**SCHOOLOFLIBRARY, ARCHIVES AND DOCUMENTATION STUDIES**

**(SLADS – BAGAMOYO)**

**RESEARCH REPORT ON**

# ASSESSMENT OF LIBRARY AUTOMATION SYSTEMS IN ENHANCING INFORMATION SERVICE DELIVERY IN ACADEMIC LIBRARIES: A CASE OF KAOLE COLLEGE OF AGRICULTURE

**BY**

**MWAJABU HASSANI**

A Research Report Submitted to the School of Library, Archives and Documentation Studies SLADS) as Partial Fulfillment for the Award of Ordinary Diploma in Library, and Information Management.

**August, 202**

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## CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the School of Library, Archives and Documentation Studies, a Research Report entitled, ***"Assessment of Library Automation Systems in Enhancing Information Service Delivery in Academic Libraries: A Case of Kaole College of Agriculture"*** as a Partial Fulfillment of the Requirement for the Award of Ordinary Diploma in Library and Information Management.

**Signature: _____**

**SIR GRAYSON**

**Supervisor**

**Date: _____**



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I, Mwajabu Hassani, declare that this research report is my own original work and that it has not been presented and will not be presented to any other institution for an Ordinary Diploma or any other similar award.

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## ACKNOWLEDGMENTS

There are many people without whom this study would not have been possible. First and foremost, I wholeheartedly thank the Almighty God for making that which seemed impossible become possible and attainable.

I would also like to sincerely thank my supervisor, (Supervisor's Name), who determinedly read through this research report as a whole and made many constructive criticisms and recommendations that shaped this work.

More thanks go to the librarians and staff of Kaole College of Agriculture (KCA) Library for providing me with information to nourish this study and for the immeasurable support they gave me during all the days of data collection, as well as their views and recommendations. I appreciate their advice, care, and support whenever I needed more time to collect data from different respondents. I also extend my gratitude to the students of KCA who devoted their time to respond to the questionnaires and interviews.

My special thanks go to my parents for their financial support and encouragement at all stages of my studies. Truly, it is difficult to mention by name everyone who made a worthy contribution to this study, and I am compelled to say to all of them, thank you.

Lastly, I would like to thank all my classmates and friends for their ideas, support, and encouragement in one way or another that resulted in the successful completion of this work.



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## DEDICATION

I dedicate this work to my beloved parents for their great help, sacrifices, and encouragement during the course of my study; to my classmates for their constructive support, cooperation, and encouragement; and to all who always supported me in many ways through their prayers and support.

***May the Almighty God bless you abundantly.***



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## ABSTRACT

This study assessed the role of library automation systems in improving information service delivery at Kaole College of Agriculture (KCA) Library. It aimed to examine the contribution of automation to library operations, evaluate user satisfaction, identify challenges affecting automated services, and propose improvement strategies. The study used a descriptive research design with a mixed-method approach. Data were collected from 30 respondents (25 library users and 5 librarians) through questionnaires, interviews, and observation, and analysed using descriptive statistics and thematic analysis.

The findings revealed that library automation has improved multiple areas of library services, with circulation services being the most improved (32%), followed by OPAC services (28%), information retrieval (24%), and cataloguing processes (16%). The majority of respondents (80%) strongly agreed that automation has improved efficiency in service delivery, and 76% were highly satisfied with automated library services. However, the study identified internet connectivity (40%), inadequate ICT infrastructure (24%), and power outages (16%) as the main challenges affecting the effective use of the automation system.

The study concludes that while library automation has positively contributed to information service delivery at KCA, its effectiveness is limited by infrastructure challenges. The study recommends strengthening internet connectivity, upgrading automation systems regularly, increasing funding for library automation, conducting continuous staff training, providing user orientation and training, ensuring stable power supply, and establishing a system monitoring and feedback mechanism to ensure sustainable improvement of automated library services.




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## LIST OF ABBREVIATIONS

| Abbreviation | Meaning |
|---|---|
| **ICT** | Information and Communication Technology |
| **ILS** | Integrated Library System |
| **KCA** | Kaole College of Agriculture |
| **OPAC** | Online Public Access Catalogue |
| **SDI** | Selective Dissemination of Information |
| **SLADS** | School of Library, Archives and Documentation Studies |
| **UPS** | Uninterruptible Power Supply |



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# CHAPTER ONE
# INTRODUCTION AND BACKGROUND OF THE STUDY

## 1.0 Introduction

This section presents an introduction to the study focusing on the evaluation of disaster recovery planning and its effectiveness in public institutions. It outlines the background of the study, statement of the problem, objectives of the study, research questions, significance of the study, and scope of the study.

## 1.1 Background of the Study

Library automation refers to the use of computer systems and software applications to perform library operations such as cataloguing, circulation, acquisition, serials control, inventory management, and online public access catalogue (OPAC) services. In modern academic libraries, automation has become an important tool for improving the efficiency, accuracy, and speed of information service delivery. Through automated library management systems, libraries are able to reduce manual workload, minimize errors in record keeping, and provide faster access to information resources.

With the advancement of information and communication technologies (ICTs), academic libraries worldwide are increasingly shifting from traditional manual systems to automated and digital service platforms. According to Breeding (2024), current library management systems are designed to integrate different library functions into one system, allowing libraries to manage collections, circulation, discovery tools, and user services more effectively. This integration helps libraries to avoid duplication of work and enables users to access library resources more conveniently.

Library automation is particularly important in academic institutions because libraries support teaching, learning, research, and innovation. Students and academic staff require timely access to books, journals, research reports, and electronic resources. Automated systems such as OPAC help users to search for materials by author, title, subject, or



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keyword without depending entirely on library staff. This improves independent information searching and reduces delays in accessing learning materials. The Association of College and Research Libraries Research Planning and Review Committee (2024) emphasizes that academic libraries are increasingly expected to provide technology-supported services that respond to changing user needs in higher education environments.

Furthermore, automation enhances information service delivery by supporting remote access to library catalogues and electronic resources. This is important because users may need to access information beyond the physical library building and outside normal working hours. Rafiq, Batool, Ali, and Ullah (2021) observe that academic libraries have increasingly relied on digital and remote services to continue supporting users, especially in situations where physical access to library buildings is limited. Therefore, automation strengthens the ability of academic libraries to provide flexible, timely, and user-centered services.

In addition, library automation supports better decision-making in library management. Automated systems can generate statistical reports on book borrowing, overdue materials, user registration, collection usage, and frequently requested resources. Such reports help librarians to understand user needs, improve collection development, plan budgets, and evaluate service performance. Breeding (2023) notes that modern library systems are increasingly valued not only for managing resources but also for improving service responsiveness and operational planning.

Kaole College of Agriculture (KCA), as a higher learning institution, depends on its library to support teaching, learning, and research activities. The quality of library services at KCA depends largely on how well the automation system is implemented, maintained, and utilized by both library staff and users. If properly used, library automation can improve circulation services, OPAC searching, cataloguing, information retrieval, and general access to academic resources. However, if the system is affected



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by poor infrastructure, unstable internet, inadequate training, or low user awareness, its contribution to service delivery may be limited.

Therefore, assessing the contribution of library automation systems in enhancing information service delivery at KCA is essential. The assessment helps to determine whether the automation system is improving library operations, satisfying users' information needs, and supporting the academic mission of the college.

### 1.2 Statement of the Problem

Library automation has been widely adopted by academic libraries as a strategy for improving efficiency, accuracy, and accessibility of information services. However, despite this adoption, many academic libraries continue to face challenges that limit the effectiveness of their automation systems. Common problems include poor system utilization, inadequate ICT infrastructure, unstable internet connectivity, insufficient staff training, frequent technical failures, and limited user awareness. Breeding (2024) observes that although modern library management systems offer advanced features, their actual benefits depend heavily on the technical environment and the level of institutional support available.

Similarly, Ternenge and Kashimana (2020) note that many academic libraries in developing countries have installed automation software, but the systems remain underutilized due to weak infrastructure, inadequate training, and low levels of user orientation. Igbo and Imo (2022) further argue that where automation is not properly assessed, libraries fail to realize the full benefits of their investment because gaps in performance and user satisfaction remain unidentified. These challenges suggest that the mere presence of an automation system does not automatically translate into improved information service delivery unless the system is effectively implemented, maintained and used.

At Kaole College of Agriculture (KCA), the library has adopted an automation system to support its operations and services. However, it is not clearly known whether this



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automation system effectively enhances information service delivery to students and staff. There is no documented evidence showing the extent to which the system supports library operations, the level of user satisfaction with automated services, or the challenges limiting its effective use. Without a proper assessment, gaps in system performance, user satisfaction, and service efficiency may remain unidentified, making it difficult for library management and college administration to take appropriate corrective measures.

Therefore, this study seeks to assess the effectiveness of library automation systems in enhancing information service delivery at Kaole College of Agriculture (KCA). Specifically, the study examines how automation systems support library operations, evaluates users' satisfaction with automated services, and identifies the challenges affecting the use of library automation.

