief that observation and reasoning may help people comprehend human conduct. This viewpoint is common in quantitative research.
- 2) Constructivist paradigm. According to the idea, persons build their grasp and understanding of the universe by engaging in activities and reflecting on their experiences. When we learn something new, we have to incorporate it into our prior opinions and observations, which may force us to adjust our views or disregard the new information as irrelevant. In any case, we have an active role in shaping our understanding. For this to be so, we need to pose questions, explore, and assess what we know. (Creswell & Clark, 2011),
- 3) Pragmatic paradigm Creswell & Clark, (2011), Creswell, (2009), and Badley, (2013) state that the pragmatic paradigm emphasizes that reality is actively created by individuals' ever-changing actions on earth. It permits researchers with freedom to apply available strategies and methods to solve a problem at hand.
- 4) Participatory approaches ascertain that the persons in charge of solving a problem or designing an innovation are those people concerned with the study outcome. (Creswell, 2003, & Rubin & Babbie, 2008). Problem-solving and innovation are thus conducted directly about the situation to be transformed.

The pragmatist paradigm underpinned this study as discussed below.

4.2.1 Pragmatist Paradigm

Pragmatism permits researchers with freedom to apply available strategies and methods to solve a problem at hand. Consequently, the paradigm emphasizes “what works” instead of what is viewed as unquestionably and factually “true” or “real”. Creswell (2008) argues that

pragmatism emphasizes Decisions concerning which aims are most important and which tactics are most appropriate. Pragmatism's affinity with transformational, liberating, and collaborative study models allows for a more in-depth analysis of social issues. Furthermore, Badley (2003) and Creswell (2008) agree that pragmatism is a connection between actions and consequences and not descriptions of reality. The study adopted pragmatic paradigm because, in discussing pragmatism Shusterman (2016) avers that;

- a) Pragmatism does not adhere to a single philosophy or reality system;
- b) Individual researchers are free to choose;
- c) When conducting research, the investigators freely draw from both quantitative and qualitative assumptions. They are free to select the research methods, strategies, and procedures that best suit their requirements and goals;
- d) Pragmatists do not view the world as a single entity; rather, they consider a variety of ways to data collection and analysis rather than sticking to just one.

Additionally, the study embraced the pragmatic paradigm since it emphasizes the research problem and the application of heterogeneous methodologies to learn more about it (Stuhr, 2015). The study sought to assess the ILS among medical undergraduate students in two selected universities.

The choice of paradigm was influenced by the fact that information literacy skills is influenced to a large extent socio-economic and technological context whose exploration would require an understanding and propping through pragmatic perspective. Some of the concepts in the study are based on unique opinions, personal experiences and expectations, traditions and cultures all experienced within certain social contexts that could differ from

individual to individual or from group to group. These may not necessarily be able to be quantified or analysed quantitatively and each scenario needs to be described in its unique context. On the other hand, some of the concepts are purely quantitative or numerical and need to be handled as such to answer the research questions effectively. In conducting the study, the researcher sought to gain an in-depth description of experiences based on the pragmatism assumption that meaning is embedded in experiences, and therefore, in order to uncover meaning, one has to uncover experience (Morgan, 2014). In this study, some of the questions in the questionnaire (See Appendices 1 and 2) were closed-item questions (therefore quantitative) such as --Please indicate the information literacy skills you have gained that aid you in carrying out your studies ‘, and ‘, What skills does the ILS policy cover?’ where respondents were asked to select answers from a given list. Other questions were open ended (therefore qualitative) such as ‘Please comment on other gains you have as a result of learning information literacy skills ’ and ‘In your opinion, are the skills possessed by staff adequate in facilitating ILS instruction in your institution?’ These questions required the respondents to give their personal experience and opinions in answer to the questions.

The researcher is in agreement with Simpson, (2018) who opines that science requires precision, logical reasoning and attention to evidence but this is not confined to that which can be directly perceived. Evidence can be in inferable forms such as the self-reports inherent in interviews or questionnaires. Furthermore, the use of mixed methods in this study served to test consistency of findings from both quantitative and qualitative methods (i.e. corroboration). Mixing methods also enriched the study by revealing details that would otherwise be left out if just one method was employed. This is in line with the purposes of

mixing methods in research, namely corroboration and elaboration, as proposed by Cohen et al, (2018).

Again in applying pragmatism to the current study the researcher understands that ILS among medicine, dentistry and nursing undergraduate students are not fixed and would vary from case to case, and would require different methods to institute them. Hence, pragmatist paradigm was found appropriate for this study because it provided the study with the liveness needed to select analytical techniques that satisfactorily addressed all the research questions. The triangulation that resulted from the combination of both qualitative and quantitative data helped the researcher in generalization of the study findings (Onwuegbuzie, 2009). This enabled the researcher to cross-check for consistency of data and facts on specific items, thus validating the data collected.

Moreover, this study adopted the pragmatist paradigm since it provided a pathway to choose inquiry methodologies that best addressed the study research questions. As such, the mixed method strategy selected enabled the researcher to collect both qualitative and quantitative data.

Morgan (2007), Tashakkori & Teddlie (2010), and Creswell (2012), agree that pragmatic individuals support a sort of naturalism (the view that philosophy is concurrent with science rather than before it), making them suited for mixed-method research. In addition, the consequence of integrating quantitative and qualitative results is the likelihood of realizing a wholesome scenario concerning the research topic (Johnson and Onwuegbuzie, 2004).

Furthermore, Onwuegbuzie (2009) allude that a research study that adopts mixed methods enables triangulation of quantitative and qualitative findings.

4.3 Research Approaches

Komp and Tromp (1999); Creswell & Plano, (2011); Kothari, (2014), and Saunder et al (2014) argue that research methods or approaches are means used for data collection to facilitate understanding of a phenomenon under inquiry. Furthermore, Cohen (2017) emphasizes that study approaches are grouped into three categories, namely; qualitative, quantitative, and mixed-method. Richards & Morse (2013) and Creswell (2012) explain the stated approaches as follows:

(a) The qualitative technique seeks to generate knowledge from data as the study progresses. Furthermore, Cozby et al (2005) claims that the qualitative technique focuses on individuals behaving naturally and reporting their surroundings on their terms. They are utilized to acquire detailed information on a small number of people or in a very specific situation. According to Newman et al (2003), qualitative researchers perform in-depth investigations of instances that develop naturally in the course of social interactions. The researcher is a "human instrument" because, during data collection, he or she asks questions, observes, describes, interprets, and records what he or she sees.

b) Quantitative method emphasis on statistical analyses of data. It concentrates on specific behaviors that can be quantified. Babbie, (2007) & Cozby et al (2005) assert that the quantitative approach allows for empirical investigations ranging from basic averages to sophisticated formulae and mathematical frameworks, and it often incorporates bigger samples;

c) Mixed method. It employs inquiry strategies that incorporate data collecting, either concurrently or sequentially, to best understand the study topic using two methodologies. According to Flick (2009), a mix of quantitative and qualitative methodologies provides a more generic representation of the subject, since structural components are analyzed quantitatively and procedural factors qualitatively.

This study employed a mixed-method approach where both qualitative and quantitative methods were equally utilized in order to comprehensively collect data that could answer the research problem.

4.3.1 Mixed Method

In this technique, the researcher gathers, examines, and combines qualitative and quantitative data in a single study (Creswell 2012). Clark (2011) and Manion (2016) agree that the mixed method strategy promotes the systematic integration, or "mixing," of both qualitative and quantitative data within a single research or continuous program of inquiry. The fundamental concept of this technique is that such integration enables a more comprehensive and complementary use of data.

Similarly, Creswell & Clark, (2011) and Saunders et al, (2013) agree that mixed-method strategy is using qualitative and quantitative methods to investigate the same phenomenon in a single study. The mixed-method approach helps a researcher to capitalize on the advantages of both qualitative and quantitative data because it brings out their complementary styles.

Moreover, Greenstein, (2006); and Fossen (2018) acknowledged three distinctive usages of a mixed methods study:

(1) Assessing the consistency of findings received from multiple measuring equipment;

- (2) Outlining and expanding on the findings of one technique with another method; and
- (3) Showing how the findings of a particular approach might influence future methods or inferences taken from the results.

The mixed-method approach was thought suitable for this study because it permitted the study to use different research approaches to assess the ILS among medical undergraduate students. Further, mixed methods, enabled the researcher to collect both qualitative and quantitative data, to facilitate detailed knowledge of ILS status; ILS policy and curriculum; ILS understanding; ILS knowledge and skills possessed by staff in enhancing ILS among undergraduate students; and the role of ICT in enhancing ILS among medical undergraduate students.

Furthermore, the researcher employed mixed methods research for the following reasons: Firstly, in order to seek convergence and corroboration of findings through the use of more than one method of gathering and analyzing data about information literacy skills among medical undergraduate students therefore eliminating the inherent biases associated with using only one method (Cohen et al, 2018). Second, mixed methods research allowed the researcher to gain broader perspective as a result of using the different methods as opposed to using the predominant method alone; third, so that results from one methodology would be enhanced by the results from the other methodology (Manion, 2016). In this case qualitative data from the university librarians, head medical librarians and HODs in some cases enhanced by quantitative data from the students and lecturers. Lastly, mixed methods research allowed the researcher to study different groups or levels. The qualitative methods were used to collect data that pertained to availability of ILS policy and curriculum, adequacy of ILS training, ILS competencies of medical undergraduate students, adequacy

of skills possessed by staff facilitating ILS instruction, collaboration between faculty and librarians among others (see Appendices 3, 4 and 5), while the quantitative methods were used to collect statistical data from students and lectures (see Appendix 1 and 2). The strength of this approach is seen in its ability to enable the researcher to collect two types of data simultaneously therefore providing the advantages of both the qualitative and quantitative data. The researcher therefore gained different perspectives from the different types of data and from the different levels within the study.

Research scholars like Plano, (2013); Flick, (2007); Creswell & Clark, (2007), assert that the various categories of mixed methods associated with pragmatic paradigm are;

- 1) Explanatory sequential mixed-method research entails collecting quantitative data, analyzing the data, producing results, and then expanding on the findings using qualitative research to elucidate the findings in detail.
- 2) Exploratory sequential approach - The researcher begins with a qualitative data collecting stage during which he or she analyses the viewpoints of respondents. The information obtained from the data is then used to design a second, quantitative data-gathering stage.
- 3) Transformative sequential mixed methods is a strategy that incorporates cross-validation through a theoretic lens founded on equality that embraces both quantitative and qualitative data.
- 4) Concurrent triangulation- is to utilize both qualitative and quantitative data collected at the same time to describe relations between variables that are important more precisely

- 5) Concurrent nested designs qualitative as well as quantitative data are gathered simultaneously and analyzed in the same phase; however, one type of data receives greater significance than the other.
- 6) Concurrent transformative designs are theoretic and they focus on initialing societal change. It is popular in the assessment and program intervention domains

This research used concurrent triangulation. Data collection of both quantitative and qualitative done simultaneously, ensuring that the deficiencies of qualitative data were optimally countered by the advantages of quantitative data. In the blending of the findings, the two types of data were given equal significance. Quantitative and qualitative data were analyzed separately, and the conclusions were mixed. The concurrent triangulation technique guided the researcher to comprehensively examine the problem of the study by using the two types of data in interpreting the findings (Cohen et al, 2017). That is, interviews with HODs in the departments of Medicine, Dentistry and Nursing, University librarians, and medical librarians were done at the same time as when students lecturers and students were answering the questionnaires.

4.4 Research Design

A research design is a plan on how to collect, measure, and analyze the acquired data in an inquiry. According to Akhtar (2016), research design is the bond that links the research study together; it demonstrates how all of the primary components of the research study interact with one another. Similarly, Kothari (2004) suggests that a decent study design reduces prejudice and hence increases the dependability of collected data. According to Manheim (2021), study design not only predicts and postulates the infinite decisions associated with gathering,

analyzing, and interpreting data, but it also provides a logical justification for these decisions.

The design aids in making decisions regarding:

1. The nature of data needed
2. The setting and period
3. The respondents and sources
4. The variables
5. Measurement and
6. Analysis of data.

Further, Manheim (2021) argues that a research design defines the limits of a study and decides precisely what will be executed in an investigation. In addition, Babbie, (2001) and (Flick, 2007) opine that the choice of a research design is to a greater extent informed by its appropriateness in speaking to the research problem of the study.

Saunders, Lewis & Thornhill (2012) emphasize the prudence of a researcher to use more than two designs in a study. This helped the researcher understand more clearly the research problem and enabled him to anchor on the strengths of each design. The study used descriptive survey design within a case study.

4.4.1 Case Study Research Design

A case study is a scientific approach used to analyze a current issue, concentrating on the case's distinctiveness within its real-life setting. (McKinney, 2014). Case studies could be exploratory, descriptive, or explanatory (Ruspini, 2002).

According to Yazan (2015), a case study is a single event that is usually used to demonstrate a broader idea. Similarly, Tight (2010) describes a case study as a thorough assessment of a small sample. Similarly, Simons (2009) defines it as an in-depth examination of a single, actual situation, policy, organization, program, or structure from several angles to capture its intricate nature and distinctiveness.

According to Ericson (2017), the case study research undertaken in behavioral sciences can be classified as:

- 1) Single case designs – they focus on a representative or a typical case.
- 2) Embedded single-case designs –several units of observation and analysis are incorporated within a single case.
- 3) Multiple-case designs - where a study has two case studies to compare which is far more helpful than gathering double the amount of data in a single instance of research.
- 4) Embedded multiple-case designs have distinct sub-units that comprise various cases, and a variety of data collection tools may be employed for each sub-unit, which is maintained independently from one another.

The present research used the multiple case design, with the two selected institutions considered as separate units of analysis: Moi University's College of Health Sciences and UON's College of Health Sciences. Similarly, the study used a descriptive research approach inside a multiple-case design. Multiple case studies involve more than one case and, like the single case approach, can be either holistic or embedded. Holistic designs include single units of analysis, while embedded designs include more than one unit of analysis per case. Yin (2013) observes that multiple case designs have great possibility

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of direct replication, with conclusions from the cases being “more powerful than those coming from a single case.” Evidence from multiple cases is generally considered to have more weight, compared to that from a single case. The present study adopted the embedded multiple-case design comprising lecturers, heads of departments, university librarians and students as units of analysis in each case.

In the selection of the case study design, the present research was guided by, among others, the understanding that case studies are generally good in presenting the uniqueness of the object of an inquiry, which makes them best suited for in-depth investigation of the phenomenon (Simons, 2009; De Vos *et al.*, 2011). In addition to offering uniqueness, the case study is “a frame that offers the boundary to your research” (Thomas, 2011). It gives the demarcation for the study, stating the direction and extent you want your study to cover, irrespective of the methods used to do the study. A researcher is able to see the completeness of a phenomenon under inquiry in a case study, because it allows looking at the phenomenon from many different angles. In addition to the above advantages, De Vos *et al.*, 2011 (2005) observe that case studies also have potential for achieving high conceptual validity through their contextual approach and have the capacity to address casual complexities compared to other designs.

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4.4.2 Descriptive Survey Design

Hollweck (2014) postulate that descriptive survey design is a research design that enables the investigator to generalize the study outcomes and demonstrate significant demographic features of the population. The current study adopted descriptive survey design because the

researcher tried to determine the characteristics of a population or a particular phenomenon by describing the status, understandings, attitudes, opinions, and characteristics regarding ILS delivery and enhancement among medical undergraduate students. Descriptive survey guided the research to identify patterns in the characteristics of the study respondents. In addition, descriptive survey enabled the study to acquire data that characterizes occurrences and then organizing, tabulating, depicting, and describing the information gathered (Kumar, 2011). Similarly, Stagnor (2011) emphasizes that when thorough narrative descriptions of a small number of instances are used, description is used as a tool to organize data into patterns that emerge during analysis. The patterns help the mind in understanding a qualitative study and its insinuations. Descriptive survey design facilitated the collection of data from the many respondents of the study.

4.5 Population of the Study

Walliman (2021) define population as events, people, or a group on which the researcher concludes. It's generally defined to mean a group or set of elements that a researcher wants to know more information about. Likewise, Creswell (2012); and Cohen, ~~&~~ Manion, (2018) describe it as a group of items, individuals, or units of observation that share similar characteristics. Furthermore, Creswell (2012) avers that the study population is important because it enables the generalization of study findings with confidence in a cost-effective way. In research, according to Walliman (2021) refinement of the general population yields a target population which is termed as the collection of entities or participants with precise attributes of interest and relevance (Walliman (2021) and Creswell, 2013). According to Manion et al (2019), the target population is important because it sets clear a path on the scope and objective of the research and data types, defines the characteristic variables of the individuals

who qualify for the study, and provides the scope of the total population or universe for determining sample size.

The study population comprised medicine, dentistry, and nursing students, University librarians, medical librarians, lecturers, and departmental heads in the two colleges of health sciences of the University of Nairobi and Moi University as discussed below;

4.5.1 Medicine, Dentistry, and Nursing Undergraduate Students

The first category of the study population was a total of 2118 medicine, dentistry, and nursing undergraduate students from the University of Nairobi's Faculty of Health Sciences and Moi University's colleges of Health Sciences as shown in Table 4.1. Student participants in this study were proportionately from each university's college of health science because they vary in size and population. The study targeted 6th-year students in Medicine, 5th-year students in Dentistry, and 4th-year students in Nursing from both institutions. The reason for choosing this cadre of population was that these students were at advanced/ final levels in their studies hence understood how ILS affect their studies and can best describe ILS experiences, perception, attitudes and notions. In addition, the students were at a stage of applying the theory learned into practical scenarios in search of information to carry out their studies.

University	Year of Study	Medicine	Dentistry	Nursing	Total
University of Nairobi	1 st	121	25	146	292
	2 nd	114	22	138	274
	3 rd	137	34	155	326
	4 th	120	28	117	265
	5 th	109	38		147

	6 th	110			110
	Total	711	147	556	1414
Moi University	1 st	71	30	40	141
	2 nd	67	28	37	132
	3 rd	59	46	41	146
	4 th	68	33	34	135
	5 th	52	35		87
	6 th	63			63
	Total	380	172	152	704
TOTAL		1091	319	708	2118

Table 4.1: Target Population of Medicine, Dentistry and Nursing Undergraduate Students

Source: Commission for University Education 2019 & Statistics from Individual Universities (year; 2020)

4.5.2 Heads of Departments and Lecturers

The second category was the heads of departments and lecturers teaching various course units in the six departments, that is 3 departments from each of the two selected institution. Six departmental heads that is three each from the University of Nairobi and Moi University as shown in table 4.2. HODs provided information about ILS program/ curriculum and whether it's meeting the required competency level in as far as imparting ILS is concern because they are in charge of ILS curriculum development and ILS policy formulation. Equally, Lecturers teach students on how to search, use, disseminate and apply information learnt. Therefore, they helped the study understand students' skills, knowledge, attitudes, perception, and experience towards ILS. Furthermore, they provide their perspectives on ILS policies, curricula, and how they affect students' learning experiences. Because lecturers are involved in teaching and assessing the students, their point of view was crucial in understanding the students' ILS understanding instruction, and the students' ILS status.

Table 4.2: Target Population of Heads of Departments and Lecturers

INSTITUTION	DEPARTMENT	HEADS OF DEPARTMENTS	LECTURERS
UON	Clinical medicine and therapeutics	1	24
	Dental Sciences	1	11
	Nursing	1	23
TOTAL			58
MOI	Department of Medicine	1	18
	Maxillofacial Surgery, Oral Medium/Pathology/Radiology	1	10
	Nursing Education Management and Research	1	12
TOTAL		6	40
GRAND TOTAL		6	98

Source: from the dean's office of the two colleges of health science in both universities (year, 2020)

4.5.3 University Librarians and Medical Librarians

The third category comprised of two University librarians and two medical librarians as shown in Table 4.3. University Librarians serve, assist, train students on information issues and they are knowledge ambassadors in a university. Hence very critical in providing information on ILS training, utilization and its effectiveness among the students. Additionally, medical librarians are responsible in Library sections/departments that deal with medical information resources hence better positioned to understand students' level of ILS competencies, ILS challenges that Medicine, Dentistry and Nursing undergraduate students face about information search and use.

Table 4.3: Target Population of University Librarians, Medical Librarians

University	University Librarians	Heads Medical Librarians	Total
University of Nairobi	1	1	2
Moi University	1	1	2
TOTAL	2	2	4

Source: DVC academic affairs office from both universities (2019)

Table 4.4: Summary Table of the Entire Target Population

Institution	Medicine students	Dentistry students	Nursing students	Lecturers	UL	ML	HODs	Total
UON	110	38	117	58	1	1	3	328
MOI	63	35	34	40	1	1	3	177
Total	173	73	151	98	2	2	6	505

Source: DVC academic affairs office from both universities (2019)

4.6 Sampling Procedure

It may be difficult to collect data from every participant (population) in a research study (Durrheim, 2006), therefore a researcher, has to come up with a sample which is picked the study population (Hollweck, 2015). A sample is a subsection of the study population that has comparable characteristics to the population. The sample's outcomes and inferences are representative of the larger population (Babbie, 2007). A sample is considered representative if the analysis is conducted using a study's sampling unit yields findings that are comparable to those generated if the researcher analyzed all of the participants/population. (Creswell, 2013).

A researcher must do sampling to acquire an accurate representation from the target population (Hollweck, 2015). Furthermore, Kothari (2004) allude that the efficacy of a research is

determined by the suitability of its adopted methodology and instruments, as well as the correctness of the sampling approach used.

In Kenya, 13 universities offer medicine, nursing and dentistry courses and as such they are supposed to be the units of observation for this inquiry. However, Manion and Cohen (2018), argue that sampling is an appropriate choice whenever it is not feasible to collect data on the entire population due to financial and time constraints. For these reasons, the researcher purposefully sampled two institutions, namely the Moi University and UON (University of Nairobi).

The two universities were purposefully selected since they are pioneers in offering health sciences degree programs in Kenya, they were chartered first in Kenya and have a sizeable number of medical students enrolled. They have been in operation for over 35 years. Therefore, there is a likelihood that they have established ILS programmes that can act as a model for other universities that have started or are starting to offer medical courses in Kenya.

Students: The students were grouped (stratified) into three groups based on their fields of study/ area of specialization, that is, medicine, nursing, and dentistry. Purposive sampling was used to select 6th, 5th and 4th year students because they were in their final year of study hence better placed to explain their ILS experiences in relation to their studies. To successfully undertake this, the researcher first determined the sample size that was required for this study. The student sample size was determined by applying a 98 percent confidence level and a 2% margin of error (Saunders et al-e, 2012). Once the sample size was determined, the researcher obtained a sampling frame. The sampling frame for the students constituted a list containing names of students registered in dentistry, medicine and nursing programs in the two selected universities, which was provided by the departments. Using the sampling frame identified, a

simple random sampling technique was applied to select the sample for student respondents. Then simple random sampling technique was used to select a sample size of 305 students as shown on table 4.6 (in section 4.6.1.1). This technique gave each student the same chance of being selected (Creswell, 2013).

Lecturers: The lecturers were stratified into the departments in which they teach in, that is, medicine, nursing and dentistry. Thereafter, simple random sampling technique was applied to select a sample size of 62 lecturers. A list of all lecturers teaching in the six departments, from the two institutions, was acquired from the heads of departments and served as a sampling frame. Using the sampling frame identified, a simple random sampling technique was applied to select the sample for lecturers respondents. Then simple random sampling technique was used to select a sample size of 62 lecturers students as shown on table 4.7 (in section 4.6.1.2). This technique gave each student the same chance of being selected (Creswell, 2013).

The key informants for the study were, the University librarians, medical librarians, and

HODs: Purposive sampling technique was utilized in selecting two University Librarians, two Heads Medical Librarians, and six Heads of Departments from the selected two Universities under study. Purposive sampling is suitable where a researcher purposely targets certain respondents believed to have relevant information appropriate for the research inquiry (Kombo and Tromp, 2006).

4.6.1 Sample Size

4.6.1.1 Sample Size for Students

Undergraduate students in 4th year nursing, 5th year dentistry and 6th year medicine who were 397 were sampled using the table of determining sample sizes developed by Saunders, Lewis, and Thornhill (2012). The student sample size was determined by applying a 98 percent confidence level and a 2% margin of error because according to [Saunders et al \(2012\)](#)-when the items under study are not many more items are required to be part of the sample for precision and generalization of the study findings.

Table 4.5: Saunders, Lewis and Thornhill (2012) Table of Selecting Sample Sizes at 95 Level of Certainty

Population	Margin of error			
	5%	3%	2%	1%
50	44	48	49	
100	79	91	96	99
150	108	132	141	148
200	132	168	185	196
250	151	203	226	244
300	168	234	267	291
400	196	291	343	384
500	217	340	414	475
750	254	440	571	696
1000	278	516	706	906
2000	322	696	1091	1655
5 000		357	879	1622
10 000		370	964	1936
100 000		383	1056	2345
1 000 000		84	1066	2395
10 000 000		384	1067	2400

Source: Saunders, et al, 2012

To attain a sample size for 4th year nursing, 5th year dentistry and 6th year medicine students respectively, Saunders, Lewis and Thornhill (2012) table of selecting sample sizes as shown above in table 4.2 was used. According to Saunders, Lewis & Thornhill (2012), Simple random selection is desirable since it gives all respondents an equal opportunity to take part in the investigation. The target population is 397

The average of 267 and 343 will be taken because 397 lie between the 300 and 400:

$$267+343 = 610/2 = 305$$

The distribution of the sample sizes in each department is indicated in table 4.6 using this formula

$$\text{DENTAL SCIENCES} = \frac{\text{DENTAL SCIENCES POPULATION} * \text{SAMPLE SIZE}}{\text{TOTAL POPULATION}} \text{ \{at 2\% error margin\}}$$

$$\text{TOTAL POPULATION}$$

$$\frac{38*305}{397} = 29 \text{ (DENTAL sample size)}$$

$$397$$

Table 4.6: Sample Size of Undergraduate Students (6th year Medicine, 4th year Dentistry and 5th year Nursing) University of Nairobi (UON) and Moi University (MU)

INSTITUTION		Total population	Sample size
UON	Clinical medicine and therapeutics	110	85
	Dental Sciences	38	29
	Nursing	117	90
TOTAL		265	204
MOI	Department of Medicine	63	48
	Maxillofacial Surgery, Oral Medium/Pathology /Radiology	35	27
	Nursing Education Management and Research	34	26
TOTAL		132	101
GRAND TOTAL		397	305

4.6.1.2 Sampling Procedure of Lecturers

Similarly, the Saunders, Lewis, and Thornhill (2012) table for determining sample size, as provided in table 4.2, was used to pick a sample of lecturers. A sample consisting of 62 lecturers was chosen on the basis of a 95 percent confidence level and a margin of error of 5%. According to Mahmutovic (2022) a 5% margin of error helps determine how close others can reasonably expect result to fall relative to the true population value. A midpoint of 44 and 79 was chosen because they fall within the real 50 and 100:

$$44+79 = \frac{123}{2} = 62$$

Example: $24 \times 62 / 98 = 15$ clinical medicine and therapeutics lecturers

Table 4.7: Relative Sample Size of Entire Population of Lecturers Teaching all the Units in Medicine, Nursing and Dentistry from University of Nairobi (UON) and Moi University (MU)

INSTITUTION	DEPARTMENT	TARGET POPULATION	SAMPLE SIZE
UON	Clinical medicine and therapeutics	24	15
	Dental Sciences	11	7
	Nursing	23	15
TOTAL		58	37
MOI	Department of Medicine	18	11
	Maxillofacial Surgery, Oral Medium/Pathology/Radiology	10	6

	Nursing Education Management and Research	12	8
TOTAL		40	25
GRAND TOTAL		98	62

4.6.1.3 Sampling Procedure of University Librarians, Medical Librarians and HODs

The purposive sample approach was used to pick two University Librarians, two Medical Librarians, and six heads of departments (three from each of the two universities under investigation). Purposive sampling is suitable where a study purposely targets certain respondents believed to have relevant information appropriate for the research inquiry (Kombo and Tromp, 2006). Similarly, Cohen et al (2018) avers that the strength of purposive sampling is anchored in choosing informants who are well versed with relevant information regarding the phenomenon under study. Furthermore, Creswell, (2013) posit that both qualitative and quantitative studies can adopt the purposive sampling technique. This technique is of essence when the researcher is focused on discovering the phenomenon under study since it entails applying logic and adequate judgement in selecting the proper habitations and seeing the right quantity of people who are suitable for the focus of a research (Holmes, 2013).

4.7 Data Collection Methods

The procedure of gathering and analyzing data on particular variables in a research study helps the investigator to address the research topic. This process is known as data

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collection. The goal of data collecting, according to Mazhar et al (2021) is to collect high-quality information that enables analysis to result in the construction of plausible and persuasive solutions to the research topic. This study's mixed-method strategy required the employment of both qualitative and quantitative data collection methods. Interviews, questionnaires, and document analysis were utilized to gather both qualitative and quantitative data. The data collection instruments yielded accurate and sufficient data that was pertinent to the study's research problem. Mazhar (2021) allude that instrument selection affects the type, quantity, and quality of data that must be collected as well as the selection analysis that must be performed. The goal of the semi-structured interview was to gather qualitative information from heads of departments, head medical librarians, and university librarians. students and lecturers were asked to complete a self-administered questionnaire in order to gather quantitative data. Correspondingly, Cohen et al. (2017) and Creswell (2012) agree that the selection of data collecting tools affects a research study's results.

4.7.1 Interviews

An interview, according to Knott et al (2022) is a deliberate conversation between two or more persons. Similarly, Cohen et al. (2017), avers that, an interview is a flexible tool for data collection that permits the use of speech, nonverbal communication, visible said, and auditory multimodal channels. Additionally, Tepperman, and Albanese (2012), assert that both quantitative and qualitative data may be gathered through interviews. Furthermore, they claim that while qualitative data can be gathered through the use of a less formal, non-directive interview to investigate a broader variety of subjects, including the ideas and feelings of

research participants, quantitative data can be gathered via the utilization of a formal, controlled interview.

Correspondingly, Cohen et al (2018) state that using interviews can aid in the gathering of not only accurate but trustworthy data that are pertinent to a study's questions and objectives. Equally, interviews might be highly professional and structured with standardized questions for each responder, or they can be casual and unstructured chats, according to Cohen, Manion, and Marrison (2018).

Personal interviews were used to collect data from the university librarians, head medical librarians and HODs in both ~~universities~~universities. Separate interview schedules were developed for these three groups of participants (See Appendices 3, 4 and 5). This is in line with their different job descriptions and interactions and perceptions of the concepts in the study. The researcher approached each of the interviewees beforehand to arrange for an appropriate time and duration for the interviews. Once this was granted, the researcher then supplied each respondent with a list of themes that would be explored during the actual interviews with a request that the interviewees use it to prepare beforehand for the interviews.

Subsequently, the researcher personally carried out an individual face-to-face interview with each of the respondents. During the interviews, the researcher was able to clarify questions, correct misunderstandings and probe responses for more information that all added to the collection of in-depth information from the respondents. Using open-ended questions in the interviews enabled collection of a variety of information in detail that provided a lot of information for the study. Examples of such questions were: *-What is your opinion on Information Literacy Skills competency of the medical Students in your department? How*

adequate are the ILS in enabling medical undergraduate students in your department carry out their studies effectively? Does your institution have a formal information literacy policy and curriculum; Briefly state the procedure of formulating the ILS policy and curriculum? As the interviews progressed, notes were taken by hand as well as recording of the conversations using an audio-recording device. Permission to record the conversations was obtained via the informed consent letter.

Manion et al (2019) & Kothari (2014) agree that interviews enable a researcher to discover in much more depth than compared to any other method of collecting data. Respondents are not only given the opportunity to explain in a manner that comparable methods do not, but they are also given the option of sharing information with investigators in their own phrases and perspectives, instead of being compelled to fit their viewpoints into the researcher's potentially restricted choice of responses. (Saunders, Lewis and Thornhill, 2007).

Nonetheless, interviews have the drawback of depending on respondents' capacity to remember precise and truthful details about their life, situations, ideas, feelings, or behaviors. Therefore, according to Patten (2016) during an interview, hesitancy, specific inhibitive reactions, and so on from the respondents may raise certain suspicions about the veracity of the replies, and the interviewer can subsequently pose indirect questions to confirm his doubts.

4.7.2 Self- administered Questionnaire

According to Zheng et al (2020), the key tool in descriptive survey study is the questionnaire. Questionnaires are used by researchers to gather data pertaining to the opinions, emotions, views, beliefs, convictions, principles, perception, personality, and behavioral goals of study respondents in a broad population (Siedlecki, 2020). Similarly, Cohen et al. (2018) assert that

a questionnaire is a popular and useful technique for obtaining information from surveys because it offers organized quantitative data that can be provided without the investigator's presence, and is often relatively straightforward to interpret and analyze.

