

## Effect of Institutional Digital Repository Information Services on Utilisation of Library Resources by Postgraduate Students at Selected University Libraries in Kenya

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### Abstract

**Purpose:** Every year, Kenya does local studies worth billions of shillings, which are rarely disseminated outside of the institutions' office drawers and library shelves. Therefore, research findings should be shared for advancement right away. Institutional repositories are a significant recent development in the field of research exchange within libraries. Effective utilization of these services is essential for postgraduate students to access relevant resources, expand their knowledge, and complete quality research projects. However, gaps in the use of information services by postgraduate students have been observed, indicating the need for a deeper understanding of their usage patterns, preferences, and challenges. This study examines how postgraduate students in selected Kenyan universities utilise institutional digital repositories to support their academic needs.

**Methods:** The study was grounded in the Diffusion of Innovation Theory (DIT) focusing on 2,452 individuals - 2,372 postgraduate students and 80 librarians from the University of Embu, Kenya Methodist University, Kirinyaga University, Meru University of Science and Technology, and Chuka University. A random sampling technique was used to select a sample of 493 respondents, including 475 postgraduate students and 18 librarians. Data was collected through self-administered questionnaires for students and interviews with selected librarians to provide both quantitative and qualitative insights. Quantitative data was analysed using descriptive and inferential statistical methods, while qualitative data was presented narratively.

**Results:** Findings revealed that digital repository services ( $\beta=0.109$ ,  $p < 0.05$ ) had significant positive effects on library utilization.

**Conclusion:** The study concludes that Digital Institutional Repositories (DIRs) are essential in supporting postgraduate students' effective use of library services. It recommends the university management together with the ICT department should ensure the provision of reliable internet connectivity to facilitate the seamless use of digital resources, Initiative for regular training and workshops should be organised by the library administration. To provide librarians with knowledge of digital resources, information services, and efficient user support and service delivery. Additionally, Librarians should create more awareness of DIR functionalities among postgraduate students to maximize their engagement and benefit from these resources.

**Keywords:** *Library utilisation, Digital Institutional Repositories (DIRs), Information services*

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## 1.0 Introduction

The use of library resources and services by postgraduate students is crucial for academic achievement, these resources support advanced research, critical thinking, and knowledge creation. University libraries provide a range of services, including access to digital repositories, virtual reference services, and circulation services, knowledge management, document delivery among others which postgraduate students rely on for sourcing credible and relevant information for their studies. Effective use of these resources enables students to stay updated with current research, access specialized databases, and leverage expert guidance in navigating complex research topics. The implementation of Digital Institutional Repositories (DIRs) within universities serves as a cornerstone in preserving and disseminating scholarly output, embodying an institution's commitment to knowledge generation and accessibility (Henok & Wilson, 2019). DIRs host a variety of academic resources, including theses, dissertations, journals, books, and conference papers, making them vital tools for postgraduate students who rely on access to current, diverse, and relevant research. By bringing together students and institutional resources, DIRs offer an established structure through which academic content can be explored, accessed, and utilised. Tracking metrics such as downloads, views, and citation counts provide insights into usage patterns and help universities evaluate the impact and effectiveness of DIRs in meeting students' research needs (Mgonzo & Yonah, 2014; Nunda & Elia, 2019).

In Kenya and across other African nations, DIR usage has been growing, although the rate of adoption is slower than in developed countries due to challenges such as limited institutional policy support and funding (Makori et al., 2015; Henok & Wilson, 2019). Studies show that postgraduate students benefit significantly from DIRs, gaining exposure to a range of research topics that aid in the selection of novel areas of study, while also reducing the likelihood of duplicative research (Nunda & Elia, 2019). Despite these benefits, barriers such as lack of user awareness, inadequate technological skills, and insufficient resources can hinder DIR utilization (Patrickson Stewart & Newman, 2017). This study aimed to evaluate the effect of DIR information services on postgraduate students' use of library resources in selected university libraries in Kenya, exploring how DIRs can enhance access to resources and foster academic success.