## 1.3 Objectives of the Study

### 1.3.1 General Objective

To assess the effectiveness of library automation systems in enhancing information service delivery in academic libraries, with reference to KCA

### 1.3.2 Specific Objectives:

i. To examine how automation systems support library operations and services.
ii. To assess users' satisfaction with automated library services.
iii. To identify challenges affecting the use of library automation systems.
iv. To suggest strategies for improving library automation services.

## 1.4 Research Questions

i. How do automation systems enhance library service delivery?
ii. Are users satisfied with automated library services?
iii. What challenges affect the effectiveness of library automation?
iv. What measures can improve library automation services?



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## 1.5 Significance of the Study

The findings of this study are expected to be beneficial to various stakeholders in the following ways:

To Library Management: The study provides library management at KCA with evidence-based information on the actual performance of the library automation system, including the areas where automation has improved services and the areas that still face challenges. This information was help management to make informed decisions regarding system upgrades, resource allocation, staff deployment, and the prioritization of interventions needed to improve automation practices and overall service delivery.

To Library Users: The study is significant to students, academic staff, and other library users because its findings and recommendations aim at improving the accessibility, reliability, and efficiency of automated library services. When the recommendations are implemented, users were benefit from faster access to information resources, reduced waiting time at service points, improved OPAC searching, and generally enhanced information service delivery that supports their learning and research activities.

To Policy Makers and College Administration: The findings was assisted policy makers, the college administration, and other relevant government bodies in planning and budgeting for ICT infrastructure in academic institutions. The study highlights critical areas such as internet connectivity, power supply, and system maintenance that require policy attention and sustainable financial support, thereby guiding the formulation of ICT policies and strategic plans for academic libraries.

To Librarians and Information Professionals: The study was help librarians understand user expectations and satisfaction levels regarding automated services, enabling them to improve user support, orientation programs, and information literacy training.

To Future Researchers and the Academic Community: The study contributes new knowledge to the existing body of literature on library automation, particularly in the



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context of Tanzanian academic libraries where limited research has been conducted. It was served as a reference source for students, scholars, and researchers who wish to undertake similar or related studies, and it identifies areas for further research.

### 1.6 Scope of the Study

This study focused on assessing library automation systems in enhancing information service delivery in academic libraries, with specific reference to Kaole College of Agriculture (KCA) Library, located in Bagamoyo. In terms of content, the study confined to four main aspects derived from the specific objectives: examining how automation systems support library operations and services (such as cataloguing, circulation, OPAC, and information retrieval); assessing users' satisfaction with automated library services; identifying challenges affecting the use of library automation systems; and suggesting strategies for improving library automation services.

In terms of population, the study limited to library staff and library users (students) at KCA, from which a sample of 30 respondents drawn, comprising 5 librarians and 25 library users. Geographically, the study conducted at KCA Library only and did not extend to other academic libraries in Tanzania. Therefore, the findings of this study reflect the situation at KCA Library, although they may provide useful insights applicable to other academic libraries with similar characteristics and operating environments.

### 1.7 Limitations of the Study

Like any other research, this study encountered several limitations during its execution:

Time Constraints: The time allocated for conducting the study limited, as the researcher had to balance data collection with other academic responsibilities. This restricted the depth and coverage of the study. To address this, the researcher prepared a clear time schedule and adhered to it strictly to ensure all research activities were completed within the available period.



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Financial Constraints: The study self-funded, and the limited budget affected expenses such as transport, printing, stationery, and secretarial services. The researcher managed this limitation by preparing a realistic budget and concentrating data collection within a single institution to minimize costs.

Limited Access to Technical Records: Some technical records and system reports related to the library automation system were not readily accessible due to institutional confidentiality and administrative procedures. The researcher minimized this limitation by relying on data collected directly from respondents through questionnaires, interviews, and observation, and by using only the records that were officially made available.

Possible Non-Response from Participants: Some respondents were initially reluctant or slow to complete questionnaires and attend interviews due to their tight academic and work schedules. The researcher overcame this challenge by explaining the purpose of the study, assuring respondents of confidentiality and anonymity, and making follow-ups, which ultimately resulted in a high response rate.

Despite these limitations, the researcher took appropriate measures to minimize their effects, and therefore the limitations did not significantly affect the validity and reliability of the study findings.

## 1.8 Definition of Key Terms

### Library Automation

Library Automation refers to the application of computer systems and information technologies to perform traditional library operations and services more efficiently and accurately. It involves the use of integrated library systems (ILS) or library management software to automate core functions such as acquisition, cataloguing, classification, circulation, serials control, and online public access catalogues (OPAC).

According to Koha Development Team, modern library automation systems such as Koha integrate multiple modules into a single system that allows libraries to manage



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their resources electronically. Automation reduces manual workload, improves accuracy in record-keeping, enhances resource discovery, and speeds up service delivery.

Rowley, Jennifer (1998) explains that library automation improves operational efficiency by minimizing repetitive manual processes and enabling faster access to bibliographic information. Similarly, Borgman, Christine L. (2000) emphasizes that automation enhances access to information resources by integrating digital technologies and networked systems.

Key components of library automation include Online Public Access Catalogue (OPAC), automated circulation systems, electronic acquisition and cataloguing, Digital repositories, and electronic resource management systems. In academic libraries, automation supports research and learning by providing remote access to catalogues and electronic databases, improving user satisfaction and service efficiency.

**Information Service Delivery**

**Information Service Delivery** refers to the processes and methods through which libraries provide information resources and assistance to meet users' needs. It includes reference services, circulation services, current awareness services, selective dissemination of information (SDI), user education, and access to electronic resources.

According to Reitz, Joan M. (2014), information services involve assisting users in locating, accessing, and effectively using information resources. Effective service delivery ensures that users receive accurate, timely, and relevant information.

Wilson, T. D. (1996) notes that information-seeking behavior influences how services should be designed and delivered, emphasizing the importance of understanding user needs. Furthermore, Parasuraman, A., Zeithaml, Valarie A., and Berry, Leonard L. (1988) highlight that service quality depends on reliability, responsiveness, assurance, empathy, and tangibles—principles applicable in evaluating library information service delivery.



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Effective information service delivery in academic libraries includes Timely response to reference queries, Access to updated and relevant materials, Remote access to electronic databases, User training in information literacy, Friendly and professional staff assistance, good service delivery increases user satisfaction, academic performance, and research productivity.

**Academic Library**

According to Reitz, Joan M. (2014), An Academic Library is a library established within a higher education institution such as a university, college, or research institute to support teaching, learning, research, and community engagement activities. Academic library primarily serves students, faculty, and researchers by providing scholarly resources and specialized services. Evans, G. Edward and Saponaro, Margaret Zarnosky (2012) explain that academic libraries focus on curriculum-based collections and research-oriented materials, distinguishing them from public or school libraries.

Key characteristics of academic libraries include Curriculum-aligned collections, Access to scholarly journals and databases, Research support services, Institutional repositories, Information literacy instruction. Modern academic libraries integrate automation systems, digital collections, and online databases to enhance information service delivery. Their effectiveness is often measured by the relevance of their collections and the quality of services provided to users.



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# CHAPTER TWO
# LITERATURE REVIEW

## 2.0 Introduction

This chapter reviews empirical and theoretical literature related to library automation systems and their impact on information service delivery in academic libraries. It is organized according to the research objectives:

## 2.1 Library Automation Systems and Support to Library Operations and Services

Library automation refers to the use of computers and software applications to perform and manage routine library functions such as cataloguing, circulation, acquisitions, serials control, and user services (Kumar & Sharma, 2017). Automation systems shift library work from manual practices to digitally managed workflows, increasing efficiency and accuracy in daily operations. Before automation, libraries depended entirely on manual systems such as card catalogues, manual charging systems, and handwritten acquisition registers. These manual practices were labour-intensive, time-consuming, and highly prone to human error, such as misplaced catalogue cards, incorrect borrower records, and lost circulation slips. By transferring these functions to computerized systems, libraries are able to process transactions faster, maintain more accurate records, and serve a larger number of users with the same or fewer staff.

Automation systems enable online public access catalogues (OPAC), which allow users to search, reserve, and access bibliographic information without human mediation (Babu, 2019). Unlike the traditional card catalogue, which could only be consulted physically inside the library and offered limited access points, OPAC provides multiple search options, by author, title, subject, or keyword, and can be accessed remotely at any time. This means users can confirm the availability of materials before visiting the library, reserve items in advance, and save considerable time in locating information resources. According to Ameen and Haider (2020), automation has transformed the role of librarians from custodians of books to information facilitators who focus on user



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engagement and digital literacy training. This transformation is significant because it means library staff are no longer confined to repetitive clerical routines such as filing cards and stamping books; instead, they can devote more time to reference services, user education, research support, and other value-added professional activities.