Additionally, Creswell (2012) proclaim that the two types of questionnaire design are the open-ended (unstructured) and closed-ended (structured) questionnaires. Open-ended questionnaire is where the respondent is at liberty to give his/her responses without any restrictions, whereas in closed-ended questionnaire research participants are confined to select answers from the many-choice answers provided. the open-ended responses allow an investigator to discover motives (Nassaji, 2015)

This study utilized questionnaire as means of collecting data because, the questionnaires are cost effective in collecting data from a number of participants who would otherwise not be reached through face-to-face interviews. Additionally, the questionnaires are convenient to the participants since the respondents can complete them at their own convenience (Atmowardoyo, (2018); Creswell, 2012). The study utilized open-ended (unstructured) and closed-ended (structured) questionnaires, because, according to Erickson, (2017) the shortcomings of questionnaires can be hugely minimized by mixing structured and unstructured questions. Furthermore, Mazhar (2021) state that there are two categories of questionnaire, that is self-completed and interviewer-completed questionnaires. The study adopted self-completed questionnaires to collect data from students and lecturers from the two selected universities. The choice of a questionnaire as one of the data collection instruments for these particular respondents was informed by the fact that they are widely dispersed

The questions in the data collection instruments were divided into different sections reflecting the thematic areas captured in the research questions, theoretical framework and literature

review. These included questions drawing on the status of ILS among medical undergraduate students; adequacy of ILS policies and curriculum; ILS understanding among medical undergraduate students; ILS possessed by staff facilitating ILS instruction; and ICT integration in ILS learning and instruction. Self-administered questionnaires were designed to enable collection of facts, attitudes and opinions and establish the respondents' experiences and knowledge about different concepts of importance to the study, such ILS curriculum design, implementation and review. Closed-ended type questions were used in the questionnaire to enable standardized data to be collected (for example: "what skills does ILS policy cover?") For this question, respondents were provided with a limited set of responses and they were required to pick one from. Closed-ended questions enabled collection of quantitative data that was easily coded and analysed thereafter. Open-ended questions were also included in the questionnaire to allow respondents to answer them as they saw fit and provide their own opinions and observations on certain aspects of the research questions (for example — "What strategies do you think should be utilized to improve information literacy skills training among medical undergraduate students?"). Open-ended questions allowed gleaning of information in rich details that were hitherto unknown to the researcher and which the researcher had not thought of beforehand. These type of questions gathered qualitative data. The self-administered questionnaires were advantageous for the study as they enabled the researcher to collect data cost-effectively from a large group of people who would otherwise not have been reached by face-to-face encounters. They were also convenient for the respondents who could complete them at their own convenience. Separate questionnaires were developed for the students and lecturers (see Appendices 1 and 2).

4.7.3 Document Analysis

This includes a thorough assessment of papers created throughout a wide spectrum of social sciences, ranging from the written word to visual pictures. Document review helps in triangulation to help reduce biasness and increase credibility and confidence in the research findings. The documents which were analyzed include: Commission for University Education guidelines; university policies, university calendars, strategic plans, syllabi and course outlines from participating universities, past research publications in ILS; relevant official documents and research documents on university education were also analyzed.

By triangulating data from documents review and interviews, the researcher attempted to provide a confluence of evidence to enhance credibility and reduce the impact of potential biases that can exist in a single study (Mazhar, 2021). In sum, documents review provided background and context, supplementary data, a means of tracking change and development, and verification of findings from other data sources.

4.8 Data Collection Procedures

This study used mixed methods, which allowed the researcher to obtain quantitative data from medical undergraduate students and lecturers, as well as qualitative data from university librarians, heads of departments, and heads of medical librarians. The use of mixed method guarantees that data acquired by one approach may be confirmed by the other (Cohen et al, 2018). Before beginning data collection, the researcher generated data collecting tools, which comprised of questionnaires and interview schedules. These instruments were validated through to face and content validities by choosing a sample of specialists in the field of study to provide a critical assessment of the translation of the constructs in the research tools (Komp & Tromp, 2008; and Cohen et al, 2018). Correspondingly the research subject the data collection instruments to Cronbach's alpha

values of above 0.7 to test internal consistency, which entails correlating replies to items in the questionnaire with one another (Kothari, 2014; and Creswell, 2013). Data collection tools were adjusted to suit the research problem. After acquiring study permissions and gatekeeper authorization letters the data gathering exercise began.

A week to commencement of data collection exercise, the researcher visited the two selected universities for an introduction session and to book appointments with the university librarians, head of departments, head medical librarians, lecturers and class representatives. Heads of departments set up meetings with the lecturers where the lecturer distributed the questionnaires to individual lecturers. The respective heads of departments, university librarians and heads medical librarians personally gave the appointment dates of when they would be available for the exercise. The class representatives helped set up meetings with researchers to give students in their classes the questionnaires. Some respondents consented and they were interviewed and others filled the questionnaires which were picked up later. All the lecturers filled and returned the questionnaires. Some of the students however, declined entirely to take part in the study explaining that their schedule was too tight and did not have time to attend to the questionnaire.

Throughout the interviews, the conversations were audio recorded, and the researcher also took handwritten notes as a backup to the audio recording. Creswell (2013) praise audio recording interviews because they can be played back and listened to frequently to acquire clarity, it gives a permanent record, and it is full in terms of the speech that transpired. Two interviews were done in a day depending on the availability of the interviewee. In some cases, interview appointments had to be rescheduled on numerous occasions due to the participants' busy nature of work. The interviews done on each day were transcribed at the

end of every day to avoid any confusion with other interviews. Questionnaires were collected at the two universities' colleges of Health Sciences.

4.9 Data Validity and Reliability

Scholars in research methodology (Cohen et al 2017; Kothari, 2014; Saunders, Lewis and Thornhill, 2012; & Creswell, 2013) concur that the worthiness of the precision of data gathering processes is critical to the success of any research endeavor. That is, the equipment or techniques used to gather the data must produce the sort of data that the researcher need to correctly answer the research study questions. Furthermore, Cohen et al. (2017) state that for data to be credible and legitimate, the data collection approach must produce information that is both relevant to the study objectives and correct.

4.9.1 Validity

Validity is the extent to which data collection method(s) accurately and exactly measure what they were supposed to measure, or the amount to which research results are actually related to what they claim to be about (Saunders, Lewis and Thornhill, 2012).

The study espoused both content and face validities. Content validity is an estimate of how well data acquired through a certain data collection tool represents a particular set of indicators or specific ideas (Erickson, 2017).

Face validity implies that the questions meant to test an idea should appear to test the ideas on the surface of the schedule (Saunders et al., 2012). To ensure that the questionnaires and interview schedules are valid, the researcher sent out the tools for collecting data to ILS experts for recommendations, suggestions and proposals on desired changes that needed to be made in terms of question suitability, questionnaire structure, and interview schedule

(Saunders et al., 2012). These specialists included academicians from Moi University's School of Information Sciences as well as four university librarians from around Kenya. Their feedback was used to improve the data collection instruments. Similarly, the researcher adapted questions from survey techniques used in past comparable studies. The researcher believes that these instruments must have been tested for validity before usage in these studies. As such, the study adapted and modified questionnaires used in another relevant research, namely Kingori (2015); Kanguha (2015); Kavulya (2004) Baro & Zuokemefa (2011); and Foo & Majid (2009).

Other method for determining validity is to triangulate the interviews, questionnaires and document review (Yeasmin and Rahman, 2012;). Furthermore, the shortcomings of a particular technique are offset via the positive aspects of the other (Cohen, 2018).

4.9.2 Reliability

Reliability entails showing that the procedures of a study, like data gathering strategies and analysis processes, would yield comparable results if conducted on another period or by a different scholar (Cohen et al 2018; Creswell, (2013); Saunders, Lewis and Thornhill (2012) have identified various ways of ascertaining reliability, namely; test-retest technique method which is issuing the same data collecting tool two times to the same respondents; equivalent-form approach which employs two comparable tools, whereby each item in each form vary from one another, but they are meant to assess a similar idea. Split-half technique is an approach in which a tool is divided into two separate sections, and theme results from a single section are tallied with results from the other; internal consistency technique, in which the rating derived in one item is tallied with ratings gathered from other questions in the instrument. Following the pre-test, Cronbach's alpha, a statistical significance measure, was

employed to assess the internal uniformity of responses to the questionnaire's particular inquiries.

4.9.3 Pilot Study

Piloting of data collection instruments was carried out to achieve reliability and validity.

This is a preliminary test or 'trying out' or carrying out trials on the data collection instruments (Kothari, 2014; Komp and Trompo, 2011). A pilot study allows a researcher to gain an early warning about where research procedures may fail or whether planned methodologies or instruments are unsuitable or overly complicated (Doody and Doody, 2018). Conducting a pilot study allows the researcher to acquire and improve the abilities required before beginning the larger inquiry. The researcher gets preliminary data, checks whether the instruments are effective, evaluates the data-analysis process, and clarifies what resources are necessary (Doody and Doody, 2018). The data collection tools were piloted at AMREF University because the institution trains medical doctors, hence, it had similar characteristics related to medical training. The interview schedules were administered to the university librarian, two heads of departments, and one reference librarian, and questionnaires were administered to forty (40) sixth-year students in medicine. This translated to forty-four (44) participants. This was deemed adequate for piloting because according to Doody and Doody, (2018), thirty-five (35) participants and above are a reasonable representative. Once the exercise was completed, the researcher assessed the results and adjusted the instruments appropriately. [The number was informed by Creswell \(2013\) who suggests that 30 representative participants is a reasonable minimum recommended for a pilot study. Once the pilot study was complete, the outcome of the interviews and the questionnaire were assessed consulting scholars with experience](#)

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[in ILS. Further, the statistician used the outcome of the questionnaires to test the reliability of the instruments using Cronbach values of above 0.7. The responses obtained were used to adjust the data collection instruments to suit the study.](#)

4.9.4 Cronbach's Alpha

Additionally, the questionnaires' reliability was assessed using Cronbach's Alpha.

Cronbach's alpha was applied to assess the internal consistency of the data collection tools, this entails how intently connected a set of items are as a set. Cronbach's alpha is made up of an alpha coefficient with a value spanning from zero to one as shown in table 4.7 below. An item with a reliability coefficient below 0.5 is deemed unacceptable, 0.5 to 0.6 is unfortunate, 0.6 to 0.7 is dubious, 0.7 to 0.8 is acceptable, 0.8 to 0.9 is decent while above 0.9 is exceptional.

Table 4.8: Cronbach's Alpha Table

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Table 4.9: Cronbach's Alpha Values

Research Objectives	Number of Items	Cronbach's Alpha
To assess the status of information literacy skills	12	0.803

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of medical undergraduate students at Moi University and the University of Nairobi.		
To examine the information literacy skills policies and curricula supporting the adequacy of ILS among medical undergraduate students at the two universities	16	0.707
To explore the ILS understanding among medical undergraduate students	6	0.672
To analyze the knowledge and skills possessed by staff engaged in facilitating ILS among medical undergraduate students	9	0.831
To examine the role of ICT in facilitating and promoting information literacy skills among medical undergraduate students at the two universities	18	0.877

Additionally, the study utilized triangulation method to realize reliability and validity. According to Saunder et al (2013) and Kothari (2014) triangulation allows validation of collected study data by cross corroboration of the adopted data collection instruments. The research tools were triangulated employing interviews, questionnaires, and a review of documents.

4.11 Data Analysis Strategies

The data was analyzed statistically and qualitatively to provide answers to the study questions. The study examined qualitative data, segmented it into significant logical units, coded the data into significant descriptions or group labels, and grouped the groups of data into themes that responded to the research objectives and questions (Creswell, 2012). Similarly, while analyzing statistical data, the researcher assigned code groups based on a pre-established coding scheme. The chosen coding method suited the study's research objectives and represented the reasoning derived from the data (Babbie, 2007). The codes were then transformed into numerical formats (Creswell, 2013). The ensuing data from these numerical representations enabled the study's description, explanation, summary, comparison and understanding data by means of percentages graphs and charts. Table 4.8 summarizes the mapping of research questions to data sources, respondents, and the strategy used to analyze data in each.

Table 4.10: Mapping Research Questions to Sources of Data and Data Analysis Approach

Research Questions	Data sources	Respondents	Data analysis technique
What is the status of ILS among medical undergraduate students at the University of Nairobi and Moi University?	Interview schedule Survey Questionnaire	University Librarians, Medical Librarians, HODS Lecturers Students	Qualitative data: thematic analysis Quantitative data
How does information literacy skills policy and curriculum guide in imparting ILS to medical, undergraduate students?	Interview schedule Survey questionnaire	University Librarians, Medical Librarians, HODS	Qualitative data: thematic analysis Quantitative data: SPSS

		Lecturers Students	
How is the understanding of ILS among medical undergraduate students?	Interview schedule	HOD University Librarians	Qualitative data: thematic analysis
What are the knowledge and skills possessed by staff facilitating ILS among medical undergraduate students?	Interview schedule Survey questionnaire	University Librarians, Medical Librarians, HODS Lecturers Students	Qualitative data: thematic analysis Quantitative data: SPSS/ thematic
How is ICT facilitating learning of ILS among medical undergraduate students?	Interview schedule Survey questionnaire	University Librarians, Medical Librarians, HODS Lecturers Students	Qualitative data: thematic analysis Quantitative data: SPSS/ thematic

4.12 Ethical Issues

Cohen et al. (2017) assert that ethical matters are concern with what is good and bad, and what is right and wrong. Ethical research concerns what researchers ought and ought not to do in their research and research behaviour. Further, Cohen et al (2017) enumerate the various ethical considerations that every researcher should note and embrace when planning to conduct a research study;

- a) Acquainted consent
- b) Privacy and innominateness

- c) Recognition and imperceptible
- d) benevolence
- e) Goodwill and obligation of care
- f) Responsibilities
- g) Obtaining access
- h) Directly and concealed research
- i) Transparency and accessible compared to discrete comprehension and spaces
- j) Connection and variations authority interactions in research
- k) Research interests

Simons and usher (2012) argue that ethics are “situated” i.e., they ought to be interpreted in specific, local situations. Each stage in the study process/sequence raises ethical issues. Sikes (2006) states that ethics touch “researchers and their research choices, research topics, methodologies and methods, and writing style”. As such, ethical concerns may emanate from the type of study being carried out; the context for the research; the procedures to be adopted; strategies for collecting data; the various categories respondents/participants; and the categories of data collected, analyzed and reported (Oliver, 2012). In this regard, the researcher sought consent from the respondents to voluntarily engage in the study. The participants were guaranteed of their privacy, confidentially and anonymity. The participants were also informed that it was within their right to withdraw from the study at any stage if they so wish without any authorizations.

Additionally, the researcher complied with Moi University research ethical guidelines. Also, the study obtained a research permit from NACOSTI in Kenya.

4.13 Chapter Summary

The focus of the study was to assess information literacy skills of medical undergraduate students in the selected public universities in Kenya, with a view, of proposing a framework to enhance delivery of the information literacy skills. The paradigm and methodology of the study have been elaborated and justified. The Methods of enquiry in this study included survey research (face-face interviews and questionnaires) and content analyses of other materials including official documents. A schedule of interviews with the University librarians, HODs, and heads medical librarians was carried out. Purposive, stratified sampling in conjunction with simple random sampling techniques were applied to sample data relating to lecturers and undergraduate student population while purposive sampling used to handpick the University librarians, medical librarians and head of departments that were included in the sample.

CHAPTER FIVE

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

5.1 Introduction

The chapter covers the response rate, demographic characteristics and analysis of data as guided by the thematic areas derived from research objectives. The researcher utilized mixed methods in collecting quantitative data among students and lecturers (check Appendices I and II), and qualitative data from heads medical librarians, HODs, and university librarians (see Appendices III, IV, and V). A mixed-methods strategy was appropriate because it facilitated the authentication of data collected by one method through another method. The collected data was evaluated via coding, in which every question in the questionnaire was assigned a unique number code. After that, SPSS was used to create tables, graphs, and statistics that were used to show, explain, and evaluate the patterns and relationships in the data (Saunders et al., 2012 and Kothari, 2014).

Qualitative data collected through interviewing participants was also prepared first by transcribing the audio-recorded interviews into word-processed text. From the transcripts of the interviews, summaries were made that presented the main ideas and themes emerging from each interview. The interview findings complemented the quantitative data results.

The objectives that guided the study were used in presenting the findings, namely:

1. To assess the status of information literacy skills of medical undergraduate students at Moi University and the University of Nairobi.
2. To examine the information literacy skills policies and curricula supporting the adequacy of ILS among medical undergraduate students at the two universities
3. To explore the ILS understanding among medical undergraduate students

4. To analyze the knowledge and skills possessed by staff engaged in facilitating ILS among medical undergraduate students
5. To examine the role of ICT in facilitating and promoting information literacy skills among medical undergraduate students at the two universities
6. To propose a framework to enhance ILS among medical undergraduate students in the selected universities in Kenya

5.2 Response Rate

The response rate is the proportion of eligible sample units that cooperate in a survey (Babbie and Mouton, 2011). Response rate is calculated as the total number of responses divided by the total number in the sample (usually expressed as a percentage (Saunders et al., 2012). Higher percentages of responses, according to Groves and Peytcheva (2008), are desirable because they limit the possibility of bias caused by non-response and guarantee a representative sample. Similarly, According to Babbie and Mouton (2011), a response rate of 50% is adequate for data analysis and presentation, a response rate of 60% is satisfactory, and a response rate of 70% is exceptional.

From the 353 questionnaires distributed to the students respondents, 255 questionnaires were returned, representing 65.4% response rate, as shown in Table 5.1. Additionally, a total of 62 completed questionnaires were obtained from the lecturers in the two public universities representing 100% saturation level. There was a 100% saturation level on the semi-structured interviews which were conducted on 2 university librarians, 2 heads medical librarians, and 6 HODs that is, the departments of Nursing; Dental Sciences; and Clinical Medicine and Therapeutics from the University of Nairobi; and departments of Nursing Education

Management and Research in the school of Nursing; Maxillofacial Surgery, Oral Medium/Pathology/Radiology in the school of Dentistry; and Medicine in the School of Medicine at Moi University. The researcher was able to attain 100% saturation level of both the lecturers, 2 university librarians, 2 heads medical librarians, and 6 HODs through persistently making appointments the participants, then made several visitations to the participants' places of work both at their universities and private practice (offices/ clinics). The researcher aligned the time of interviews with the participants' free time.

Table 5.1: Response Rates

Target Group	Sample Size (N)	Response Rate (n)	Response Rate in percentages
Interviews			
University Librarians	2	2	100
Head of Departments	6	6	100
Head medical Librarians	2	2	100
Interviews target rate	10	10	100
Questionnaires			
Medical undergraduate students	397	255	64.2
University lecturers	62	62	100
Questionnaires target rate	462	327	71.6

Source: Field data (2021)

The adequate response rate was because of the researcher's tenacity and frequent follow-ups.

5.3 Respondents' Background Information

This section examines the demographics of study the respondents of Moi University and the University of Nairobi (UON).

5.3.1 Students Demographic Data

A total of 255 questionnaires were received from students in the two public Universities in the sample. Table 5.2 depict the distribution of the students in the two institutions.

Table 5.2: Students Demographics (n=255)

Biographical Information	Categories	Frequency	Percentages (%)
University	Moi University	120	47
	UON	135	53
Schools	Dentistry	52	20
	Medicine	84	33
	Nursing	119	47
Gender	Male	151	59
	Female	104	41

Source: Field data (2021)

The outcome denotes that majority 135 (53%) of the students were from the University of Nairobi while 120 (47%) were from Moi University. The participants were distributed into respective area of study as follows: 51 (20%) were in dentistry, 83 (33%) were in medicine, and 119 (47%) were in nursing. Moreover, male respondents consisted of 151 (59%), while 104 (41%) were female.

5.3.2 Lecturers Demographic Data

The researcher received 62 questionnaires from the lecturers. The lecturer demographics are indicated in Table 5.3 below:

Table 5.3: Lecturers Demographics Data (n=62)

Biographical Information	Categories	Frequency	Percent
University	Moi University	25	31.3
	UON	37	68.7
Gender	Male	43	69.5
	Female	19	30.5
Education level	PhD	32	51.6
	Masters	30	48.4
Official Title	Tutorial	33	53.9
	Lecturer	9	12.5
	Senior Lecturer	17	28.9
	Professor	3	4.7
Specialty	Nursing	16	26.6
	Maxillofacial Surgery	6	17.2
	Obstetrics and Gynecology	10	16.4
	Surgery and Anesthesiology	1	2.3
	Dental Sciences	4	7
	Clinical medicine and Therapeutics	3	4.7
	Medicine	4	7.8
	Human Anatomy/Physiology/Human Pathology	6	10.9
	Ophthalmology	8	7
Work experience	0-5 years	7	4.7
	5-10 years	14	23.4
	10-15 years	6	11.7
	15-20 years	21	35.9
	Over 20 years	14	24.2

Source: Field Data (2021)

The upshots indicated that 88 (68.7%) of the respondents were from the University of Nairobi (UON), and 40 (31.3%) were from Moi University. Male respondents consisted of 89 (69.5%), while 39 (30.5%) were female. From the findings, 66 (51.6%) and 62 (48.4%) of the lecturers had attained a PhD and Master's level education respectively. The lecturers indicated their official job title, where 16 (12.5%) were lecturers, 6 (4.7%) were professors, 37(28.9%) were senior lecturers, while 69 (53.9%) were Tutorial Fellows. The lecturers were attached to various departments as follows: 34 (26.6%) were in the Nursing department, 22 (17.2%) were in Maxillofacial Surgery, 21 (16.4%) were in the obstetrics and gynecology department, 3 (2.3%) were in Surgery and Anesthesiology department, 9 (7%) were in Dental Sciences department, 6 (4.7%) were in Clinical medicine and Therapeutics department, 14 (10.9%) were in human anatomy and physiology and human pathology while 9 (7%) indicated they were in ophthalmology.

Furthermore, the findings indicated that 46 (35.9%) of the lecturers had 15 to 20 years of experience, 31 (24.2%) had over 20 years of experience, 30 (23.4%) had 5 to 10 years of experience, 15 (11.7%) had a 10 to 15 years' experience while 6 (4.7%) had a less than 5 years' experience.

5.3.3 Demographic Data of University Librarians, Heads Medical Librarians and Heads of Departments

5.3.3.1 Demographic Data of University Librarians

Table 5.4: Demographic Data of University Librarians (n=2)

Biographical Information	Categories	Frequency	Percentage
University	Moi University	1	50
	UON	1	50
Gender	Male	1	50
	Female	1	50
Education level	Bachelors	0	0
	Masters	2	100
	PhD	0	0
Work experience	0-5 years	0	0
	5-10 years	1	50
	10-15 years	0	0
	15-20 years	0	0
	Over 20 years	1	50

Source: Field data (2021)

The respondents were asked to declare their gender. It was divulged that the University Librarians from the two institutions were male and female, representing 1 (50%) respectively. Concerning academic qualifications, the two University librarians 2 (100 %) each had a master's degree. Regarding the work experience of the University librarians, the results showed that 1 (50%), had worked for over 20 years and another 1 (50%) had worked for amid 15 to 20 years.

5.3.3.2 Demographic Data of Head Medical Librarians

Table 5.5: Head Medical Librarians Demographics Data (n=2)

Biographical Information	Categories	Frequency	Percentage
University	Moi University	1	50
	UON	1	50
Gender	Male	1	50
	Female	1	50
Education level	Bachelors	0	0
	Masters	2	100
	PhD	0	0
Work experience	0-5 years	0	0
	5-10 years	1	50
	10-15 years	0	0
	15-20 years	0	0
	Over 20 years	1	50

Source: Field data (2021)

The study findings revealed that 1 (50%) and 1(50%) of Head Medical Librarians were male and female respectively. The study results further, established that 2 (100%) of the participants have Masters degree. Regarding work experience, the findings indicate that 1 (50%) of the respondent had work experience of over 20 years while 1(50%) had a work experience of between 5 to 10 years. This indicates that they have adequate experience in matters of ILS.

5.3.3.3 Demographic data of Head of Departments

Table 5.6: Head of Departments Demographics Data (n=6)

Biographical Information	Categories	Frequency	Percentage
University	Moi University	3	50
	UON	3	50
Gender	Male	4	66.7
	Female	2	33.35
Education level	Bachelors	0	0
	Masters	1	16.7
	PhD	5	83.3
Work Experience	5-10 years	2	33.3
	10-15 years	1	16.7
	15-20 years	2	33.3
	Over 20 years	1	16.7

Source: Field data (2021)

As indicated in table 5.6., 4 (66.7%) HODs were male and 2(33.35%) were female. Further, the outcome indicated that 2(33.3%) of the respondents had worked for 5 to 10 years, 1(16.7%) had work experience of amid 10 to 15 years, 2(33.3%) had work experience of between 15 to 20 yrs and 1(16.7%) had over 20 years' experience. Additionally, the research wanted to know the educational qualifications of the HODs and found out that 5(83%) HODs had Ph.D. qualification while 1(16.7%) had a Master's degree therefore they were able to ascertain the appropriate ILS curriculum and policy needed to successfully impart ILS to the undergraduate medical students.

5.4 Data Presentation and Analysis Based on Themes from Research Objectives

The following part examines the empirical outcomes of a study conducted to assess the ILS of medical undergraduate students at Moi University and University of Nairobi. As indicated in Section 5.1 above, qualitative and quantitative data were analyzed using themes and sub-themes drawn from the research objectives and questions.

5.4.1 Status of ILS among Medical Undergraduate Students

The sauce model underpinned the ILS adequacy among medical undergraduate students as explained in chapter two of this thesis. The model emphasizes on communication; numeracy; information; problem-solving; self-management and competitive; social and cooperative; and labor and learning skills as key ILS that students must possess (Bond, 2011). Similarly, Bruce's Six Frames model (Bruce, Edwards & Lupton, 2015) which informs this study is also relevant in relation to the research question because it can be applied to explain the levels of ILS among undergraduate medical students. However, the Sauce model informs this research question because of the inherent weaknesses of the Bruce's Six Frames model as explained in chapter two of this thesis. Status of ILS provides viable feedback on what ILS are required and their importance to undergraduate medical students at the University of Nairobi and Moi University. Further, it helps the study understand with clarity the various ILS that medical undergraduate students possess and possibly what deficit there exists. Furthermore, the status of ILS acts as a pointer on the adequacy of the ILS acquired, effectiveness of the ILS curriculum and policy in place; effectiveness of the pedagogy applied; how medical undergraduate view ILS and its training; and on how technologically oriented undergraduate students are towards the utilization of various ICT innovation for example big data, artificial intelligence. This section covers the study question: *What is the status of ILS among medical*

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undergraduate. This question had a Cronbach's Alpha values of 0.803 in the questionnaire. This indicated that the questions had a good internal validity (as shown in appendix I-IV).

Both students and lecturers were requested to declare their views regarding the status of ILS among medical undergraduate students. Their responses are presented in two parts that are; 5.4.1.1-students' responses on the status of ILS and 5.4.1.2-lecturers' responses on the status of ILS.

5.4.1.1 Students' response on ILS parameters to determine their ILS status

5.4.1.1.1 ILS status of medical students

Students' Responses on the Status of their ILS

The students were asked to express their current ILS status that facilitate them to determine their information requirements, search, evaluate, synthesis, apply and share information through a Likert scale on a scale of 5 to 1; where 5 represented Strongly Disagree (SD), 4 for Disagree (D), 3 for Neutral (N), 2 for Agree (A) and 1 for Strongly Agree (SA), in that order. The responses are shown in Table 5.7. The study finding in table 5.7 above are discussed under various sub-themes derived from the essential skills facet of the Sauce model (Bond, 2011). The variables of the essential skills facet are information; communication; numeracy; solving problems; self-management and competitive; social and cooperative; and labor & learning abilities.

Table 5.7: Status of Students' ILS (n= 255)

	SD		D		N		A		SA		Total		mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
I can express my exact information requirements.	3	1.18	6	2.35	14	5.49	148	58	84	32.9	255	100	4.2	3.7
I can accurately clarify a topic's concepts.	6	2.35	6	2.35	18	7.04	141	55.3	84	32.9	255	100	4.1	3.7
I comprehend the need to use the information to undertake an everyday task	3	1.18	3	1.18	21	8.23	108	42.4	120	47.1	255	100	4.3	3.9
I can utilize a variety of reference materials to become more acquainted with a subject	87	34.1	132	51.8	16	6.27	6	2.35	14	5.49	255	100	1.9	1.7
I can choose information materials and abridge them in my own words for my use	81	31.8	134	52.6	30	11.8	7	2.74	3	1.18	255	100	1.9	1.5
I comprehend the nature of publicly available information on the worldwide web	108	42.4	96	37.6	39	15.3	6	2.35	6	2.35	255	100	1.8	1.6
I am able to capture notes from both print and electronic sources by printing them or storing them to a disc.	6	2.35	15	5.88	54	21.2	87	34.1	93	36.5	255	100	4.0	3.6
I utilize truncation techniques	153	60	27	10.6	42	16.5	26	10.2	7	2.74	255	100	1.9	1.7
I utilize Boolean search techniques	103	40.4	20	7.84	69	27	39	15.3	24	9.41	255	100	2.5	2.3
I can narrow down the internet search by fields.	30	11.8	114	44.7	39	15.3	42	15.9	30	11.8	255	100	2.7	2.5
I utilize a mailing list to get and exchange information	33	12.9	39	15.3	57	22.4	66	25.9	60	23.5	255	100	3.3	3.1
I utilize group discussions to gather and share information	6	2.35	20	7.84	45	17.6	84	32.9	100	39.2	255	100	4.0	3.6
I utilize newsgroups/online forums to gather and share information	9	3.52	25	9.8	42	16.5	99	38.8	80	31.4	255	100	3.8	3.5
I can distinguish precise and comprehensive information	3	1.18	24	9.41	57	22.4	105	41.2	66	25.9	255	100	3.8	3.4
I utilize acquired information to critically think and solve study related problems.	106	41.6	96	37.6	33	12.9	12	4.71	8	3.13	255	100	1.9	1.6
I can efficiently search for certain library materials using the library's online public access catalogue.	70	27.5	61	23.9	14	5.49	76	29.8	34	13.3	255	100	2.8	2.7
I am capable of incorporating learnt information into an existing body of knowledge	42	16.5	105	41.2	29	11.4	64	25.1	15	5.88	255	100	2.6	2.4
I can arrange information for practical use	57	22.4	99	38.8	12	4.7	70	27.5	17	6.67	255	100	2.6	2.4
I utilize web addresses for internet searching	12	4.7	15	5.88	10	3.92	96	37.6	122	47.8	255	100	4.2	3.8
I utilize information ethically and legally	90	35.3	108	42.4	36	14.1	18	7.05	3	1.18	255	100	2.0	1.7

Source: Field Data (2021)**5.4.1.1.2 Information Skills Levels**

The study sought to understand if students understood the type and application of information.

To effectively gauge if students understood the type and application of information, students were requested to respond to these sentiments; *you can define your exact information*

requirements., you use the information to undertake your everyday tasks, you can recognize precise and comprehensive information and you can arrange information for practical use.

The findings revealed that 9 (3.53%), 6 (2.36%), 27 (10.59%) and 156 (61.18%) of the students gainsaid that they can define their exact information requirements, they understood the need to use the information to carry out their day-to-day tasks, they are capable of recognizing correct and comprehensive information and they are able to arrange information for practical use respectively. In contrast, 232 (90.9%) 228 (89.4%), 171 (67.1%) and 87 (34.12%) of the students agreed that they could define their exact information requirements, they appreciated the requirement to utilize information to carry out daily duties, that they were capable of recognizing correct and comprehensive information. , they understood the need to use information to carry out their day-to-day tasks and they are capable of arranging information for practical use, in that order.

5.4.1.1.3 Numeracy Skills

The study intended to know if students understood how information may be utilized for numeracy.

The results revealed that 180(70.59%), 123 (48.24%) and 219(85.89%) of the students disagreed that they use truncation techniques, Boolean logic to search for information and can utilize a variety of reference materials to become more acquainted with a subject. While 33(12.94%), 63(24.71%) and 20(7.84) of the students agreed that they use truncation, Boolean logic techniques to information search and can utilize a variety of reference materials to become more acquainted with a subject.

5.4.1.1.4 Problem-Solving Skills

The study attempted to figure out if students utilized the retrieved information to solve problems that were of academic nature. The respondents were requested to respond to these statements: *you can limit online search fields, are you capable of applying acquired information to critically think and solve study related problems, and can you effectively utilize the library catalogue to retrieve relevant information.*

The results in table 5.7 disclosed that the plurality of the respondents 144(56.47%), 202(79.22%) and 131(51.37%) were oblivion on ways to limit a search by fields, use information to critically think and solve study related problems, and the ways of utilizing the library catalogue to effectively retrieve information materials based on their information need/s. On the contrary, 72(28.23%), 20(7.84%) and 110(43.13%) of the students agreed that they utilize information for thinking critically and solving problems, and that they utilize a library catalogue to retrieve relevant information materials based on their information need/s.

5.4.1.1.5 Communication

The study also wanted to identify if information seekers (students) were capable of communicating information effectively. The study findings revealed that 126 (56.00%) and 218 (96.89%) of student respondents stated that they use mailing lists to obtain and exchange information, and that they utilize web addresses for internet searches respectively. However, 72(28.23%) and 27(10.59%) of the students surveyed disagreed that they utilize mailing lists to exchange or obtain information from their peers in that order.

5.4.1.1.6 Self-Management and Competitive

The study also aimed to determine if students were able to self-manage, competitively search and use information to advance their studies. The respondents were requested to assert their reactions to these statements- *do you comprehend the type of information accessible through the internet, and can you choose information materials and abridge the content in your own words.*

Majority of the student respondents 204(80%) and 215(84.31%) of the respondents disagreed that they comprehend the nature of publicly available information on the worldwide web and that they can choose information materials and abridge content for use. On the other hand, 12 (4.71%) and 10 (3.92%) of respondents believed that they understood the nature of freely available information on the internet, and could easily select and abridge information material in that order.

5.4.1.1.7 Social and Co-operative

According Sauce model (2009) a person who is well-versed in information (information literate), among other requirements, should be able to share/exchange acquired information with peers and also obtain information from their peers. To address this concern, the respondents addressed the following statements: - *can you use group discussions to obtain and exchange information, can you use newsgroups to obtain and use information, and do you incorporate contemporary information into an established body of expertise.*

The findings revealed that 184 (72.16%), 179 (70.20%), and 79 (30.98%) of the students stated that they use group discussions to receive and exchange information, newsgroups to obtain and manipulate information, and can amalgamate contemporary information into the current insights/expertise in that order. While 26 (10.20%), 34 (13.33%), and 147 (57.65%) of those

respondents disputed that they use group conversations to gather and distribute knowledge, they exploit newsgroups/online forums to receive and use information, and can integrate new information into the current knowledge base correspondingly.