## 1.1 Problem Statement

University libraries in Kenya, guided by standards from the Commission for University Education (CUE), provide essential digital institutional repository (DIR) services to support academic research and preserve scholarly output. However, underutilisation of these repositories, a trend seen in various African countries, limits postgraduate students' access to valuable research resources, which can negatively impact the quality of their work. Contributing factors include inadequate service delivery, budget constraints, poor digital repository content, network issues, and limited technology. This study aims to investigate the barriers to DIR utilisation among postgraduate students in selected Kenyan universities and explore strategies to improve their engagement with these critical resources. The study's objective was to evaluate the effect of digital institutional repository service on utilisation of library resources by postgraduate students in selected university libraries in Kenya.

## 2.0 Literature Review

Digital Institutional Repositories (DIR) are critical in universities, supporting the preservation of scholarly output and showcasing an institution's commitment to knowledge generation (Henok & Wilson, 2019). These repositories store dissertations, journals, books, and conference papers, which connect postgraduate students with valuable research resources. By organizing academic content systematically, DIRs enable students to engage with university research outputs, with usage often tracked by downloads, views, and citation data to evaluate student interaction with the material.

DIRs, defined as electronic storage of university-owned scholarly documents, hold important research materials such as grey literature, including reports and seminar papers (Mgonzo & Yonah, 2014; Nunda & Elia, 2019). These repositories help disseminate academic work, raise the institution's research profile, and prevent duplicate research by exposing students to a variety of studies. Furthermore, DIRs offer researchers more citation opportunities, increasing their visibility and standing in academia.

While DIRs are widely utilised in developed countries and parts of Asia, they are implemented more gradually in developing nations (Patrickson, Stewart & Newman, 2017). For example, a study in Finland found that postgraduate students actively use DIRs due to reliable computer and internet access, though international students from developing countries face challenges (Soltani & Nikou, 2020). African universities, including those in Namibia and Tanzania, show gradual DIR integration but face challenges due to limited management support and low deposition rates from authors (Henok & Wilson, 2019; Nunda & Elia, 2019).

User awareness, resources, and DIR content are pivotal in determining usage levels. For instance, postgraduate students prefer accessing theses, dissertations, and journal articles through DIRs. A lack of institutional policies, funding, and awareness can hamper the effective implementation of DIRs. Research from the University of Nairobi highlights the benefits of DIRs in enhancing research visibility and providing open access to learning resources, despite challenges like funding constraints, low internet connectivity, and copyright issues (Makori et al., 2015; Achieng, 2016).

## 2.1 Theoretical Review

This study used diffusion innovation theory. The theory was applied to assess if postgraduate students perceived these repositories as better than other sources of academic sources of information, examine how well these repositories integrate with the research and academic workflows of postgraduate students, understand the challenges the postgraduate students undergo while using the DIT, Look at whether students can do a trial exploration of the repositories, Assess the degree to which the student population can observe the benefits of accessing these repositories, This theory by Rogers focuses on how innovations, in this case, digital institutional repository information services are adopted and spread within a social system. The DIT theory provided insight into how institutional repositories have diffused and been adopted by postgraduate students. The theory was used to explore factors influencing the adoption rate of digital institutional repository services among postgraduate students, including the role of early adopters, and communication channels.

### 3.0 Methodology

This study utilised a descriptive and correlational research design to examine the influence of digital institutional repositories (DIRs) and other library information services on the utilisation of resources by postgraduate students. A descriptive quantitative approach was chosen to gather comprehensive data on postgraduate students' beliefs, attitudes, behaviors, and values related to DIR usage, while a correlational approach assessed the relationships between information services and library resource utilization. The research was conducted across five Kenyan universities - University of Embu, Kenya Methodist University, Kirinyaga University, Meru University of Science and Technology, and Chuka University - selected for their robust postgraduate programs and established library systems. The study's target population included 2,372 postgraduate students and 80 librarians, from which a sample size of 493 was determined using a random sampling technique for students and purposive sampling for librarians directly involved in DIR and other library services. The table below shows a sample for each category;

**Table 1: Sample Size for each Selected University**

| University          | Postgraduate Students |            | Librarians |           |
|---------------------|-----------------------|------------|------------|-----------|
|                     | Population            | Sample     | Population | Sample    |
| UoEM                | 434                   | 87         | 9          | 2         |
| KeMU                | 500                   | 100        | 11         | 3         |
| KyU                 | 350                   | 70         | 12         | 3         |
| MUST                | 438                   | 88         | 25         | 5         |
| CU                  | 650                   | 130        | 23         | 5         |
| <b>Total Sample</b> | <b>2372</b>           | <b>475</b> | <b>80</b>  | <b>18</b> |