Moreover, automation supports integrated library management through modules that interconnect acquisitions, cataloguing, and circulation data, minimizing redundancy and speeding up processing time (Mahmood, 2018). In an integrated system, a bibliographic record created once at the acquisition stage flows automatically through cataloguing to circulation, eliminating the need to re-enter the same data at each stage. This integration ensures consistency of records across all service points and significantly reduces the time between the arrival of a new book and its availability on the shelf. A study by Nwalo (2016) revealed that automation enhances the accuracy of inventory management, reduces errors in record keeping, and supports remote access to library resources. In addition, automated systems generate reliable statistics on borrowing patterns, overdue materials, and collection usage, which provide library management with dependable data for collection development, budgeting, and decision-making, data which would be extremely difficult and slow to compile under a manual system.

Despite these benefits, the effectiveness of library automation depends on factors such as software choice, infrastructure, and staff skills. Open-source systems like Koha and Evergreen have been widely adopted due to cost-effectiveness and community support (Satija & Rana, 2017). Open-source systems are particularly attractive to institutions with limited budgets because they eliminate expensive licensing fees while still offering the full range of automation modules, and they are continuously improved by a global community of developers and librarians. International research indicates that academic libraries with well-implemented automation systems exhibit improved service delivery, data accessibility, and user responsiveness (Kaske, 2020). This implies that when automation is properly planned, adequately resourced, and fully operational, it directly



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translates into faster, more accurate, and more accessible services for the user community.

However, context matters. In many African academic libraries, automation remains partially implemented, with core modules operational while others remain manual due to training and funding gaps (Aina, 2014; Bagaka's, 2019). For example, a library may automate circulation and OPAC while acquisitions and serials control continue to be handled manually, resulting in fragmented workflows, duplicated effort, and inconsistent records. Bagaka's (2019), evaluating automation implementation in Kenyan academic libraries, found that institutional capacity, including budget size, ICT infrastructure, and management commitment, largely determined whether automation projects succeeded or stalled. This suggests that implementation outcomes vary by institutional capacity, and that the mere presence of automation software does not guarantee improved service delivery unless it is supported by adequate infrastructure, skilled staff, and sustained funding. This observation is directly relevant to the present study, which examines how the automation system at KCA actually supports library operations in practice.

### 2.2 Users' Satisfaction with Automated Library Services

User satisfaction in library services refers to the extent to which users feel that the services meet their expectations and information needs (Oliver, 2014). Satisfaction is essentially a subjective judgment that results from comparing the service actually received with the service expected: when performance meets or exceeds expectations, users are satisfied, and when performance falls short of expectations, dissatisfaction occurs. In the context of library automation, automated services are expected to enhance convenience, timeliness, and accessibility of information, leading to higher user satisfaction. This makes user satisfaction one of the most important indicators for evaluating whether an automation system is achieving its intended purpose, because a system may be technically functional yet still fail to satisfy the people it is meant to serve.



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Several studies have examined users' perceptions of library automation. Ameen and Haider (2020) found that students and faculty were more satisfied with libraries that offered online catalogue search, digital borrowing, and e-resource accessibility. Users reported that automation reduced queues at circulation desks and saved time (Iwhiwhu & Egharevba, 2015). The time-saving benefit is particularly important in academic settings, where students operate under tight lecture schedules and assignment deadlines. The ability to search the catalogue remotely, confirm the availability of a book before physically visiting the library, and complete borrowing transactions quickly has a direct positive effect on students' academic experience and productivity.

Similarly, Kaur and Gill (2018) established that users rated OPAC and digital reference services highly, especially when interfaces were user-friendly and internet connectivity was stable. Satisfaction was strongly associated with system reliability, speed, and ease of navigation. This finding is important because it demonstrates that satisfaction is not determined merely by the presence of an automated system, but by the quality of the user's day-to-day interaction with it. A system that is frequently offline, slow to respond, or difficult to navigate was generate dissatisfaction regardless of how sophisticated its underlying technology may be.

However, some studies highlighted dissatisfaction due to system complexity, software downtime, and lack of training for users (Zhong & Zhao, 2019). When systems fail frequently or when users are left to figure out complicated interfaces on their own, initial enthusiasm quickly turns into frustration, and users may abandon the automated services altogether in favour of asking staff for manual assistance. For instance, in a study of East African academic libraries, Mtega and Bernard (2019) concluded that many users struggle with automated systems due to lack of orientation, despite the systems being available. This finding is particularly relevant to the Tanzanian context of the present study, as it demonstrates that investment in automation technology must be accompanied by investment in user education and orientation if satisfaction is to be achieved.



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In summary, while automation generally improves user experiences, satisfaction levels are mediated by system quality, user skills, and institutional support. This relationship justifies the present study's second objective, which assesses users' satisfaction with automated library services at KCA.

### 2.3 Challenges Affecting the Use of Library Automation Systems

Although automation offers considerable advantages, several challenges hinder its full utilization in academic libraries, particularly those in developing countries. These challenges may be technical, financial, human, or organizational in nature, and they often interact with and reinforce one another, for example, inadequate funding leads to poor infrastructure, which in turn causes system failures and user dissatisfaction.

#### 2.3.1 Inadequate Funding and Infrastructure

One of the primary barriers is limited financial resources to procure hardware, software licenses, and maintenance services (Aina, 2014). Library automation is not a one-off investment; it requires continuous expenditure on equipment replacement, software maintenance, internet bandwidth subscription, and technical support. Libraries in low-resource settings often face outdated computers, insufficient servers, and unstable internet connectivity (Kaske, 2020). When library budgets are inadequate or irregular, automation systems gradually deteriorate: computers break down without being replaced, software is not updated, and services that were once automated may even revert to manual operation. In many institutions, the library is not given priority in institutional budget allocation, which makes sustainable automation extremely difficult to achieve.

#### 2.3.2 Human Resource and Training Gaps

Staff competency significantly affects the use of automated systems. According to Mahmood (2018), many libraries have automation software, but staff lack the required technical skills to manage, troubleshoot, or customize systems. Continuous training is often missing due to budget constraints. The consequence is that libraries become



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dependent on external technicians or vendors for even minor system problems, leading to prolonged downtime whenever faults occur. The problem is compounded by the rapid pace of technological change, which requires librarians to continuously update their skills. Where training is provided only once during system installation, staff knowledge quickly becomes outdated as the software is upgraded or new modules are introduced, and the system ends up being underutilized despite its full capabilities.

### 2.3.3 Software and Technical Limitations

Systems may lack relevant modules, be poorly customized, or fail to integrate with digital resource platforms (Babu, 2019). Some automation systems are adopted without a proper needs assessment, resulting in software that does not match the library's actual workflows or the users' expectations. Compatibility issues between automation software and library resource formats also complicate efficient use (Satija & Rana, 2017). For instance, a system that cannot integrate with electronic databases or digital repositories forces users to search multiple platforms separately, undermining the goal of seamless, one-stop information access. Poorly customized systems may also display irrelevant fields, use confusing terminology, or omit functions that local users need, all of which reduce the practical value of the automation investment.

### 2.3.4 Resistance to Change

Resistance from staff accustomed to traditional practices can slow down automation adoption (Iwhiwhu & Egharevba, 2015). Such resistance may arise from fear of job loss, anxiety about learning new technologies, or simple comfort with familiar manual routines that staff have used for many years. Integration of new technology often requires change management strategies, such as involving staff in system selection, communicating the benefits of automation clearly, and implementing the system in phases, which many institutions overlook. When staff are not adequately prepared for the transition, they may underutilize the system or continue running parallel manual processes alongside the automated system, thereby duplicating work and defeating the very purpose of automation.



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### 2.3.5 Power and Connectivity Issues

In many developing countries, unstable power supply and low bandwidth internet slow down system performance, leading to frustration among users and librarians (Mtega & Bernard, 2019). Because automated systems depend entirely on electricity and network connectivity, frequent power outages interrupt circulation transactions, risk corrupting data, and render the OPAC inaccessible to users. Similarly, low bandwidth makes searching slow and discourages users from relying on the system. Where backup solutions such as generators, solar power systems, or uninterruptible power supplies (UPS) are unavailable, libraries are forced to revert to manual operations during outages, creating gaps and inconsistencies in electronic records that must later be reconciled manually. Mtega and Bernard (2019) specifically identified unreliable connectivity as one of the leading factors limiting the effective use of automated services in Tanzanian academic libraries, which makes this challenge directly relevant to the present study at KCA.

## 2.4 Strategies for Improving Library Automation Services

To enhance automation and information service delivery, various interventions have been proposed in the literature. These strategies respond directly to the technical, financial, human, and organizational challenges discussed in the previous section.