5.4.1.1.8 Labor and Learning Skills

The study sought to understand if students have learnt skills that can empower them to search information appropriately, access information from any format or source, and ethically use the accessed information. To adequately address this sub-theme the respondents were requested to answer the following questions: *"Can you accurately clarify a topic's concepts?" "Are you able to take notes from both print and electronic resources?" "Do you use information in an ethical and legal manner?"*

The results found out that majority 232 (90.98%), 180 (70.59%), and 21 (8.24%) of the students, agreed that they can accurately clarify a topic's concepts, take notes from non-print and print sources by printing or saving into a disc, and apply information legally and ethically in that order. Whereas 9(3.53%), 21(8.24%), and 198(77.65%) of respondents disputed that they can accurately clarify a topic's concepts, can take notes from print and electronic sources by printing and saving them to a disc and apply information legally and ethically respectively.

5.4.1.2 Lecturers' Response on ILS Parameter to Determine ILS Status of Medical Students

5.4.1.2.1 ILS Status of Medical Students

The lecturers were prompted to respond to closed-ended questions on a Likert rating scale that aimed to quantify the status of ILS among undergraduate medical students on a rating scale of 5 to 1, with 5 indicating strongly disagree, 4 indicating disagree, 3 indicating neutral, 2 indicating agreement, and 1 indicating strong agreement.

Table 5.8: Lecturers' Responses on the Status of ILS of Undergraduate Medical Students (N=62)

Statement	SD		D		N		A		SA		Total		Meas	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Students can accurately clarify a topic's concepts.	6	9.68	5	8.06	7	11.72	25	40.63	18	29.69	62	100	3.72	3.42
Students understand the need to use the information to undertake an	2	3.13	3	4.69	5	8.06	38	60.94	14	21.88	62	99	3.92	3.51
Students can utilize a variety of reference materials to become more	9	14.84	43	69.53	4	6.30	2	3.13	3	4.69	62	98	2.15	1.81
Students can choose information materials and abridge them in their	11	17.97	40	64.06	6	9.38	4	6.30	1	1.56	62	99	2.11	1.75
Students comprehend the nature of publicly available information on	13	21.09	36	58.59	5	8.06	4	6.30	3	4.69	62	99	2.16	1.86
Students are able to capture notes from both print and electronic sources	2	3.13	3	4.69	2	3.13	17	27.34	38	60.94	62	99	4.37	3.97
Students utilize Truncation search techniques	23	37.50	17	28.13	5	8.06	13	21.09	3	4.69	62	99	2.27	2.13
Students utilize Boolean search techniques	35	56.25	7	11.72	10	15.63	5	8.06	5	8.06	62	100	2.01	1.96
Students can narrow down the internet search by fields.	14	21.88	15	24.22	6	9.38	12	18.75	16	25.78	62	100	3.02	2.91
Students utilize a mailing list to find and exchange information	6	9.38	7	11.72	10	15.63	20	32.03	19	31.25	62	100	3.64	3.36
Students utilize group discussions to gather and share information	1	1.56	2	3.13	3	4.69	24	39.06	31	50.00	62	98	4.33	3.90
Students utilize newsgroups/online forums to gather and share information	1	1.56	2	3.13	3	4.69	26	42.19	29	46.77	62	98	4.27	3.85
Students can recognize accurate and complete information	27	43.55	27	43.55	5	8.06	2	3.13	1	1.56	62	100	1.77	1.45
Students are capable of utilizing acquired information to critically think	28	44.53	24	38.28	5	8.06	3	4.69	2	3.13	62	99	1.85	1.62
Students can effectively use the library catalog to search for specific	16	25.80	16	25.80	5	8.06	19	30.64	6	10.16	62	100	2.76	2.60
Students can integrate new information into an existing body of knowledge	29	46.88	21	33.59	7	10.94	3	4.69	2	3.13	62	99	1.84	1.62
Students can arrange information for practical use	31	50.39	19	30.71	2	3.13	6	9.45	4	6.30	62	100	1.91	1.78
Students utilize web addresses for internet searching	1	1.56	2	3.13	5	8.06	22	35.48	31	50.00	62	98	4.30	3.87
Students utilize information ethically and legally	18	28.91	10	16.41	8	13.28	9	14.84	16	25.81	62	99	2.94	2.87

Source: Field data (2021)

The analysis of the findings in table 5.8 above are also discussed using the sub-themes derived from the essential skills facet as suggested in the Sauce model (2009) as drawn from the literature. The sub-themes are information; numeracy; solving problems; communication; individual-management and competitiveness; co-operative and social; and labor & learning abilities.

5.4.1.2.2 Information Skills Level

Respondents were requested to state how they rate students' ILS skills based on how they search, synthesize, and apply facts. The lecturers responded to these statements; *Students can define their exact information requirements, students use the information to undertake their everyday task, and students can recognize accurate and complete information*

The study findings revealed that 53 (85.48%), 52 (82.82%), and 3 (5.47%) of the lecturer respondents agreed that undergraduate medical students were able to define their exact

information requirements, use the information to undertake their everyday tasks, and can recognize accurate and complete information in that order. However, 6 (10.16%), 5 (8.59), and 54 (87.09%) of the respondents gainsaid that were able to define their exact information requirements, use the information to undertake their everyday tasks, and can recognize accurate and complete information respectively.

5.4.1.2.3 Numeracy Skills

According to the findings, 5 (8.60%), 16 (25.70%), and 10 (16.12%) of the respondents indicated that students use several sources of information to improve knowledge about a topic, students use truncation to search for information, and students use Boolean logic to adequately search and retrieve information. On the other hand, 52 (83.37%), 40 (65.63%), and 42 (67.97%) of lecturer respondents disagreed that students can use a variety of reference materials to become more familiar with a subject, can use truncation techniques to search for information, and can use Boolean logic to search for information respectively.

5.4.1.2.4 Problem-Solving

The study sought to understand if students use searched information for problem-solving, therefore, the lecturer respondents were asked to respond to statements: *students can narrow down the internet search by fields, students are capable of applying acquired information to critically think and solve study related problems, and students can effectively use the library catalogue to look up for particular information.*

The findings allude that most of the lecturer respondents 29 (46.08%), 52 (82.81%) and 32 (50.75%) disagreed that students can narrow down the internet search by fields, students utilize the information for problem-solving and critical thinking and students utilize the

catalog to search for specific information correspondingly. On the contrary, 6 (9.38%), 5 (8.06%) and 5 (8.06%) of the respondents were of a neutral opinion that students can limit the online search by field, utilize information for thinking critically and problem solutions, and can utilize the library catalog to find explicit information in that order.

5.4.1.2.5 Communication

The lecturers were requested to respond to statements: *students utilize mailing lists to obtain and use information and students utilize the web address to search the internet*

The results indicated the majority of lecturers 39 (63.28%) and 53(85.48%) agreed that students use mailing lists to collect and use information, and they use web addresses for internet searches in that order. However, 13 (21.08%) and 3(4.69%) of respondents disagreed that students use mailing lists to collect and use information, and that they use web addresses to look for information on the internet respectively.

5.4.1.2.6 Self-Management and Competitive

The research intended to determine if learners utilized information for self-management and for competitiveness. This concern was addressed through the following statements;

ability of the students to choose information materials and abridge in their own words and use, and comprehend the type of information accessible through the global web.

Majority of the study participants 51(82.03%) and 49(79.68%) disagreed that students can choose information items and summarize them in their unique terms for their individual use, and they understood the type of information accessible through the global web correspondingly. However, 11(8.59%) and 7(11.72%) of the respondents agreed that students can choose information materials and abridge in their own words for their use, and students comprehend the type of information accessible through the global web respectively.

5.4.1.2.7 Social and Co-operative

To address this sub-theme, the respondents were required to respond *if students utilize group discussions to gather and share information, if students utilize newsgroups/online forums to gather and share information and whether they can integrate new information into an existing body of knowledge.*

Study results indicated that, 55 (89.06%), 55 (89.06%), and 5 (7.81%) of the participants surveyed agreed that students use group discussions for collecting and exchanging information, newsgroups/online forums to gather and share information, and may incorporate fresh facts into the current knowledge in that order. While 3 (4.69%), 3 (4.69%), and 50 (80.47%) of respondents disagreed that students leverage group discussions to acquire and exchange information, newsgroups/online forums to gather and share information, and may incorporate fresh facts into the current knowledge respectively.

5.4.1.2.8 Labor and Learning Skills

The study wanted to divulge if students can recognize accurate and complete information. The study findings revealed that 3 (4.69%), 55(88.28%), 43(70.32%) and 25 (40.61%) of the lecturers agreed that learners can recognize accurate and complete information, can take notes from print and electronic sources by the printing or saving them to disk, can accurately clarify a topic's concepts and can utilize information ethically and lawfully in that order. However, 54 (87.08%), 8(6.24%), 5 (8.06%), 11(17.74%) and 28 (45.32%) of the lecturers gainsaid that student can recognize accurate and complete information, can take notes from print and electronic sources by the printing or saving them to a disk, can accurately clarify a topic's concepts and can utilize information ethically and legally correspondingly.

Concerning the Status of their ILS, One University librarian (UL01) was interviewed and had this to say:

".... ILS has helped many students improve and refine their communication and socialization abilities, as well as fundamental information locating and usage skills.... However, majority of students are unable to synthesize and apply the knowledge needed... We also have a plagiarism problem among our finalist pupils..."

Additionally, one Medical Librarian (ML02) said:

"..... majority of our undergraduate students do not have sufficient ILS skills hence majority of them don't have independent searching skills, or ability to compare and contrast information retrieved from a range of information resources and understand them...."

Further, quoting one of the Head of Department (HD05)

"...students can conduct basic information resources searches in the library; however, majority of students are unable to search information in complex information databases especially MEDLINE, PROQUEST, NEXISLEXIS ... an indication of insufficient ILS skills.... majority of the students cannot do high level information searches...."

However, another Head of Department (HD02) interviewed said

".....majority of our students do not possess enough or sufficient ILS to enable them to be independent learners and information searchers...."

Additionally, one Medical Librarian (ML01) said:

"... all is not lost, because lecturers are embracing group learning which is helping in imparting ILS learning and training among students...."

The sentiments made by HD02 concurred with the sentiments of other heads of departments regarding the status of ILS among undergraduate medical students. The results indicated that students can define their information needs. However, students have difficulty in obtaining information from different resources like the internet, e-databases, and library shelves, and are incapable of utilizing acquired information to critically think and solve study related problems in their fields of study.

5.4.2 ILS policy and Curricula supporting delivery of ILS to medical undergraduate students

To adequately address this objective, the study started off by interrogating the availability, tenets and viability of ILS policies and then delved into the ILS curricula in place to support ILS learning and training, in the terms of its adequacy, content, delivery mechanisms, assessment and levels of success.

5.4.2.1 ILS Policy

The essential skills facet of the Sauce model (Bond, 2012) guides ILS policy formulation used in imparting ILS by advocating for the formulation and implementation of policies that will help empower students search, retrieve, utilize and share information using learned ILS. The Cronbach's alpha value is 0.707 for objects in the students' questionnaire. An indication that the internal validity of the questions is high. Therefore, the researcher sought answers to the question "*What ILS policy and curriculum are used in imparting?*"

The findings are as follows;

5.4.2.1.1 The availability of a Formal ILS Policy

Students Response on the availability of a Formal ILS Policy

The students were requested to indicate if there was an ILS policy in their institution of learning.

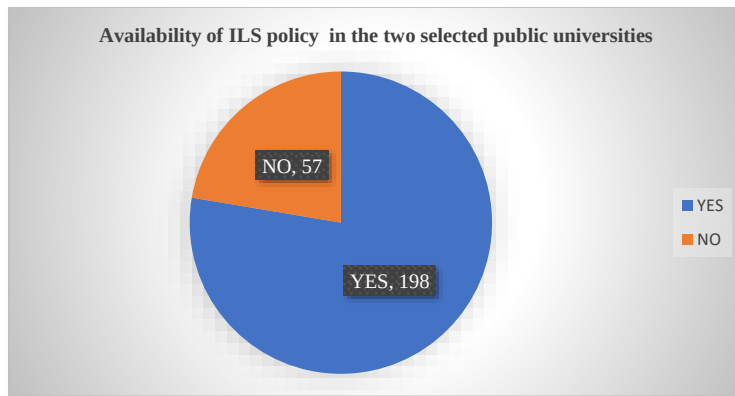


Figure 5.1: Availability of ILS Policy (N=255)

The outcome in Figure 5.1 shows that 198 (77.64%) of the students indicated that their universities had a formal ILS policy that guided the training of ILS to undergraduate medical students, whereas 57(22.35%) of the respondents stated that there was absence of ILS policy.

Lecturers' Response on Availability of a Formal ILS Policy

The lecturers were asked if an ILS policy was in place to guide the imparting of ILS. The upshots are indicated in figure 5.2.

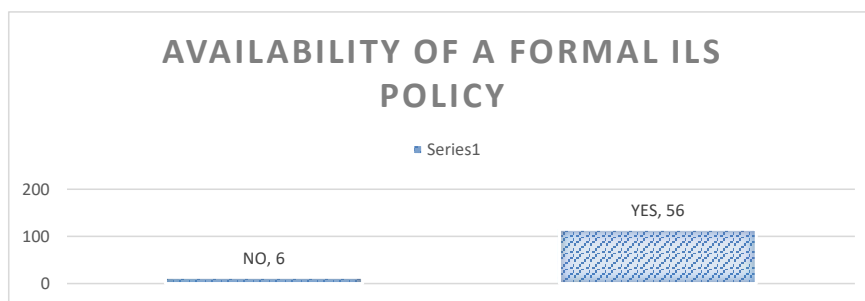


Figure 5.2: Lecturers' Responses on availability of a Formal ILS Policy n=62

The results found that 56 (90.32%) of the lecturers agreed that an ILS policy was available and on the contrary, 6(9.68%) of the lecturers stated that an ILS policy was absent. The university librarians, head medical librarians, and heads of departments were asked if a formal ILS policy was available to guide the imparting of ILS to students. The interviews conducted revealed that institutions had an ILS policy in place but they were not being utilized in curriculum development and implementation. In addition, the respondents who were interviewed stated that the policies were outdated and didn't reflect the changes taking place in the information realm.

In essence, one head of the department (HD01) commented:

“.... Yes, the ILS policy is available which guides students on how to search and use information independently..... The procedure also stipulates on how the teaching of ILS ought to be carried out...however the ILS policy has no timeframe on when and how it should be updated to cater for new developments in the information landscape....”

Additionally, one of the heads of medical librarians (ML02) stated that:

“..... Yes..... We are all engaged in information literacy skills and we are all committed to student-centered and life-long learning to equip students tackle real problems as elaborated in our information literacy skills policy.....”

5.4.2.1.2 Covered in the ILS Policy

Students' Response on the ILS Skills Covered by the ILS Policy

The students were requested to divulge on the different skills-areas covered by the ILS policy.

Table 5.9 summarizes the study's findings.

Table 5.9: ILS Skills Covered by the ILS Policy (n=255)

Statement	SD		D		N		A		SA		Total		mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Knowledge and information skills	13	5.09	24	9.42	18	7.05	132	51.76	68	26.67	255	100	3.9	3.5
Problem-solving and critical thinking skills	15	5.88	29	11.37	13	5.1	148	58.04	50	19.61	255	100	3.7	3.4
Communication skills	8	3.14	12	4.7	10	3.92	124	48.62	101	39.61	255	100	4.2	3.8
Information technology skills	11	4.31	13	5.09	16	6.27	166	65.49	49	19.21	255	100	3.9	3.5
Social Responsibility skills	14	5.49	23	9.01	19	7.45	169	66.27	30	11.76	255	100	3.7	3.3
Referencing and legal issues skills	9	3.52	17	6.67	32	12.55	142	55.68	55	21.56	255	100	3.9	3.4

Source: Researcher, 2021

The outcome in Table 5.9 indicates that 200(78.43%) of the students affirmed that ILS policy covered knowledge and information skills. While 37(14.51%) of the respondents disagreed that knowledge and information skills were covered by the ILS policy. Additionally, 198(77.65%) of the respondents expressed that problem-solving and critical thinking skills were contained in ILS policy, while 44(17.25%) respondents disagreed that problem-solving and critical thinking skills were not contained in the ILS policy. Respondents who stated that ILS policy covered communication skills were 225(88.23%), and 20(7.84%) respondents disagreed that ILS policy covered communication skills.

Furthermore, 215(84.31%) of the respondents agreed that ILS policy addressed information technology skills, whereas, 24(9.41%) of the respondents disagreed that information technology skills was not contained in ILS policy. The study findings also revealed that social responsibility skills were covered by the policy according to 199(78.04%) of the respondents however, 37(9.40%) of the respondents disagreed that the policy covered social responsibility skills. Additionally, referencing and legal issues skills facet was covered in the ILS policy as stated by 197(77.25%) of the respondents but 26(10.19%) of the respondents disagreed that the ILS policy addressed referencing and legal issues skills.

Lecturers' Response on the ILS Covered by the ILS Policy

The lecturers were requested to state the ILS covered in the ILS policy. The findings are shown in Table 5.10.

Table 5.10: Lecturer's Response on Information Literacy Skills Covered by the ILS Policy (N=62)

ILS	SD		D		N		A		SA		Total		Mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Knowledge and information skills	2	3.13	1	1.56	1	1.56	53	85.94	5	8.06	62	100	3.94	3.46
Problem-solving and critical thinking skills	3	4.69	2	3.13	1	2.34	50	81.25	5	8.06	62	99	3.82	3.39
Communication skills	1	1.56	1	1.56	2	3.13	49	79.69	9	14.06	62	100	4.03	3.55
Information technology skills	2	3.13	2	3.13	3	4.69	51	82.81	4	6.25	62	100	3.86	3.40
Social Responsibility skills	3	4.69	2	3.13	1	1.56	47	75.00	10	15.63	62	100	3.94	3.50
Referencing and legal issues	2	3.13	3	4.69	2	3.13	50	81.25	5	8.06	62	100	3.90	3.43

Source: Field data (2021)

The Table 5.10 depict that most of the lecturer respondents 58 (93.76%), 55 (89.06%), 58 (93.76%), 55 (89.06%), 57 (90.63%) and 55 (89.06%) agree that knowledge and information skills, problem-solving and critical thinking, communication, IT, **social responsibility**, referencing and legal skills are areas covered by the ILS policy respectively. On the other side, 3 (4.69%), 5 (8.06%), 2 (3.13%), 4 (6.25%), 5 (8.06%), and 5 (8.06%) lecturer respondents disagreed that knowledge and information, communication, IT, social responsibility, and referencing skills were covered by the ILS policy.

These insights are consistent with the outcomes of the interview, in which department heads stated that ILS policies in place covered areas of knowledge and information skills exemplar, such as educating learners to utilize both technical and information skills suitable within their area of study. Furthermore, they pointed out that the communication skills exemplar in the ILS policy enabled students to learn how to retrieve, arrange, and convey information, especially via technologically driven activities, as well as the problem-solving skills exemplar,

which trains one on how to locate, gather, examine, handle, and utilize pertinent details in a variety of media.

5.4.2.1.3 Formulation and Implementation of the ILS Policy

The study investigated the procedure that is followed to develop and implement an ILS policy including roles played by every stakeholder. HODs, Head Medical Librarians, and University Librarians were implored to highlight their contributions in the formulation of ILS policy. The responses have been tabled as shown in table 5.11.

Table 5.11: Contributions of Various Stakeholders to ILS Policy

Response from questionnaires		Respondents
Action/function	Tasked	
<i>Interpretation and Advice</i>	<i>University Librarian</i>	HOD 03
<i>Development and/or Review</i>	<i>University Librarian and Heads of Departments</i>	UL02
<i>Monitoring and Evaluation</i>	<i>University Librarian</i>	LT34
<i>Compliance and Implementation</i>	<i>University Librarian Lecturers Heads of Departments Head Medical Librarians</i>	HOD 06
<i>Decision Making and Guidance</i>	<i>Vice-Chancellor, Deputy Vice-Chancellor (Academic and Students Affairs), Registrar (Academic and Students Affairs) Teaching and Learning</i>	LT07

Key: UL-University librarian; LT-Lecturer; HOD-Head of department

Source: Field Data (2021)

Interviewed respondents were required to explain the personalities behind ILS policy formulation. The results point out that university librarians are the initiators of ILS policy development in universities, by interpreting the patterns of information access and use within the university. The respondents, further, stated that once university librarians identify the need

to initiate ILS policy or gaps in ILS policy, then notifies the heads of departments who are the quality assurances officers and custodians of curricula in their departments through a memorandum or submissions to the deans' committee. Once the deans' committee approves, university librarians, head medical librarians, and heads of departments embark on generating the content of the ILS policy or reviewing the existing ILS policy to fill in the identified gaps. In addition, university librarians have been bestowed the task of monitoring and evaluating the ILS policy whereas, heads of departments and lecturers fortify that there is adherence to the ILS policy. The top university management have the function of supporting the enactment of ILS policy through providence of the infrastructure and resources.

5.4.2.1.4 Adequacy of the ILS Policy

The interviewed respondents rated the adequacy of the ILS policy in addressing ILS training and learning among medical students. Two university librarians, six heads of departments, and two heads of medical librarians responded. Out of the total 10 respondents interviewed, 2 (20%) stated that the ILS policy in place was adequate in addressing the training and learning of ILS among students. While 8 (80%) of the interviewed respondents stated that the ILS policy in place was inadequate in addressing ILS training and learning needs among students because it does not state who is responsible for ILS training, timeframes for reviews and updates are not indicated, assessments and reviews have never been carried out and the policy updated to reflect changes in the information environment. Furthermore, ILS training is never timetabled and is carried out at the convenience of the librarian and the lecturers and the requisite facilities for ILS instruction are not available/provided. The results are shown in Figure 5.3.

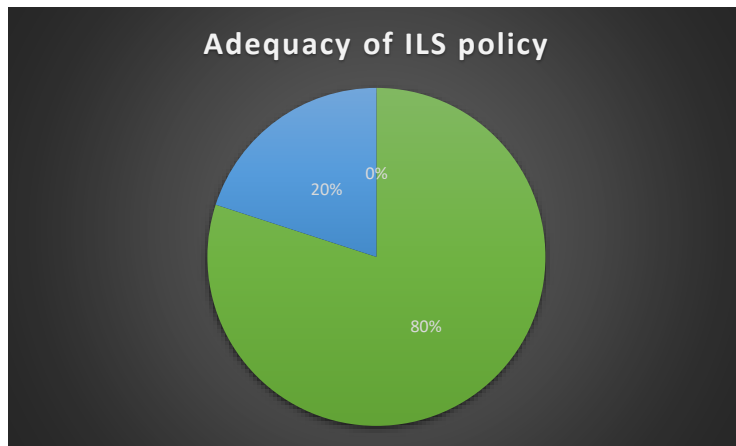


Figure 5.3: Adequacy of ILS Policy

Source: Field data (2021)

5.4.2.2 ILS curricula and the methods of delivery

The relational frame from Bruce's six frames for information literacy education approach (Bruce et al., 2006) served as the study's foundation. It illustrates how the content, learning to learn, and experience frameworks are mediated or brought together to influence the ILS curriculum development and delivery. The relational frame is concerned with how the ILS curriculum is developed and delivered to students. The relational frame does not see the student and information literacy skills as separate entities; rather, it sees the relationship between the student and information as one entity. The Cronbach's Alpha values for this question were 0.769 for objects in the students' questionnaire. This suggested a high internal validity of the test items. The question that is being addressed here is

“What is the adequacy of information literacy skills curriculum or programmes and assess the methods used in delivering to medical undergraduate students in the two universities.

The findings are organized under the following headings:

5.4.2.2.1 Existence of ILS Curriculum

ILS training not only covers the conventional library functions but also how to exploit various sources of information advantageously (Mokhtar and Majid, 2008). According to Albitz (2007) it is ability to discover new knowledge from the existing one through application of critical thinking, problem solving and analytical skills. Therefore, according to Webber and Johnston (2018) an effective ILS curriculum design should address how a subject is taught as much as it addresses what is taught. Content and method of instruction go hand in hand. The ILS curriculum should focus on encouraging students to experience ILS in a manner that encourages them to easily apply the skills across disciplines as far as selection, evaluation and application of information is concerned. The study sought to find out if there was an ILS curriculum in place and how it facilitated the learning and training of ILS in medical institutions.

Students' Response to the Existence of the ILS Curriculum

Medical students from the two public universities were asked if their institution had an ILS curriculum. The results are illustrated in figure 5.4.

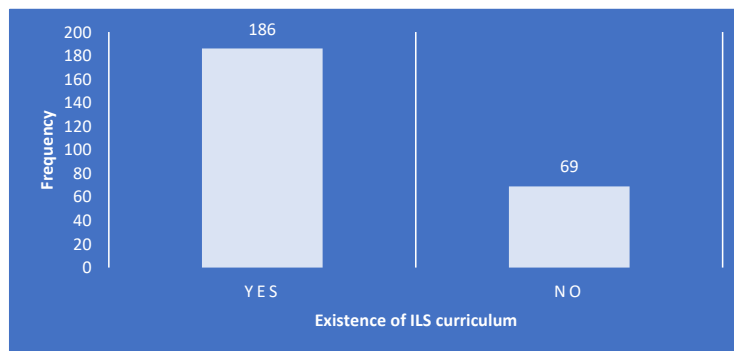


Figure 5.4: Students' Response on the Existence of ILS Curriculum (N=255)

Source: Field data (2021)

Figure 5.4 shows that 186 (72.94%) of students asserted that their university had an ILS curriculum, whereas 69 (27.05%) indicated that their university did not have an ILS curriculum.

Lecturers' Response to the Existence of the ILS Curriculum

The lecturers were asked whether their institution had an ILS curriculum. The lecturer participants 53 (85.50%) stated that their institution had an ILS curriculum, while 9 (14.50%) indicated that their institution did not have an ILS curriculum. One of the Heads of departments commented:

".... We have an elaborate curriculum that lecturers in my department and to some extent librarians use to train ILS to our undergraduate medical students...."

5.4.2.2.2 Topics Covered by the ILS Curriculum

The study sought to find out the topics covered by the ILS curriculum. The findings are provided in sections 5.4.2.6.1 and 5.4.2.6.2 for students' and lecturers' responses respectively.

Students' Response on the Topics Covered by the ILS Curriculum

The study wanted to know the various topics that were covered by ILS curriculum at the two selected universities.

Table 5.12: Students' Responses on the Topics Covered by the ILS Curriculum (n=255) (Source: Field data (2021))

Statement	SD		D		N		A		SA		Total		Mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Problem-solving and critical thinking	12	4.71	23	9.01	16	6.3	129	50.6	75	29	255	100	3.91	3.54
Information search and retrieval	18	7.06	43	16.86	20	7.8	114	44.7	60	24	255	100	3.61	3.30
Legal Issues in information use	22	8.63	32	12.55	15	5.9	123	48.2	63	25	255	100	3.68	3.37
Computer literacy skills in information use	19	7.45	28	10.98	10	3.9	116	45.5	70	27	255	100	3.60	3.38
Socialization and effective communication skills	11	4.31	21	8.23	8	3.1	151	59.2	64	25	255	100	3.93	3.53
Integration of information	34	13.3	46	18.04	6	2.4	114	44.7	55	22	255	100	3.43	3.19
Basic library guidelines on how to access library materials	10	3.92	22	8.62	13	5.1	132	51.8	78	31	255	100	3.96	3.58
Research skills	37	14.5	54	21.17	11	4.3	108	42.4	45	18	255	100	3.27	3.05

The finding indicated that majority of the students 204(79.99%), 174(68.22%), 186(72.94%), 186(72.94%), 215(84.31%), 153(58.99%), 169(64.26%) and 210(82.34%) agreed that problem-solving and critical thinking skills, information search and retrieval, legal issues in information use-course, computer literacy skills in information use, socialization and effective communication skills and the research skills, integration of information and basic library guidelines on how to access library materials were covered by the ILS curriculum respectively. However, 35 (13.72%), 61(23.92%), 54(21.18%), 47(18.43%), 80(31.37%), 32(12.54%), 32(12.54%) and 91 (35.67%) of the students respondents disagreed that problem-solving and critical thinking skills, information retrieval and search skills, legal issues in the information used, computer literacy skills in information use, integration of information, socialization and effective communication skills, basic library guidelines on how to access library materials topic and research skills are topics that are covered by the ILS curriculum

Lecturers' Response on the Topics Covered by the ILS Curriculum

The study sought know the response of lecturers concerning the topics covered in the ILS curriculum. The responses are presented in table 5.13.

Table 5.13 Lecturers' Responses on the Topics Covered by the ILS Curriculum (N=62)

Statement	SD		D		N		A		SA		Total			
	f	%	f	%	f	%	f	%	f	%	f	%	Mear	sd
Problem-solving and critical thinking	2	3.23	2	3.23	1	1.61	40	64.52	17	27.42	62	100	4.05	3.62
Information search and retrieval	2	3.23	2	3.23	2	3.23	37	59.68	19	30.65	62	100	4.08	3.65
Legal Issues in information use	1	1.61	1	1.61	1	1.61	42	67.74	17	27.42	62	100	4.15	3.69
Computer literacy skills in information use	2	3.23	2	3.23	2	3.23	35	56.45	21	33.87	62	100	4.11	3.69
Socialization and effective communication skills	1	1.61	1	1.61	2	3.23	32	51.61	26	41.94	62	100	4.25	3.81
Integration of information	2	3.23	2	3.23	1	1.61	36	58.06	21	33.87	62	100	4.11	3.69
Basic library guidelines on how to access materials in the library	1	1.61	1	1.61	1	1.61	39	62.90	20	32.26	62	100	4.18	3.73
Research skills	2	3.23	1	1.61	1	1.61	33	53.23	25	40.32	62	100	4.27	3.83
Information search and retrieval	1	1.61	1	1.61	2	3.23	41	66.13	17	27.42	62	100	4.14	3.67

Source: Field data (2021)

The findings of the study revealed that 57(91.94%), 56(90.33), 59(95.16%), 56 (90.33%), 58 (93.55%), 57 (91.94%), 59 (95.16%), 58 (93.55%) and 58 (93.55%) of the respondents agreed that problem-solving and critical thinking skills, information search and retrieval skills concept, legal issues in information use, computer literacy skills in information use, socialization and effective communication skills, integration of information, basic library guidelines on how to access materials in the library, research skills, and information searching and retrieval techniques are covered by the ILS curriculum in that order. On the contrary, 4 (6.46%), 4 (6.46%), 2 (3.23%), 4 (6.46%), 2 (3.23%), 4 (6.46%), 2 (3.23%), 3(4.84%) and 2 (3.23%) gainsaid that problem-solving and critical thinking skills, information search and retrieval skills concept, legal issues in information use, computer literacy skills in information use, socialization and effective communication skills, integration of information, basic library guidelines on how to access materials in the library, research skills, and information searching and retrieval techniques are covered by the ILS curriculum respectively.

From interviews with university librarians and heads of departments, the results confirmed that the ILS curriculum covered information search techniques, information use, plagiarism check and avoidance, citation methods, referencing techniques, integration of information, effective communication, writing skills, basic research skills, and computer literacy skills. Has one university librarian (HD01) asserted that:

“...the contents of ILS curriculum are tailored towards creating a product (student) ... who can recognize when information is required and discover, analyze, and effectively utilize that knowledge in an ethical and non-plagiarized manner ...”

5.4.2.2.3 Methods of ILS Delivery

The study sought to establish the methods utilized in delivering ILS curriculum to medical undergraduate students. The findings are shown in sections 5.6.2.1.1 and 5.6.2.1.2 for the students and lecturers respectively.

Students' Response to Methods of ILS Delivery

Table 5.14: Students' Response to Methods of ILS Delivery (N=255)

Methods of ILS delivery	SD		D		N		A		SA		Total		Mean sd	
	f	%	f	%	f	%	f	%	f	%	f	%		
Computers	12	4.7	10	3.92	9	3.5	172	67	52	20.39	255	100	3.95	3.53
Face to face teaching	3	1.2	13	5.09	5	2	186	73	48	18.82	255	100	4.03	3.57
Online materials	4	1.6	8	3.13	2	0.8	192	75	49	19.21	255	100	4.07	3.60
Handouts	15	5.9	10	3.92	17	6.7	175	69	38	14.9	255	100	3.83	3.42
Library orientation	19	7.5	22	8.67	24	9.4	156	61	34	13.33	255	100	3.64	3.28
WhatsApp group engagements	31	12	21	8.23	9	3.5	142	56	52	20.39	255	100	3.64	3.34
Peer training	33	13	15	5.88	10	3.9	124	49	73	28.62	255	100	3.74	3.45
Pre-recorded audio-video clips	12	4.7	10	3.92	18	7.1	146	57	69	27.05	255	100	3.98	3.58
Weekly librarian -student engagements	8	3.1	7	2.74	11	4.3	169	66	60	23.52	255	100	4.04	3.60

Source: Field data (2021)

The findings revealed that majority of the students 224(87.84%), 234(91.76%), 241(94.50%), 190(74.50%) and 241(94.50%) agreed that use of computers, face to face teaching, handouts given to students, library orientation, and online materials were used to impart ILS among medical undergraduate students in that order. However, 22(8.62%), 16(6.25%), 12(4.69%), 25(9.80%) and 31(12.15%) of the respondents disagreed that computers, face to face method, online materials, handouts and library orientation were teaching methods used to impart ILS among medical undergraduate students respectively.

