

# University Libraries and the Use of Open Educational Resources (OERs) in Blended Learning (BL): Effective Strategies from Nairobi County Kenya

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Publication Date: 2025/07/29

**Abstract:** The study investigated the strategies for effective integration of OERs in BL environments in university libraries in Nairobi County. The technology acceptance model, diffusion of innovation, and institutional theory provided the theoretical framework. This survey research utilized a mixed-methods approach involving 2 public and 2 private universities, with a sample of 86 library staff and 4 librarians. Semi-structured questionnaires and interview guides were used to collect data and was analysed using SPSS™, thematic and content analysis. Critical strategies used in integrating OERs included; collaboration, linking OERs to institutional repositories, providing links to e-resources, search interface in the catalogue, OERs in reading lists, and integrating OERs in curriculum design. The lowest number of respondents that agreed was 43 (62.3%); the lowest mean (3.62) and the highest standard deviation (1.187), showed tendency toward large extent. Modern ICT to foster access to OERs, online repositories, and partnerships, fostered the successful integration of OERs in BL environments. The lowest number of participants indicating agreement was 48 (69.5%), with the lowest mean (3.74) and highest standard deviation (1.221), tending toward agreeing. It was evident that university libraries in Nairobi County used different strategies to adopt and integrate OERs in BL environments, with notable gaps that should be addressed for successful integration. The study recommended that university administrators and librarians should continue to build on technology, foster collaboration, training and capacity building, and avail different OERs to foster growth of BL. The findings are significant for researchers, librarians, university administrators and leaders, and policy makers.

**Keywords:** *Blended Learning (BL), Higher Education Institutions (HEIs), Nairobi County, Open Educational Resources (OERs), Strategies, University Libraries.*

**How to Cite:** Nyamboga Felysta Nyamusi; Gichohi Paul Maku; Kiarie Julie W. (2025) University Libraries and the Use of Open Educational Resources (OERs) in Blended Learning (BL): Effective Strategies from Nairobi County Kenya. *International Journal of Innovative Science and Research Technology*, 10(7), 2223-2229.  
<https://doi.org/10.38124/ijisrt/25jul985>

## I. INTRODUCTION

Blended Learning is a growing asynchronous teaching and learning format, driven by recent technological innovations and development (Lane et al., 2021). BL, according to Alnahdi (2019), leverages the traditional face-

to-face teaching and internet or online-based elements, resulting in more accessible and interactive teaching and learning environment. Making similar observations, Vallée et al. (2020) observed that BL must seamlessly transition from in-person to online teaching. Accordingly, it has become imperative to identify and use a combination of

resources to foster accessibility of learning and teaching strategies and materials to foster accessibility and improvements in the teaching and learning processes, such as OERs. More specifically, university libraries in Nairobi County provide critical services to enhance the teaching and learning process. To this end, these institutions, in line with global trends, have endeavoured to integrate OERs in BL environments. However, considering that these measures are in early stages, it is important to investigate the strategies and initiatives these institutions are using to integrate OERs in BL environments. The findings will inform improvements for optimal utilisation of OERs in BL environments.

### ➤ *Research Rationale*

The adoption and integration of OERs in university libraries in Kenya is in early stages (Ochieng & Gyasi, 2021). The study focused on libraries in private and public university libraries, addressed the limitations in current studies and publications, which focused on specific institutions, thereby providing more generalisable insights. Further, the findings, conclusions, and inferences provided insights into current practices and strategies university libraries have used to foster the adoption and use of OERs in BL environments. Compared to best practices elsewhere, the findings formed the basis for recommendations to improve current practices and strategies that these libraries have implemented. The findings are particularly important for scholars, university administrators, librarians and library staff, and policy makers at the regulatory level to foster informed decision-making to foster the successful implementation and use of OERs in higher educational institutions (HEIs).