### 2.4.1 Capacity Building and Training

Continuous professional development for library staff and user training programs are crucial for maximizing automation benefits (Mahmood, 2018). Librarians need skills in systems administration, troubleshooting, and user support so that routine technical problems can be resolved internally without prolonged system downtime or dependence on external technicians. Equally important is training for library users: orientation programs at the beginning of each academic year, information literacy sessions, and simple user guides help users exploit the full capabilities of OPAC and other automated services. Training should not be treated as a one-off event conducted only at system



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installation; rather, it should be a continuous process that accompanies every system upgrade and every new intake of students.

### 2.4.2 Adequate Funding and Resource Allocation

Investment in reliable hardware, licensed software, and internet infrastructure enhances system performance and user access (Aina, 2014). Budget planning should prioritize sustainability rather than one-off purchases. This means institutions should establish dedicated, recurrent budget lines for automation that cover routine maintenance, bandwidth subscription, replacement of aging equipment, and staff development, rather than treating automation as a single capital project that is funded once and then forgotten. Sustainable funding ensures that the system continues to function effectively and remains up to date long after the initial installation.

### 2.4.3 User-Centered System Design

Automation systems should be intuitive and user-friendly. Libraries should involve users in needs assessment to customize interfaces and service features (Kaur & Gill, 2018). When users participate in identifying the features they need, such as simplified search screens, mobile-friendly access, or automatic renewal notifications, the resulting system is more likely to be accepted, trusted, and heavily used. User feedback collected after implementation should also inform continuous refinement of the system, so that the automation service evolves together with changing user needs rather than remaining static.

### 2.4.4 Collaboration and Sharing of Resources

Consortia models allow libraries to share digital resources, technical expertise, and training costs (Kaske, 2020). Such collaborations reduce individual institutional strain by spreading the costs of software support, bandwidth, and capacity building across several institutions. Collaboration also enables smaller libraries, such as college libraries with limited budgets and few technical staff, to benefit from the experience of larger



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university libraries that have already implemented automation successfully, thereby avoiding common implementation mistakes and reducing the learning curve.

### 2.4.5 Policy Support and Strategic Planning

Institutional policies that mandate continuous system evaluation, feedback mechanisms, and upgrades ensure automation systems remain relevant (Satija & Rana, 2017). Strategic planning enables library services to align with broader academic goals, ensuring that automation is treated as an institutional priority rather than a library-only concern. Clear policies should define responsibilities for system maintenance, data backup and security, and quality assurance, and should commit the institution to periodic review of automation performance against user needs. Without such policy backing, automation initiatives tend to depend on individual champions and collapse when those individuals leave the institution.

## 2.5 Research Gap

The reviewed literature demonstrates that library automation has been widely studied at the international and regional levels. Studies from Asia (Kumar & Sharma, 2017; Kaur & Gill, 2018; Mahmood, 2018; Satija & Rana, 2017), Nigeria (Nwalo, 2016; Iwhiwhu & Egharevba, 2015), and Kenya (Bagaka's, 2019) have established that automation improves library operations and service delivery, but that its effectiveness depends heavily on infrastructure, funding, staff competence, and user training.

However, several gaps remain. First, there is a geographical gap: limited research exists on library automation effectiveness in Tanzanian academic libraries. The few available Tanzanian studies, such as Mtega and Bernard (2019), examined the general status and prospects of automation at the national level rather than evaluating the effectiveness of automation in enhancing information service delivery within a specific institution. Second, there is a contextual gap: most existing studies focus on large university libraries, while little attention has been paid to smaller college libraries, such as Kaole College of Agriculture, which operate with more limited budgets, infrastructure, and



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staffing, and whose automation experiences may therefore differ considerably from those of universities. Third, there is an evidence gap at the institutional level: no known empirical study has assessed the performance of the library automation system at KCA, meaning that the extent to which the system supports operations, satisfies users, and faces challenges remains undocumented.

It is these gaps that the present study sought to fill by assessing library automation systems in enhancing information service delivery at KCA, thereby generating institution-specific evidence and contributing to the limited body of literature on library automation in Tanzanian academic libraries.



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# CHAPTER THREE
# RESEARCH METHODOLOGY

## 3.0 Introduction

This section shows approaches that was be used to undertake the study. It focuses on research approach, area of study, population of the study, sample size, sampling technique, data and collection methods, research instrument, research ethics and data analysis plan.

## 3.1 Research Design

A research design is a comprehensive plan that outlines how a study was conducted, detailing the methods and procedures for collecting and analyzing data (Creswell & Creswell, 2017). This study was adopting a descriptive research design because it is appropriate for systematically describing characteristics of the population or phenomenon under investigation. A descriptive design allows the researcher to gather information, identify patterns, and provide insights into the study.

## 3.2 Research Approach

A research approach refers to the overall strategy that guides the collection and analysis of data (Creswell &Poth, 2018). This study was employing a mixed approach which combines both qualitative and quantitative research methods. The rationale for this choice is that it allows for a more comprehensive understanding of the research problem by integrating numerical data with detailed, context-rich qualitative insights. This approach is ideal for exploring both the statistical patterns and in-depth challenges related to the study under study.

## 3.3 Area of the Study

The area of the study refers to the specific geographic location or context where the research is conducted (Bryman, 2016). This study was be conducted at KCA Bagamoyo Library. This area of study is considered relevant due to the fact that, researcher is expecting to get relevant data in relation to the topic under study.



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### 3.4 Population of the Study

The population of a study encompasses all the individuals or elements that fit the criteria for inclusion in the research (Etikan, Musa, & Alkassim, 2016). In this study, the population was be 300 including students, academic staff, and library staff.

### 3.5 Sample Size

The sample size refers to the number of participants or elements selected from the population for inclusion in the study (Taherdoost, 2017). For this study, a sample size of 30 participants was be selected, comprising 5 librarians and 25 library users. This sample size is considered appropriate as it balances the need for meaningful data while ensuring manageability. It allows for sufficient diversity of perspectives without overwhelming the scope of the study.

### 3.6 Sampling Techniques

Sampling techniques refer to the methods used to select participants or elements from the population (Etikan et al., 2016). This study was employing a combination of simple random sampling and purposive sampling techniques.

#### 3.6.1. Simple random sampling Technique

This is a technique in which every member of the population has an equal probability of being selected (Taherdoost, 2016). This method ensures that the sample is representative of the entire population and minimizes selection bias, thereby enhancing the generalizability of the study's findings. In this study, simple random sampling was be used to select 25 library users.

#### 3.6.2 Purposive Sampling Technique.

Purposive sampling, also known as judgmental or selective sampling, involves selecting specific individuals who are most likely to provide relevant and insightful data (Palinkas et al., 2015). This technique is often used when the researcher needs to gather in-depth information from a targeted group that possesses unique knowledge or expertise. For this study, purposive sampling was be used to select 5 experienced librarians understanding the details on the topic under study.



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### 3.7 Data Collection Methods

Data collection refers to the process of gathering information from various sources to address the research questions (Creswell&Poth, 2018). This study was use both primary and secondary data collection methods to obtain a comprehensive understanding of the preservation strategies and challenges at the Bagamoyo archives. Primary data was be collected through questionnaires, interviews, and observations with ensuring first hand insights. Secondary data was be gathered from library records, reports, and other relevant documents to supplement primary data.

#### 3.7.1 Primary Data

Primary data refers to information collected directly from original sources for specific research purposes, providing firsthand evidence (Kothari, 2014). This type of data is tailored to meet the study's objectives, allowing for in-depth exploration of specific issues relevant to the research (Babbie, 2013). In this study, primary data was be collected using three methods: questionnaires, interviews, and observation.

##### 3.7.1.1 Questionnaires

A questionnaire is a structured tool designed to collect responses from a target population in a standardized format, making it suitable for gathering quantifiable data (Creswell, 2014). In this study, structured questionnaires were be distributed to 10 librarians and to capture their perceptions and experiences regarding the topic under study. The structured format of the questionnaire was ensured consistency and comparability across responses, enhancing the reliability of the collected data.

##### 3.7.1.2 Interviews

An interview is a qualitative method that involves a conversation between the researcher and the respondent, typically in a semi-structured format that allows for open-ended questions and elaboration (Merriam &Tisdell, 2016). For this research, semi-structured interviews were be conducted with selected individuals, enabling a deeper exploration of topics covered in the questionnaires. This approach allows



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respondents to provide in depth responses and clarifications, facilitating a comprehensive understanding of the topic under study

#### 3.7.1.3 Observation

Observation is a research method where the researcher records behaviors or conditions as they naturally occur without interference, providing a direct assessment of real-world practices (Patton, 2015). Direct observations were be made within the library to evaluate presence of library services automated system and identify user satisfaction from the services. This method was provided firsthand insights on the topic under study.

### 3.7.2 Secondary Data

Secondary data refers to information that has been previously collected and documented for purposes other than the current research, often used to provide background or supplementary data (Saunders, Lewis, &Thornhill, 2016). Secondary data can help place primary findings within a broader context, providing comparative insights (Creswell, 2014). In this study, secondary data was be gathered from library records and reports where these sources provide information on roles of significance of automated library services in enhancing services delivery to library users.