Furthermore, the study revealed that 194(76.07%), 197(77.25%), 215(84.31%) and 229(89.80%) of respondents stated that WhatsApp group engagements, peer training, Pre-recorded audio-visual video clips and weekly librarian-student engagements/discourse were used as methods of ILS delivery respectively. There were 52(20.38%), 48(18.82%), 22(8.62%) and 15(5.87%) respondents who disagreed that WhatsApp group engagements,

peer training, Pre-recorded audio-visual video clips and weekly librarian-student engagements/discourse were used as methods of ILS delivery respectively.

Lecturers' Response on Methods of ILS Delivery

Table 5.15: Lecturers' Response on Methods of ILS Delivery (N=62)

Statement	SD		D		N		A		SA						Meansd
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	
Computers	1	1.61	1	1.61	2	3.23	51	82.26	7	11.29	62	100	3.99	3.51	
Face to face teaching	1	1.61	2	3.23	4	6.45	44	70.97	11	17.74	62	100	3.98	3.52	
Online materials	4	6.45	3	4.84	5	8.06	39	62.90	11	17.74	62	100	3.80	3.41	
Handouts	2	3.23	1	1.61	1	1.61	48	77.42	10	16.13	62	100	3.97	3.52	
Library orientation	1	1.61	1	1.61	2	3.23	53	85.48	5	8.06	62	100	3.95	3.46	
WhatsApp group engagements	6	9.68	8	12.90	6	9.68	35	56.45	7	11.29	62	100	3.50	3.17	
Peer training	9	14.52	5	8.06	3	4.84	31	50.00	14	22.58	62	100	3.60	3.33	
Pre-recorded audio-video clips	2	3.23	6	9.68	5	8.06	40	64.52	9	14.52	62	100	3.76	3.35	
Weekly librarian -student engagements	1	1.61	1	1.61	5	8.06	35	56.45	20	32.26	62	100	4.15	3.69	

Source: Field data (2021)

As shown on table 5.15 significant proportion of the lecturers 58(93.55%), 55(88.70%) and 50(80.65%) agreed that computers, face to face learning and online materials were methods of ILS delivery to students correspondingly. On the contrary, 2 (3.23%), 3 (4.84%) and 4 (6.45%) respondents disagreed that computers, face to face learning and online materials were methods used in delivering ILS to medical undergraduate students in that order.

Correspondingly, 58 (93.55%), 58(93.55%), 42 (67.74), 46 (74.20%), 49 (79.03%) and 55 (88.71%) of the lecturers agreed that handouts, library orientation, WhatsApp group engagements, peer training, weekly librarian-student engagements/discourse and pre-recorded audio-visual video clips were used to impart ILS to undergraduate medical students respectively. Whereas 1 (1.61%), 2 (3.23%), 6 (9.68%), 3 (4.84%), 5 (8.06%) and 5 (8.06%) of the respondents were undecided that handouts, library orientation, WhatsApp group engagements, peer training, weekly librarian-student engagements/discourse and pre-recorded

audio-visual video clips were utilized to train used to train ILS to medical undergraduate students.

The verbatim findings also gave similar responses which are summarized in the words of two respondents, that is a university Librarian (UL 02) and one head of the department (HD05).

According to the sentiments of the university librarian (UL 02) from one of the universities had this to say:

“.... We utilize peer training through knowledge ambassadors among the students I also have a program known as librarian-student weekly engagement where we discuss issues on library information material access and use, find out the challenges that they face in retrieving and using the information”

One head of department (HD05) reverberated:

“...professionals involved in ILS teaching employ several tools to teach these important skills, the methods include among other methods, online classes, pre-recorded audio-visual videos prepared by the library personnel, formation of social media groups where the department engage positively with students on issues concerning access to information materials, originality in clinical writings, usage of information. We also have face-to-face engagements, giving out handouts on information usage, search, ...”

5.4.2.2.4 Who Teaches ILS

The study aims to learn about the evaluation procedures used to determine the success of ILS curriculum instruction. Lecturers were asked to describe the assessment procedures they used to evaluate the efficiency of ILS curriculum instruction. The replies were similar, and they are summarized in Table 5.16.

Table 5.16: Staff Involved in ILS Instruction

Respondents	Responses from the questionnaire
ST98	<i>Librarians conduct the training</i>
ST78	<i>Lecturers conduct the training</i>
ST132	<i>Head librarian at the college of health science</i>
LT61	<i>Librarian at the medical school library</i>
LT03	<i>Collaboration between the lecturer and university librarian</i>

Source: Field data (2021): [key: ST-STUDENT; LT-LECTURER]

The interview responses are similar to the ones stated in table 5.14. The heads of departments, heads of medical librarians, and university librarians stated that lecturers and librarians were involved in teaching ILS. This is done collaboratively.

One university librarian (UL01) commented:

“.... Lecturers and librarians conduct the training of ILS in consultation based on the topics....”

5.4.2.2.5 Techniques for Assessing the Effectiveness of the ILS Curriculum

The study sought to learn about the assessment techniques used to determine the success of ILS curriculum instruction. Lecturers were asked to describe the assessment procedures they used to evaluate the efficiency of ILS curriculum instruction. The replies were similar, and they are summarized in Table 5.15.

Table 5.17: Techniques for Assessing the Effectiveness of the ILS Curriculum

Respondents	Responses from the questionnaire
LT11	<i>practical research writing; creative clinical presentations;</i>
LT23	<i>ILS feedback forms</i>
LT36	<i>Focus groups, interviews</i>
LT 41	<i>Knowledge tests</i>
LT55	<i>Informal assessment techniques</i>
LT57	<i>On the spot assessment</i>
LT 59	<i>Pre-Assessment Using CATs,</i>
LT60	<i>Examination for those trained under Communication skills classes</i>
LT62	<i>Continuous assessment Tests</i>

Source: Field data (2021) [Key: LT- Lecturer]

The verbatim findings affirmed that several methods are employed to assess the effectiveness of the ILS curriculum. Heads of departments, heads medical librarians, and university librarians agreed that numerous methods were employed such as focus groups, on the spot assessment concept maps, CATs, information assessment techniques, interviewing, knowledge tests through creative clinical and research papers, and ILS feedback forms. One University Librarian (UL01) said:

"..... Librarians use concept maps more frequently because they provide unique opportunities to assist students in integrating new concepts..... they are appropriate as a pre-test and post-test for students and therefore work best in assessing course-integrated information literacy instruction and standalone information literacy courses like communication skills...."

Further, one head medical librarian (ML02) interviewed said:

“.... Our institution uses the focus groups, concept maps and CATs to assess ILS of our medical students”

In addition, one head of department interviewed (HD02) stated that:

“... we use various methods to assess how effective ILS curriculum is ...the most common one that we use in my department is interviewing, information assessment techniques, knowledge tests, performance assessments where we allow students to demonstrate what they can do, as opposed to describing what they know.... This helps in assessing learning outcomes that focus on higher-order thinking skills, however, I cannot ascertain how effective the methods are...”

From the analysis of the findings, it is vivid that the majority of the participants agreed that there were several methods of assessing the effectiveness of the ILS curriculum training.

5.4.3 ILS Understanding among Undergraduate Medical Students

According to Krubu (2017), ILS guides and motivates learners to seek solutions by combining existing and newly acquired information and simplifying knowledge. Bruce's six frames model underpins the perception of staff and undergraduate medical students towards ILS learning. The theory informed students' perception towards ILS learning and application, that is the way, trainers and learners develop a positive attitude towards ILS learning and training because they (the trainers and learners) are the driving force behind learning, hence take an active role and establish broader applications for skills learned through activities that encourage critical thinking in problem-solving and probing. The Cronbach's Alpha values for this question were 0.672 for items in the students' questionnaire. This suggested a high internal validity of the test items. This study sought responses to this objective through the answers to the question “*what is the perception/attitude of medical undergraduate students towards ILS instruction in Nairobi and Moi universities in Kenya?*” Questions E (1-3) of the questionnaire for students (Appendix I), questions E (1-3) of the questionnaire for lecturers (Appendix II),

questions E (1-8) of the interview schedule for heads of department (Appendix III), questions E (1-7) of the interview schedule for University Librarians (Appendix IV) and questions E (1-7) of the interview schedule for heads of medical librarians (Appendix V) addressed this question. The results are presented in the following sub-heading;

5.4.3.1 ILS Training and Learning

Students' Views towards ILS Training and Learning

Students were asked to provide responses to a survey on their attitudes towards ILS instruction and learning. The majority of students 143 (63.56%) were negative about the value of acquiring /learning ILS while 82 (36.44%), were enthusiastic about studying ILS, as shown in figure 5.6.

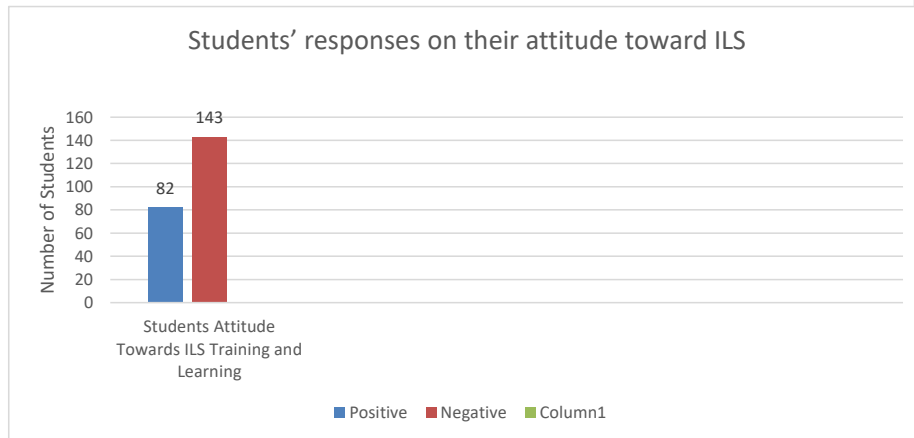


Figure 5.56: Students' Views toward ILS Training and Learning

Respondents were asked to elaborate on their responses. First, students who had a good attitude towards ILS learning and training are given with their comments presented in Table 5.18:

Table 5.18: Responses of Students who were Enthusiastic about ILS Learning and Instruction

Respondents	Responses from the questionnaire
ST22	<i>I have learned how to communicate effectively with my fellow students and my lectures</i>
ST42	<i>Enable me to know how to search information e-databases like ProQuest, Medline</i>
ST67	<i>I think possessing information literacy skills is prestigious</i>
ST 89	<i>Known various information sources</i>
ST192	<i>Ability to use the information to solve problems</i>
ST201	<i>Ability to write quality research papers</i>
ST218	<i>Learned various ICT techniques to assist me in accessing information</i>
ST223	<i>Learned how to find books in the library</i>

Source: Field Data (2021) Key: [ST-Students]

Secondly, the comments of those who were negative towards ILS learning and training are presented in Table 5.19:

Table 5.19: Student Responses Indicating Unfavorable View towards ILS Learning and Instruction

Respondents	Responses from the questionnaire
ST12	<i>The trainers are not audible enough hence I learned very little</i>
ST 13	<i>I already know where the library is</i>
ST23	<i>We are so many during the training hence no personalized attention</i>
ST76	<i>The skills have not helped me at all</i>
ST79	<i>It was one shot training not regularly taught</i>
ST83	<i>Some topics in the handouts are difficult to understand</i>
ST91	<i>Insufficient time spent on instruction sessions</i>
ST 130	<i>Confusion on who is to teach the skills</i>
ST178	<i>The time difference between training and course offerings</i>

ST 193	<i>Computers are not working during training, WIFI is not working</i>
ST222	<i>Students' absence of awareness regarding library resource utilization trainings</i>

Source: Field data (2021) **Key:** [ST-Students]

Several students mentioned the following as reasons why ILS instruction was ineffective for them: Absence of student awareness regarding library usage training, separation of training and course offerings, insufficient time spent on training sessions, and other factors are listed in Table 5.19.

Lecturers' Response on the ILS Understanding among Medical Undergraduate Students

Lecturers were asked in the questionnaire to comment on the attitude of students towards ILS learning and training. The findings found that 32(51%) of the lecturer respondents stated that students had an undesirable attitude while 30(49%) of the lecturer respondents stated that students had a positive attitude towards ILS training and learning. Table 5.20 below show the responses of those lecturers who stated that students had a negative towards ILS training and learning.

Table 5.20: Lecturers' Response on the' ILS Understanding among Undergraduate Medical Students

Respondents	Responses from the questionnaire
LT 07	<i>Students don't show interest in the ILS training</i>
LT16	<i>They still don't write their research papers and clinicals to the required levels</i>
LT 25	<i>Students state that it's a waste of time</i>
LT 32	<i>Students equate the training to library tour</i>
LT 52	<i>Students are overconfident</i>
LT44	<i>Sometimes few students turn up for training</i>

LT57	<i>Don't ask questions just sit there</i>
LT60	<i>Few students can evaluate information</i>

Source: Field Data (2021) Key: [LT-Lecturer]

The lecturers who believed that ILS training and learning has positively impacted the students, pointed out that students have learned how to locate information resources in the library effortlessly, they have learned various ICT skills that have facilitated them to access information easily, they can write research papers among others. While the lecturer respondents who said that students had a negative attitude towards ILS training and learning stated that many students don't show interest during the ILS training, few show up for the ILS training, students think ILS training is all about library tours, and they don't ask any questions during the training.

The results of interviews conducted with university librarians, heads of departments, and heads of medical librarians revealed that students have a negative attitude towards ILS learning and training and as such, absence of interest by the students, that they display casual attitudes when they are called upon to attend orientation programs, webinar seminar trainings on ILS, access and retrieval trainings and public talks with information literacy scholars. One Head of department (HD04) noted:

"...our students when called upon to attend ILS classes and training don't attend, they lack interest. Majority of them have not become independent learners, don't know how to avoid of plagiarism..."

One head medical librarian (MH02) said:

".... Students are generally not positive on ILS learning and training...."

A university librarian (UL01) noted:

".... Only a few students attend the ILS training session. Again, the vast majority of individuals who attend depart before the ILS training sessions are completed. As a consequence, students bring their lecture notes to the library to study.... they seldom consult textbooks in both formats, and library attendance is relatively low, except at the end of the semester when students are preparing for end-of-semester examinations... This is a strong sign that our students are dissatisfied with ILS instruction..."

5.4.3.2 Experience after ILS Training

Students' Library Experience after ILS Training

The respondents were required to rate their library experience after undergoing ILS training.

The items were as shown in Table 5.21 There was a total of 5 items measuring this variable.

The students who participated in this study were asked to score the items in this section based on how strongly they disagreed or strongly agreed with them.

Table 5.21: Students' Library Experience after ILS Training (N=255)

Library Experiences	SD		D		N		A		SA		Total		Mearsd
	f	%	f	%	f	%	f	%	f	%	f	%	
I use the library resources for my term papers and general information needs	11	4.3	28	11	27	11	154	60	35	14	255	100	3.68 3.29
I know how to get specific titles easily using online library catalogs	14	5.5	28	11	15	5.9	166	65	32	13	255	100	3.68 3.30
I can find and use various types of information materials resources like books, journals, audiovisuals	15	5.9	25	9.8	29	11	148	58	38	15	255	100	3.66 3.29
I can evaluate the various sources of information materials	21	8.2	19	7.5	24	9.4	150	59	41	16	255	100	3.67 3.31
I know how to access e-resources off-campus and on-campus	23	9	40	16	9	3.5	145	57	38	15	255	100	3.53 3.21

Source: Field data (2021)

The results in Table 19, revealed that 189 (74.11%), 198 (77.64%), and 186 (72.94%) of the respondents agreed that they use the library resources to write term papers and to satisfy their general information needs, that they know how to easily get specific titles using the library's online public access library catalogue, and that they can find and use various library resources

such as books, journals, and audiovisual videos. In contrast, 39 (15.29%), 42 (16.47%), and 40 (15.68%) of respondents disagreed that they use library resources to write term papers and satisfy general information needs, that they know how to easily get specific titles using the library's online public access catalogue, and that they can find and use various library resources such as books, journals, and audiovisual videos correspondingly.

In addition, 191(74.90%) and 183(71.76%) agreed that they can evaluate the various sources of information and they know how to access e-resources off-campus and on campus. However, 24(9.41%) and 9(3.52%) of the respondents were undecided that they can evaluate the various sources of information materials and know how to access e-resources off-campus and on-campus respectively.

Lecturers' Response on Students' Library Experience after ILS Training

Lecturers were required to respond to students' library experience after ILS training and learning. Table 5.19 presents the results.

Table 5.22: Lecturers' Response on Students' Library Experience after ILS Training (N=62)

Students' library experience	SD		D		N		A		SA		Total		Mean sd	
	f	%	f	%	f	%	f	%	f	%	f	%		
Students utilize the library resources for my term papers and general information needs	3	4.84	3	4.84	4	6.45	29	46.77	23	37.10	62	100	4.06	3.68
Students know how to get specific titles easily using online library catalogs	4	6.45	2	3.23	3	4.84	35	56.45	18	29.03	62	100	3.95	3.58
Students can find and use various types of information materials resources like books, journals	2	3.23	1	1.61	3	4.84	27	43.55	29	46.77	62	100	4.25	3.84
Students can evaluate the various sources of information materials	3	4.84	3	4.84	2	3.23	29	46.77	25	40.32	62	100	4.11	3.72
Students know how to access e-resources off-campus and on-campus	4	6.45	4	6.45	3	4.84	28	45.16	23	37.10	62	100	3.99	3.63

Source: Field data (2021)

Respondents were asked to describe students' library experience after undergoing ILS training and learning. The results indicated that 52 (83.87%), 53 (85.48%), 56 (90.32%), and 54 (87.09%) of the lecturers respondents agreed that students utilize library resources to write their term papers and satisfy their general information needs, know how to get specific titles easily using library online public access library catalog, can find and exploit various types of library information materials like books, journals, and audiovisual material without any hitch, correspondingly.

However, 6 (9.68%), 6 (9.68%), 3 (4.84%), 6 (9.68%) and 8 (12.90%) of the respondents gainsaid that students consult library information materials to write their term papers and satisfy their general information needs, know how to get specific titles easily using the library's online catalog, they can find and use various library resources like books, journals, and audiovisual videos in the library, understand how to access e-resources off-campus and on-campus basis and can evaluate the various sources of information materials in that order.

University librarians, heads of departments, and heads of medical librarians who were interviewed stated that after undergoing ILS training and learning, those undergraduate medical students who attend the training are able to seek for information materials in the library without any problems, they know the various information sources available in the library, usage of online information resources had greatly improved, reference questions at the information/reference desk had reduced, there was satisfactory behavior in the library, the ability to consult numerous information sources when writing their term papers, students were able to determine the authoritativeness, correctness, and reliability of the information sources. . In support of statements made during the interview, head medical librarian (ML02) had this to say:

“.... Through ILS learning students can understand the correctness, precision, and reliability of the information sources they are using. Students are able to determine and recognize their individual information needs accurately, as a result, student information requests and inquiries are no longer vague compared to the past...”

A university librarian (UL01) commented:

“.... After undergoing ILS training, those students who attend the trainings have built independent learning skills to deal with the explosion of information...as evident in the way they search for information in the library...”

The study findings indicate that the majority of students have a negative attitude towards ILS instruction and learning. However, the data show that students who devote their time to ILS training and learning gain abilities that allow them to use information appropriately and write authentic and well-referenced term papers.

5.4.4 Knowledge and Skills Possessed by Staff Facilitating ILS among Medical Undergraduate Students.

Gatero (2011) states an individual must possess ILS knowledge and skills for effectual tutelage (training) and utilization of information resources in both hardcopy and softcopy formats. The higher thinking skills facet of Bond’s Sauce model (Bond, 2011) was adopted to underpin knowledge and skills possessed by staff in facilitating ILS because it encompasses the capability to understand, scrutinize, synthesize and assess information for operative problem-solving and decision-making. The theory also helps investigate how lecturers and librarians are helping students to find, investigate, and analyze information to derive a personal perspective. How successfully staff carry out this task is pegged on their ILS competencies. The Cronbach’s Alpha values for this question were 0.831 for items in the students’ questionnaire. This suggested a high internal validity of the test items. The research question sought to find out *the knowledge and skills possessed by staff of the University of Nairobi and Moi University in facilitating ILS among medical undergraduate students?* Questions F (1-2)

of the questionnaire for students (Appendix I), questions F (1-2) of the questionnaire for lecturers (Appendix II), questions F (1-6) of the interview schedule for heads of department (Appendix III), questions F (1-5) of the interview schedule for university librarians (Appendix IV) and questions F (1-7) of the interview schedule for heads of medical librarians (Appendix V) addressed this question. The results are presented below.

5.4.4.1 Knowledge and Skills Possessed by Staff Facilitating ILS among Medical Undergraduate Students.

Students' Response on Knowledge and Skills Possessed by Staff Facilitating ILS among Medical Undergraduate Students.

The study sought to establish the skills possessed by staff that enable them to serve the students efficiently. The responses from the students are presented in Table 5.23

Table 5.23: Students' Response to Knowledge and Skills Possessed by Staff Facilitating ILS among Medical Undergraduate Students. (N=255)

Information literacy skills	SD		D		N		A		SA		Total			
	f	%	f	%	f	%	f	%	f	%	f	%	Mean	sd
The capacity to select information that is most relevant to the indicated information demands	86	33.7	124	48.62	11	4.31	22	8.62	12	4.7	255	100	2.02	1.79
Ability to discern potential information sources	74	29	123	48.24	19	7.45	16	6.27	23	9.01	255	100	2.18	1.99
Aptitude to create tactics for finding information	52	20.4	146	57.25	10	3.91	25	9.8	22	8.62	255	100	2.29	2.07
Aptitude to contrast and analyze information obtained from different sources	48	18.8	161	63.13	12	4.7	19	7.45	15	5.88	255	100	2.18	1.90
Aptitude to arrange, use, and pass on information	23	9.01	178	69.8	13	5.09	24	9.41	17	6.66	255	100	2.35	2.04
Aptitude to generate and expand on existing information	64	25.1	123	48.23	28	11	27	10.6	13	5.09	255	100	2.22	1.98

Source: Field Data (2021)

The findings revealed that majority 210(82.35%), 206 (80.78%), 198 (77.64%), 209 (81.96%), 201(78.82%) and 187(73.33%) of the students refuted that librarians can select the information that is relevant to their information needs, can create tactics for finding information, can contrast and analyze information obtained from different sources, can arrange, use, and pass

on information to others, and can generate and expand on existing information respectively in that order.

On the contrary, 34(13.33%), 39(15.29%), 47(18.43%), 34(13.33%), 41(16.07%) and 40(15.59%) of the respondents agreed that librarians can select the information that is most appropriate to the information needs expressed, librarians can discern potential information sources, create tactics for finding information, can contrast and analyze information obtained from different sources, can arrange, use, and pass on information to others and they can generate and expand on existing information correspondingly.

Lecturers' Response to Knowledge and Skills Possessed by Staff Facilitating ILS among Medical Undergraduate Students.

Similarly, the research intended to ascertain lecturers' perspectives on library staff's ILS competencies. The replies are shown in Table 5.24.

Table 5.24: Lecturers' Response to ILS skills Possessed by Library Staff (N=62)

Information literacy skills	SD		D		N		A		SA		TOTAL		Mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Capacity to select information that is most relevant to the indicated information demands	2	3.23	1	1.61	1	1.61	43	69.35	15	24.19	62	100	4.10	3.65
Ability to discern potential information sources	1	1.61	1	1.61	1	1.61	37	59.68	22	35.48	62	100	4.26	3.79
Ability to create tactics for finding information	15	24.19	42	67.74	3	4.84	1	1.61	1	1.61	62	100	1.90	1.49
Ability to contrast and analyze information obtained from different sources	15	24.19	44	70.97	1	1.61	1	1.61	1	1.61	62	100	1.88	1.47
Ability to arrange, use, and pass on information	2	3.23	1	1.61	2	3.23	37	59.68	20	32.26	62	100	4.13	3.70
Ability to generate and expand on existing information	20	32.26	39	62.90	1	1.61	1	1.61	1	1.61	62	100	1.77	1.38

Source: Field data (2021)

The findings show that the majority 58 (83.54%), 59 (95.16%), 2 (3.23%), 2 (3.23%), 57 (91.94%) and 2 (3.23%) of the respondents agreed that librarians can select the information that is most appropriate to the needs of students and other library users of the respondents

stated that librarians can discern potential information sources, can arrange, use, and pass on information, can create tactics for finding information, and can contrast and analyze information obtained from different sources and can generate and expand on existing information to others in that order. However, 3 (4.84%), 2 (3.23%), 57 (91.94%), 59 (95.16%), 3 (4.84%), and 59 (95.16%) of the lecturers gainsaid that that librarians can select the information that is most appropriate to the needs of students and other library users of the respondents stated that librarians can discern potential information sources, can arrange, use, and pass on information, can create tactics for finding information, and can contrast and analyze information obtained from different sources and can generate and expand on existing information to others respectively.

The results from interviews show that librarians play a critical role as information providers cum facilitators in the access to and retrieval of information in a library. However, according to the responses of the heads of medical librarians interviewed, majority of the librarians require technical, digital, intellectual, and communicative capabilities that are meant to empower them to serve library patrons competently and satisfactorily. Equally, the heads of departments affirmed that librarians especially the aged ones have deficiency on the effective search strategies skills and require adequate skills on how to check the relevancy, currency, authenticity, and purpose of retrieved information materials.

In addition, the heads of departments stated that majority of librarians are unable to help students understand the fair use of information regarding its security, permission, censorship, and plagiarism. The sentiments of respondents interviewed were as follows

One head of department (HD06) commented:

“.... staff need reskilling on information literacy skills because what majority of them are doing is merely offering reference services to students. Whereas a well-grounded librarian has the skills to guide a student develop abilities to read and interpret information and be able (the student), to synthesize information from different sources...sadly majority of our librarians lack these essential ILS abilities...”

One head of medical librarians (ML01) alluded:

“... There are few lecturers and librarians who are well-informed about information literacy skills to enable train students become independent and successful lifelong learners after graduation...”

One University librarian (UL01) opined:

“...Majority of librarians possess traditional literacies or they are traditional librarians and as such lack modern information literacies like critical thinking skills, life-long learning skills, computer literacy skill among other hence they are unable to competently train students on ILS...”

5.4.5 Role of ICT in Facilitating and Promoting Information Literacy Skills

Sauce Model's ICT integration variable was adopted to underpin ICTs that facilitate the application of various technologies for effective and quality ILS learning (Bond, 2001). The application of ICT in ILS teaching provides new avenues for transferring ILS to students. This facet informs the research on the ICT prowess of Information providers in the library and lecturers. According to Kumar (2009), literacy in ICT enables information professionals to identify, evaluate, organize and disseminate information as and when it's required for resolving issues and making decisions thereby meeting the exact information requirements of their organization. The research question being addressed is *“What is the role of ICT in facilitating and promoting the learning of ILS among medical undergraduate students?”* The Cronbach's Alpha values for this question were 0.877 for items in the researcher's questionnaire. This suggested a high internal validity of the test items. Questions G (1-6) of the questionnaire for students (Appendix I), questions G (1-4) of the questionnaire for lecturers (Appendix II), and questions G (1-6) of the interview for heads of department (Appendix III),

questions G (1-3) of the interview schedule for university librarians (Appendix IV) and questions G (1-4) of the interview schedule for heads of medical librarians (Appendix V) addressed this question. The results are presented in the following sub-titles.

5.4.5.1 Integration of ICT Skills with ILS

Students' Integration of ICT Skills with ILS

The study sought to find out how students are integrating ICT skills with ILS. The responses of students are presented in table 5.23.

Table 5.25: Students' Integration of ICT skills with ILS (n=255)

ICT skills	SD		D		N		A		SA		Total		Mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
I use a computer to prepare reports and term papers	12	4.71	8	3.14	5	1.96	167	65.5	63	24.7	255	100	4.02	3.60
I use email or other online communication programs effectively	7	2.75	9	3.53	12	4.71	182	71.4	45	17.7	255	100	3.98	3.53
I search the internet for course-related materials	3	1.17	13	5.1	19	7.45	191	74.9	29	11.4	255	100	3.90	3.44
I use electronic databases with ease to get needed information	41	16.1	172	67.45	15	5.88	11	4.31	16	6.27	255	100	2.17	1.86
I understand how to evaluate free information on the internet for validity	54	21.2	169	66.27	9	3.53	10	3.92	13	5.1	255	100	2.05	1.74
Electronic sources are my priority when looking for information	20	7.84	161	63.14	22	8.63	33	12.9	19	7.45	255	100	2.49	2.20
I can perform data analysis with a computer package	46	18.04	64	25.10	42	16.47	64	25.10	39	15.29	255	100	2.95	2.75

Source: Field data (2021)

The findings of the study indicate that 230(90.20%), 227(89.01%), 220(86.27%), 23(9.12%), 52(20.39%) and 88(34.50%) of the respondents assented that they utilize computers to prepare reports and answers to term papers, use email or other online communication programs effectively, use the internet to search for course-related materials, they understood how to evaluate free information on the internet for validity, that electronic sources were their priority source of information when looking for information, and can perform data analysis with computer packages in that order.

On the other hand, 20(7.84%) 16(6.27%) , 16(6.27%), 213(83.52%), 223 (87.45%) , 181(70.98%) and 133(52.16%) of the respondents dissented that they use computers to prepare reports and term papers, they use email or other online communication programs effectively, they use the internet to search for course-related materials, use electronic databases with ease to get the needed information, understood how to evaluate free information on the internet for validity, electronic sources were their priority source of information when looking for information and can perform data analysis with computer packages correspondingly

The Lecturers' Response on Students' Integration of ICT Skills with ILS

The study aimed to discover how students integrate ICT skills with ILS. The reactions from lecturers are shown in Table 5.26.

Table 5.26: The Lecturers' Response on Students' Integration of ICT Skills with ILS

ICT skills	SD		D		N		A		SA		Total		Mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Students use computers to prepare reports and term papers	6	9.68	5	8.06	4	6.45	31	50.00	16	25.81	62	100	3.78	3.45
Students use email or other online communication programs effectively	6	9.68	7	11.29	3	4.84	31	50.00	15	24.19	62	100	3.64	3.34
Students search the internet for course-related materials	16	25.81	36	58.06	2	3.23	4	6.45	4	6.45	62	100	2.12	1.88
Students use electronic databases with ease to get needed information	23	37.10	10	16.13	9	14.52	10	16.13	10	16.13	62	100	2.58	2.52
Students understand how to evaluate free information on the internet for validity	19	30.65	26	41.94	3	4.84	7	11.29	7	11.29	62	100	2.28	2.15
Students use electronic sources as their priority when looking for information	12	19.35	34	54.84	3	4.84	6	9.68	7	11.29	62	100	2.39	2.19
Students can analysis data with a computer package	12	19.35	36	58.06	2	3.23	6	9.68	6	9.68	62	100	2.32	2.11

Source: Field data (2021)

From the results presented in table 5.26, 47 (75.81%), 46 (74.19%), 8 (12.90%), 20 (32.16%), 14 (22.58%), 13 (20.97%) and 12 (19.36%) of the respondents agreed that students use computers to prepare reports and answers to term papers assignments, use email or other online communication programs effectively, use the internet to search for course-related materials,

use electronic databases with ease to get the needed information, understand how to evaluate free information on the internet for validity, electronic sources were students' priority source of information when looking for information and they can undertake analysis of data with computer packages in that order.

However, 11 (17.74%), 13 (20.97%), 52 (83.87%), 33 (53.3%), 45 (72.59%), 46 (74.19%) and 48 (77.41%) of the respondents disagreed that students use computers to prepare reports and term papers, use email or other online communication programs effectively, use the internet to search for course-related materials, use electronic databases with ease to get the needed information, understand how to evaluate free information on the internet for validity, use electronic sources as their priority source of information when looking for information, and can carry out analysis of data using computer packages correspondingly.

Results from interviews with university librarians, department directors, and heads of medical librarians demonstrated that students require appropriate ICT competencies to search and evaluate databases, as well as access legitimate information resources on the internet, employ various digital technologies, communication tools, and/or networks to identify information needs, evaluate information, and develop new information.

One head of department (HOD 06) held:

"...majority of the students don't possess adequate ICT skills. Many students think that copying information from Wikipedia constitute proficiency in ICTs but this is not the case. Many students don't know how to conduct research through access to vast e-databases and how use ICT solutions like STATA, Webex among others to analyse their research data and hence generate new knowledge..."

One university librarian (UL01) said:

"...whereas ICT support various types of interactions in the learning environment that is student – content, student-student, student-lecturer, and student-system interface,

many students don't possess sufficient ICT skills hence restricted in their quest to retrieve and use relevant information..."

5.4.5.2 Integration of ICT Skills in ILS Training

The lecturers' integration of ICT skills in ILS training

The lecturers were requested to explain how they used ICT to teach ILS. Table 5.24 summarizes the findings.

Table 5.27: The Lecturers' Response on ICT Skills Integration in ILS Training

ICT utilization	SD		D		N		A		SA		Total		Mean sd	
	f	%	f	%	f	%	f	%	f	%	f	%		
Use ICT resources for the preparation of lecture notes	1	1.61	1	1.61	1	1.613	47	75.81	12	19.35	62	100	4.08	3.61
Deploy ICT resources during lecture delivery	1	1.61	1	1.61	1	1.613	42	67.74	17	27.42	62	100	4.16	3.70
Utilize ICT resources when I'm conducting an assessment	5	8.06	7	11.29	9	14.516	37	59.68	4	6.45	62	100	3.43	3.07
Use ICT resources in the preparation of assignments and term papers	1	1.61	2	3.23	2	3.226	39	62.90	18	29.03	62	100	4.15	3.70
Use ICT to support the ILS learning of students with special needs and different learning styles	2	3.23	1	1.61	2	3.226	36	58.06	21	33.87	62	100	4.16	3.72

Source: Field data (2021)

The results of the findings indicate that 59 (95.16%), 59 (95.16%), 41 (66.13%), 57 (91.93%) and 57(91.93%) of the respondents assented that they use ICT resources for the preparation of lecture notes, deploy ICT resources during lecture delivery, utilize ICT when conducting assessments, use ICT to prepare assignments and term papers, and use ICT to support the ILS learning of students with special needs and different learning styles respectively.