Data collection was carried out through structured interviews with librarians and self-administered questionnaires for postgraduate students. The interview schedule, organized into five sections, facilitated an in-depth exploration of librarians' perspectives on DIR with questions aligned to the study's objectives. For students, questionnaires offered privacy and ease, divided into sections addressing background information, DIR, with responses on a 5-point Likert scale. A pre-testing was conducted at Tharaka University to test the reliability and relevance of the research instruments, leading to further refinement and validation of the data collection tools. The piloting also enabled the researcher to anticipate practical issues, such as timing and cost, for efficient implementation of the full study.

Qualitative analysis was performed to interpret non-numerical data, focusing on understanding the characteristics of responses through narrative analysis. Quantitative analysis, on the other hand, uses statistical methods, including regression and correlation analysis, to interpret numerical data. Descriptive statistics, such as percentages, frequencies, means, and standard deviations, were calculated using SPSS to extract meaningful insights. The findings were systematically presented in tables for clarity.

## 4.0 Results and Discussion

### 4.1 Descriptive Statistics

To evaluate the utilisation of institutional digital repository services by postgraduate students in selected university libraries in Kenya, the study measured these services based on its effectiveness and the satisfaction levels reported by the students.

#### 4.1.1 Satisfaction with Digital Institutional Repository Services

The study aimed to assess satisfaction with the usability and access of various types of digital institutional repository outputs provided by the library. It was assessed through a five-Likert scale where: very satisfied (VS = 1), satisfied (S =2), neutral (N = 3), dissatisfied (D=4), and very dissatisfied (VD = 5). Results are presented in Table 2.

Table 2: Satisfaction with Digital Institutional Repository Services at the University Libraries

|                        | VS (%) | S (%) | MS (%) | D (%) | VD (%) |
|------------------------|--------|-------|--------|-------|--------|
| Research Papers        | 66.0   | 21.7  | 2.5    | 3.5   | 5.3    |
| Thesis                 | 59.9   | 25.2  | 8.8    | 2.3   | 3.8    |
| Conference Proceedings | 49.6   | 21.9  | 20.2   | 6.5   | 1.8    |
| Datasets               | 53.4   | 25.7  | 13.9   | 4.8   | 2.3    |
| Multimedia content     | 49.6   | 26.2  | 16.9   | 4.8   | 2.5    |
| Valid N (listwise)     | 397    |       |        |       |        |

It is shown that the highest satisfaction is with research papers, where 66.0% of respondents are very satisfied and 21.7% are satisfied, leading to a combined satisfaction rate of 87.7%. Only 2.5% are moderately satisfied, and dissatisfaction is relatively low, with 3.5% dissatisfied and 5.3% very dissatisfied. This indicates that research papers are generally well-regarded for usability and access.

These also receive strong satisfaction ratings, with 59.9% very satisfied and 25.2% satisfied, totalling 85.1% positive feedback. About 8.8% are moderately satisfied, and a small percentage are dissatisfied (2.3%) or very dissatisfied (3.8%). This suggests that while most users are satisfied, there is room for improvement in accessing or using this content. Conference proceedings show a mixed satisfaction level, with 49.6% very satisfied and 21.9% satisfied, making a total of 71.5% positive responses. However, 20.2% are moderately satisfied, and 6.5% are dissatisfied, with 1.8% very dissatisfied. This indicates that while a majority are satisfied, there are notable concerns regarding access or usability. These results are supported by the study of Murithi, et al. (2020) who found that whereas postgraduate students found e-resources easy to access and download and were diverse, a good number of them were least satisfied with e-resources' relevance (42.9%) and sharing ability (37.7%).