## 3.8 Data Collection Instruments

Data collection instruments are tools used to gather, measure, and analyze data relevant to research questions and objectives. According to Kothari (2014), these instruments facilitate the systematic collection of information necessary to address a study's objectives. Creswell (2014) also emphasizes that the selection of appropriate instruments contributes significantly to the reliability and validity of research findings. This study was utilizing three primary data collection instruments: questionnaire guides, interview guides, and observation checklists.

### 3.8.1 Questionnaire guides

A questionnaire is a structured instrument used to gather data from respondents by providing them with a series of questions, often in a written format. Kothari (2014)



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defines a questionnaire as a method that allows respondents to provide answers independently, promoting honesty and reducing bias. In this study, the questionnaire was included both closed-ended and open-ended questions designed to capture quantitative and qualitative data related to the study. The questionnaire was be distributed to librarians allowing the researcher to collect a wide range of responses.

### 3.8.2 Interview Guide

An interview guide is a flexible tool used to conduct structured or semi-structured interviews, facilitating open-ended responses and in-depth exploration of the study's themes. According to Yin (2011), an interview guide provides an outline of key questions and topics, allowing the researcher to adapt based on the interviewee's responses while maintaining focus on the research objectives. In this study, the interview guide was be used to collect information from library users enabling the researcher to gain deeper insights of the study.

### 3.8.3 Observation Checklist

An observation checklist is a systematic tool that outlines specific items or behaviors to be observed, ensuring consistency and accuracy in data collection (Patton, 2022). It enables researchers to observe actual conditions and practices as they occur in natural settings. In this study, the observation checklist applicable allowing the researcher to document real-time behaviors and conditions relevant to the study. The researcher was observing the provision of library automated services to clients.

## 3.9 Data Quality Control

Data quality control involves measures taken to ensure the accuracy, reliability, and validity of the data collected (Creswell & Creswell, 2017). This study was implementing several quality controls measures, including pilot studies to test the instruments for clarity and relevance, and triangulation, where multiple data sources (questionnaires, interviews, and documents) was be used to cross-validate findings. These measures are critical to enhance Data Processing and Analysis.



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**Data processing and analysis**

This refers to the procedures used to organize, interpret, and draw conclusions from the collected data (Saunders et al., 2019). In this study, quantitative data from questionnaires was be analyzed using statistical methods, such as descriptive statistics to identify patterns and trends. Qualitative data from interviews was be analyzed using thematic analysis**,** which allow the identification of recurring themes and in-depth insights into topic under study. This dual approach enables a comprehensive understanding of both measurable and narrative aspects of the research.

## 3.10 Research Ethics

Researchethicsinvolvetheprinciplesandguidelinesthatgoverntheconductofresearch to ensure the protection of participants and the integrity of the study (Resnik, 2020).This study was adhered to strict ethical standards by obtaining informed consent from all participants, ensuring confidentiality and anonymity to protect their privacy, and avoiding harm by minimizing any potential risks or discomfort



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# CHAPTER FOUR
# DATA ANALYSIS, PRESENTATION AND DISCUSSION

## 4.1 Introduction

This chapter presents the data analysis, presentation, discussion, and interpretation of findings of the study on the assessment of library automation systems in enhancing information service delivery at Kaole College of Agriculture (KCA). The findings are organized according to the four specific objectives of the study. The chapter begins with the questionnaire response rate, followed by demographic details of respondents, and then presents findings based on each research objective.

### 4.1.1 Questionnaire Response Rate

The study distributed 25 questionnaires to library users at KCA Library. All 25 questionnaires were returned and properly completed, indicating a response rate of 100%. In addition, 5 librarians participated in interviews, making the total number of respondents in the study 30 participants. A response rate above 70% is considered excellent and adequate for social science research (Creswell & Creswell, 2018). Therefore, the 100% response rate was sufficient for data analysis and reliable interpretation of findings.

## 4.2 Respondent's Demographic Details

This section presents the demographic characteristics of the respondents, including age, gender, and level of education. Although these characteristics were not the main variables of the study, they help in understanding the background of respondents and how such characteristics may influence their perception of library automation systems and information service delivery.

### 4.2.1 Respondents Age

The researcher intended to know the respondents' age groups; hence respondents were asked to specify their age categories as it was necessary to understand their age



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distribution. The respondents were asked to indicate their age because the researcher wished to determine how age characteristics may influence the use of automated library services.

The results revealed that 15 (60%) respondents were aged between 18–25 years, 7 (28%) were aged between 26–35 years, and 3 (12%) were aged 36 years and above. Moreover, the findings are displayed in Figure 1 below.

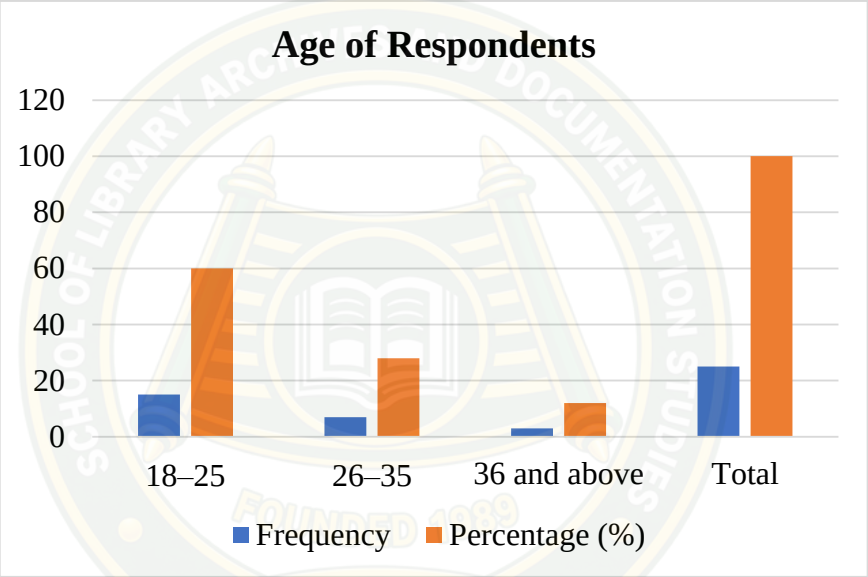



**Figure 1: Age of Respondents (N = 25)**

Source: Field Data (2026)

The findings reveal that the majority of respondents were aged between 18–25 years. This indicates that most library users at KCA are young students who are likely familiar with digital technologies and automated systems. Such age distribution suggests that automation systems should be user-friendly and compatible with the digital skills of young users.

### 4.2.2 Respondents Gender

In this part, the researcher sought to know the gender of the respondents so as to determine whether gender differences may influence the use of automated library



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systems. Gender diversity helps in understanding participation in automated service utilization.

The results showed that 14 (56%) respondents were male and 11 (44%) respondents were female. The findings are presented in Figure 2 below.

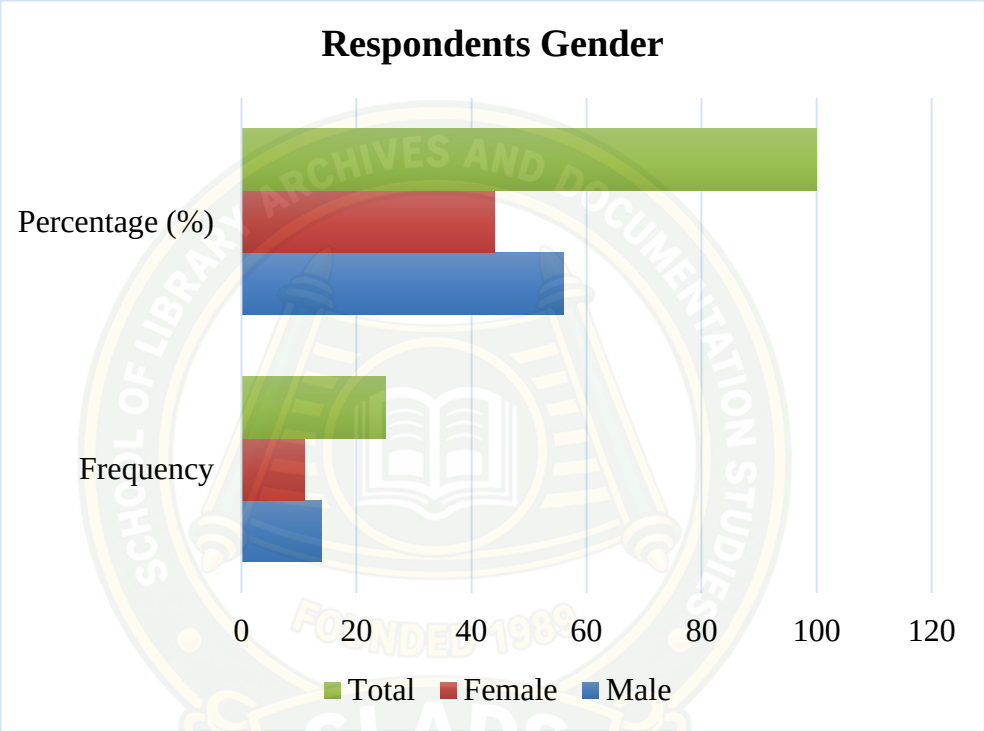



**Figure 2: Gender of Respondents (N = 25)**

Source: Field Data (2026)

The findings show that the majority of respondents were male. However, the gender distribution is relatively balanced, indicating that both male and female students actively use automated library services at KCA.