On the contrary 2 (3.23%), 2 (3.23%), 12 (20.35%), 3 (4.94%), and 3 (4.94%) of the respondents disagreed that they use ICT resources for the preparation of lecture notes, deploy ICT resources during lecture delivery, utilize ICT when conducting assessments, use ICT to prepare assignments and term papers, and use ICT to support the ILS learning of students with special needs and different learning styles correspondingly.

The interviews conducted with university librarians, heads of departments, and heads of medical librarians revealed that lecturers apply ICTs in the delivery of ILS through the preparation, of course, teaching materials, communication with students for example use of email and WhatsApp; online teaching/content delivery for example use of Microsoft Teams, MUSOMI, M-Elimu and Zoom solutions; preparation and of Power-point Presentation slides during lecturing, checking similarity indexes of submitted clinical and term papers.

One head of department (HD06) held that:

“...with the availability of smartboards and mounting of LCD projectors in our lecture rooms and clinical rooms, lecturers in my department use PowerPoint slides to deliver their lectures to undergraduate students. Because we are having a blended teaching model of utilizing online teaching and physical teaching because of COVID-19 Pandemic our lecturers are exploiting online solutions like Zoom, Microsoft Teams, MUSOMI, M-Elimu...”

One head medical librarian (ML02) remarked:

“...to ensure independent learning lecturers have been taken through training and seminars on how to check for similarity index of assignments submitted by students. Consequently, lecturers have been allocated user accounts in the similarity index checker solution to facilitate them in this task...”

5.4.5.3 Types of ICT Tools and Devices used for ILS Learning and Training to

Medical Undergraduate Students

Table 5.28, shows the various ICT tools and devices used for teaching ILS to medical undergraduate students according to the student respondents.

Table 5.28: Students' Response on the ICT(S) Tools and Devices used for ILS Learning and Training (N=225)

ICT tools and devices	Used	
	Freq.	%
Mobile phones	86	33.73
iPad and tablets	186	82.67
Projectors	215	84.31
Cameras	70	31.11
Scanners	22	9.78
Internet	218	96.89
Computers/laptops	220	97.78
Printers	58	25.78
Television/VCD/DVD player	42	18.67
Radio	11	4.89
Smart-board	92	40.89

Source: Field data (2021)

The results presented in Table 5.28 show that 215 (84.31%), 220 (97.78%), and 218 (87.5%) of the students ranked projectors, computers/laptops, and the internet respectively as the most ICT tools and devices used for ILS learning and training. Similarly, 92 (40.89%), 86(33.73%), and 186 (82.67%) of the students stated that smartboards, mobile phones, iPad/tablets, and cameras in that order, were other ICT tools and devices used for ILS learning and training. On the other hand, the least used ICT tools and devices as indicated by students are: scanners, printers, Television/VCD/DVD players, and radio as noted by 22(9.78%), 58 (25.78%), 42 (18.67%) and 11 (4.89%) correspondingly.

Similarly, interview responses from heads of departments, head medical librarians and university librarians revealed that iPad, laptops, software programs, public address systems, smartboards, projectors, internet, smartphones, printers, WI FI, and cameras were the ICT tools and devices that are used to impart ILS to undergraduate medical students.

One head medical librarian (ML01) interviewed said:

“...the library provides computers that are connected to the internet, an instruction room within the library that has a smartboard and an overhead mounted LCD projector to enable lecturers to teach ILS with a lot of ease ...”

One head of department (HD03) interviewed stated:

“... Simply put, ICT tools are digital infrastructures like computers, laptops, printers, scanners, software programs, data projectors, interactive teaching boxes, clicker devices, mobile applications public address systems that amplify a message and subsequently assist lecturers and trainers deliver ILS perfectly well...”

5.4.5.4 Adequacy of the ICT Infrastructure in Moi University and University of Nairobi Universities

The study sought to find out the adequacy of the various ICTs that were available in the selected universities. This was achieved through interviews with university librarians, heads of departments, and heads of medical librarians.

The interviews conducted with university librarians, heads of departments, and heads of medical librarians revealed that institutions had unstable internet connectivity, outdated computers, inadequate computer laboratories with limited internet connection, projectors were available but not in good working conditions, outdated Microsoft application, available Wi-Fi networks all-round the universities compound were very weak, subscription fee meant for internet and e-resource providers had not been paid.

Quoting one head of department (HD03)

“.....we have got a lot of challenges with our ICT infrastructure for example weak internet connectivity, absence of sufficient IT qualified personnel, WI FI access points are not functioning, outdated computers and softwares, power fluctuations in the lobaratories, inadequate computers in our computer laboratory ...”

A university librarian (UL02) commented:

“...the computers in the library’s ICT centre are not working at all, the internet connectivity is not there hence the ICT tools may not be available and accessible to students for practical exercises. In addition, the university has not paid subscription fee to our software and e-resource suppliers, hence the e-databases are not available There are never-ending power supply issues...the power is constantly off...”

5.4.5.5 ICT Challenges Hindering Effective ILS Training

Further the study sought to find out the ICT challenges that were hindering utilization ILS training and learning. The responses are classed as follows;

Students’ responses to challenges hindering effective utilization of ICT tools and devices facilitating ILS

The study sought to know the various challenges that hinder the effective utilization of ICTs in ILS learning among medical undergraduate students.

Table 5.29: Students’ Response to Challenges Hindering Effective Utilization of ICT Tools and Devices Facilitating ILS (n=255)

Challenges	SD		D		N		A		SA		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Unreliable internet connection and accessibility	8	3.56	4	1.78	6	2.67	177	78.67	30	13.33	225	100
Limited ICT tools and infrastructure	4	1.78	4	1.78	11	4.89	153	68.00	53	23.56	225	100
Absence of effectual tutelage (training)	4	1.78	6	2.67	8	3.56	175	77.78	32	14.22	225	100
Limited ICT training time	6	2.67	4	1.78	4	1.78	181	80.44	30	13.33	225	100
Absence of lecturers’ competency	10	4.44	4	1.78	6	2.67	155	68.89	50	22.22	225	100
Absence of interest of lecturers in technology usage	6	2.67	2	0.89	4	1.78	159	70.67	54	24.00	225	100

Source: Field data (2021)

The finding on Table 5.29, indicate that 207 (92.00%), 206 (91.56%), 207 (92.00%), 211 (83.45%) and 205 (93.78%) and 213 (94.67%) of the students affirmed that unreliable internet connectivity and limited accessibility, limited ICT tools and infrastructure, absence of effectual tutelage (training), limited ICT training time, trainers' ICT incompetency and lack of interest among lecturers in using ICT technologies were factors contributing to the underutilization of ICT in ILS learning respectively.

On the contrary, 12 (5.33%), 8 (3.56%), 10 (4.44%), 10 (4.44%), 14 (6.22%) and 8 (3.56%) of the respondents gainsaid that unreliable internet connectivity and limited accessibility, limited ICT tools and infrastructure, absence of effectual tutelage (training), limited ICT training time, trainers' ICT incompetency and lack of interest among lecturers in using ICT technologies were factors contributing to the underutilization of ICT in ILS learning correspondingly.

Lecturers' Responses to Challenges Hindering Effective Utilization of ICT Tools and Devices Facilitating ILS

The study intended to identify the numerous issues that impede the successful use of ICTs in the teaching and learning of ILS medical students from lecturer replies. The results are shown in Table 5.30 below.

Table 5.30: Lecturers' Response to Challenges Hindering Effective Utilization of ICT Tools and Devices Facilitating ILS (N=62)

Challenges	SD		D		N		A		SA		Total		Mean	sd
	f	%	f	%	f	%	f	%	f	%	f	%		
Unreliable internet connection and accessibility	2	3.23	1	1.61	1	1.61	43	69.35	15	24.19	62	100	4.10	3.65
Insufficient technical assistance	1	1.61	1	1.61	1	1.61	37	59.68	22	35.48	62	100	4.27	3.80
Absence of effectual tutelage (training)	1	1.61	2	3.23	2	3.23	42	67.74	15	24.19	62	100	4.09	3.63
Limited ICT tools and Infrastructure	1	1.61	1	1.61	1	1.61	44	70.97	15	24.19	62	100	4.12	3.65
Absence of lecturers' ICT competency	2	3.23	1	1.61	2	3.23	38	61.29	19	30.65	62	100	4.13	3.69
Absence of interest of lecturers in ICT usage	1	1.61	1	1.61	1	1.61	39	62.90	20	32.26	62	100	4.20	3.74

Source: Field data (2021)

The findings disclosed that 58 (93.74%), 59 (97.64%), 57 (92.96%), 59 (95.21%) 57 (92.96%) and 59 (97.64%) of the respondents agreed that unreliable internet connection and accessibility, insufficient technical assistance, lack of effectual tutelage (training) on how to apply various ICT technologies in their teaching, limited ICT tools and infrastructure for ICT training, lack of lecturers' competency and absence of interest in ICT usage among lecturers were the reasons for the low utilization of ICT in ILS instruction respectively.

However, 3(4.72%), 2(3.23%), 2(3.23%), 2(3.23%), 3(4.84%) and 1(1.56%) of the respondents disputed that unreliable internet connection and accessibility, insufficient technical assistance, lack of effectual tutelage (training) on how to apply various ICT technologies in their teaching, limited training time, lack of lecturers' competency and absence of interest in ICT usage among lecturers were reasons for limited ICT utilization in teaching ILS.

During the interview with university librarians, heads of departments, and heads of medical librarians, it was established that the challenges hindering effective use of ICT tools and devices facilitating ILS among students as low internet access, WI-FI not operational, phobia of some staff members and students to embrace ICT technologies, outdated/ obsolete ICT technology in use, inadequate computers, unstable power supply, absence of management support, slow speed of computers, insufficient training time, insufficient ICT systems personnel, absence of effectual tutelage (training), and poor ICT literacy among students.

One of the heads of departments (HD 05) asserted:

"...for active use of ICT in institutions of higher learning, appropriately trained personnel with appropriate ICT skills and knowledge should be present.....However, there is a dearth of robust internet access; there is not enough time dedicated to ICT skill training; inadequate infrastructure; students lack the zeal to learn and acquire the

ICT skills; absence of a comprehensive pre-service course on ICT that ought to equip lecturer trainees with the right ICT skills and knowledge... “

One university librarian (UL02) observed that

“...the inability of lecturers to understand why and how to implement ICT in teaching impedes its effective use; renewal of subscriptions to ICT solution providers; lack of university management support on ICT infrastructure set-up; misplaced priorities of our university management; frequent power outages; unwillingness to change on the part of lecturers and students...”

5.4.6 Challenges Hindering ILS Delivery to Medical Undergraduate Students

The final research question investigated challenges that respondents felt were impeding the ILS delivery in the two public universities. The responses are as follows;

Students’ responses to challenges hindering ILS delivery to medical undergraduate students

Table 5.31: Students’ Responses to Challenges Hindering ILS Delivery to Medical Undergraduate Students

Respondents	Responses to questionnaire
ST02	absence of well-trained lecturers to impart information literacy knowledge and skills to students
ST09	Large class size hence there is no personalized learning
ST16	Unstable power supply
ST23	Computer skills are low
ST45	Some facilitators are rude and not accommodative
ST56	No feedback from facilitators on their ILS skills level
ST 87	Inadequate support from the lecturers and librarians
ST 93	Smartphones are very expensive to purchase
ST135	Inadequate information resources
ST190	Poor internet connectivity with low bandwidth
ST210	Students generally lack basic knowledge of information literacy skills.
ST231	Lack of training on how to upload an assignment to the enterprise resource management system

Source: Field data (2021): Key [ST-Student]

Lecturers' responses to challenges hindering ILS delivery to medical undergraduate students

Table 5.32: Lecturers' Responses to Challenges Hindering ILS Delivery to Medical Undergraduate Students

Respondents	Responses
LT09	Reluctance by faculty staff to adopt an information literacy skills approach in their teaching
LT14	At times it is difficult to assess information literacy programs' skills
LT19	Misconceptions among students in their perception that they already have ILS competences.
LT23	absence of collaboration between librarians and faculty
LT28	Inadequate support from university management
LT 35	Some students don't have smartphones/laptops
LT38	Inadequate support, limited/poor internet connectivity
LT39	Some lecturers lack pedagogical skills because some are experts in their areas of study and not trained lecturers/teachers
LT43	Large class size for example in the communication skills I & II unit
LT46	ICT skill of students is low, and this affects their internet search skills.
LT52	ILS policy guidelines not adopted fully
LT56	ILS are not well-integrated or embedded in the University's curriculum.
LT58	Inadequate infrastructure like ICT laboratories
LT60	Power outages
LT 62	Students generally lack interest in learning ILS

Source: Field Data (2021): Key [LT-Lecturer]

The study established that respondents interviewed cited challenges hindering ILS delivery to medical undergraduate students in the selected universities were; large classes, unstable

power supply, inadequate support from management organs in the university, poor and unstable internet connectivity, limited internet bandwidth from the internet service providers, students' lack of interest in learning ILS, inadequate time for instruction, limited number of skilled staff, inadequate time allocated to the program, inadequate computers in the computer laboratories, lack of teaching methodology/pedagogical skills among the lecturers, especially librarians.

5.4.7 Strategies to Improve ILS Learning and Training

Following the mentioned challenges, the respondents were requested through questionnaires and interview schedules to propose strategies to mitigate the challenges. The respondents proposed the following mitigation measures:

- i. Integration of ILS competences in the learning outcomes of modules,
- ii. Facilitation of sessions focusing on the prevention of plagiarism,
- iii. Provision of pedagogical training for lecturers,
- iv. Guide students appropriately so that they can develop an upbeat mindset towards ILS learning,
- v. Allocate adequate time for ILS training,
- vi. Develop a partnership with mobile phone (smartphone) manufacturers to enable students purchase subsidized smartphones,
- vii. Improve internet bandwidth,
- viii. Equip computer laboratories adequately.

5.5 Chapter Summary

The chapter discussed data analysis and presentation of findings based on themes derived from the study's research objectives and questions. The findings reveal that students have inadequate ILS. The study indicated that ILS has enabled the students to know about proper communication, research, critical thinking, and problem-solving. Students also noted that their knowledge of ILS has enabled them to be independent thinkers, gain information searching skills, and can compare information from different sources and utilize them.

It was also found that the ILS curriculum in place is inadequate in assisting to impart ILS to undergraduate medical students. The results also show that there is adequate utilization of ICT technologies in imparting ILS and that the ILS policy is adequate, though an improvement is needed in areas of truncation, internet, and mail listings. The respondents noted that the schools/faculties should avail more computers, robust internet, connectivity stable power supply, among other factors. The findings revealed that learning ILS is a challenge due to scheduling of ILS training, a large number of students per session, lack of smartphones, a limited number of skilled trainers to teach and train students during orientation, and inadequate time allocated to the program. The finding was interpreted and discussed in chapter six (6) based on the research questions of the study.

CHAPTER SIX

INTERPRETATION AND DISCUSSION OF FINDINGS

6.1 Introduction

According to Hess (2017), the interpretation and discussion chapter in a research study is intended at explaining the meaning of the results of the study and the key findings, the importance of the findings, and how the findings relate to those of similar studies. The interpretation and discussion of findings is an integral component of any study because it explains the significance of results concerning the research objectives and questions of a study. Manion (2019) states that a discussion section in a research study encompasses bringing together and clarifying the meaning of findings gathered by the data collection instruments. The study sought to assess the information literacy skills of undergraduate medical students in the selected public universities in Kenya, with a view, to propose a framework to enhance the delivery of information literacy skills.

The respondents comprised 255 medical undergraduate students, 2 university librarians, 2 heads of medical librarians, 6 HODs, and 62 lecturers from the two selected public universities (Moi and UON). This study was primarily underpinned by the Sauce Model (Bond, 2011) and the Six Frames of Information Literacy Education Model (Bruce, Edwards & Lupton, 2015). Moreover, the study adopted a pragmatic paradigm that permits researchers the freedom of applying available strategies and methods to solve a problem at hand. As such the researcher utilized mixed methods to collect quantitative data from undergraduate medical students and lecturers through questionnaires and likewise qualitative data from university librarians, heads of departments, and heads of medical librarians through interviews.

6.2 Status of Information Literacy Skills among Medical Undergraduate Students

Information literacy skills empower students to recognize when information is needed and have the ability to locate, evaluate, organize, create, use, and communicate effectively the needed information (Rasaki, 2008; Marriott et al 2012; Lwehabura, 2018a; ACRL, 2004). Further, Kingori (2014) agrees that Information literacy skills enable university students to cope with the data smog and information explosion that is being experienced in the information era. In this respect, there is a need to develop competent information literacy skills among medical undergraduate students to empower them with the critical skills which will help them to become independent lifelong learners. The discussion on these ILS skills is provided in sections 6.2.1 - 6.2.7 correspondingly.

6.2.1 Information Skills Levels

The findings of the study revealed that undergraduate medical students can define their exact information requirements, recognize accurate and complete information with a mean of 3.7. This was supported by the majority of students 232(90.9%), 228(89.4%), 171(67.1%), and 156(61.18%) agreed that students can define their specific information needs, they understood the need to use the information to carry out their day-to-day tasks, they recognize accurate and complete information respectively as shown in table 5.7.

Majority 53 (85.48%), and 52 (82.82%) of the lecturers agreed that undergraduate medical students were able to define their exact information requirements and can use information to undertake their everyday tasks in that order. Correspondingly, the university librarians, heads of medical librarians, and heads of departments interviewed agreed that students can refine their information needs and they are able to recognize accurate and complete information. However, 156(61.18%) of the students and 54(87.09%) of the lecturers stated that students

were unable to practically apply retrieved information to carry their medical assignments as shown in tables 5.7 and 5.8 respectively.

The findings seem to suggest that although students have gained some ILS in relation to information skills for example being able to refine their information needs, recognize accurate and complete information; they still have challenges in practically using retrieved information to undertake their medical assignments. This is an indication that students have limited ILS hence they are unable to utilize retrieved information to conduct their day-to-day learning activities.

These study findings concur with Thirion and Pochet's (2009) study on the role of university libraries in education and training of information literacy skills which found out that, the advent of the information age and its rapid growth, has brought an enormous increase in the quantity of information available to learners and multiplied the media of knowledge transfer such as internet, CDs and electronic databases, exposing students to a vast amount of information that students find difficult to comprehend, apply, and ascertain in terms of authenticity and reliability. Furthermore, Thirion and Pochet (2009) contend that this poses special challenges for students in evaluating, understanding, and using the information ethically and legally. Thirion and Pochet (2009) conclude by noting that Information literacy skills are a core skill that will guide students to locate the needed information and evaluate it critically to face the new challenges of the information age.

Additionally, these findings corroborate with Sauce Model (Bond, 2011) assertion that an information-literate individual is a person who can recognize when information is needed and can access, evaluate and use effectively the needed information.

6.2.2 Numeracy Skills

Numeracy is one of the stages/processes of the Sauce model. The steps of this process are

1. Define keywords and phrases 2. Write the search questions 3. Choose an appropriate source 4. Select relevant information 5. Validate information 6. Assess and review progress (Arora, 2024).

The six steps are realized through the understanding of the techniques or strategies of information searching, that help learners access several information sources.

According to Arora, (2024) the techniques of information searching are truncation and utilization of the Boolean logic. The respondents were asked whether they are able to search for information using truncation and Boolean logic techniques. The findings, as shown in table 5.7 revealed that the majority 219 (85.88%), 180 (70.59%) and 123 (48.24%) of the students disagreed that they use several reference sources to increase familiarity with a topic, that they use truncation techniques and Boolean logic to search for information respectively. Additionally, 52 (83.37%), 40 (65.63%), and 42 (67.97%) of lecturers gainsaid that student can use a variety of reference materials to become more familiar with a subject, can use truncation techniques to search for information, and can use Boolean logic to search for information in that order as illustrated in table 5.8. Correspondingly, 50 (80.65%) of the lecturers stated that students were incapable of arranging information retrieved for practical use. Correspondingly, this finding agrees with the interview results of the study conducted on university librarians, heads of medical librarians, and heads of departments which show that students are unable to abridge information from multiple reference materials, use Boolean logic and truncation techniques to search for information.

The findings above reveal that students have not learned sufficient ILS especially on how to use multiple sources of information to address a specific or multifaceted area/s of concern and

application of competent information search techniques. Therefore, the findings seem to suggest that majority of the students have not gained sufficient information-searching skills and therefore, they are not able to apply proper search strategies to find the most relevant information and save information search time. This is a drawback on the part of the students because in the age of information overload and technology advancements, learning how to effectively search for information and knowing what to do with the information are crucial skills to acquire (Dlamini, Block & Rampedi, 2022)

These findings are in tandem with Oluwaseye et al. (2017) study on the assessment of information needs of medical students in Nigeria, which revealed that students have not acquired the required information search skills to adequately retrieve the precise required medical information. Similarly, these findings are in agreement with the March et al. (2020) study that assessed the information needs and seeking behavior of nurses at Rivers State University Teaching Hospital (RSUTH) which found that nurses were unable to retrieve relevant information because they lacked information search skills such as application of Boolean logics and truncation. Another related research carried out by Dorvlo and Dadzie (2015) on the IL level among students of Ghana University, noted that students did not have adequate information evaluation skills, they were unskillful in information search strategies and search tools.

Equally, these findings validate Dubicki (2013) study on the IL level of Nursing students in Nigeria which found that the majority of the students were not aware of Boolean logic, field, truncation, and phrase searches hence they had difficulty in locating the desired information materials.

6.2.3 Problem-Solving Skills

According to the Sauce model (Bond ,2011) to be information literate is to be able to locate, access, acquire, comprehend, analyze and critique relevant information, then utilize it to make valid, informed decisions and also communicate those decisions appropriately with validation where necessary. Therefore, the problem-solving facet of the Sauce model stresses the use of information to provide solutions to identified problems.

However, according to the majority of students 144(56.47%), 202(79.22%) and 131(51.37%) stated that they didn't know how to limit the search by fields, how to use information to critically think and solve study related problems, and how to use the library catalog to effectively retrieve information materials based on their information need/s respectively, as illustrated in table 5.7. Correspondingly, 52 (82.81%) and 32 (50.75%) of the lecturers disagreed that students utilize the information for problem-solving and critical thinking, and students utilize the catalog to search for specific information in that order as shown in Table 5.8. In addition, interview results showed that students are incapable of utilizing acquired information to critically think and solve study related problems in their fields of study.

These findings seem to suggest that students not only don't have the required information literacy skills for finding and presenting information but also for problem-solving. Furthermore, these findings reveal that majority of students lack critical information judgment skills.

The results seem to concur with Kavulya's (2003) study on challenges facing information literacy efforts in Kenya, which found out that many students lack information literacy skills to find information to help them problem-solve and make decisions – in formal and informal

learning contexts, at home, at work or /and in educational settings. Moreover, these findings agree with Baro, Endouware, and Ubogu's (2010) study on information literacy among medical students in the college of health sciences at Niger Delta University which found that undergraduate medical students don't know how to critically judge the relevance of the information sources before retrieving information from them.

6.2.4 Communication Skills

According to Sauce model (2009) information literacy skills is the ability to find, evaluate, organize, use, and communicate information in all its various formats, most notably in situations requiring decision making, problem solving, or the acquisition of knowledge. Furthermore, information literacy skills are vital to the success in education, occupation, and day to day communication. The findings established that majority of the student respondents 126(56.00%) and 218 (96.89%) agreed that they use mailing lists to exchange information and they utilize web addresses for internet searching for information. Congruently, majority of the lecturers 81(63.28%) and 110(80.46%) agreed that students utilize web addresses for internet searching so as to retrieve relevant information and use mailing lists to obtain and use information. This may suggest that with the advancement of computer technology and readily available internet connectivity, students are exploiting mailing lists, SMS technology and emails to send and receive information. Additionally, this is an indication that students have gained information literacy skills on how to share and receive information from peers or lecturers, and therefore they can effectively and correctly communicate information and knowledge they create or come across to their peers and colleagues. This encourages information sharing through communication. skills. This indicates that information literacy skills are instrumental in equipping students with appropriate communication skills. The

findings agree with the communication facet of the Sauce Model which states that the end product in an information search should be to communicate the retrieved information in the form of printed form, electronic form, an artifact, idea, product, or solution.

This finding relates to Diehm and Lupton's (2014) study on university students' experiences of learning information literacy, in which they found that students applied information literacy skills learned to access relevant and appropriate information for self-growth and the growth of fellow students. Additionally, the Association of College and Research Libraries, (2002) alludes that it is not enough to know how to gather information and knowledge, if what is gathered cannot be effectively passed on to others.

Furthermore, the findings agree with Limaye and Fotwenge, (2015) study results on the impact of IL among post-primary students in Botswana which found that information literacy skills enabled students to communicate information and get information.

6.2.5 Self-Management and Competitive Skills

The findings revealed that the majority of the students 204(80%) and 215(84.31%) of the respondents gainsaid that they comprehend the nature of publicly available information on the worldwide web and that they can choose information materials and abridge its content for use in that order. Likewise, majority of the lecturers, 51(82.03%) and 49(79.68%) disagreed that students can choose information materials and abridge them in their own words for their personal use, and they understood the nature/type of information available on the internet correspondingly. These findings could suggest that students do not know how to synthesize retrieved information, hence they have not gained appropriate skills to help them ascertain the authenticity of the information available on the internet, therefore cannot competitively self-manage themselves. In addition, students are not able to carry out self-directed learning. These

suggestions are in line with the higher thinking skills facet of the Sauce Model. The facet state that an information literate student should apply the higher thinking skills to refine retrieved information, from whichever source, before using the information for problem solving or/and for need satisfaction or form an opinion.

The findings agree with Kanguha (2016), Badke (2009), Baro & Zuokemefa (2011) and Buzzetto-More (2009) various studies which found that in the present 21st-century information era, students are needed to develop information literacy skills to become skilled users of information sources available in different locations and formats for their self-directed learning. Equally, the finding corroborates with Anyaoku, Ezeani, and Osuigwe's (2015) study on information literacy practices in universities in South East Nigeria, which found that information literacy skills enable students to manage themselves appropriately, become critical thinkers so that they can find the right information among the myriad of sources and apply it to make wise decisions and to sustain their learning after graduation.

Furthermore, the findings are similar to those of Milliard et al. (2020) study which found that though most students use the internet in their daily lives to satisfy personal needs, they have a problem locating and evaluating information for coursework. In like manner, Ariole, (2017) in their study found that more than one-quarter of undergraduate students are not able to use the URL to locate websites.

6.2.6 Social and Co-operative Skills

The findings revealed that majority of the students 184 (72.16%), and 179 (70.20%) stated that they use group discussions to receive and exchange information, and newsgroups to obtain and use information. Similarly, 55 (89.06%), 55 (89.06%) of the lecturers were of the opinion that those students use group discussions for collecting and exchanging information, and newsgroups/online forums to gather and share information. However, 147 (57.65%) of the students and 50 (80.47%) of the lecturers stated that students are incapable of integrating new information into the current knowledge base, as illustrated in table 5.7. Additionally, the interview results showed that, even though many students are unable to integrate new information into the current body of knowledge majority are able to study collaboratively through group discussions, blogs, online news groups, and various social media platforms. These findings seem to suggest that students engage in collaborative learning. Through collaborative learning, students can develop high-level skills because they are being tasked to work as a group to realize a common goal. Further, the findings can indicate that students learn how to manage themselves and others because as a group they have to learn how to organize, assign, and teach themselves. As a result, students are likely to acquire analytical and critical thinking skills through group discussions and newsgroups. Hence become cautious consumers of information by sieving through various sources of information to establish their appropriateness to presenting students' information needs.

The findings indicate that students are engaging in collaborative learning which is one of the key tenets of information literacy skills training and learning as advanced by the collaborative learning facet in the Sauce model (Bond, 2011). The facet elucidates that student who have gained information literacy skills engage and support group problem-solving positions as

important aspects of the learning process. In addition, the finding agrees with the sixth facet (social and cooperative) of the Sauce model which states that collaborative learning emphasizes using groups to enhance learning through working together. Where groups of two or more students work together to solve problems, complete tasks, or learn new concepts. This approach actively engages learners to process and synthesize information and concepts, rather than using rote memorization of facts and figures. Students work with each other on projects, where they must collaborate as a group to understand the concepts being presented to them. Through defending their positions, reframing ideas, listening to other viewpoints, and articulating their points, students gain a more complete understanding as a group than they could as individuals.

The findings are in tandem with Johnson & Johnson's (2016) study on the importance of collaborative learning in information acquisition and utilization among university students, which found that there is persuasive evidence that cooperative teams achieve higher levels of thought and retain information longer than learners who work quietly as individuals. The study further found that shared learning allows learners to engage in discussion, take responsibility for their learning, and thus become critical thinkers. Moreover, John et al (2015) study on social and cooperative learning among learners found that collaborative learning enables students to engage in an active exchange of ideas within small groups, which in turn increases interest among the participants and promotes critical thinking skills. Similarly, Srinivas et al (2019) affirms that in a collaborative learning setting, learners have the opportunity to converse with peers, present and defend ideas, exchange diverse beliefs, question other conceptual frameworks, and are actively engaged.

6.2.7 Labor and Learning Skills

The results revealed that 232 (90.98%) and 180 (70.59%) of the students together with 43(70.32%) and 55(88.28%) of the lecturers concurred that students can accurately clarify a topic's concepts and take notes from print and electronic sources by printing and saving them to a disc, as shown in Table 5.7 and 5.8. respectively. However, 198 (77.65%) of the students and 28 (45.32%) of the lecturers stated that medical undergraduate students are unable to use information legally and ethically. The interview responses indicate that students can conduct basic information searching in the library and that they are unable to search for information in complex information databases like MEDLINE, PROQUEST, NEXISLEXIS. These findings seem to suggest that students have just acquired basic computer skills which enables them do simple Google searches and save retrieved information to discs and then print it later. This is an indication of insufficient ILS among students; hence majority of the students cannot do high level information searches. Furthermore, the findings indicate with these limited computer skills, the students are unable to determine the authenticity of the information they find on websites and other online sources. This might be the reason why they are not using retrieved information in a legal and ethical manner. This conforms to the ICT integration variable facet of the Sauce Model which states that ICT provides new avenues for searching, accessing, vetting, transferring and storing information. Moreover, the Sauce model states that ICT is central in promoting ILS teaching and learning because of its role as communication and instruction tools for learners and lecturers.

The findings are in support of Alemu's (2017) study on the impact of ICT literacy skills among undergraduate students at the University of Botswana, which found that students have acquired elementary computer skills which are insignificant in the achievement of degree-

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based education, in the sense that they are unhelpful to students in finding information in electronic resources for learning reasons. In addition, Doyle et al (2019) in his study on information search and retrieval skills among university students found that although students have acquired competencies in knowing how to learn, formulate questions, access potential sources of information, students still face challenges on how to evaluate retrieved information for accuracy and use information ethically and effectively.

Similarly, these results agree to the findings of Fiawotoafor (2018) study on the assessment of the information literacy skills of the College of Agriculture Education, University of Education, which found that majority of the students had limited skills in applying computer and telecommunication technologies in the process of information seeking and retrieval, had issues in using information ethically, had limited know-how on how to evaluate and interpret retrieved information.

6.3 ILS Policies and Curricula Supporting Delivery of ILS to Medical Undergraduate Students

6.3.1 ILS Policies

A policy and a framework for imparting information literacy skills are key (Nyamboga, 2013 & Kavulya, 2003). Information literacy skills service is keen to build on existing good practices to ensure that all students who have undergone a program of study at university become truly information literate. This can aid their employability by providing them with the skills to help in finding work and the knowledge needed, once in employment, to manage their information needs. Therefore, ILS training should be appropriately carried out among learners in a way that the learners would appreciate its relevance and apply it directly in carrying out their day-to-day tasks.

Moreover, according to the Foo et al (2021), ILS policies are an integral part of the university learning experience because they foster and guides how to integrate students fully into research and hence, advance lifelong learning among students.

6.3.1.1 Availability of ILS Policies

The study sought to find out whether the two universities had documented and communicated ILS policies. The findings revealed that the universities had ILS policies. This is according to 198(77.64%) of the students as illustrated in figure 5.1 and 56 (90.32%) of the lecturers as shown in figure 5.2. Similarly, the respondents interviewed unanimously agreed that information literacy skills policy and procedures were available. This finding is contrary to Kanguha (2016) study on information literacy learning among Psychology students in Kenya where he found that there was absence of information literacy policy for information literacy skills learning and training. Similarly, Baro's (2013) study on information literacy programs in Nigerian universities revealed that the absence of an information literacy skills policy was a major challenge to the development of information literacy skills in universities in Nigeria. Also, Lwehabura and Stilwell's (2008) study on the challenges and opportunities of IL programs in Tanzanian universities revealed that the absence of an Information Literacy skills policy impeded Information Literacy skills instruction and learning.

6.3.1.2 Information Literacy Skills Covered in the ILS Policy

The respondents were asked to state the areas covered by ILS policies. The findings revealed that the majority of the students' respondents stated that knowledge and information skills; problem-solving and critical thinking; communication skills, information technology skills; social responsibility skills; and referencing and legal issues were the areas covered by the ILS

policies in 200(78.43%), 198(77.65%), 225(88.23%), 215(84.31%), 199(78.04%) and 197(77.25%) in that order.

Similarly, the majority of the lecturer lecturers 58 (93.76%), 55 (89.06%), 58 (93.76%), 55 (89.06%), 57 (90.63%) and 55 (89.06%) agreed that knowledge and information skills; problem-solving and critical thinking; communication skills; information technology skills; **social responsibility skills; and** referencing and legal issues are areas covered by the ILS policy in that order.