## II. LITERATURE REVIEW

OERs have become an integral part of the contemporary educational systems. OERs include a wide range of easily accessible and sharable educational materials and resources, which are available to the public free of charge or at minimal cost (Nascimbeni et al., 2020; Vallée et al., 2020), which can potentially benefit teachers, learners, and educational institutions at various levels, especially higher education institutions (HEIs). OERs ensure the availability of high-quality learning materials, fosters inclusion in education by mitigating budgetary and financial constraints, and geographical barriers (Aguilar et al., 2022; Moody (2020). OERs also foster learning, creativity, and innovation (Crompton et al., 2020; Valverde-Berrocso et al., 2020). Reimers et al. (2020) summarised the benefits of OERs; they can potentially transform education by fostering open access to learning materials, and encouraging a culture of sharing and collaboration.

Recognizing the potential and benefits of OERs, governments, institutions, and other stakeholders have instituted measures to foster their accessibility and use in the education sector, particularly in HEIs, with 45 countries having enacted OER policies, including 21 countries having implemented national policies governing use of these resources (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2023). At the institution

level, HEIs like Massachusetts Institute of Technology (MIT) have the Open Courseware Project (Zhu & Kadirova, 2021), the University of California has in place the California Digital Open-Source Library [DOSL] (Thompson & Muir, 2020), and the University of British Columbia (Hysten, 2020). Similar patterns are evident in Africa, with the African Virtual University (AVU) and the Continental Educational Strategy for Africa showing strong efforts and drivers of the adoption and use of OERs within Africa, with Makerere University being one of the institutions using the AVU platform (Njagi, 2013; Idara, 2016). Locally, the Commission for University Education (CUE), has articulated the importance of ensuring equitable to different types of learning resources, which intimates the importance of adopting and integrating OERs to foster access by addressing any potential barriers and disparities (Karanja & Areba, 2025). These studies and reports demonstrate the sustained efforts to foster the adoption, integration, and continued use of OERs in HEIs to address various barriers that may inhibit equitable access to educational opportunities, such as geographical and financial or budgetary barriers.

Libraries play a critical role in the institutionalisation of OERs. Libraries collect, store, maintain, and share learning resources, with librarians playing a critical role in making OERs available to instructors and learners (Kolesnykova & Matveyeva, 2021). Virtual libraries are repositories of OERs and provide training for accessing and using resources, including advisories on licensing and copyright matters, and ensuring that the available OERs are compliant (Adu and van der Walt, 2022; Mncube & Mthethwa, 2022). As such, libraries play a critical role in the institutionalisation and successful use of OERs in BL environment.

To ensure the successful integration of OERs in BL, libraries have used various strategies to address potential challenges. While accessing OERs is important, the greatest challenge for users is identifying, locating, and applying information to address various information-related challenges (Nipa & Kermanshachi, 2020) and deficient library use and literacy skills (Ntaga, 2022; Shiferaw, 2019). HEIs have instituted strategies to address the challenges and barriers to effective and efficient use of OERs. These strategies include aligning OERs strategies with institutional goals to meet user needs fosters their continued adoption and use (Ellis et al., 2014); use of modern and innovative ICT infrastructure, including social media platforms, and training and capacity building (Ishtiaq et al., 2020; Rodés and Gewerc (2021); and using existing platforms and collaboration, such as MIT Open Courseware, MERLOT, and OER commons among others, can potentially foster the successful integration of OERs in HEIs (Kodua-Ntim & Fombad, 2020; de Hart et al., 2015; Kassim, 2019).

Evidently, while there have been studies across the globe, and in Kenya, there are limited studies focusing on the strategies libraries in Nairobi County have adopted for successful integration of OERs. The integration of OERs in BL environments in Kenya is in its nascent stages (Ochieng

& Gyasi, 2021), which was further complicated by limitations in extant literature. For example, the study by Adala (2016) is institutional specific, limiting the generalisability of the findings, while the study by Ochieng and Gyasi (2021) does not specifically focus on particular strategies that can inform best practices for libraries' integration of OERs. Similar limitations were evident in the studies by Njagi (2013) and Kwanya and Adika (2020) in which the methodological and scopes limit the generalisability of their findings to broader contexts. These limitations necessitate further holistic and contextual research to inform best practices and strategies to foster libraries successful integration of OERs in HEIs.