### 4.2.3 Education Level of Respondents

Findings of the study indicated that respondents had two levels of education: Diploma and Certificate. The researcher included the level of education because education level may influence understanding and effective use of library automation systems.



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The results revealed that 17 (68%) respondents were pursuing Diploma programs, while 8 (32%) respondents were pursuing Certificate programs. See Figure 3 below.

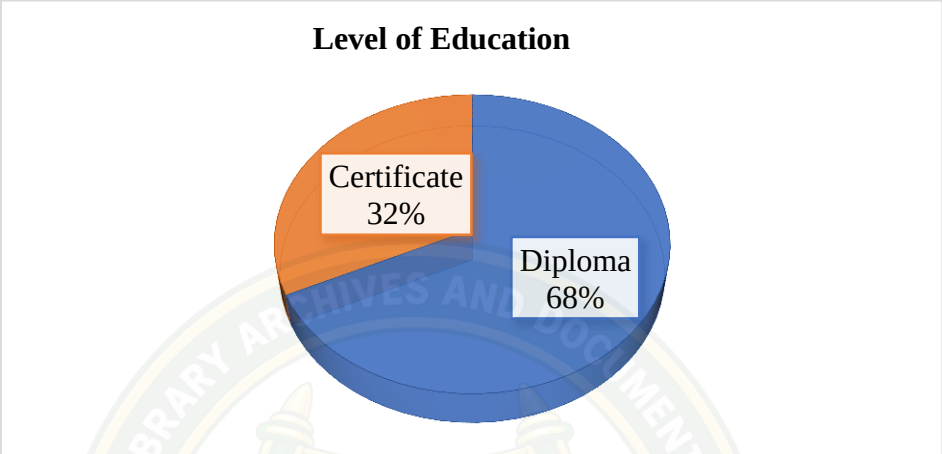



**Figure 3: Education Level of Respondents (N = 25)**

Source: Field Data (2026)

The findings indicate that the majority of respondents were Diploma students. This suggests that most users of automated library systems at KCA are at intermediate academic level, which may influence their expectations and satisfaction regarding automated services.

### 4.3 How Automation Systems Support Library Operations and Services

Respondents were asked to indicate how library automation systems have improved various library operations and services at KCA Library. The purpose was to examine whether automation contributes positively to service delivery. Respondents were required to select the main area where automation has improved services. The options provided were cataloguing processes, circulation services, OPAC services, and information retrieval.

The collected data as summarized in Table 1 below show that 8 (32%) respondents indicated circulation services, 7 (28%) indicated OPAC services, 6 (24%) indicated information retrieval, and 4 (16%) indicated cataloguing processes.



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**Table 1: Areas Where Automation Has Improved Library Services (N = 25)**

| S/N | Library Service | Frequency | Percentage (%) |
|---|---|---|---|
| **1** | Cataloguing processes | 4 | 16 |
| **2** | Circulation services | 8 | 32 |
| **3** | OPAC services | 7 | 28 |
| **4** | Information retrieval | 6 | 24 |
| | Total | 25 | 100 |

Source: Field Data (2026)

The findings reveal that circulation services are the most improved area due to automation, as indicated by 32% of respondents. This was followed by OPAC services (28%) and information retrieval (24%). The lowest percentage was for cataloguing processes (16%).

These findings indicate that automation systems have significantly enhanced front-end services that directly interact with users, particularly circulation (borrowing and returning of books) and OPAC (searching for materials). This suggests that users can now perform basic library operations independently without relying heavily on library staff, which reduces waiting time and improves service efficiency.

The relatively lower percentage for cataloguing suggests that improvements in back-end operations may not be as visible to users compared to circulation and search functions. This is consistent with Ameen and Haider (2020), who argue that automated circulation and OPAC systems greatly enhance accessibility and speed of service delivery in academic libraries, while cataloguing improvements are often perceived as administrative rather than user-facing benefits. Similarly, Kumar and Sharma (2017)



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note that automation reduces manual workload and improves accuracy in service operations, particularly in circulation and information retrieval.

Furthermore, the 24% of respondents who identified information retrieval as the main improvement area suggests that automation has also enhanced users' ability to locate academic resources independently, which is critical for research and learning. This aligns with Nwalo (2016), who asserts that integrated library systems improve access to bibliographic information and support academic work.

The presence of responses across all four areas indicates that automation has contributed positively to multiple library operations, not just one specific function. This comprehensive impact supports the argument by Babu (2019) that modern library automation systems integrate multiple modules that collectively improve library performance and user experience.

### 4.3.1 Automation and Efficiency in Service Delivery

Respondents were further asked whether automation has improved efficiency in library service delivery. Two options were provided: Strongly Agree and Strongly Disagree.

The collected data as summarized in Table 2 below show that 20 (80%) respondents strongly agreed that automation has improved efficiency in service delivery, while 5 (20%) strongly disagreed

**Table 2: Automation and Efficiency in Service Delivery (N = 25)**

| Response | Frequency | Percentage (%) |
|---|---|---|
| **Strongly Agree** | 20 | 80 |
| **Strongly Disagree** | 5 | 20 |



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| | | |
|---|---|---|
| **Total** | **25** | **100** |

Source: Field Data (2026)

The findings indicate that the majority of respondents (80%) strongly agree that library automation systems have improved efficiency in service delivery. This suggests that automation has enhanced speed, reduced delays, and improved overall access to information services at KCA Library. The high agreement level indicates that users have directly experienced the benefits of automation in their daily library interactions, such as faster book borrowing, quicker search processes, and reduced manual procedures.

This finding aligns with Kaske (2020), who emphasizes that automation enhances operational efficiency, improves user experience, and reduces service time in academic libraries. Similarly, Satija and Rana (2017) note that automated systems minimize repetitive manual processes, allowing librarians to focus on more value-added services such as user education and information literacy training.

However, the 20% who strongly disagreed suggests that some users still experience inefficiencies, possibly due to system downtime, slow internet, or limited training. This finding is consistent with Zhong and Zhao (2019), who argue that the benefits of automation are only fully realized when supported by stable infrastructure and adequate user capacity building. Therefore, while automation has significantly improved efficiency, there is still a need to address technical and human resource challenges to ensure uniform benefits for all users.

### 4.4 Users' Satisfaction with Automated Library Services

Respondents were asked to indicate their level of satisfaction with automated library services at KCA Library. The purpose of this question was to determine whether the automation system meets users' expectations in accessing and utilizing library services. Respondents were required to choose one option between highly satisfied and highly dissatisfied.



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The collected data as summarized in Table 3 below show that 19 (76%) respondents were highly satisfied with automated library services, while 6 (24%) were highly dissatisfied.

**Table 3: Users' Satisfaction with Automated Library Services (N = 25)**

| Response | Frequency | Percentage (%) |
|---|---|---|
| **Highly satisfied** | 19 | 76 |
| **Highly dissatisfied** | 6 | 24 |
| **Total** | **25** | **100** |

Source: Field Data (2026)

The findings reveal that the majority of respondents (76%) are highly satisfied with automated library services. This indicates that automation systems at KCA Library have positively contributed to improving service accessibility, efficiency, and user experience. High satisfaction levels suggest that users find the system useful in supporting their academic activities, particularly in searching for and accessing library materials.

However, 24% of respondents reported dissatisfaction. This suggests that although automation has improved services, there may still be challenges such as system downtime, slow internet connectivity, or limited user training that affect some users' experiences. The presence of dissatisfaction among a notable proportion of users indicates that satisfaction is not universal and that systemic issues may affect specific groups of users.

This finding is supported by Kaur and Gill (2018), who argue that user satisfaction in automated libraries is strongly influenced by system reliability, ease of use, and access speed. Similarly, Zhong and Zhao (2019) emphasize that satisfaction levels decrease when automation systems experience technical failures or lack user support. Furthermore, Iwhiwhu and Egharevba (2015) note that user satisfaction is also



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influenced by the level of training and orientation provided to users before and during system implementation.

The researcher also conducted interviews with students regarding their satisfaction with automated services, and one respondent stated:

> *"The system makes it easier to find books using OPAC, but sometimes the computers are slow or the internet is not stable." [Respondent, June, 2026]*

### 4.5 Challenges Affecting the Use of Library Automation Systems

Respondents were asked to indicate the main challenge they face when using automated library services at KCA Library. The aim was to identify the most common barrier affecting the effective use of automation systems. Respondents were required to select one main challenge. Five options were provided: ICT infrastructure, trained staff, power outages, internet connectivity, and costs resistance.