The responses from interviews were that ILS policies covered areas of knowledge and information skills, communication skills, research skills, problem-solving skills, information technology skills, and anti-plagiarism skills. The findings suggest that the medical undergraduate students are appropriately trained with ILS skills and hence equipped with research skills, good communication techniques, and critical skills which will help them to become independent lifelong learners. These skills will enable people to apply their knowledge from the familiar environment to the unfamiliar that is, apply new and more effective medicines being discovered, new medical devices and procedures being invented, and new diseases which are causing havoc to humanity such as COVID-19, Ebola, Zika virus and HIV among many others.

The findings are in line with Kanguha (2016) study on information literacy learning experiences of fourth-year psychology students in Kenyan universities, which revealed that ILS policies are meant to promote information literacy skills as a key competency for lifelong learning among students and that they are fundamental to ILS teaching, learning and research focus of the African Universities community. Furthermore, the study found that ILS policies

enable and empower students to be critical and independent users of information by embedding information literacy skills into their university experience.

6.3.1.3 Formulation and Implementation of the ILS Policies

The respondents who were interviewed were asked to state their contributions to the formulation of ILS policies. The results indicate that university librarians are the initiators of ILS policy and procedure development in universities through interpreting the patterns of information access and use within the university. The respondents, further, stated that once university librarians identify the need to initiate ILS policies or gaps in ILS policies, they notify the heads of departments who are the quality assurances officers and custodians of curricula in their departments through a memorandum or submissions to the deans' committee. Once the deans' committee approves, university librarians, head medical librarians, and heads of departments embark on generating the content of the ILS policies or reviewing the existing ILS policies to fill in the identified gaps. In addition, university librarians have been bestowed the task of monitoring and evaluating the ILS policies implementation, whereas, heads of departments and lecturers ensure that there is compliance with the ILS policies. Correspondingly, top university management that is the Vice-Chancellor, Deputy Vice-Chancellor (Academic and Students Affairs), and Registrar (Academic and Students Affairs) have the role of decision-making concerning the providence of the infrastructure and resources.

The findings suggest that the ILS policies have total institutional support because all stakeholders in the university management are involved. This is a good indication because it signifies that ILS initiatives have the support of top management hence chances are that implementation will be smooth. Mokhtar and Majid, (2008) state that the development and

implementation of ILS policies whether for each country, state, or institution, should come about with some form of stakeholders or government involvement. Information policies that are backed by the government or those in power are taken more seriously and resonate more strongly among users. This in turn would ensure more efficient and effective implementation, which is an important first step in integrating information-related skills within educational institutions and the workforce. In addition, the findings imply that finally universities are actively involved in coming up with home-grown ILS policies that address the unique information needs of Kenyan medical undergraduate students.

Moreover, the findings suggest that librarians are the key stakeholders and main drivers in the formulation and implementation of the ILS policies. The finding indicates that librarians are heavily involved in training students in the use of the resources available, and how to find and evaluate information some librarians also cover issues of ethics, particularly relating to copyright, referencing, and plagiarism. Thereby leading to the successful implementation of the ILS policies. The findings concur with the University of West of England (2009) findings that librarians through the stellar implementation of ILS policy and standards are keen to build on existing good practices to ensure that all students who have undergone a program of study at the University of West of England become truly information literate. This can aid their employability by providing them with the skills to help in finding work and the knowledge needed, once in employment, and to manage their information needs.

The findings are contrary to assertions by scholars Kavulya (2003), Kingori (2015), and Mathangani and Irura (2005) who state that lack of home-grown standards and policies are a great challenge to the provision of information literacy skills in Kenya. Equally, these findings differ with Mokhtar and Majid, (2008) in their study entitled Information Literacy Standards,

Guidelines and their Implementation in seven Southern Asia Countries, which revealed that the majority of the universities in these countries lacked leadership for ILS standards and implementation. This study also found that there was a low rate of ILS implementation in universities because of low literacy rates, lack of funding, lack of awareness, shortage of classroom or library space, and insufficient guidelines on ILS integration into the institutions' curriculum.

6.3.1.4 Adequacy of the ILS Policies

The findings revealed that the majority of the respondents who were interviewed 8(80%) noted that the ILS policies in place were inadequate in addressing ILS training and learning among the medical undergraduate students, as illustrated in figure 5.3. The findings suggest that policy reviews have never been conducted, updates have never been affected, the policy did not advocate for the allocation of adequate time for ILS training and learning, the ILS training is conducted at the convenience of the librarians and lecturers because it is not timetabled. This is an indication that ILS policy has not been implemented as envisioned and it does not address the changes taking place in the medical field. As a consequence, students have not been adequately trained on ILS. Bazrafkan et al (2018) emphasize that medical faculty students need extensive and varied sources of information to perform their job roles and also cope with the complexities of different medical specializations. To satisfy this need medical undergraduate students need information literacy skills to help utilize the information resources available by enhancing their information search, retrieval, and evaluation skills.

Similarly, the findings concur with Kavulya (2003) study which demonstrated that the limited time allocated to the lecture, demonstration, and library tour is inadequate to impart useful skills to new university students. consequently, the timing of library orientation programs in

the first and second week of students' life in the university is poor since at this time students have little motivation to participate, and may not be in a position to appreciate the centrality of the library in academic life.

6.3.2 ILS Curricula and Delivery Methods Used

According to ALA, (2020) an individual is deemed to be information literate when he/she can recognize when information is needed combined with the capability to discover, assess and effectively utilize the desired information. As such, any ILS curriculum should go beyond library instruction/education to provide content that facilitates learners to know the necessity for information, the accurateness, and extensiveness of the information, identify the potential sources of the information, develop successful search strategies, access the information, evaluate the information and arrange information for practical use and integration. Correspondingly, Aiyepoku (2022), state that the emphasis of the ILS curriculum is to inculcate problem-solving, critical thinking, and lifelong learning skills among students.

The study sought to establish if there was an ILS curriculum in place and ascertain the various methods used to facilitate the training and assessment of information literacy skills among undergraduate medical students.

6.3.2.1 Existence of ILS Curriculum

The respondents were asked if their institutions had an ILS curriculum. The findings revealed that 186(72.94%) of the students' respondents stated that their universities had an ILS curriculum as illustrated in figure 5. 4. Similarly, 109(85.15%) of the lecturers stated that their institutions had an ILS curriculum, as illustrated in figure 5.5. Additionally, interview results showed that institutions had an ILS curriculum that is used to impart ILS to students. The findings suggest that there are active initiatives for training medical students in ILS, as a result,

therefore, students will acquire appropriate and relevant information literacy skills in line with the medical field. The findings are in line with the relational frame from in Bruce's six frames for information literacy education approach (Bruce et al., 2006) which among other factors is concern with the availability of an ILS curriculum to guide the learning and teaching of ILS.

The finding concurs with Kavulya (2003); Mathangani and Irura (2005), Saunders (2012) Kingori (2015), Anyaoku et al (2015), and Kanguha (2016) in their various studies which found that training on the use of library resources has been an integral part of university academic training for ages. This was done through orientation programs and various user education initiatives involving one-on-one and classroom-based instruction. Moreover, Dubicki, (2013), states that the basic and foremost important focus of institutions of higher learning is to ensure that all faculties work in tandem to graduate information-literate students who can effectively utilize information literacy skills in the workplace, as well as make informed decisions in their personal lives, long after leaving the institutions of higher learning. This according to Dubicki (2013) is achieved through the development of a viable ILS curriculum that could help train ILS competencies to students.

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6.3.2.2 Topics Covered by the ILS Curriculum

The study sought to establish the topics covered by the ILS curriculum. The findings revealed the majority of 204(79.99%), 174(68.22%), 186(72.94%), 186(72.94%), 215(84.31%), 169(64.26%), 210(82.34%), and 153(58.99%) of the students' respondents, together with, majority 57(91.94%), 56(90.33%), 59(95.16%), 56 (90.33%), 58 (93.55%), 57 (91.94%), 59 (95.16%), and 58 (93.55%) of the lecturers agreed that problem-solving and critical thinking skills; information search and retrieval; legal issues in information use; computer use and effective communication skills; integration of information; basic library guidelines on how to

access library materials; and research skills were the topics covered by the ILS curriculum, in that order. Similarly, interviews results revealed that the ILS curriculum covered information search techniques, information use, plagiarism check and avoidance, citation methods, referencing techniques, integration of information, effective communication, writing skills, basic research skills, and computer literacy skills.

The findings suggest that common information literacy skills programs offered to university medical undergraduate students include training on an information database search, communication skills, critical thinking skills, library usage skills, information ethics, information retrieval techniques, research skills, and basic computer studies. These findings clearly indicates that an ILS curriculum covers all the aspects that make a complete information literate student, that is, if the ILS curriculum is effectively delivered. The relational frame from Bruce's six frames for information literacy education approach states that a student and information literacy skills should be viewed and treated as one entity rather than separate entities. The model further alludes that an ILS curriculum should cover more complex information areas so as to enable students develop complex ILS understandings. Thereby, aligning students to learn how to learn, become independent learners and lifelong learners (Bruce, 2006). Thus, the relational frame advocates for designing instructing and learning areas that enhance developing complex understanding among students. These findings concur with Breivik, (2018) study which revealed that instructing students to successfully access, critically assess and utilize information, and put into use skills learned to solve current and foreseeable challenges is a crucial goal of an ILS curriculum.

6.3.2.3 Methods of ILS Delivery

The study sought to find out from the students and lecturers the various methods that were used to deliver the ILS curriculum to medical undergraduate students. The findings revealed that computers, face-to-face teaching, online materials, handouts, library orientation, WhatsApp group engagements, peer training, pre-recorded audio-video clips, and weekly librarian-student engagements, were the most common methods used for ILS delivery to medical undergraduate students, as noted by 224(87.84%), 234(91.76%), 241(94.50%), 190(74.50%) and 241(94.50%) of the students in that order as shown in table 5.14. Similarly, 58 (93.55%), 58(93.55%), 42 (67.74), 46 (74.20%), 49 (79.03%) and 55 (88.71%) of the lecturers stated that handouts, library orientation, WhatsApp group engagements, peer training, weekly librarian-student engagements/discourse and pre-recorded audio-visual video clips were used to impart ILS to undergraduate medical students respectively as illustrated in table 5.14.

In the same breath, interview responses revealed that computers, the formation of social media groups where the department engages with students on issues concerning access to information materials, peer training, one on one teaching, and online materials offered to students are some of the methods used to deliver ILS to medical undergraduate students. Additionally, interview responses found that most of the institutions offer ILS classes via online platforms, library websites and library engagement forum. The findings also seem to suggest that computers facilitated utilization of (Information Technology) IT solutions like Google MEET and ZOOM to train information literacy skills to undergraduate medical students. This indicates the mode of ILS instruction is technology orientated and that there are variations in channels used to train students contributing high uptake of ILS among students. The relational frame of Bruce's Six Frames Model supports these findings by stating that learning occurs when variations in

ways of understanding are recognized. That is, ILS are learned when different means and ways are recognized and used to deliver the ILS content. The model states that “bringing about learning through widening experience and thus revealing variation, is the underlying principle” of ILS learning and teaching (Bruce, 2006).

The findings agree with Bruce, (2009) study on information literacy training in Africa, which found that ILS instruction in higher education institutions has taken a variety of forms namely online tutorials, stand-alone courses or classes, workbooks, course-related instruction, or course-integrated instruction. In support of these findings, Kennedy-Clark (2013) study on the most common methods adopted in ILS training found that the common methods of delivering ILS are one-on-one sessions, library orientation, and formal or classroom instruction. Similarly, in Baro and Zuokemefa's (2011) study on Information literacy programs in Nigeria: a survey of 36 university libraries revealed that the common methods of ILS delivery were face-to-face in the library training room and face-to-face in a venue external to the library. However, their study found that there was limited online training because the libraries require adequate IT personnel who are skilled in using technology, absence of facilities such as modern computers with internet connectivity in some university libraries, and unreliable power supply.

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6.3.2.4 Who Teaches ILS

The respondents were asked to state who teaches ILS to undergraduate medical students. The Heads of departments, heads of medical librarians, and university librarians noted that lecturers and librarians were involved in teaching ILS. However, the findings further revealed that librarians are partially involved in ILS content delivery and in many occasions, they simply took instructions from the communication skills unit lecturers on what they are to teach

yet the teaching is supposed to be done collaboratively. The findings suggest that ILS teaching is not done collaboratively and this might be the reason why in spite of the availability of an elaborate ILS curriculum, students have limited/ underdeveloped information literacy skills. The findings also indicate that it is not enough to embed information literacy skills into the curriculum, lecturers and librarians should model information literacy skills instruction and also model collaboration to strengthen the integration. The relational frame in Bruce's Six Frame model, argues that learning and teaching of ILS should be a collective endeavor because the process involves changing a student's perception, and that teachers must help students create new and more complex ways of learning and applying ILS. The theory further states that the trainers should be more focused in developing learning procedures that encourage the formation of professional thinking patterns and how to assist students generate knowledge effectively. Furthermore, the theory states that this will not be achieved if the training is not conducted collaboratively among the stakeholders involved in content delivery.

The findings corroborate with Derakhshan and Singh's (2011) study on the integration of information literacy into the curriculum: a meta-synthesis that found that lecturers and some faculty members were/ are unwilling to collaborate with librarians, they do not view librarians as partners and they are reluctant to integrate ILS into their curriculum. This view is supported by Wheeler and McKinney (2015) who assert that despite librarians being well placed to teach ILS as an extension of library skills, they are overlooked by faculty members.

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Similarly, Lwehabura and Stilwell's (2008) study on impediments to information literacy implementation in Tanzanian universities, revealed that inadequacy of resources and lack of teamwork among librarians and lecturers in information literacy activities were challenges facing information literacy skills training effectiveness. They further contend that these

impediments occur because most institutions are not conversant with the role that ILS play in improving research and learning among undergraduate students.

Scholars in ILS (Kavulya, 2003; Nyamboga, 2005; Kanguha, 2016; Tewell, 2015 ; Hearn, 2005; Edzan, 2008; Lwehabura, 2018; and Baro & Zuokemefa, 2011) in their various study findings have found that absence of collaboration between librarians and faculty is a major hindrance to successful ILS teaching and learning. As a result, they have separately advocated for collaboration between librarians and lectures to develop and deliver ILS to students in higher institutions of learning.

These findings differ Bruce's (2001) study on faculty-librarian partnerships in Australian higher education: critical dimensions which revealed that librarians have established successful partnerships at a variety of levels and have discerned the critical features of the university agenda which enable them to contribute effectively. Some librarians have been able to use the broad interest in lifelong learning to work closely with faculty in raising the profile of information literacy skills and constructing a university-wide focus on information literacy skills as a key to student learning. Examples of such institutions as elaborated by Bruce (2001) are the University of Ballarat, the Australian Catholic University, Central Queensland University (Orr & Appleton, 2001), and the University of South Australia (George et al, 2001). In many institutions, the emphasis on flexible delivery has enabled collaborative work on product development or curriculum design.

6.3.2.5 Techniques for Assessing the Effectiveness of the ILS Curriculum

University librarians, heads of departments, and heads of medical librarians were asked to state the various techniques used to assess the effectiveness of the ILS curriculum delivery.

The findings revealed that several methods were used such as focus groups, concept maps, CATs, information assessment techniques, written examination in the Communication Skills Unit, on the spot assessment, clinical presentations, ng, knowledge tests through creative clinical and research papers, and ILS feedback forms. In addition, the findings revealed that Librarians more often use concept maps. Because concept maps offer unique opportunities to help students integrate new concepts into their existing understanding of information seeking, evaluation and use, and to allow the instructors to gauge the understanding level. The findings suggest that assessment on ILS learning is conducted through summative assessment which seeks to gauge what students have learned at the conclusion of a learning session by juxtaposing it to some norm or guideline. These findings indicate that this form of assessment might be another reason why students have underdeveloped ILS, because once the assessment is done at end of a training exercise, there isn't time or another session to address students' weaknesses found by assessments. Also, the method puts students under stress which affect ILS learning among the students. the suggestions are supported by the assessment techniques of the relational frame of the six frames model, which argue that assessment is designed to identify which ways of seeing IL, or other relevant phenomenon, students have learned to discern.

In support of these findings, Bruce (2013) states that the effectiveness of ILS training is an examination and assessment testing. Furthermore, Bundy (2004) posits that the effectiveness and efficiency of information literacy skills, should be assessed on sound elements which include generic skills – that is problem-solving, collaboration, teamwork, communication, and critical thinking; information skills- that is information seeking, information use, information technology fluency; and values and beliefs- that is using information wisely and ethically,

social responsibility and community participation. This will ensure that the students have the necessary knowledge and skills for long-life learning.

6.4 ILS Understanding among Medical Undergraduate Students

According to Adekunle et al (2019) attitude determines not only altitude but everything in life. It dictates how individuals respond to situations and shapes decisions and actions. It sums up individual perceptions, dispositions, notions, ideas, fears, convictions, inclinations and worldview about a given phenomenon or topic. Gajalakshmi (2013) notes that attitudes have three components which are affective, cognitive and behavioral towards a particular entity. Furthermore, Gajalakshmi (2011) state that attitude is the most powerful determinant of information literacy skills acquisition by students and students' perception, attitude and experience are significantly related to information literacy skills.

6.4.1 Students' Views towards ILS Training and Learning

The study sought to find out students' and staff's attitudes toward ILS training and learning. The findings revealed that 143 (63.56%) of the students and 32(51%) of the lecturers stated that students had a negative attitude toward ILS training and learning. The results indicated that many students don't show interest during the ILS training, few show up for the ILS training, students think ILS training is all about library tours, and they don't ask any questions during the training Likewise, interviews conducted with university librarians, heads of departments, and heads of medical librarians revealed that revealed that students have a negative attitude towards ILS learning and training and as such, that they display casual attitudes when they are called upon to attend orientation programs, webinar seminar trainings on ILS and one-on-one ILS training.

The students who were negative towards ILS cited the reasons for their indifference as trainers were not audible enough when they were teaching them, the class was overpopulated, the learned skills have not helped them in their academic journey, some topics were difficult to understand, inadequate time spent on training sessions and lack of awareness about library resource usage training.

The findings suggest that medical students have not developed firm self-efficacy which in turn make them unsuccessful in learning ILS due to decreased motivation. This is an indication that the pedagogical strategies applied by trainers were ineffective and hence did not motivate students enough to develop eagerness to learn ILS. The relational frame of the six frames concurs with these findings by stating that information literacy skills gained by a learner are directly proportional to the learner's attitude. In addition, the model advocates for learning of pedagogical skills among the trainers to enable them (trainers) develop and sustain the interest of a learner. The relational frame state that learning is about changes in conception — teachers need to assist students in developing new and more complex ways of experiencing information literacy skills.

A study by Bandura, (1997) found that students with firm self-efficacy beliefs achieve successful outcomes due to increased motivation, effort, and focus on the task at hand while having decreasing anxiety and dispelling negative thinking. Additionally, students with higher self-efficacy will most likely aim for higher goals and use more effective self-monitoring strategies (Waldman, 2003).

Furthermore, these findings mirror Adekunle (2019) study on the attitude of undergraduate Students to Information Literacy: Bowen University which revealed that students had a negative perception on ILS training because they felt that the course was not helpful to them,

information materials used were difficult to understand, instructors were boring and very unfriendly. Furthermore, Ondari-Okemwa (2016) study allude to the imperative nature someone's perception as a reagent of learning experience. Additionally, ILS scholars (Ahmed & Bora, 2012; Beetham, 2011; and Gajalakshmi, 2013) agree that perception is a crucial factor in ILS learning and teaching. The observe that there is a direct correlation between learner's attitude and academic prowess, concluding that undergraduates who have a positive attitude gain more in the learning process.

However, these findings are in contrary to the results of a study conducted by Lanning (2002) on information literacy attitudes of students in Malaysia which outlined that ILS instruction enables students to become information literate, hence able to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information. In addition, Brant (2001) states that ILS learning and training enable individuals to use computers, databases, and other techniques to gain a wide range of academic information. Likewise, State *et al.* (2013) investigated and analyzed students' perceptions, attitudes, and experience of IL skills in three Nigerian universities by applying the quantitative method. The results showed that students' perceptions of IL skills were high. It further revealed that students' perceptions, attitudes, and experiences were significantly associated with IL skills.

6.4.2 Students' Library Experience after ILS Training and Learning

The respondents were asked to rate their library experience after undergoing ILS training. The results revealed that 189(74.11%), 198(77.64%), 186 (72.94%), and 183(71.76%) of the students, together with 52 (83.87%), 53 (85.48%), 56 (90.32%), 54 (87.09%) and 51 (82.26%) of the lecturers, agreed that students use the library resources to write their term papers and to satisfy their general information needs, know how to get specific titles easily using the

library's online public access library catalog, and can find and use various library resources like books, journals, and audiovisual videos, in that order. Similarly, university librarians, heads of departments, and heads of medical librarians who were interviewed stated that after undergoing ILS training and learning undergraduate medical students can search for information in the library without any problems, they know the various sources of information available in the library, usage of online information resources had greatly improved, there was a remarkable reduction in the number of reference questions at the information/reference desk in the library, there was satisfactory behavior in the library, the ability to use multiple information sources when writing their research papers, students were able to organize information to present a sound central idea supported by relevant material in a logical order, students were able to determine the authoritativeness, correctness, and reliability of the information sources.

The findings suggest that after ILS training, students gained some skills of an information-literate student, though limited. The skills gained include the ability to; formulate an information query, determine the type and format of the information source, assess the quality of information, and to use and share information.

These findings are in agreement with Grassian and Kaplowitz, (2001) study on information literacy instruction theory and practice, which revealed that the training on the process of research that students underwent made them acquire lifelong learning skills that enabled them to function independently inside the library to meet their information needs. Furthermore, the ACRL (2000) avers that learners who have undergone ILS training become lifelong learners, more self-directed, and can master content, extend their investigations and assume greater control over their learning and information searching in a library. Additionally, (Mackey and

Jacobson, (2004) state that learners who are information literate are better equipped for today's complex information landscape and environment than students who do not possess such skills and abilities

Underscoring the importance of ILS training and learning especially in the internet era. Foo et al., (2017) assert that with the proliferation of false information on the Internet and in social media, information literacy skills training and learning has become a critical skill for students to identify which information is reliable and which one is not.

6.5 Knowledge and Skills Possessed by Staff Facilitating ILS among Medical Undergraduate Students.

A rising appreciation of the importance and nature of information literacy skills and the need for contextualization in specific institutions and disciplines is discernible (Bruce, 2001). Similarly, Foo et al (2013) state that an ideal information literacy skills conception includes life-long learning, fostering students' capacity for self-directed independent inquiry (the emancipatory view), and making possible ongoing reskilling (the corporate view) through continuing education. For reskilling to be successful, competent and skilled staff is required to bring these approaches together through the introduction of action learning, action research, and problem-based learning.

As such, the study sought to find out the knowledge and skills possessed by staff facilitating ILS among medical undergraduate students. The results revealed that majority 210(82.35%) of the students and majority 59 (95.16%) of the lecturers gainsaid that staff can select the information that is relevant to their information needs, can create tactics for finding information, can contrast and analyze information obtained from different sources, and can generate information and expand on existing information.

Similarly, according to the responses of the heads of medical librarians interviewed, majority of the staff require technical, technological, digital, intellectual, and communicative capabilities that are meant to empower them to serve students competently and satisfactorily. Equally, the heads of departments affirmed that librarians especially the aged ones require skills on effective search strategies and adequate technological skills on how to check the relevancy, currency, authenticity, and purpose of retrieved information materials.

These findings suggest that staff facilitating ILS among medical undergraduate students do not possess the requisite ILS to successfully impart ILS to students. This is an indication that the staff either they don't have the right tools for imparting ILS or they have traditional library skills hence require reskilling and retooling. This is true because with the advent of Web 2.0 technologies the current child is technology savvy, therefore, for the staff to serve these students they (staff) require training on the modern information technologies. The higher skills facet of Bond's Sauce Model (2012) advocate for constant building up, learning, and sharing of one's information and knowledge skills in a field of interest, especially in the ever-changing information rich platforms and technologies. These skills are then applied to engage students in information tasks that facilitate them to develop higher thinking skills.

These findings corroborate the results of a study conducted by Asibey et al. (2017) on the student's use of the internet for health information at Ghanaian universities which revealed that universities require qualified professionals to successfully teach and impart ILS among the students. On the same note, Bruce (2013) observes that recent discussions regarding the skills needed by information professionals have focused on several factors including employer needs, generic skills vs specific skills, and the competencies needed by staff working in more information technology or digital environments. Similarly, Buarki et al. (2011), note that the

trend of ILS training and learning programs has been to shift the emphasis from library to information. However, despite this trend of integrating more information technology or digital courses into ILS programs, research suggests that, although there is an emphasis on technical skills and knowledge in today's digital environment, traditional ILS skills are still sought and needed (Chow et al., 2011; Stephens and Hamblin, 2006).

Another study conducted at one LIS school in the US, to investigate if the LIS curriculum being delivered that teaches skills and knowledge to equip students in a rapidly changing environment, found that library managers were satisfied with the skills of graduates from the LIS program (Chow, 2011). The study also found that the most successful skills managers were looking for were more general skills such as communication and that some skills such as cataloging were seen as skills that could be learned on the job. This is a clear indication that staff teaching ILS have general and specific LIS skills and knowledge, but most importantly the staff can be flexible and adaptable in the constantly changing digital environment.

Similarly, the use of digital information tools in libraries and information centers demands technical competencies to successfully navigate through digital information. Librarians and faculty require new skills to work effectively in this digital environment and to meet the challenges of digital librarianship. Equally, Singh and Pinki (2009) stressed that library professionals must develop digital competencies and skills to manage change and fulfill the information needs of users. Additionally, the new information environment demands modern skills and library and information science (LIS) professionals to become adaptable to this new environment (Chinen and Boutin, 2011). McDonald (2004) stated that library professionals should acquire technical and analytical skills to meet the future demands of digital librarianship. Raju (2014) concluded that librarians must possess knowledge of digitization,

metadata creation and management, preservation of digital information, and computer skills, which are useful to work in online information environments. Mendez (2002) highlighted that librarians should play their dynamic role in the emerging digital culture by demonstrating digital skills to serve library users efficiently. Yakel (2007) explained that librarians with sufficient digital skills will remain successful and relevant in working with modern information systems. Gorny *et al.* (2010) were alarmed those librarians, who are not technically skilled, should perceive digital libraries as a threat to their employment.

6.6 Role of ICT in Facilitating and Promoting Information Literacy Skills

The study sought to find out the role that ICT played in facilitating information literacy among medical undergraduate students. The findings revealed that ICT play a great role in effective ILS training and learning, because it enables ILS content creation, offer channel of communicating the content and acts as a catalyst to ILS training and learning process. This could mean that librarians and lecturers can create ILS learning and training tools faster using ICT tools that can be made accessible to students whenever and wherever they are. This has an impact on the efforts expended by lecturers and librarians in improving the teaching and learning of ILS This gives an indication that ICT is critical in the teaching and learning process of information literacy skills. Furthermore, the discussions delved into two areas namely students' integration of ICT skills and ILS; and types of ICT tools and devices used for ILS learning and training for medical undergraduate students

6.6.1 Students' Integration of ICT Skills with ILS

The study sought to find out how students are integrating ICT skills with ILS learning. The results show that 230(90.20%), 227(89.01%), 220(86.27%) of the students and learning. The results show that 230(90.20%), 227(89.01%) of the students and 47 (75.81%), 46 (74.19%) of

the lecturers stated that students use computers to prepare reports of assignments and for email or other online communication. However, 213(83.52%), 223 (87.45%), 181(70.98%) and 133(52.16%) of the students stated that they cannot use electronic databases adequately, they cannot evaluate information on the internet for validity, electronic resources are not their first priority when looking for information and that they cannot perform data analysis using computer software. These findings are in tandem with the lecturers responses, where majority 52 (83.87%), 33 (53.3%), 45 (72.59%), 46 (74.19%) and 48 (77.41%) of the lecturers disagreed that students use the internet to search for course-related materials, use electronic databases with ease to get the needed information, understand how to evaluate free information on the internet for validity, use electronic sources as their priority source of information when looking for information, and can carry out analysis of data using computer packages correspondingly as shown in Table 5.26. Results from interviews with university librarians, department directors, and heads of medical librarians demonstrated that students require appropriate ICT competencies to search and evaluate databases, as well as access legitimate information resources on the internet.

These findings suggest that students are yet to master Web 2.0 ICT skills which are essential in ensuring that access and use retrieved information resources effectively by the students. The ICT integration facet in the Sauce Model which advocates for the application and exploitation of various ICT technologies for ILS instruction and learning (Bond, 2009). The ICT integration facet emphasizes the need for proficiency in ICT. Because ICT integration with ILS increases the skills of teachers, students and librarians for problem solving and appropriate decision making.

The findings agree with Okafor's (2015) study on ICT skills acquisition and competencies of students: Implications for a digital and electronic environment in Nigerian universities, which found that many of the students do have knowledge and skills of email use and word processing tasks but lack knowledge of search engines and directories other than Google and Yahoo, respectively. Moreover, many of them do not know how to evaluate and catalog e-resources; have no knowledge of subject gateways, specialized databases, and some open-access library databases.

Gatero (2010) noted that because of the convergence of computer technology and information technology, it is no longer sufficient to educate those in academia on how to use the library but how to harness the various ICT technologies in information evaluation. Hence students and researchers must know not only how to access this information using computers but also how to evaluate it most effectively.

Similarly, Bothman (2007) asserts that ICT is the backbone of the delivery of quality information services. Additionally, Ghuloum and Ahmed (2011) assert that the ICTs used in academic libraries attempt to deliver numerous applications such as wide-area network applications, local area networks, online information services (the Internet), online databases, library databases, CD-ROMs, online access catalogs, retrieval networks, digital online archives, mainframe computers, microcomputer labs, and other digital content services. With increasing online learning comes the need to equip students with skills to search and evaluate information available in online platforms.

6.6.2 Types of ICT Tools and Devices Used for ILS Learning and Training for Medical Undergraduate Students

Equally, the study sought to find out the various ICT tools and devices that were used for teaching ILS to medical undergraduate students. The findings revealed that the majority 215 (84.31%), 220 (97.78%), 218 (87.5%), 92 (40.89%), 86(33.73%), and 186 (82.67%) of the students agreed that projectors, computers/laptops, the internet, smartboards, mobile phones, iPad/tablets, and cameras were ICT tools and devices used for ILS learning and training respectively. Similarly, interview responses from heads of departments, head medical librarians, and university librarians revealed that iPad, laptops, software programs, public address systems, smartboards, projectors, internet, smartphones, printers, clicker devices, WI FI, and cameras were the ICT tools and devices that are used to impart ILS to undergraduate medical students.

These findings seem to suggest that usage of ICT tools enable lecturers and librarians to work with contents that are packaged, such as digital files for manuals or procedures, as well as wikis, ZOOM, Google forms, blogs, and platforms that allow the students to collaborate for information sharing. Additionally, the findings could suggest that with prudent utilization and application of the ICT tools makes ILS training and learning process more enjoyable and fun.

Various studies conducted by Ghavifekr (2015), Kanguha (2016), Makori (2014), Majid (2008), Singh (2008), Kanguha (2016), Obegi (2022) and Nyamboga (2021) on ICT and information literacy skills found that ICT tools are digital infrastructures like computers, laptops, printers, scanners, clicker devices, software programs, multimedia projectors, and interactive teaching boxes.

Similarly, Mahmood, et al (2007), AI-Ansari (2011), Ahmad (2011), Berners-Lee (2006) and Dawes (2001) in their various research studies on the role of ICT and information literacy skills, agree with the findings by stating that new technologies have the potential to upkeep

education across the curriculum and deliver opportunities for efficient student-teacher communication in ways not possible before. Furthermore, they state that ICT in education has the potential to transform teaching. Correspondingly, Gurney and Wilkes (2008) studied the impact of ICT on teaching and learning ILS to first-year applied science students at the University of New England. In their study, they found that students who applied ICTs and various search strategies learnt to find resources they needed for a given unit gave more and complete citations of articles and got higher grades compared to those who did not bother to use the library's ILS instructions and trainings. The implication of these studies to the current one is that, the rapidly changing ICT environment requires ILS instruction to be at par, in order to provide effective ILS learning.

6.6.3 Adequacy of the ICT Infrastructure in Moi University and University of Nairobi

The interviews conducted with university librarians, heads of departments, and heads of medical librarians revealed that institutions had unstable internet connectivity, outdated computers, inadequate computer laboratories with limited internet connection, projectors were available but not in good working conditions, outdated Microsoft application, available Wi-Fi networks all-round the universities compound were very weak, subscription fee meant for internet and e-resource providers had not been paid. The findings seem to suggest that the institutions have not kept abreast with the changing technologies. This might indicate that these institutions have misplaced responsibilities or/both absence of university management support

6.6.4 Challenges Hindering Effective Utilization of ICT Tools and Devices Facilitating ILS

Universities are faced with many ICT challenges in their quest to train and equip students with appropriate ILS. The findings revealed majority 207 (92.00%), 206 (91.56%), 207 (92.00%), 211 (83.45%) and 205 (93.78%) and 213 (94.67%) of the students and majority 58(93.74%), 59(97.64%), 57(92.96%), 59(95.21%) 57(92.96%) and 59(97.64%) of the lecturers affirmed that unreliable internet connectivity and limited accessibility, limited ICT tools and infrastructure, absence of effectual tutelage (training), limited ICT training time, trainers' ICT incompetency and lack of interest among lecturers in using ICT technologies, respectively, were factors contributing to the underutilization of ICT in ILS learning as illustrated in Table 5.29.