#### ➤ Theoretical Framework

The diffusion of innovations (DOI), technology acceptance model (TAM), and institutional theory, provided the theoretical framework. On one hand, the DOI, developed by Everett Rogers in 1962, provides a proposition for assessing the process through which new ideas and innovations are accepted in organisations at different phases (Antwi-Boampong, 2020; Pinho et al., 2021). The characteristics of individuals within organisations results in categorisation under innovators, early majority, late majority, and laggards, depending on how quickly they accept new innovations and ideas (Ezzatlo, 2020; Pinho et al., 2021). On the other hand, the TAM, developed by Fred Davis in 1989, explains individuals' readiness to accept and embrace technology driven by ease of use and the perceived benefits (Utami, 2021). From this perspective, users are more likely to quickly adopt and use technologies that are perceived to be more useful and easier to use, compared to more complex and less useful technologies (Ray et al., 2019; Shanmugapriya et al., 2023). Finally, the institutional theory, developed by John Meyer and Richard Scott in 1977, presents a lens through which to explore and explain how

organisations propagate norms, values, and ideologies, fostering homogeneity (Anthony et al., 2022; Antwi-Boampong & Bokolo, 2022). Combined, these theories provided a theoretical basis for exploring and interpreting how technology and organisational factors influenced the adoption and integration of OERs and the strategies used to ensure their successful integration in BL environments.

### III. METHODOLOGY

A mixed methods approach was used to collect data from the participants drawn from Nairobi University, Technical University of Kenya, Strathmore University, and the Catholic University of Eastern Africa. A mixed methods survey was used. A population sampling approach was used, which resulted in the inclusion of four (4) university librarians and eighty-six (86) library staffs being included in the study. Pre-testing the data collection instrument resulted in a Cronbach alpha of more than 0.7, which demonstrated validity and reliability in both sampled libraries (Kenyatta University and Mount Kenya University). The collected data was analysed using the Statistical Package for Social Sciences (SPSS®) version 25 and presented using tables.

### IV. FINDINGS

#### ➤ Response Rate and Demographics

A response rate of 80% was achieved, which was satisfactory, considering Babbie's (2020) observation that a 60% or more response rate is desirable. From the data collected data, Table 1 summarises the findings on the demographic characteristics of the participants in the study. Key: Education: Cert=certificate, Dip=Diploma, Bac=Bachelor's degree, Mas+=Master's degree and above. Gender: M=Male and F=Female. Tenure: A=0-5 years, B=6-10 years, C=11-15 years, and D=15+ years.

Table 1. Summary of Participants' Demographic Characteristics

Education				Gender		Tenure			
Cert.	Dip.	Bac.	Mas+	M	F	A	B	C	D
2	17	38	15	29	43	10	32	21	9

From the data collected, in terms of educational qualifications, two (2) of the participants held relevant certificate qualifications, seventeen (17) had diploma qualifications, thirty-eight (38) had a bachelor's degree, and fifteen (15) had a master's degree or greater qualifications. In terms of gender, twenty-nine (29) of the participants were male and forty-three (43) were females. Finally, in terms of the period the participants had served in their present capacity, ten (10) of the participants had been in the position for 0 to 5 years, thirty-two (32) had been in their position for 5 to 10 years, twenty-one (21) had been in their position for 11 to 15 years, and seven (9) had been in their position for more than 15 years.