The collected data as summarized in Table 4 below show that 10 (40%) respondents indicated internet connectivity as the main challenge, 6 (24%) indicated ICT infrastructure, 4 (16%) indicated power outages, 3 (12%) indicated trained staff, and 2 (8%) indicated costs resistance.



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**Table 4: Main Challenges in Using Automated Library Services (N = 25)**

| S/N | Challenge | Frequency | Percentage (%) |
|---|---|---|---|
| **1** | Internet connectivity | 10 | 40 |
| **2** | ICT infrastructure | 6 | 24 |
| **3** | Power outages | 4 | 16 |
| **4** | Trained staff | 3 | 12 |
| **5** | Costs resistance | 2 | 8 |
| | **Total** | **25** | **100** |

Source: Field Data (2026)

The findings show that internet connectivity is the most common challenge affecting the use of automated library services, as indicated by 40% of respondents. This was followed by ICT infrastructure (24%) and power outages (16%). The relatively lower percentages for trained staff (12%) and cost resistance (8%) suggest that human resource and financial challenges exist but are less dominant compared to technical infrastructure issues.

The dominance of internet connectivity as the main challenge suggests that while automation systems are in place, the supporting infrastructure, particularly network reliability, remains a major barrier to effective service delivery. Without stable internet, automated services such as OPAC, digital borrowing, and online resource access become slow or unavailable, which directly affects user experience.

This finding is supported by Mtega and Bernard (2019), who argue that in many African academic libraries, unstable internet connectivity and outdated ICT infrastructure significantly hinder the effective utilization of automated library systems. Similarly,



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Mahmood (2018) notes that automation systems cannot function efficiently without stable power and reliable network connectivity. Aina (2014) further emphasizes that inadequate infrastructure remains one of the primary barriers to successful automation implementation in developing countries.

The challenge of power outages (16%) also indicates the broader issue of unstable electricity supply in many Tanzanian institutions, which affects both network equipment and user access to digital services. This is consistent with findings by Satija and Rana (2017), who note that automation systems are highly dependent on continuous power supply to remain operational.

The lower percentage for trained staff suggests that KCA may have a relatively competent technical team, but there is still a need for continuous professional development to keep up with system upgrades. This aligns with Iwhiwhu and Egharevba (2015), who argue that staff capacity is critical for sustainable automation, as poorly trained staff can cause system misuse, downtime, and user frustration.

The researcher also conducted interviews with librarians regarding challenges affecting automation, and one librarian stated:

> *"The biggest challenge we face is internet instability. Sometimes the OPAC becomes very slow or completely unavailable, which frustrates users and forces them to come manually to search for books." [Respondent 2, June, 2026]*

### 4.6 Strategies for Improving Library Automation Services

Respondents were asked to suggest measures that should be taken to improve the use of library automation systems at KCA Library. The aim was to gather user perspectives on practical solutions that can enhance automation services. Respondents were required to select one main measure. Five options were provided: training, upgrades, internet, funding, and user training.



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The collected data as summarized in Figure 4 below show that 9 (36%) respondents indicated internet improvement as the main strategy, 6 (24%) indicated upgrades of the system, 5 (20%) indicated funding, 3 (12%) indicated staff training, and 2 (8%) indicated user training.

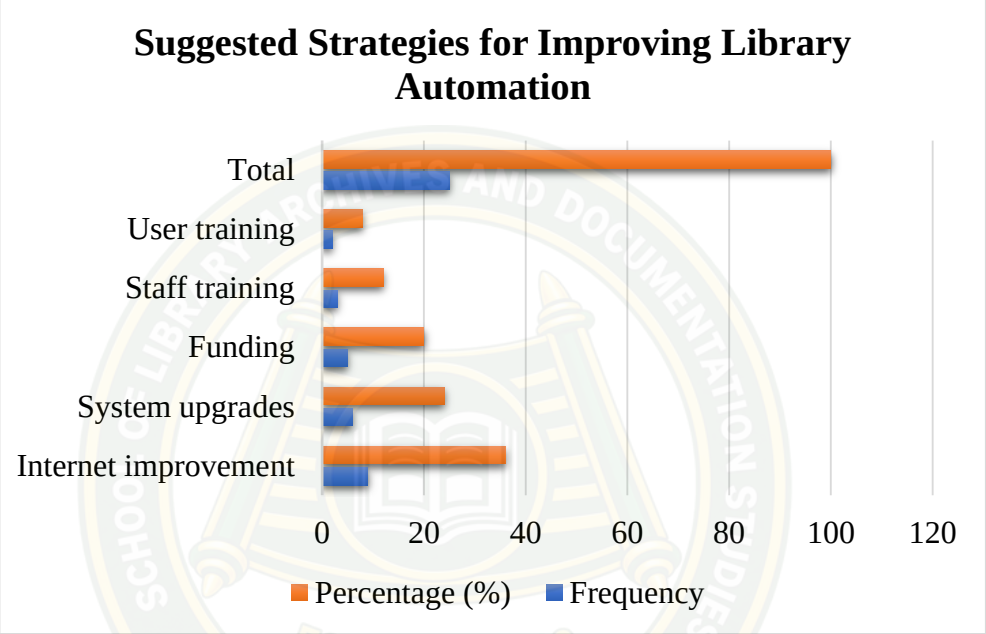



**Figure 4: Suggested Strategies for Improving Library Automation (N = 25)**

Source: Field Data (2026)

The findings show that the majority of respondents (36%) suggested that improving internet connectivity is the most important strategy for enhancing library automation services. This was followed by system upgrades (24%) and funding (20%). This suggests that users recognize that the main barrier to automation effectiveness is the technical infrastructure, particularly internet reliability.

The emphasis on internet improvement is consistent with the challenges identified in 4.5, where internet connectivity was the leading challenge. This consistency between problems and proposed solutions indicates that users have a clear understanding of the



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systemic issues affecting automation and are aligned on the priority interventions needed.

The relatively lower percentages for staff training (12%) and user training (8%) indicate that while training is important, users perceive infrastructure improvements as more urgent. This may suggest that users have already received basic orientation on how to use the system, but the system itself is failing due to technical limitations. This is supported by Satija and Rana (2017), who argue that automation systems require regular upgrades, reliable network infrastructure, and adequate funding to remain effective. Similarly, Kaur and Gill (2018) emphasize that user satisfaction depends on system performance, which is closely linked to infrastructure investment.

The suggestion of funding (20%) indicates that users recognize that infrastructure improvements require financial investment. This aligns with Kaske (2020), who argues that automation sustainability depends on continuous financial support for hardware maintenance, software licensing, and internet subscription.

The researcher also conducted interviews with librarians regarding strategies for improvement, and one librarian stated:

> *"If we can get a stable internet connection and upgrade the automation system, many of the current challenges was be solved. Students was be able to search materials quickly and we were reducing the workload at the circulation desk."[Respondent 3, June, 2026]*

### 4.7 Chapter Summary

This chapter has presented the data analysis, presentation, and discussion of findings based on the four specific objectives of the study. The findings revealed that library automation systems at KCA have improved circulation services, OPAC services, and information retrieval, with circulation services being the most improved area. The



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majority of respondents agreed that automation has improved efficiency in service delivery.

Regarding user satisfaction, the majority of respondents were highly satisfied with automated services, although a notable proportion reported dissatisfaction due to system downtime and slow internet. The main challenges identified were internet connectivity, ICT infrastructure, and power outages, while the most recommended strategies were internet improvement, system upgrades, and increased funding.

Overall, the findings indicate that while library automation has positively contributed to service delivery at KCA, its effectiveness is limited by infrastructure challenges. Therefore, sustainable improvement requires investment in internet connectivity, system upgrades, and adequate funding, supported by continuous training for both staff and users.



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# CHAPTER FIVE
# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.0 Introduction

This chapter presents the summary of the findings, conclusion, and recommendations of the study. The aim of this research was to assess the effectiveness of library automation systems in enhancing information service delivery in academic libraries, with specific reference to Kaole College of Agriculture (KCA). This chapter also highlights the summary of the findings, general conclusions, and recommendations drawn from the analysis of the collected data, as well as areas for further research.

## 5.1 Summary of the Findings

The general objective of this study was to assess the effectiveness of library automation systems in enhancing information service delivery at KCA Library. The study was guided by four specific objectives: to examine how automation systems support library operations and services, to assess users' satisfaction with automated library services, to identify challenges affecting the use of library automation systems, and to suggest strategies for improving library automation services. The study used a descriptive research design and a mixed-method approach. A total of 30 respondents participated in the study, comprising 25 library users who responded to questionnaires and 5 librarians who participated in interviews. Purposive sampling and simple random sampling techniques were used. Data were collected using questionnaires and interview guides, and analysed using Microsoft Excel to produce descriptive statistics presented in tables. The summary of the findings based on the specific objectives of the study is presented below.