Similarly, interviews with university librarians, heads of departments, and heads of medical librarians established that the challenges hindering effective utilization of ICT tools and devices facilitating ILS among students were; low internet access, lack of pedagogical skills among trainers, slow speed of computers, insufficient training time, insufficient ICT systems personnel, lack of effectual tutelage (training), and poor ICT literacy among students.

These findings seem to suggest that the challenges facing effective ICT utilization on ILS training are; lack of training in digital literacy, connectivity issues, lack of pedagogic and didactic training in how to use ICT in the classroom and lack of training concerning technology use in specific subject areas were obstacles to using new technologies ILS in classroom. This is an indication of limited support from the university management.

The findings are consistent with a study conducted by Polepalli and Ramesh, (2016) which revealed that the respondents faced slow internet access speed, computers with limited memory and capacity. Correspondingly, the findings agree with Cox et al (1999a) in his study on use of ICT tools and pedagogical training for teachers, assert that if teachers are to be

convinced of the value of using ICT tools in their teaching, their training should focus on the pedagogical issues. In addition, a study by Ghavifekr et al (2015) on teaching and learning with ICT tools: issues and challenges from teachers' perceptions found that teachers' deficiency of technological competence is a main barrier to their acceptance and adoption of ICT

6.7 Challenges Hindering ILS Delivery to Medical Undergraduate Students

This section addresses the challenges of ILS delivery. The study established that the challenges hindering ILS delivery to medical undergraduate students in the two universities were: large classes, unstable power supply, inadequate support from management organs in the university, poor and unstable internet connectivity, limited internet bandwidth from the internet service providers, information literacy skills are not well-integrated or embedded in the universities' curriculum, students lack interest in learning ILS, inadequate support from university management, ILS policies not fully adopted, students misconceptions that they already possess information literacy skills and competencies, inadequate time for instruction, limited number of skilled staff, inadequate time allocated to the program, inadequate and outdated computers and software in the computer laboratories, reluctance by faculty staff to adopt an information literacy skills approach in their teaching, ICT skills of students is low, and this affects their internet search skills, and limited pedagogical skills among the lecturers and librarians.

These findings are supported by Dennis (2004) study on the user education program at the University of Ghana, findings that, identified inadequate number of qualified staff to instruct students during orientation, and inadequate time allocated to the program as some of the challenges facing information literacy skills training and learning. Similarly, Dadzie (2007) in her study on information literacy: assessing the readiness of Ghanaian universities, identified

several problems hindering the implementation of ILS programs at the university of Ghana and the University of Cape Coast. The problems were; lack of university commitment to the project, inadequate information about what ILS is, the unwillingness of the various departments already handling components of the ILS programs to collaborate to form a campus-wide project, unwillingness to accept innovations in curricula planning, inadequate technological infrastructure/computers, inadequate electronic resources, and inadequate human resources (Anunobi, and Ukwoma, 2016).

Likewise, Lwehabura (2008) identified several factors hindering the ILS delivery in Tanzania universities. They are lack of clear ILS policy, inadequate time, the teaching of IL as a stand-alone course voluntarily, and non-involvement of teaching staff. Similarly, Lwehabura and Stilwell (2008) in their study, pointed out that, to a large extent, ILS instruction is weak in terms of its effectiveness in imparting ILS knowledge and skills in Tanzania. Among the reasons given are

- there is no dedicated ILS policy to guide ILS practice;
- there is a lack of awareness among students about the IL instruction sessions;
- instruction sessions are affected by time constraints because IL is not allocated official time for university academic timetables;
- attendance by students is voluntary and as a result, not all students take advantage of the sessions that are in place;
- there is a lack of resources such as computers and CD-ROMs to support hands-on practice, and information skills sessions are not integrated into the curriculum.

Correspondingly, Kavulya (2003) observed that there is a failure on the part of librarians to push ILS to the fore as a function of the university library. Equally, Amunga (2007) identified over-dependence on one-day orientation programs; lack of collective curriculum for user education program in Kenyan universities; and use of unqualified personnel to teach the course as challenges facing ILS training and learning. Likewise, Odero-Musakali and Mutula (2007) identified lack of trained personnel and a negative attitude of university management toward IT as major factors that impede the effective adoption of ILS in university libraries.

6.8 Strategies to Improve ILS Learning and Training

The respondents proposed the following as mitigation measures to improve ILS learning and training. Institutions of higher learning should establish a partnership with mobile phone (smartphone) manufacturers to enable students to purchase subsidized smartphones. To further sensitize lecturers on the importance of information literacy skills, librarians and teachers must collaborate to evolve the information literacy skills course and periodically revise the course according to new developments; library resources and ILS infrastructure facilities should be strengthened; librarians should develop interest and zeal to acquire the needed IT skills; partnerships between librarians and teachers can be developed by lobbying to be involved in teaching part of information literacy skills course, such as instruction about catalog and databases, how to assess or evaluate internet sources, referencing and citation patterns; and librarians can collaborate with other stakeholders (students, staff and management) in their institutions to ensure proper implementation of ILS policy in their institutions.

Table 6.1: Summary of Findings Mapped to the Theoretical Models and the Research Questions

Theoretical models	Key variables addressed	Research question	Summary of findings
Sauce Model (Bond, 2009)	Status of Information literacy skills	What is the status of ILS among medical undergraduate students at the University of Nairobi and Moi University?	The students have basic information literacy skills such as general internet search skills, referencing, print and electronic sources, etc Students are deficient in advanced search skills Discussion groups are informative Students utilize computer-based and other technologies in the search for sources
Relational frame of the six frames for information instruction education mode according to Bruce, et al (2006)	Information literacy skills policy Information literacy skills procedure	How does information literacy skills policy and curriculum guide in imparting ILS to medical, undergraduate students?	time management during the data searching and organizing process is necessary for students learning areas of information literacy skills (ILS) include identification, evaluating applying, and acknowledging sources of information on literacy learning there is ethical consideration and training in accessing certain websites
Relational frame of the six frames for information instruction education mode	Information skills curriculum adequacy	How is the understanding of ILS among medical undergraduate students?	ILS training help students differentiate between primary and secondary sources of information and evaluate information resources found.

according to Bruce, et al (2006)			students also learn orientation and e-resources. students learned was library orientation. students physically borrow books from the library and use their online portal training enhances the technological literacy of students computers, one on one teaching, and online materials offered to students are some of the ways of learning adopted
Sauce Model (Bond, 2009)	Perception towards ILS	What is the perception of staff and medical, dentistry, and nursing undergraduate students towards ILS in Nairobi and Moi universities in Kenya?	The clarity in the information literacy course the studies on ILS are intellectually stimulating examples and illustrations are useful teaching methods students utilize online library catalogs there is a need for more student-librarian interaction
Sauce Model (Bond, 2009)	(1) ILS knowledge (2) ILS skills (3) ILS training	What knowledge, skills, and training are possessed by the staff of Nairobi and Moi universities in facilitating ILS among medical, dentistry, and nursing undergraduate students?	Staff have skills to use several reference sources Staff understand the selection of materials and information on ILS Staff utilize advanced search techniques in ILS such as Boolean and Truncation The staff can recognize accurate and complete information in ILS

Sauce Model (Bond, 2009)	ICT(s)	What is the role of ICT in facilitating and promoting the learning of information literacy skills among medical, dentistry, and nursing undergraduate students at the University of Nairobi and Moi University?	Students utilize computers for their study needs There are online communication programs that effectiveness Students can evaluate free information on the internet for validity computers are necessary for learning information literacy
Sauce Model (Bond, 2009)	(1) ILS delivery, (2) ILS challenges (3) ILS training	What are the challenges in ILS delivery and what framework should be developed to enhance ILS training among medical, dentistry, and nursing undergraduate students at the University of Nairobi and Moi University?	university Libraries are not well-organized and equipped information literacy and academic performance are correlated there is a lack of well-trained lecturers there is no policy for continuous assessment of students' information literacy skills students are not well-trained in information literacy in their first year Universities lack the necessary infrastructure for ILS training

6.9 Chapter Summary

Chapter Six has discussed and interpreted the findings of this research study, as presented in Chapter Five. Chapter Six was systematized in themes, sections and sub-sections based on data from the seven research objectives and questions. The interpretation and discussion of

findings covered the main research objectives and questions as underpinned by the Sauce Model (Bond, 2009) and Relational frame of the six frames for information instruction education mode according to Bruce, et al (2006). Furthermore, interpretations and discussions showed how the findings relates to similar studies in the literature.

The findings demonstrate that majority of the students were not aware of Boolean logic, field, truncation, and phrase searches. The study established that the challenges hindering ILS delivery to medical undergraduate students in the selected universities were: large classes, unstable power supply, inadequate support from management organs in the university, poor and unstable internet connectivity, limited internet bandwidth from the internet service providers, Information literacy skills are not well-integrated or embedded in the University's curriculum, students lack of interest in learning ILS, Inadequate support from university management, ILS policies not adopted fully, Students' misconceptions are shown by their belief that they already possess information literacy skills and competencies, lack of adequate time for instruction, limited number of skilled staff, inadequate time allocated to the program, inadequate computers in the computer laboratories, Reluctance by faculty staff to adopt an information literacy skills approach in their teaching, ICT skill of students is low, and this affects their internet search skills, and lack of teaching methodology/pedagogical skills among the lecturers, especially librarians.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

This chapter presents a summary of the key findings, conclusion and recommendations based on the objectives and research questions of the study as presented in chapter one. The aim of the study was to investigate information literacy skills of medical undergraduate students in selected public universities in Kenya with a view of establishing the challenges and proposing a framework to enhance ILS delivery and utilization.

The research objectives and questions of the study are used as the organizing framework for this chapter under the following subject headings: summary of the findings, conclusion, recommendations and suggested studies for future research.

7.2 Summary of the Findings

The summary of findings covers status of information literacy skills of undergraduate medical undergraduate students; information literacy skills policy and procedure used in imparting ILS; the information literacy skills curriculum and assess the methods used in delivering the curriculum; the attitude of undergraduate medical students towards ILS; knowledge and skills possessed by staff engaged in facilitating ILS training; role of ICT in facilitating and promoting the learning of information literacy skills; challenges experienced in ILS delivery and a framework/model to guide and enhance ILS training.

7.2.1 Background Information of the Respondents

The findings revealed that the majority of the student respondents were from University of Nairobi that is 54.1% of the study participants, and 45.9% were from Moi University. The students noted down the departmental fields they were studying, where 14.6% were in

dentistry, 35.3% were in medicine, and 42.4% were in nursing. The findings further revealed that the majority of student respondents (61.2%) were in the 4th year of their study, 16.5% were 6th year students and 14.1% were in the 5th year of their studies. Furthermore, the study revealed that the male respondents consisted of 58.8% of the population and 41.2% were female respondents. The researcher collected 62 filled questionnaires from the lecturers in the two public universities in the study sample.

Moreover, the majority of the lecturers were from University of Nairobi representing 68.8% of the study participants and 31.3% were from Moi University. Male lecturer respondents consisted of 69.5% of the population which responded, and 30.5% were female respondents. The majority of the lecturers 51.6% had attained a Ph.D. level of education while 48.4% had a master's level education. Additionally, the lecturers stated their official job title, where 53.9% were tutorial fellows, 12.5% were lecturers, 28.9% were senior lecturers and 4.7% were professors. 34 (26.6%) were in the Nursing department, 22 (17.2%) were in Maxillofacial Surgery, 21 (16.4%) were in the obstetrics and gynecology department, 3 (2.3%) were in Surgery and Anesthesiology department, 9 (7%) were in Dental Sciences department, 6 (4.7%) were in Clinical medicine and Therapeutics department, 14 (10.9%) were in human anatomy and physiology and human pathology while 9 (7%) indicated they were in ophthalmology. The findings reveal that majority of lecturer respondents 46 (35.9%) of the lecturers had 15 to 20 years of experience, 31 (24.2%) had over 20 years of experience, 30 (23.4%) had 5 to 10 years of experience, 15 (11.7%) had a 10 to 15 years' experience while 6 (4.7%) had a less than 5 years' experience.

7.2.2 Status of Information Literacy Skills among Medical Undergraduate Students

The finding of the study revealed that undergraduate medical students were moderately information literate, in the sense that they can define and refine their specific information needs, recognize accurate and complete information but were not able to apply the information and knowledge assimilated as shown in (Table 5.7).

The results established that students understand the need to use information to undertake everyday task hence they used several reference sources to increase familiarity with a topic. However, majority of the students were unable to use truncation and Boolean logic techniques to search for information. This greatly impacted negatively on the specificity of information searched and locating the desired information materials. As a result, students are unable to select the most appropriate sources or databases related to their studies and that they need more help in the formulation of search strategies and evaluation of what they find. Further, others are not aware of the most appropriate databases applicable to their disciplines.

The study results showed that students don't know how to limit the search by field and solve search queries appropriately and that they were not able use the library online catalog to retrieve relevant information materials. The students were not able to use information for critical thinking and for problem solving. Hence, students have not acquired adequate ILS to be able to be critical and convergent thinkers and they didn't have adequate information search competences/skills to find the required information from the catalogues.

The study results further, revealed that with the advancement of computer technology and readily available internet connectivity, students are exploiting mailing lists, SMS and emails to send and receive information. This means that information literacy skills gained have

enabled students develop appropriate communication skills hence they are able to communicate information and get information.

Moreover, the findings also revealed that students have not developed abilities to understand and evaluate the nature of the information available on the internet. A clear indication that students did not only have ability for self-directed learning but also were not able to organize bibliographic information and convey it to others, including constructing a personal bibliographic system, citing references appropriately and understanding issues of copyright and plagiarism.

The findings of the study showed that students use group discussions and newsgroups to obtain and exchange information hence they work together to solve problems, complete tasks, or learn new concepts. This is an indication that students are engaging in collaborative learning which is one of the key tenets of information literacy skills training and learning as advanced by the Sauce model (Bond, 2009).

The findings revealed that all the students can use web addresses to search the internet. The study further found out that undergraduate students were still using Google, Wikipedia, and social media tools to find information. This indicates that students do not possess adequate information literacy skills required to conduct high level research using credible and viable information sources for example MEDLINE, PROQUEST, NEXISLEXIS among other medical information databases. This is an indication that students want the easy way or the “fast” way to find information because they are comfortable with searching the internet rather than searching online information rich databases.

7.2.3 ILS Policy and Curriculum Imparting ILS

7.2.3.1 ILS Policy

These findings clearly demonstrate that ILS policy was available and that they were clearly documented. However, the study revealed that the ILS policy was not being fully implemented in the sense there was unavailability of an examinable information literacy skills unit or units that fully covered all the ILS content instead the universities offered some ILS skills through the communication and writing skills unit. This is inadequate for imparting meaningful ILS skills to students. As results efforts of integrating some form of library instruction, orientation or user education to communication skills & writing unit have not been able to develop an all-round student who can find, evaluate, use, create, organize or share information.

The study revealed that knowledge and information skills, problem-solving and critical thinking, communication skills, information technology skills, social responsibility skills, research skills, referencing and legal issues were the areas that the ILS policy and curricula stipulate that should be taught as shown in figure 5.1 and 5.2. This indicates that the policy support, promote and enhance teaching and research as well as create a learning culture that encourages institutions to produce graduates with the capacity and desire for lifelong learning.

Findings showed that university librarians interpret the patterns of information access and use within the university, once they identify the need to initiate ILS policy or gaps in ILS policy and curricula, they notify the heads of departments who are the quality assurances officers and custodians of curricula in their respective departments through a memorandum or submissions through the deans' committee.

In relation to the adequacy of ILS policy, the findings revealed that the ILS policy were inadequate because they did not advocate for the allocation of adequate time for ILS training and learning, it did not attach responsibility, it did not state the infrastructure required. Additionally, the policy did not advocate or stipulate the contact hours required to successfully impart ILS skills. Furthermore, the policy did not state the policy review cycle and as a result, ILS policy reviews and updates have never been carried out to incorporate changes taking place in the information environment.

7.2.3.2 ILS Curricula

It was found that there are different kinds of information literacy skills programs provided by Kenyan universities and that there is existence of an ILS curriculum. The topics covered by the ILS curriculum are: problem-solving and critical thinking skills; information search and retrieval; legal issues in information use; computer use and effective communication skills; integration of information; basic library guidelines on how to access library materials; and research skills.

Concerning the teaching modes of ILS or ILS delivery methods, the findings show that use of computer software, face-to-face teaching, online materials, handouts, online platforms, library orientation, WhatsApp group engagements, library forum engagements through Web 2.0 tools (Google MEET, YouTube and ZOOM), peer training, pre-recorded audio-video clips, and weekly librarian-student engagements, are the methods used to impart ILS to undergraduate students.

The study found that there was limited collaboration and teamwork between lecturers and librarians in teaching ILS in the sense that some faculty members were unwilling to collaborate with librarians because they do not view librarians as partners.

With regard to methods used to assess ILS curriculum, the findings showed that focus groups, concept maps, CATs, information assessment techniques, interviewing, knowledge tests through creative clinical and research papers, and ILS feedback forms as the techniques applied for assessing the effectiveness of the ILS curriculum. This means that assessment on ILS learning is conducted through summative assessment which seeks to gauge what students have learned at the conclusion of a learning session by juxtaposing it to some norm or guideline.

7.2.4 ILS Understanding among Medical Undergraduate Students

The study found that majority of the students had a lukewarm attitude towards ILS training and learning because the trainers were not audible enough when they were teaching them, the learned skills have not helped them in their academic journey, some topics were difficult to understand, classes were very large hence absence of personalized attention, some topics were very hard to understand, computers and WIFI in the library ICT laboratory were not working, inadequate time spent on training sessions and lack of awareness about library resource usage training. In addition, the results indicated that students displayed a casual attitude especially when called to attend the training sessions, they never engaged during the training, they displayed a know-it-all attitude, and overconfidence. The implication of these findings is that trainers lack adequate pedagogical skills to motivate students during ILS training and learning.

The study findings further, showed that after ILS training, those students who took a keen interest in ILS learning and training gained skills of an information-literate student. The skills gained include the ability to; formulate an information query, function independently inside the library, determine the type and format of the information source, and use and share information using various web 2.0 tools.

7.2.5 Knowledge and Skills Possessed by Faculty Staff

The findings revealed that the staff facilitating ILS among undergraduate medical students do not possess adequate ILS competencies to successfully impart ILS to students. The staff didn't possess research writing skills, information needs diagnostic skills, technical and intellectual capabilities. In addition, the study found out that a number of librarians didn't know how to discern potential information sources, how to create strategies for retrieving information from digital databases and didn't possess skills of expanding existing information and their sources. Majority of the staff possessed traditional library skills and basic ICT skills, which are not adequate especially with the avalanche developments in the information field. Furthermore, the study found out that staff require technical, technological, digital, intellectual, and communicative capabilities that are meant to empower them to serve students competently and satisfactorily. Majority of the staff had limited skills on effective search strategies and adequate technological skills on how to check the relevancy, currency, authenticity, and purpose of retrieved information materials.

Similarly, the study found out that some faculty staff members had serious deficiency in ICT applications hence are unable to retrieve accurate information materials. This is a clear indication that staff facilitating ILS among medical undergraduate students have limited technical and analytical skills required in the advent of Web 2.0 technologies. Hence, there is an urgent need for reskilling and upskilling of librarians and faculty members in order for them to successfully impart ILS to students.

7.2.6 Role of ICT in Facilitating and Promoting Information Literacy Skills

The literature reviewed discovered that ICT impacted ILS learning by refining presentation of research work, planning and enabling digital communication (Waite, 2004). Therefore, information users need ICT skills to guide and help them access, use and share the required information. The study revealed that ICT was vital in helping ILS training and learning because of its role as communication and teaching tool. The study specifically revealed that the use of the internet, and particularly video clips, and LCD projectors had introduced a new approach to teaching ILS. As a communication tool, ICT was found to have made it possible for students to access information, thereby reaching many and providing a richer ILS teaching and learning experience (Adeniran & Onuoha, 2018).

The findings revealed that students know basic computer skills like Microsoft packages, opening their email addresses, doing basic search on google, sending emails and using web 2.0 tools. However, majority of the students have not learnt adequate ICT skills to be able to use electronic databases to get needed information, evaluate free information on the internet for validity and conduct data analysis with a computer package, hence, cannot reap maximum benefits from the available information.

The study further, revealed that usage of ICT tools enables ILS content delivery and application. ICT tools enable lecturers and librarians to work with contents that are packaged, such as digital files for manuals or procedures, as well as wikis, ZOOM, Google forms, blogs, and platforms that allow the students to collaborate for information sharing. In addition, the study found out that ICTs provides students with opportunities in adapting learning to their individual information needs; ICTs greatly facilitate the acquisition and absorption of knowledge; ICTs have a positive effect on the behavior, motivation, and communication of students; students use ICTs to work more independently and effectively; ICTs open access to

vast sources of knowledge in ways unimaginable not long ago, and ICT is integrated in a manner to support and extend curriculum objectives and engage students in gainful learning.

The study further showed that iPads, laptops, software programs, televisions, scanners, radio, tablets, public address systems, smartboards, projectors, internet, smartphones, printers, clicker devices, WI FI, and cameras were the ICT tools and devices that are used to impart ILS to undergraduate medical students.

The findings revealed that universities are faced with many ICT challenges in their quest to train and equip students with appropriate ILS. The ICT challenges faced were; unstable internet connectivity, outdated computers, inadequate computer laboratories with limited internet connection, projectors were available but not in good working conditions, absence of pedagogical skills among trainers, poor ICT literacy among staff, Microsoft software suite were outdated, slow speed of computers, available Wi-Fi networks all-round the universities compound were very weak, absence of adequate IT qualified personnel, unstable power supply due to unpaid bills, subscription fee meant for internet and e-resource providers had not been paid.

7.2.7 Challenges Hindering ILS Delivery

The findings revealed that the challenges hindering ILS delivery to medical undergraduate students in the selected universities were: large classes, unstable power supply, inadequate support from management organs in the university, poor and unstable internet connectivity, limited internet bandwidth from the internet service providers, Information literacy skills are not well-integrated or embedded in the University's curriculum, students lack of interest in learning ILS, Inadequate support from university management, ILS policy and curricula not adopted fully, Students' misconceptions are shown by their belief that they already possess

information literacy skills and competencies, lack of adequate time for instruction, limited number of skilled staff, inadequate time allocated to the program, inadequate computers in the computer laboratories, Reluctance by faculty staff to adopt an information literacy skills approach in their teaching, ICT skill of students is low, and this affects their internet search skills., and lack of teaching methodology/pedagogical skills among the lecturers, especially librarians. Findings regarding the challenges that impeded effective IL learning indicated that: lack of adequate learning resources and facilities such as computers and classrooms, greatly affected the students' ILS training learning, as discovered by other studies in Africa (Baro & Zuokemefa, 2011; Lwehabura & Stilwell, 2008; Hart & Davids, 2010). There was limited access to the internet, with frequent downtimes and a high cost of internet access at Moi University, because of its distance from the nearest major urban centre.

7.3 Conclusion

The findings of this study affirms that there is need for ILS among undergraduate medical students. The conclusion has come out clearly and strongly enough that students have not gained the requisite sufficient ILS for example use truncation and Boolean logic search techniques, to enable them apply information learned practically in their fields of study. Additionally, students do not possess adequate abilities for evaluating and critically assessing the information they retrieve from the internet and as such students are unable to use information legally and ethically.

The study also concluded that the information literacy skills policy has never been updated, and ILS has never been embedded into course unit. There is absence of shared understanding on how ILS training and learning among undergraduate students ought to be carried out. The absence of collaboration between the lecturers and librarians in training ILS to students has

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contributed to the ILS inadequacy among undergraduate medical students. Further, students often display a casual view towards ILS training and instruction, especially when called to attend the ILS training sessions, they never engaged during the training, they displayed a know-it-all attitude and overconfidence. Furthermore, staff facilitating ILS among undergraduate medical students do not possess adequate ILS competencies to successfully impart ILS to students especially in the new digital information environment. Lastly the study conclude that students have the basic computer skills and that they are yet to acquire competent high level ICT skills that are essential in ensuring that they reap maximum benefits from the available information.

7.4 Recommendations

Based on the findings of this study, as espoused in the conclusions, theory and the extent of literature reviewed, the researcher makes recommendations on the following areas: status of information literacy among medical undergraduate students, information literacy skills policy and procedures used in imparting information literacy skills, information literacy skills curriculum and methods used in delivering the ILS curriculum to undergraduate medical students, the attitude of undergraduate medical students towards ILS, knowledge and skills possessed by the staff facilitating ILS among undergraduate medical students, role of ICT in facilitating and promoting information literacy skills, and challenges hindering ILS delivery.

7.4.1 Status of Information Literacy Skills

The study sought to find out the status of ILS among undergraduate medical students. The findings revealed that majority of the students cannot use truncation and Boolean logic search techniques to find information and had challenges in using information ethically and legally. The researcher recommends short-term ILS training workshops, seminar and Webinars for all

medical undergraduate students to be conducted periodically. The training should adopt the proposed 8 step ILS adequacy enhancing model in figure 7.1.

Recommendation one: adoption of the *Proposed Framework: 8 Step ILS adequacy enhancing Model for Medical Undergraduate Students*: -



Figure 7.1: Proposed 8-Step ILS Adequacy Enhancing Framework for Medical Undergraduate Students

Source: Researcher, 2021

Step one: participant engagement: Assess the current status of learners to help one ascertain the ILS possessed by learners. This will assist the librarian or instructor identify the ILS gaps the students hope to achieve at the end of the training exercise. The trainer motivates and empower students/participant to manage their own learning. the trainer/facilitator adopts a pragmatic approach, asks the participants to state what ILS they possess Hence, design an appropriate approach of enhancing those identified ILS skills and also upskill those ILS which are underdeveloped.

Step two: Design the implementation and update procedures for ILS policy and

curricula: Because of the ever-changing information environment landscape. A guideline on continuous implementation and updating of ILS policy and curricula should be developed. This document should spell clearly who is to instruct ILS, after how long should the ILS policy and curricula be reviewed and by who.

Step three: Adopt an appropriate information search model

The instructors and information service providers should adopt a standard information search model that will enhance the ILS skills of students. The model should help in the development of an ILS manual.

Step four: Develop an ILS manual. The manual is an ILS instructional material. Material should be developed in line with the topics as listed in the ILS policy and curricula. The manual should be in multimedia format to help disseminate ILS to all categories of information users for example the physically challenged learners.

Step five: Avail innovative ICTs infrastructure to enable ILS instruction, information searching, information transfer and to manipulate information.

Step six- Train and reskill staff. To adequately enhance ILS among students the staff should be reskilled and retrained on the current information field developments. For example, with the advent of big data technology and Artificial Intelligence staff need to equip themselves with these skills to enable them either transmit these skills to learners or guide the learner become information literate. In addition, to help students develop a positive outlook on ILS trainers and librarians should be trained on how to improve their customer service and pedagogy, so that they can sustainably motivate students to develop a favorable attitude towards ILS.

Step Seven: Design a tool to continuously assess ILS among students (measuring ILS)

An appropriate ILS assessment tool should be developed to help librarians and trainers know whether students are making positive strides towards enhancing their ILS. The assessment method should be the one that is carried out continuously from the time students are being exposed to ILS instruction.

Step Eight: Remedy procedures to enhance the ILS. After the assessment is carried out, a remedial exercise should be undertaken to retrain the identified ILS weaknesses among the students. This will help in enhancing their ILS skills

7.4.2 ILS Policy and Curricula Used in Imparting ILS

7.4.2.1 ILS Policy

The findings revealed that even though ILS policy was available it was not being implemented fully because of absence of attached responsibility and unavailability of an examinable information literacy skills unit or units that fully covered all the ILS content. Further the findings revealed that there was no viable collaboration between the lecturers and librarians in imparting ILS to students.

Recommendation two: *Collaboration between librarians and heads of departments:* -In view of these findings the researcher recommends that it should be made a policy and procedure issue that university librarians and heads of departments be charged with coordinating ILS collaboration activities, right from curriculum design to its delivery to students and that ILS should be classed into 4 credit scored units whereby one unit should be taught in each academic year (Nnadozie & Nnadozie, 2008).

7.4.2.2 ILS Curricula and Methods Used in Delivery

The study found out that there was absence of standardized information literacy skills programs provided in the universities under study. This clearly demonstrated lack of harmonized ILS programs.

Recommendation three: *ILS credit scored units:* -Therefore, the study strongly recommends establishment of four ILS credit scored units that should be separated from the communication and writing skills course unit and they should take the same contact hours as other units at the universities. In addition, these units should have a practical orientation, with 70% practical and 30% theory (Kumar & Ochoa, 2012).

7.4.3 ILS Understanding among Undergraduate Medical Students

The study found that majority of the students were negative towards ILS training and learning because ILS have not helped them, the trainers were not audible, classes were very large hence absence of personalized attention. In addition, the study found out that instructors lacked pedagogical skills.

Recommendation four: *ILS sensitization exercises:* - The researcher recommends that librarians should carry out ILS sensitization exercises among the students' body through the students' leadership bodies, welfare clubs and Dean of students' office in abide to create awareness on the importance of ILS and why all students need to take the trainings seriously (Adekunle, 2019).

Recommendation five: *Pedagogical/diligence teaching:* -In addition, the ILS training and teaching should be carried out with due diligence where lecturers and librarians should **thoroughly prepare** for the its delivery through following the tenets set in the ILS curriculum and the ILS policy and curricula (Mugambi, 2017)

7.4.4 Knowledge and Skills Possessed by staff facilitating ILS among Medical Undergraduate Students

The study found out that faculty members and librarians had basic information skills and they had limited ICT competencies and abilities.

Recommendation six: *Continuous reskilling and upskilling*: - The study recommends continuous training of the lecturers and librarians through short courses on specific contemporary ILS skills, seminars and workshops intermittently so as to replenish their skills (Baro & Zuokemefa, 2011).

7.4.5 Role of ICT in Facilitating and Promoting Information Literacy Skills

The findings revealed that universities are faced with many ICT challenges in their quest to train and equip students with appropriate ILS. The ICT challenges faced were; limited accessibility and network connection, limited technical support, slow speed of computers, absence of effective training, limited training time, absence of lecturers in matters ILS, and absence of interest of lecturers in ICT usage.

Recommendation seven: *Invest in ICT Infrastructure*: - The study therefore, recommends that universities should strengthen their internet connectivity, increase the number of computers in their computer laboratories, upgrade their computers to modern computers to increase on computing speed (Adigun, 2021; & Abdelrahman, 2009).

Recommendation eight: *ICT staffing*: - Institute a culture of computer use among the staff members and avail qualified ICT staff members (Ahmad and Sheikh, 2022; & Dorvlo, and Dadzie, 2016).

7.5. Contribution and Originality of the Study

The research objectives and questions addressed in the study are of importance to government especially the Ministry of Education and Commission for University Education, universities and policy makers in relation to ILS.

From the policy and procedure perspective, the findings have the potential to influence the formulation of ILS policy and for teaching and learning of ILS in institutions of higher learning. The findings provide ILS policy directions in universities' policy-makers especially in schools of medical studies in universities. In addition, the findings are likely to form the basis for collaboration of librarians and the heads of departments in the formulation of the ILS policy and curricula.

From a pragmatic stand-point, the findings revealed and created awareness regarding the status of ILS in medical training hence the recommendations proposed by the study can improve ILS teaching and learning in medical schools hence improve learners' critical thinking skills, information search skills, information ethics skills, problem solving skills, information evaluation and use skills thereby leading to an information literate graduand.

From theory, the study contributes to the body of knowledge and literature, especially in the context of ILS among medical undergraduate students. The study contributes new model 8steps of ILS. It explains how a theory should be adopted to a study to invoke understanding of a phenomenon and creating a discourse aimed at improving ILS learning, training and application in medical field training. Also, the finding presents a basis for the formulation of a pedagogical model to help lecturers, librarians and heads of departments design an ILS teaching methodology for medical undergraduate students that meets their needs.

The findings of this study therefore, make a major contribution to literature that could facilitate effective and relevant development of ILS policy and ILS curriculum in future.

Table 6.1: Presents a summary of findings mapped to the theoretical models underpinning the study, key variables addressed and the research questions.

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7.6 Suggestions for Further Research

The study assessed the ILS among medical undergraduate students in two selected universities. This study makes the following suggestions for further study

1. A study to design varied ILS teaching proportions for artificial intelligence literacy in a rapidly changing information landscape.
2. A study to assess the place of ILS on the successful implementation of competence-based curriculum (CBC) in Kenya
3. A research study to assess ILS among lecturers teaching medical undergraduate students.

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APPENDICES

APENDIX 1: SURVEY QUESTIONNAIRE FOR STUDENTS

Introduction:

My name is Evans M. Momanyi, currently a doctoral student in the Department of Library, Records Management and Information Studies, School of Information Sciences student, Moi University, Kenya. I am undertaking a study titled “**Assessment of Information Literacy Skills of Undergraduate Medical Students in Moi University and University of Nairobi, Kenya**” You have been identified to participate in this study. I therefore, request you to respond to this questionnaire.

The study focuses on assessment of information literacy skills of undergraduate medical students in the selected public universities in Kenya, with a view, of proposing a framework to enhance ILS adequacy among undergraduate medical students. The research will gather data on the status of information literacy skills among medical undergraduate students, information literacy skills policy and curricula used in supporting ILS to medical undergraduate students, the perception of staff and medical undergraduate students towards the content and delivery methods of ILS , the role that ICT play in promoting the training and learning of information literacy skills among undergraduate medical students and knowledge and skills possessed by staff in facilitating ILS among medical undergraduate students

I kindly request your participation in filling this questionnaire to enable me collect data that will address the research problem under investigation. Your responses will be treated with strict confidentiality, and will only be used for the stated academic purpose. Your contribution is highly valued. Please do not hesitate to contact the researcher for clarification on any aspect of this research.