Datasets are rated positively by 53.4% of very satisfied respondents and 25.7% who are satisfied, totalling 79.1%. However, 13.9% are moderately satisfied, and 7.1% report dissatisfaction, indicating that there may be issues with dataset accessibility or usability for some users. Multimedia content has similar satisfaction levels to conference proceedings, with 49.6% very satisfied and 26.2% satisfied, totalling 75.8%. About 16.9% are moderately satisfied, and 7.3% are dissatisfied, with 2.5% very dissatisfied. This suggests that while the content is generally well-received, there are areas that could be improved. Results on the high satisfaction levels are in support of the study of (Ogunbodede, et al., 2020) who found that postgraduate students consider institutional repository services as important places of learning and research activities.



#### 4.1.2 Effectiveness of Digital Institutional Repository Services

The study rated the perception of postgraduate students regarding digital institutional repository services on a five-Likert scale: strongly agree (SA = 1), agree (A=2), neutral (N=3), disagree (D=4), and strongly disagree (SD = 5). Table 2 presents results on evaluation of the rating of digital institutional repository scholarly outputs provided by the university library across six key dimensions: availability, currency, accessibility, timeliness, user support, and reliability.

**Table 3: Rating of Digital Institutional Repository Services Provided at the University Library**

|                                               | SA   | A    | N   | D   | SD  |
|-----------------------------------------------|------|------|-----|-----|-----|
| Digital content is available                  | 72.3 | 19.6 | 3.0 | 1.3 | 3.8 |
| Up-to-date information                        | 62.0 | 22.9 | 8.1 | 3.3 | 3.8 |
| Easily accessible                             | 65.0 | 22.2 | 5.5 | 2.8 | 4.5 |
| The services are timely                       | 63.0 | 21.4 | 8.3 | 3.5 | 3.8 |
| University library staff provide user support | 72.8 | 12.3 | 9.6 | 1.3 | 4.0 |
| The service is reliable                       | 68.8 | 16.1 | 9.8 | .5  | 4.8 |
| Valid N (listwise)                            | 397  |      |     |     |     |

It is seen that a significant majority of respondents, 72.3%, strongly agree that digital content is available, and 19.6% agree, leading to a combined positive rating of 91.9%. Only 3.0% are neutral, 1.3% are dissatisfied, and 3.8% are very dissatisfied. This high satisfaction rate indicates that the availability of digital content is a strong point of the repository.

Regarding the currency of information, 62.0% strongly agreed and 22.9% agreed that the information is up-to-date, totalling 84.9% positive feedback. However, 8.1% were neutral, 3.3% expressed dissatisfaction and 3.8% were very dissatisfied. This shows that while most users find the information current, there is some room for improvement.

For accessibility, 65.0% strongly agree and 22.2% agree, bringing the total positive rating to 87.2%. Neutral responses account for 5.5%, while 2.8% are dissatisfied and 4.5% are very dissatisfied. This indicates that while most users find the repository easy to access, there are occasional issues. According to Tsenga and Gichohi (2023), the study found that 58.2% of respondents learned about the institutional repository through the library website, 40.3% via library tours and orientation, 0.8% through email notices, and 0.6% from brochures. The findings suggest that library management should better utilise diverse marketing methods to promote the repository effectively.

On the timeliness of services, 63.0% strongly agree and 21.4% agree, resulting in an 84.4% positive rating. Neutral responses are at 8.3%, with 3.5% dissatisfied and 3.8% very dissatisfied. This shows that the repository generally provides timely services, though some users experience delays. Satisfaction with user support is high, with 72.8% strongly agreeing and 12.3% agreeing, totalling 85.1%. Neutral responses are 9.6%, with 1.3% dissatisfied and 4.0% very dissatisfied. This suggests that while most users are satisfied with the support provided by library staff, there are a few areas needing attention. Reliability is rated positively by 68.8% of respondents who strongly agree and 16.1% who agree, giving a total positive rating of 84.9%. Neutral responses are 9.8%, with only 0.5% dissatisfied and 4.8% very dissatisfied. This indicates that the repository is generally considered reliable, although a small

proportion of users experience reliability issues. The university library's digital institutional repository scholarly output was evaluated, revealing varied satisfaction levels among users. Overall, the repository's contribution to academic research was positively rated, indicating its effectiveness in providing accessible, high-quality scholarly resources, as highlighted by Wakaro (2018). However, specific areas may need improvement to enhance user experience and resource quality further.