### 5.1.1 How Automation Systems Support Library Operations and Services

The first objective was to examine how automation systems support library operations and services at KCA. The findings revealed that automation has improved multiple areas of library services, with circulation services being the most improved (32%), followed



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by OPAC services (28%), information retrieval (24%), and cataloguing processes (16%). The findings further showed that the majority of respondents (80%) strongly agreed that automation has improved efficiency in service delivery. This indicates that automation has significantly enhanced both front-end services (circulation, OPAC) and back-end operations (cataloguing), with circulation receiving the highest recognition due to its direct interaction with users.

### 5.1.2 Users' Satisfaction with Automated Library Services

The second objective was to assess users' satisfaction with automated library services. The findings revealed that the majority of respondents (76%) were highly satisfied with automated library services, while 24% were highly dissatisfied. This indicates that although automation has generally improved service delivery and user experience, a notable proportion of users still experience challenges that affect their satisfaction. The presence of dissatisfied users suggests that satisfaction is not uniform and may be influenced by system reliability, internet stability, and user training levels.

### 5.1.3 Challenges Affecting the Use of Library Automation Systems

The third objective was to identify challenges affecting the use of library automation systems. The findings revealed that internet connectivity is the most common challenge (40%), followed by ICT infrastructure (24%), power outages (16%), trained staff (12%), and cost resistance (8%). This indicates that technical infrastructure challenges, particularly network and power reliability, are the dominant barriers affecting the effective use of automation systems at KCA Library, while human resource and financial challenges are less dominant.

### 5.1.4 Strategies for Improving Library Automation Services

The fourth objective was to suggest strategies for improving library automation services. The findings revealed that the majority of respondents (36%) suggested improving internet connectivity as the main strategy, followed by system upgrades (24%), increased funding (20%), staff training (12%), and user training (8%). This suggests that



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users recognize infrastructure improvement as the most urgent priority, and that investment in internet, system upgrades, and funding is critical for enhancing automation effectiveness.

## 5.2 Conclusion

This study on the assessment of library automation systems in enhancing information service delivery at KCA Library reveals that automation has made a significant positive contribution to library operations and service delivery. The study established that automation has improved circulation services, OPAC services, information retrieval, and cataloguing, with circulation being the most recognized improvement. The majority of users are satisfied with automated services, confirming that automation has enhanced accessibility, efficiency, and user experience at KCA Library.

However, the study also concludes that automation effectiveness is hindered by several challenges, most notably unstable internet connectivity, inadequate ICT infrastructure, and power outages. These technical barriers limit the full potential of automation, resulting in dissatisfaction among a notable proportion of users.

The study further concludes that improving automation services requires strategic investment in internet infrastructure, system upgrades, and adequate funding, supported by continuous training for both staff and users. The alignment between identified challenges and suggested strategies indicates a shared understanding between users and library staff on the priority interventions needed.

## 5.3 Recommendations

Based on the findings and conclusions of this study, the following recommendations are made to improve the effectiveness of library automation systems at KCA and similar academic libraries.



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### 5.3.1 Strengthen Internet Connectivity

The KCA Library management, in collaboration with the college administration and relevant government agencies, should prioritize investment in stable and high-speed internet connectivity. Reliable internet is the foundation for the effective functioning of automated systems such as OPAC, digital resource platforms, and online catalogues. Alternative connectivity solutions such as dedicated library bandwidth should also be considered.

### 5.3.2 Upgrade Automation Systems Regularly

Library management should ensure that the automation software and hardware are regularly upgraded to meet current technological standards. This includes updating the integrated library system (ILS), maintaining computers and servers, and replacing outdated equipment. Regular upgrades were improved system speed, reliability, and compatibility with modern digital resources.

### 5.3.3 Increase Funding for Library Automation

The college administration and the government should allocate adequate and sustainable funding for library automation. Budget allocation should prioritize infrastructure maintenance, software licensing, internet subscription, and staff development. Sustainable funding ensures that automation systems remain operational, updated, and capable of supporting academic activities.

### 5.3.4 Conduct Continuous Staff Training

Librarians and ICT support staff should undergo regular professional development and technical training to keep up with system updates, troubleshoot challenges, and provide effective user support. Training should also cover emerging technologies, digital preservation, and user education techniques to enhance service delivery.

### 5.3.5 Provide User Orientation and Training

Library management should conduct regular orientation and training programs for students and other library users to ensure they can effectively use automated systems



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such as OPAC, digital borrowing, and online databases. Training should be integrated into student orientation programs at the beginning of each academic year and reinforced through ongoing awareness sessions.

### 5.3.6 Ensure Stable Power Supply

The college should invest in reliable power backup solutions such as solar power systems, generators, or uninterruptible power supplies (UPS) to ensure continuous operation of automated systems. Stable power supply is critical for maintaining network equipment, servers, and user access points that support library automation.

### 5.3.7 Establish a System Monitoring and Feedback Mechanism

Library management should establish a system for regular monitoring of automation performance and collection of user feedback. This can include periodic surveys, suggestion boxes, and digital feedback platforms. Continuous monitoring was help identify emerging challenges, evaluate the impact of interventions, and ensure that automation services remain aligned with user needs.

## 5.4 Areas for Further Research

Based on the findings of this study, the following areas are recommended for further research:

- Research on the same topic but conducted in other academic libraries in Tanzania to allow comparison of findings.
- Research on the role of digital literacy in the effective use of library automation systems among students.
- Research on the impact of library automation on staff workload and service efficiency.
- Research on the cost-benefit analysis of implementing open-source versus commercial library automation systems in Tanzanian academic institutions.



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**APENDIX I**

# Questionnaire Guide for Librarians

1. Gender:
    a. Male
    b. Female
2. Age:
    a. Below 25
    b. 25–34
    c. 35–44
    d. 45 and above
3. Level of Education:
    a. Certificate
    b. Diploma
    c. Bachelor
4. Automation of your library has improved various library services including

a. Cataloguing processes

b. Circulation services

c. OPAC

d. Information retrieval.



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5. Automation has improved efficiency in service delivery.
    a. Strongly Agree
    b. Strongly Disagree
6. Library users are satisfied with automated library services
    a. Highly satisfied
    b. Highly dissatisfied
7. What challenges do you face when using library automated services?
    a. ICT infrastructure
    b. trained staff
    c. power outages
    d. Internet
    e. costs resistance
8. What measures should be taken to make the situation better
    a. training,
    b. upgrades
    c. Internet
    d. Funding
    e. User training.



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## APENDIX II

## INTERVIEW GUIDE FOR STUDENTS

1. How Automation has improved services accessibility in your library?
2. Are you satisfied with automated services?
3. What challenges does your library face when using library automated services?
4. What measures should be taken to make the situation better



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**APENDIX III**

# OBSERVATION CHECKLIST

This researcher was observed various aspects based on the topic under study

**A. Infrastructure**

- Computers, Internet, Automation software and Power backup

**B. System Functionality**

- OPAC, Circulation and Cataloguing

**C. User Interaction**

- Easy searching, Staff assistance, Delays and Satisfaction



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## APPENDIX IV

## BUDGET

| **ACTIVITIES** | **COST ANALYSIS** | **COST TOTAL** |
|---|---|---|
| Transport | 50,000 | 50,000/= |
| Secretarial service | 100,000 | 100,000/= |
| Stationary | 50,000 | 50,000/= |
| Binding | 2 copies@3000×2 | 6,000/= |
| **Total** | | **206,000/=** |



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## APPENDIX V

## TIME SCHEDULE

| ACTIVITIES | 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|---|
| Report at the library and get familiarization | | | | | | |
| Distribution of questionnaire and interviewing respondents | | | | | | |
| Observation the situation and collecting questionnaire and data analysis | | | | | | |
| Data interpretation and report writing. | | | | | | |



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# APPENDIX V

## APPROVAL LETTER

TANZANIA PARENTS ASSOCIATION
"KAOLE WAZAZI COLLEGE OF AGRICULTURE"

**REF NA. KWCA/WAZAZ/R/VO.1/ 04** **10/06/2026**

**TO:**
The Principal,
School of Library, Archives and Documentation Studies,
P.O. Box 227,
Bagamoyo
**Pwani**

**RE: APPROVAL FOR RESEARCH DATA COLLECTION**

With reference to your letter bearing Ref. No. **DA.201/457/VOL/1/20.**

This is to formally confirm that permission has been granted to Miss Mwajabu Hassani Athumani, a second-year student, to collect data for her research study at our institution.

We further assure you of our full cooperation and support to facilitate the successful completion of her research activities.

Yours faithfully,

Yeremiah Samson Ugula
Principal
**Kaole Wazazi- Bagamoyo**

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