Thank you in advance for your time and cooperation.

Evans Motari Momanyi

PhD student (Moi University)

E-mail: emotari9@gmail.com

Mobile No.: +254 725 594005

Thank you for your time and contribution to this research.

A. Demographics information

1. Name of the Institution.....
2. School.....
3. Field of specialization
4. Year of study []4th[]5th []6th
5. Gender: [] Male [] Female

B. The Status of Information Literacy Skills (ILS) Among Medical Undergraduate Students

1. (a) Have you been trained on information literacy skills in your institution?

Yes ☐

No ☐

- (b) If No, please comment

.....

.....

.....

- (c) If yes, have you found the information literacy training useful?

Yes ☐

No ☐

2. What information literacy skills have you gained that aid you in carrying out your studies?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree- meaning: 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Information Literacy Skills	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	I can express my exact information requirements.	1	2			5
	I can accurately clarify a topic's concepts.	1	2			5

3	I comprehend the need to use the information to undertake an everyday task	1	2	3	4	5
4	I can utilize a variety of reference materials to become more acquainted with a subject	1	2	3	4	5
5	I can choose information materials and abridge them in my own words for my use	1	2	3	4	5
6	I comprehend the nature of publicly available information on the worldwide web	1	2	3	4	5
7	I am able to capture notes from both print and electronic sources by printing them or storing them to a disc.	1	2	3	4	5
8	I utilize truncation techniques	1	2	3	4	5
9	I utilize Boolean search techniques	1	2	3	4	5
10	I can narrow down the internet search by fields.	1	2	3	4	5
11	I utilize a mailing list to get and exchange information	1	2	3	4	5

12	I utilize group discussions to gather and share information	1	2	3	4	5
13	I utilize newsgroups/online forums to gather and share information	1	2	3	4	5
14	I can distinguish precise and comprehensive information	1	2	3	4	5
15	I utilize acquired information to critically think and solve study related problems.	1	2	3	4	5
16	I can efficiently search for certain library materials using the library's online public access catalogue.	1	2	3	4	5
17	I am capable of incorporating learnt information into an existing body of knowledge	1	2	3	4	5
18	I can arrange information for practical use	1	2	3	4	5
19	I utilize web addresses for internet searching	1	2	3	4	5
20	I utilize information ethically and legally	1	2	3	4	5

21	I can express my exact information requirements.	1	2	3	4	5
----	--	---	---	---	---	---

3. What other gains do you have as a result of learning information literacy skills (ILS)?

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C. ILS policy and curricula supporting delivery of ILS to medical undergraduate students

1. Does your institution have ILS policy and curriculum?

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.....

.....

2. What skills does the ILS policy cover?

	Skills covered by the ILS Policy	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Knowledge and information skills	1	2	3	4	5
2	Problem-solving and critical thinking skills	1	2	3	4	5
3	Communication skills	1	2	3	4	5
4	Information technology skills	1	2	3	4	5

5	Social Responsibility skills	1	2	3	4	5
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4. What topics are covered by the ILS curriculum?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree- meaning: 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Topics are covered by the ILS curriculum	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Problem-solving and critical thinking	1	2	3	4	5
2	Information search and retrieval	1	2	3	4	5
3	Legal Issues in information use	1	2	3	4	5
4	Computer literacy skills in information use	1	2	3	4	5
5	Socialization and effective communication skills	1	2	3	4	5
6	Integration of information					
7	Basic library guidelines on how to access library materials					
8	Research skills					

5. Which method(s) are used to deliver ILS programme to medical undergraduate students?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree- meaning: 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Method(s) used to deliver ILS curriculum	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	Computers	1	2	3	4	5
	Face to face teaching	1	2	3	4	5
	Online materials	1	2	3	4	5
	Handouts	1	2	3	4	5
	Library orientation	1	2	3	4	5
	WhatsApp group engagements	1	2	3	4	5
	Peer training	1	2	3	4	5
	Pre-recorded audio-video clips	1	2	3	4	5

6. Who teaches you ILS?

.....

7. What assessment techniques do instructors use to measure ILS programmes effectiveness?

E. ILS understanding among undergraduate medical students

1. How do you view ILS

.....

2. What is your explanation for your views stated above

.....

3. Describe your library experience after ILS learning. (Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree- meaning: 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Type of library experience	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	I use the library resources for my term papers and general information needs	1	2	3	4	5
2	I know how to get specific titles easily using online library catalogues	1	2	3	4	5
3	I can find and use various library resources like books, journals, videos	1	2	3	4	5
4	Our library resources are appropriate for my information needs	1	2	3	4	5
5	There is need for more student librarian interaction	1	2	3	4	5

F. Knowledge and skills possessed by staff in facilitating ILS among medical undergraduate students

1. What kind of ILS skills does your institution's librarians possess in facilitating you to retrieve information resources in the library?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree- meaning: 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Knowledge and skills possessed by librarians	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	The capacity to select information that is most relevant to the indicated information demands	1	2	3	4	5
2	Ability to discern potential information sources	1	2	3	4	5
3	Aptitude to create tactics for finding information	1	2	3	4	5
4	Aptitude to contrast and analyze information obtained from different sources	1	2	3	4	5
5	Aptitude to arrange, use, and pass on information	1	2	3	4	5
6	Aptitude to generate and expand on existing information	1	2	3	4	5

(b) Any other skill and knowledge

.....

2. In your opinion are the skills adequate in facilitating ILS instruction and learning?

.....

G. The role that ICT play in promoting the training and learning of information literacy skills among undergraduate medical students

1. To what extent do you integrate ICTs in your studies?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree- meaning: 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Type of experience	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	I use a computer to prepare reports and term papers	1	2	3	4	5
2	I use email or other online communication programs effectively	1	2	3	4	5
3	I search the internet for course-related materials	1	2	3	4	5
4	I use electronic databases with ease to get needed information	1	2	3	4	5
5	I understand how to evaluate free information on the internet for validity	1	2	3	4	5
6	Electronic sources are my priority when looking for information	1	2	3	4	5
7	I can perform data analysis with a computer package	1	2	3	4	5

2. State the various types of ICT tools and devices used for ILS learning and training

.....

-

 3. Is the ICT infrastructure adequate in your institution?

4. State the ICT challenges hindering ILS learning and training

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree- meaning: 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	ICT Challenges	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Unreliable internet connection and accessibility	1	2	3	4	5
2	Limited ICT tools and infrastructure	1	2	3	4	5
3	Absence of effectual tutelage (training)	1	2	3	4	5
4	Limited ICT training time	1	2	3	4	5
5	Absence of lecturers' competency	1	2	3	4	5
6	Absence of interest among lecturers in technology usage	1	2	3	4	5

H. Challenges faced by the undergraduates in Information Literacy skills learning.

1. Describe the challenges that medical students face when learning ILS in your institution

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2. What strategies do you think should be utilized to improve information literacy skills training among medical undergraduate students?

.....
.....
.....

Thank you for your time and cooperation

APPENDIX II: SURVEY QUESTIONNAIRE FOR LECTURERS

Introduction:

My name is Evans M. Momanyi, currently a doctoral student in the Department of Library, Records Management and Information Studies, School of Information Sciences student, Moi University, Kenya. I am undertaking a study titled “**Assessment of Information Literacy Skills of Undergraduate Medical Students in Moi University and University of Nairobi, Kenya**” You have been identified to participate in this study. I therefore, request you to respond to this questionnaire.

The study focuses on assessment of information literacy skills of undergraduate medical students in the selected public universities in Kenya, with a view, of proposing a framework to enhance ILS adequacy among undergraduate medical students of information literacy skills. The research will gather data on the status of information literacy skills among medical undergraduate students, information literacy skills policy and curricula used in supporting ILS to medical undergraduate students, the perception of staff and medical undergraduate students towards the content and delivery methods of ILS, the role that ICT play in promoting the training and learning of information literacy skills among undergraduate medical students and knowledge and skills possessed by staff in facilitating ILS among medical undergraduate students

I kindly request your participation in filling this questionnaire to enable me collect data that will address the research problem under investigation. Your responses will be treated with strict confidentiality, and will only be used for the stated academic purpose. Your contribution is highly valued. Please do not hesitate to contact the researcher for clarification on any aspect of this research.

Thank you in advance for your time and cooperation.

Evans Motari Momanyi
PhD student (Moi University)
E-mail: emotari9@gmail.com
Mobile No.: +254 725 594005

Thank you for your time and contribution to this research.

A. Biographical information

1. Institution.....
2. Gender: ☐ Male ☐ Female
3. Academic qualifications: ☐ PhD ☐ Masters ☐ Bachelors
4. Official job title:
5. Department.....
6. Work experience:[☐ 0-5yrs ☐ 5-10yrs ☐ 10-15yrs ☐ 15-20yrss ☐ over 20yrs

B. Information Literacy Skills among Medical Undergraduate Students

What is your opinion on **Information Literacy Skills** competency of the medical Students in your department?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree meaning 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Information Literacy Skills	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Students can accurately clarify a topic's concepts.	1	2	3	4	5
2	Students understand the need to use the information to undertake an everyday task	1	2	3	4	5
3	Students can utilize a variety of reference materials to become more acquainted with a subject	1	2	3	4	5

4	Students can choose information materials and abridge them in their own words for their personal use	1	2	3	4	5
5	Students comprehend the nature of publicly available information on the worldwide web	1	2	3	4	5
6	Students are able to capture notes from both print and electronic sources by printing them or storing them to a disc.	1	2	3	4	5
7	Students utilize Truncation search techniques	1	2	3	4	5
8	Students utilize Boolean search techniques	1	2	3	4	5
9	Students can narrow down the internet search by fields.	1	2	3	4	5
10	Students utilize a mailing list to find and exchange information	1	2	3	4	5
11	Students utilize group discussions to gather and share information	1	2	3	4	5
12	Students utilize newsgroups/online forums to gather and share information	1	2	3	4	5

13	Students can recognize accurate and complete information	1	2	3	4	5
14	Students are capable of utilizing acquired information to critically think and solve study related problems.	1	2	3	4	5
15	Students can effectively use the library catalog to search for specific library materials	1	2	3	4	5
16	Students can integrate new information into an existing body of knowledge	1	2	3	4	5
17	Students can arrange information for practical use	1	2	3	4	5
18	Students utilize web addresses for internet searching	1	2	3	4	5
19	Students utilize information ethically and legally	1	2	3	4	5

C. ILS policy and curricula supporting delivery of ILS to medical undergraduate students

1. Does your institution have a formal ILS policy?

Yes ☐

No ☐

2. If yes, what areas does the ILS policy cover?

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3. Briefly state the procedure of formulating the ILS policy

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4. Comment on the implementation of the ILS policy

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5. How often is the policy reviewed?

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.....

6. In your view is the policy adequate?

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.....

7. Does your organization have an ILS curriculum

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.....

8. How has the ILS policy guided the drafting and delivery of the ILS curriculum?

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9. What are the main topics covered in the ILS curriculum?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree meaning 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

Topic covered in the ILS Curriculum	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Problem solving and critical thinking	1	2	3	4	5
Information search and retrieval	1	2	3	4	5
Legal issues in information use	1	2	3	4	5
Computer skills in information use	1	2	3	4	5
Socialization and effective communication	1	2	3	4	5
Integration of information	1	2	3	4	5
Basic library guidelines	1	2	3	4	5
Research skills	1	2	3	4	5

10. Which method(s) are used to deliver ILS programme to medical undergraduate students? (Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree meaning 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

Method(s) used to deliver ILS curriculum	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Computers	1	2	3	4	5
Face to face teaching	1	2	3	4	5
Online materials	1	2	3	4	5
Handouts	1	2	3	4	5
Library orientation	1	2	3	4	5
WhatsApp group engagements	1	2	3	4	5
Peer training	1	2	3	4	5
Pre-recorded audio-video clips	1	2	3	4	5
Weekly librarian-student engagements	1	2	3	4	5

11. Who delivers the ILS curriculum in your institution

.....

12. What assessment techniques do you use to measure ILS curriculum effectiveness?

.....

D. ILS Understanding among Medical Undergraduate Students

1. (a) How do students view ILS in your department/institution

.....

(b) Explain 1(a) above

.....

.....

.....

.....

2. What is the students' library experience after undergoing ILS training?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree meaning 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Students' library experience after ILS training	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Students utilize the library resources for my term papers and general information needs	1	2	3	4	5
2	Students know how to get specific titles easily using online library catalogs	1	2	3	4	5
3	Students can find and use various types of information materials resources like books, journals, audiovisual videos	1	2	3	4	5
4	Students can evaluate the various sources of information materials	1	2	3	4	5
5	Students know how to access e-resources off-campus and on-campus	1	2	3	4	5

F. Knowledge and Skills Possessed by the Staff in Facilitating ILS among Medical Undergraduate Students

3. (a) What ILS knowledge and skills do librarians possess that enable them deliver ILS content to medical undergraduate students?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree meaning 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	ILS knowledge and skills possessed by librarians	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	The capacity to select information that is most relevant to the indicated information demands	1	2	3	4	5
2	Ability to discern potential information sources	1	2	3	4	5
3	Aptitude to create tactics for finding information	1	2	3	4	5
4	Aptitude to contrast and analyze information obtained from different sources	1	2	3	4	5
5	Aptitude to arrange, use, and pass on information	1	2	3	4	5
6	Aptitude to generate and expand on existing information	1	2	3	4	5

(b) Any other skill and knowledge

-

4. In your view, are the skills adequate in facilitating ILS instruction and learning

5. In your view, what needs to be done to enhance the skills of staff facilitating ILS
 among medical undergraduate students

G. Role of ICT in Promoting the Training and Learning of Information Literacy Skills among Undergraduate Medical Students

1. How do students integrate ICT skills with ILS

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree meaning 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	How do students integrate ICT skills with ILS	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Students use computers to prepare reports and term papers	1	2	3	4	5
2	Students use email or other online communication programs effectively	1	2	3	4	5

3	Students search the internet for course-related materials	1	2	3	4	5
4	Students use electronic databases with ease to get needed information	1	2	3	4	5
5	Students understand how to evaluate free information on the internet for validity	1	2	3	4	5
6	Students use electronic sources as their priority when looking for information	1	2	3	4	5
7	Students can analysis data with a computer package	1	2	3	4	5

6. How do you as an instructor use ICT to teach ILS

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree meaning 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

	Application of ICT to teach ILS	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Students use computers to prepare reports and term papers	1	2	3	4	5
2	Students use email or other online communication programs effectively	1	2	3	4	5
3	Students search the internet for course-related materials	1	2	3	4	5

4	Students use electronic databases with ease to get needed information	1	2	3	4	5
5	Students understand how to evaluate free information on the internet for validity	1	2	3	4	5

7. What types of ICT tools and equipment do you use for your ILS teaching?

.....

8. What is the level of ICT(s) infrastructure preparedness with regard to ILS learning and training in your institution?

.....

9. What are the success factors of using ICT in your ILS teaching?

.....

10. What are the challenges hindering effective utilization of ICT tools and devices facilitating ILS?

(Please **CIRCLE** the number beside each statement that **most accurately** reflects the extent to which you agree or disagree meaning 1 is **strongly DISAGREE** and 5 means you **Strongly AGREE** with the statement)

H.

	ICT Challenges	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Unreliable internet connection and accessibility	1	2	3	4	5
2	Insufficient technical assistance	1	2	3	4	5
3	Absence of effectual tutelage (training)	1	2	3	4	5
4	Limited ICT tools and Infrastructure	1	2	3	4	5
5	Absence of lecturers' ICT competency	1	2	3	4	5
6	Absence of interest of lecturers in ICT usage	1	2	3	4	5

Challenges faced by the undergraduates in ILS learning.

1. What challenges do you face that impede effective ILS training and learning?

.....

2. How do you think the challenges above could be addressed?

.....

Again, thank you for your time, and offering information for this study.

APPENDIX III: INTERVIEW SCHEDULE FOR UNIVERSITY LIBRARIANS

Introduction:

My name is Evans M. Momanyi, currently a doctoral in the Department of Library, Records Management and Information Studies, School of Information Sciences student, Moi University, Kenya. I am undertaking a study titled “**Assessment of Information Literacy Skills among Undergraduate Medical Undergraduate Students of Moi University and University of Nairobi.**” You have been identified to participate in this study. I therefore, request for 15 minutes to respond to this interview schedule.

The study focuses on assessment of information literacy skills of undergraduate medical students in the selected public universities in Kenya, with a view, of proposing a framework to enhance ILS adequacy among undergraduate medical students. The research will gather data on the status of information literacy skills among medical undergraduate students, information literacy skills policy and regulations used in supporting ILS to medical undergraduate students, the perception of staff and medical undergraduate students towards the content and delivery methods of ILS, the role that ICT play in promoting the training and learning of information literacy skills among undergraduate medical students and knowledge, skills & training possessed by staff in facilitating ILS among medical undergraduate students

Your responses will be treated with strict confidentiality, and will only be used for the stated academic purpose. Your contribution is highly valued. Please do not hesitate to contact the researcher for clarification on any aspect of this research.

Thank you in advance for your time and cooperation.

Evans Motari Momanyi
PhD student (Moi University)
E-mail: emotari9@gmail.com
Mobile No.: +254 725 594005

Thank you for your time and contribution to this research.

A. Biographical information

1. Institution
2. Department.....
3. Current designation.....
4. Academic qualifications: [] PhD [] Masters [] Bachelors
5. Gender: [] Male [] Female
6. Work experience: [] 0-5yrs [] 5-10yrs [] 10-15yrs [] 15-20yrss [] over 20yrs
7. Field of specialization.....

B. The Status of Information Literacy Skills (ILS) Among Medical Undergraduate Students

1. What is your opinion on **Information Literacy Skills** competency of the medical Students in your department?

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.....

.....

2. How adequate are the ILS in enabling medical undergraduate students in your department carry out their studies effectively?

.....

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.....

C. Information Literacy Skills Policy and Curriculum Used in Supporting ILS delivery to Medical Undergraduate Students

1. Does your institution have a formal information literacy policy and curriculum

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2. If yes, what areas does the ILS policy cover?

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3. Briefly state the procedure of formulating the ILS policy and curriculum

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4. Comment on the implementation of the ILS policy

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5. How often is the policy reviewed?

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6. Comment on the content and methods of delivery of the ILS curriculum in your institution

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.....

7. What ILS assessment techniques does your institution use

.....
.....
.....

D. ILS understanding among Medical Undergraduate Students

8. (a) How do students perceive ILS in your institution

.....

- (b) What are the reasons for the explanation in question (1a) above?

.....

9. What is your general view of ILS training as a programme in your institution?

.....

10. What do you think could be done to enhance ILS in your university?

.....

11. What is the evidence of the impact of ILS on Medical undergraduate students?

(Observable, testable, etc)

.....

F. Knowledge, Skills and training needed by Staff in Facilitating ILS among Medical Undergraduate Students

12. Who is responsible for ILS delivery

.....

 ...

13. What is the competency level of the library staff and lecturers in enhancing adequacy of ILS among medical undergraduate students?

.....

 ..

14. In your view, what needs to be done to enhance the skills of staff facilitating ILS among medical undergraduate students

.....

G. Role of ICT in Promoting the Training and Learning of Information Literacy Skills among Undergraduate Medical Students

15. How is ICT utilized in enhancing ILS among medical undergraduate students in your institution

.....

16. What types of ICT tools and equipment do you use for your ILS teaching?

.....

17. What is the level of ICT(s) infrastructure preparedness with regard to ILS learning and training in your institution?

.....

18. What are the success factors of using ICT in your ILS teaching?

.....

19. What factors hinder ICT integration in ILS utilisation?

.....

H. Challenges

1. What challenges impede effective ILS learning?

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.....

2. How do you think the challenges above could be addressed?

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...

Again, thank you for your time, and offering information for this study.

APPENDIX IV: INTERVIEW SCHEDULE FOR HEAD OF DEPARTMENT

Introduction:

My name is Evans M. Momanyi, currently a doctoral in the Department of Library, Records Management and Information Studies, School of Information Sciences student, Moi University, Kenya. I am undertaking a study titled “**Assessment of Information Literacy Skills among Undergraduate Medical Undergraduate Students in Moi University and University of Nairobi.**” You have been identified to participate in this study. I therefore, request for 15 minutes to respond to this interview schedule.

The study focuses on assessment of information literacy skills of undergraduate medical students in the selected public universities in Kenya, with a view, of proposing a framework to enhance ILS adequacy among undergraduate medical students. The research will gather data on the status of information literacy skills among medical undergraduate students, information literacy skills policy and regulations used in supporting ILS to medical undergraduate students, the perception of staff and medical undergraduate students towards the content and delivery methods of ILS , the role that ICT play in promoting the training and learning of information literacy skills among undergraduate medical students and knowledge, skills & training possessed by staff in facilitating ILS among medical undergraduate students

Your responses will be treated with strict confidentiality, and will only be used for the stated academic purpose. Your contribution is highly valued. Please do not hesitate to contact the researcher for clarification on any aspect of this research.

Thank you in advance for your time and cooperation.

Evans Motari Momanyi
PhD student (Moi University)
E-mail: emotari9@gmail.com
Mobile No.: +254 725 594005

Thank you for your time and contribution to this research.

A. Biographical information

3. Institution
- 4 Department.....
- 5 Current designation.....

- 6 Academic qualifications: ☐ PhD ☐ Masters ☐ Bachelors
7. Gender: ☐ Male ☐ Female
8. Work experience: ☐ 0-5yrs ☐ 5-10yrs ☐ 10-15yrs ☐ 15-20yrss
☐ over 20yrs
9. Field of specialization.....

B. The Status of Information Literacy Skills (ILS) Among Medical Undergraduate Students

10. What is your opinion on **Information Literacy Skills** competency of the medical Students in your department?

.....

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.....

- .11. How adequate are the ILS in enabling medical undergraduate students in your institution carry out their studies effectively?

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13. What role do you play as a head of department to enhance ILS adequacy among the medical undergraduate students

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C. Information Literacy Skills Policy and Curriculum Used in Supporting ILS delivery to Medical Undergraduate Students

13. Does your institution have a formal information literacy policy and curriculum

.....

14. If yes, what areas does the ILS policy cover?

.....

15. Briefly state the procedure of formulating the ILS policy and curriculum

.....

16. Comment on the implementation of the ILS policy

.....

 ..

17. How often is the policy reviewed?

.....

18. Comment on the content and methods of delivery of the ILS curriculum in your institution

.....

19. What ILS assessment techniques does your institution use

.....

D. ILS understanding among Medical Undergraduate Students

20. (a) How do students perceive ILS in your institution

.....

(b) What are the reasons for the explanation in question (1a) above?

.....

21. What is your general view of ILS training as a programme in your institution?

.....

22. What do you think could be done to enhance ILS in your university?

.....

23. What is the evidence of the impact of ILS on Medical undergraduate students?

(Observable, testable, etc)

.....

F. Knowledge, Skills and training needed by Staff in Facilitating ILS among Medical Undergraduate Students

24. Who is responsible for ILS delivery

.....

25. What is the competency level of the library staff and lecturers in enhancing adequacy of ILS among medical undergraduate students?

.....

26. In your view, what needs to be done to enhance the skills of staff facilitating ILS among medical undergraduate students

.....

G. Role of ICT in Promoting the Training and Learning of Information Literacy Skills among Undergraduate Medical Students

27. How is ICT utilized in enhancing ILS among medical undergraduate students in your institution

.....

28. What types of ICT tools and equipment do you use for your ILS teaching?

.....

29. What is the level of ICT(s) infrastructure preparedness with regard to ILS learning and training in your institution?

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30. What are the success factors of using ICT in your ILS teaching?

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31. What factors hinder ICT integration in ILS utilization?

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H. Challenges

32 What challenges impede effective ILS learning?

.....

32. How do you think the challenges above could be addressed?

.....

Again, thank you for your time, and offering information for this study.

APPENDIX V: INTERVIEW SCHEDULE FOR HEAD MEDICAL LIBRARIANS

Introduction:

My name is Evans M. Momanyi, currently a doctoral in the Department of Library, Records Management and Information Studies, School of Information Sciences student, Moi University, Kenya. I am undertaking a study titled “**Assessment of Information Literacy Skills among Undergraduate Medical Undergraduate Students in Moi University and University of Nairobi.**” You have been identified to participate in this study. I therefore, request for 15 minutes to respond to this interview schedule.

The study focuses on assessment of information literacy skills of undergraduate medical students in the selected public universities in Kenya, with a view, of proposing a framework to enhance ILS adequacy among undergraduate medical students. The research will gather data on the status of information literacy skills among medical undergraduate students, information literacy skills policy and regulations used in supporting ILS to medical undergraduate students, the perception of staff and medical undergraduate students towards the content and delivery methods of ILS , the role that ICT play in promoting the training and learning of information literacy skills among undergraduate medical students and knowledge, skills & training possessed by staff in facilitating ILS among medical undergraduate students

Your responses will be treated with strict confidentiality, and will only be used for the stated academic purpose. Your contribution is highly valued. Please do not hesitate to contact the researcher for clarification on any aspect of this research.

Thank you in advance for your time and cooperation.

Evans Motari Momanyi
PhD student (Moi University)
E-mail: emotari9@gmail.com
Mobile No.: +254 725 594005

Thank you for your time and contribution to this research.

A. Biographical information

33. Institution
34. Department.....
35. Current designation.....
36. Academic qualifications: ☐ PhD ☐ Masters ☐ Bachelors
37. Gender: ☐ Male ☐ Female
38. Work experience: ☐ 0-5yrs ☐ 5-10yrs ☐ 10-15yrs ☐ 15-20yrss ☐ over 20yrs
39. Field of specialization.....

B. The Status of Information Literacy Skills (ILS) Among Medical Undergraduate Students

40. How can you rate the ILS competencies of the medical Students in your institution?.....
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- 41 .What role does the library play in enhancing the adequacy of ILS among medical undergraduate students in your institution?...
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42. What ILS gaps exist and how can they be adequately addressed?
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C. Information Literacy Skills Policy and Curriculum Used in Supporting ILS delivery to Medical Undergraduate Students

43. Does your institution have a formal information literacy policy and curriculum?

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44. If yes, what areas does the ILS policy cover?

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45 Briefly state the procedure of formulating the ILS policy and curriculum

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46. Comment on the implementation of the ILS policy and curriculum

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47. How often is the policy reviewed?

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48 Comment on the content and methods of delivery of the ILS curriculum in your institution

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49. What ILS assessment techniques does your institution use

.....

50. Is the policy and curriculum adequate in enhancing ILS among undergraduate medical students

.....

D. ILS understanding among Medical Undergraduate Students

51. (a) How do students perceive ILS in your institution

.....

(b) What are the reasons for the explanation in question (1a) above?

.....

52. What is your general view of ILS programme in your institution?

.....

53. What do you think could be done to enhance ILS in your university?

.....

54. `What is the evidence of the impact of ILS on Medical undergraduate students?
 (Observable, testable, etc)

.....

F. Knowledge, Skills and training needed by Staff in Facilitating ILS among Medical Undergraduate Students

55. Who is responsible for ILS delivery

56. What is the competency level of the library staff and lecturers in enhancing adequacy of ILS among medical undergraduate students?

57. In your view, what needs to be done to enhance the skills of staff facilitating ILS among medical undergraduate students

G. Role of ICT in Promoting the Training and Learning of Information Literacy Skills among Undergraduate Medical Students

58. How is ICT utilized in enhancing ILS among medical undergraduate students in your institution.

59. What types of ICT tools and equipment do you use for your ILS teaching?

60. What is the level of ICT(s) infrastructure preparedness with regard to ILS learning and training in your institution?

61. What are the success factors of using ICT in your ILS teaching?

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62. What factors hinder ICT integration in ILS utilisation?

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H. Challenges

63. What challenges impede effective ILS learning?

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.....

64. How do you think the challenges above could be addressed?

.....
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.....

Again, thank you for your time, and offering information for this study.

APPENDIX VI: REQUEST TO NACOSTI TO UNDERTAKE RESEARCH



MOI UNIVERSITY SCHOOL OF INFORMATION SCIENCES

DEPARTMENT OF LIBRARY, RECORDS MANAGEMENT AND INFORMATION STUDIES
Tel: 0522 43231
Fax No: 0522 43292
Email: info@moi.ac.ke
P. O. Box 1900
Eldoret
Kenya

Our Ref: IS/DPHIL/002/13

4th December, 2020

The Executive Secretary,
Kenya National Council of Science and Technology,
P. O. Box 30623,
NAIROBI.

Dear Sir,

RE: EVANS MOTARI MOMANYI – IS/DPHIL/002/13

The above named is a Doctor of Philosophy student in the Department of Library, Records Management and Information Studies, School of Information Sciences, Moi University.

Mr. Momanyi is intending to carry out research work entitled "*Assessment of Information Literacy Skills among Undergraduate Medical Students in Selected Public Universities in Kenya*".

We are kindly requesting you to issue him with a research permit to enable him proceed with his research.

Thank you. Kind regards,

Yours sincerely,



DR. ELSEBAH MASEH
SENIOR LECTURER AND CHAIR OF DEPARTMENT,
DEPARTMENT OF LIBRARY, RECORDS MANAGEMENT & INFORMATION
STUDIES

EM/mn



9001:2015 Certified Institution

APPENDIX VII: AUTHORITY FROM NACOSTI TO CARRY OUT RESEARCH

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 829124	Date of Issue: 26/September/2023
RESEARCH LICENSE	
	
This is to Certify that Mr.. Evans Mutari Momanyi of Moi University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi, Uasin-Gishu on the topic: ASSESSMENT OF INFORMATION LITERACY SKILLS OF MEDICAL UNDERGRADUATE STUDENTS IN SELECTED PUBLIC UNIVERSITIES IN KENYA for the period ending : 26/September/2024.	
License No: NACOSTI/P/23/29791	
Applicant Identification Number	829124
 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION	
Verification QR Code	
	
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	
See overleaf for conditions	

MOI UNIVERSITY
SCHOOL OF INFORMATION SCIENCES
DEPARTMENT OF LIBRARY, RECORDS MANAGEMENT AND INFORMATION STUDIES

Ref: IS/DPHIL/002/13

4th December, 2020

Deputy Vice-Chancellor
Academics and Students Affairs
University of Nairobi.

RE: DATA COLLECTION : EVANS MOTARI MOMANYI (IS/DPHIL/002/13)

The above named is a postgraduate student in the Department of Library, Records Management and Information Studies, School of Information Sciences, Moi University pursuing a Doctor of Philosophy degree in Library and Information Studies. He is carrying out a research thesis entitled *"Assessment of Information Literacy Skills among Undergraduate Medical Students in Selected Public Universities in Kenya"* under the supervision of Prof. Joseph Kiplang'at and Dr. Emily Ng'eno.

The purpose of writing is to request you kindly to allow Mr. Momanyi conduct the research and request your staff to assist him collect the necessary data. The information given will be treated with utmost confidentiality and will be used only for the purpose of writing the research thesis and it will not impact the institution in any way. We look forward to continued support and co-operation.

Any assistance accorded to him will be most appreciated.

Yours sincerely,

DR. ELSEBAH MASEH
SENIOR LECTURER AND CHAIR OF DEPARTMENT,
DEPARTMENT OF LIBRARY, RECORDS MANAGEMENT & INFORMATION STUDIES

EM/m

 9001-2015 Certified Institution

APPENDIX IX: AUTHORITY LETTER FROM UNIVERSITY OF NAIROBI



UNIVERSITY OF NAIROBI
OFFICE OF DEPUTY VICE-CHANCELLOR
(RESEARCH, INNOVATION AND ENTERPRISE)

P.O. Box 30197-00100, G.P.O.
 Nairobi, Kenya
 Website: <https://nonresearch.uonbi.ac.ke>

Telephone: 020 491 3164
 Email: dvce@uonbi.ac.ke

Our Ref: UON/CA/RIE/3/5/Vol.XXX February 13, 2024

Motari Evans Momanyi
 University Librarian
 Lukenya University,
 P.O Box 90-128,
 MTITO ANDEI
 Email: emomanyi@lukenyuniversity.ac.ke

Dear Mr. Motari

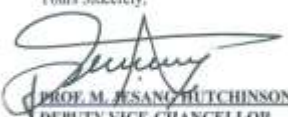
PERMISSION TO COLLECT DATA

I refer to your request to conduct research at the University of Nairobi, for your project entitled:
**"Assessment of Information Literacy Skills of Undergraduate Medical, Dentistry and
 Nursing Students in Selected Public Universities in Kenya."**

I write to inform you that your request has been approved.

You are however required to share the findings of your study with the University of Nairobi by
 depositing a copy of your findings with the Director Library & Information Services on completion
 of your study.

Yours Sincerely,



PROF. M. JESANG HUTCHINSON
DEPUTY VICE-CHANCELLOR
(RESEARCH, INNOVATION AND ENTERPRISE)
AND
PROFESSOR OF HORTICULTURE

Copy to: Director, Library and Information Services

MBig

APPENDIX X: REQUEST TO UNDERTAKE RESEARCH IN MOI UNIVERSITY



APPENDIX XI: PLAGIARISM AWARENESS CERTIFICATE



SR489

ISO 9001:2019 Certified Institution

THESIS WRITING COURSE

PLAGIARISM AWARENESS CERTIFICATE

This certificate is awarded to

EVANS MOTARI MOMANYI

IS/DPHIL/002/013

In recognition for passing the University's plagiarism

Awareness test for Thesis entitled: ASSESSMENT OF INFORMATION LITERACY SKILLS OF UNDERGRADUATE MEDICAL STUDENTS IN MOI UNIVERSITY AND UNIVERSITY OF NAIROBI, KENYA with similarity index of 9% and striving to maintain academic integrity.

Word count: 58818

Awarded by

Prof. Anne Syomwene Kisilu
CERM-ESA Project Leader Date: 15/04/2024