#### 4.2 Regression Analysis

The model summary was important in showing the coefficient of determination (R-square) in the bid to establish the percentage change in library utilisation by postgraduate students, which was attributable to the provision of institutional digital repository services. Results are indicated in Table 4.

**Table 4: Regression Model Summary**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .167 <sup>a</sup> | .028     | .025              | .35930                     |

a. Predictors: (Constant), Repository services

Results show that R-square is 0.028, which means that the institutional digital repository services contributed to 2.8% variability in the utilisation of university libraries by postgraduate students.

The analysis of ANOVA was important in assessing the viability of the model in showing the relationship between the variables. The study results are shown in Table 5.

**Table 5: Regression ANOVA**

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.              |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| 1     | Regression | 1.456          | 1   | 1.456       | 11.282 | .001 <sup>b</sup> |
|       | Residual   | 50.993         | 395 | .129        |        |                   |
|       | Total      | 52.450         | 396 |             |        |                   |

a. Dependent Variable: Utilisation

b. Predictors: (Constant), Repository services

It is shown that  $F = 11.282$  ( $df = 1, 395$ ) and  $p = 0.001 < 0.05$ . Therefore, it is concluded that the model supported institutional digital repository services to predict the utilisation of library services.

The study conducted a regression of coefficients to establish how a change in one unit of institutional digital repository services affected utilisation of library services by postgraduate students in Kenyan universities. The results are presented in Table 6.

**Table 6: Regression Coefficients**

| Model                    | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|--------------------------|-----------------------------|------------|---------------------------|--------|------|
|                          | B                           | Std. Error |                           |        |      |
| (Constant)               | 1.563                       | .041       |                           | 38.159 | .000 |
| 1<br>Repository services | .075                        | .022       | .167                      | 3.359  | .001 |

a. Dependent Variable: utilisation

It is observed that the coefficient of institutional digital repository services is 0.075. It follows that a one-unit increase in institutional digital repository services was associated with 0.075 units rise in the utilisation library services. Further results show that the  $p = 0.001 < 0.05$ . Therefore, it is concluded that institutional digital repository services have a statistically significant effect on the utilisation of library services by postgraduate students in Kenyan universities.

The study aimed at examining the effect of institutional digital repository information services on utilisation of library resources by postgraduate students in selected Kenyan universities. Results reveal varied engagement levels with different types of scholarly content. Satisfaction with the usability and access of digital repository outputs is highest for research papers, with 87.7% of respondents expressing positive feedback. These also receive high satisfaction, with 85.1% of students satisfied. The findings indicate that while students are generally satisfied with access and usability, there is room for improvement, particularly with non-text-based content. The digital institutional repository is rated highly across various dimensions. Availability of digital content is the strongest aspect, with 91.9% of respondents expressing positive views. Accessibility (87.2%), timeliness (84.4%), and reliability (84.9%) also receive favourable ratings. This shows that while postgraduate students heavily rely on digital repository services, particularly research papers and theses, there are areas for enhancement, especially in accessibility and support for other types of scholarly outputs. Librarians noted that postgraduate students were satisfied with institutional repository services as they helped them access resources for research, manage data, and enhance research quality. Digital repository services had a positive and statistically significant effect on library utilisation by post-graduate students, ( $\beta = 0.109$ ,  $p < 0.05$ ).

## 5.0 Conclusion

The postgraduate students are satisfied with their universities' digital repository information services. Additionally, the study concludes that satisfaction with the digital repository information services has a statistically significant effect on the utilisation of library resources in Kenyan universities.

## 6.0 Recommendations

The study recommends that universities through their librarians organise tailored workshops and training for postgraduate students to enable them to utilise digital repositories to access useful resources and also store and disseminate their works. It is also recommended that universities offer effective and reliable internet connectivity, sufficient computer systems, and a steady power supply to enable postgraduate students fully utilise the digital repository



information services. The current study examined the effect of Institutional Digital Repository Information Services on Utilisation of Library Resources by Postgraduate Students in selected Kenyan university libraries. Future research is suggested to explore the role of information services in public and community libraries, conduct a comparative assessment of library resource utilisation in public versus private universities, investigate challenges affecting postgraduate students' access to information services, and compare the utilisation of library resources between postgraduate and undergraduate students in Kenyan universities.

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