#### ➤ Strategies for Integration of OERs

In line with the purpose of the study, the findings indicated that university libraries in Nairobi County had leveraged different strategies to foster the successful incorporation of OERs. Key strategies identified from the findings, including collaborative strategies, linking OERs to the institutional repositories, providing OERs links in the e-resources, providing search interface in the library catalogue, including relevant OER in reading lists, and integrating OER into curriculum design. The participants were provided with a list of currently used strategies and asked to indicate the extent to which they agreed with the statements. Table 2 summarises the findings from the participants' responses to the posed question, in line with the purpose of the study, where 1 stands for not at all, 2 for small extent, 3 for moderate extent, 4 for large extent, and 5 for a very large extent.

Table 2. Strategies for Incorporating OERs

Strategies	1	2	3	4	5	Mean	Std. Dev
Collaborative strategies	3 (4.3%)	4 (5.8%)	13 (18.8%)	34 (49.3%)	15 (21.7%)	3.78	0.998
Linking OER to the institutional repository	4 (5.8%)	7 (10.1%)	15 (21.7%)	28 (40.6%)	15 (21.7%)	3.62	1.113
Library provides an Open Educational Resources link in the e –resources	6 (8.7%)	4 (5.8%)	9 (13%)	30 (43.5%)	20 (29%)	3.78	1.187
Search interface in the library catalogue	4 (5.8%)	2 (2.9%)	15 (21.7%)	33 (47.8%)	15 (21.7%)	3.77	1.017
Relevant Open Educational Resources in the reading lists	4 (5.8%)	6 (8.7%)	13 (18.8%)	31 (44.9%)	15 (21.7%)	3.68	1.091
Integrating OER into curriculum design	1 (1.4%)	2 (2.9%)	13 (18.8%)	38 (55.1%)	15 (21.7%)	3.93	0.810

From the findings, a majority of the respondents, (large and very large extent), 49 (71.0%) of the library staff, agreed collaborative strategies supported the successful integration of OERs (Mean=3.78; Std.Dev=0.998); 43 (62.3%) linking OERs to institutional repositories (Mean=3.62; Std.Dev=1.113); 50 (72.5%); library provides a link to e-resources (Mean=3.78; Std.Dev=1.187); 48 (69.5%) search interface for locating OERs (Mean=3.77; Std.Dev=1.017); 48 (65.6%) providing OERs in reading lists (Mean=3.93; Std.Dev=0.810), were important strategies for successful integration of OERs. The lowest mean (3.62) and the highest standard deviation (1.187) indicated a tendency towards agreement that these factors contributed to

the integration of OERs to a large extent among all the respondents.

Further, the participants were asked to identify the specific strategies for integrating OERs in BL environments from a list of some of the strategies identified from the literature review. They were asked to indicate the extent to which they agreed to the importance of the strategies for successful integration of OERs in BL environments. Table 3 summarises the findings, where 1 stands for strongly disagree, 2 for disagree, 3 for neither agree or disagree, 4 for agree, and 5 for strongly agree.

Table 3. Strategies for Successful Integration of OERs in BL Environments

Strategies	1	2	3	4	5	Mean	Std. Dev
The library uses the modern ICTs so as to facilitate better access to local and global Open Educational Resources	1 (1.4%)	0 (0%)	3 (4.3%)	29 (42%)	36 (52.2%)	4.43	0.717
The university has online repository for research development.	0 (0%)	2 (2.9%)	3 (4.3%)	32 (46.4%)	32 (46.4%)	4.36	0.707
The library has adopted social network-with the advancement of technology such as YouTube, twitter and Facebook to support blended learning	0 (0%)	2 (2.9%)	11 (15.9%)	31 (44.9%)	25 (36.2%)	4.14	0.791
Strategies	1	2	3	4	5	Mean	Std. Dev.
University library has employed institutional repositories and websites that support direct instruction.	1 (1.4%)	2 (2.9%)	6 (8.7%)	34 (49.3%)	26 (37.7%)	4.19	0.827
University library has employed institutional repositories and websites that support virtual interaction.	2 (2.9%)	2 (2.9%)	8 (11.6%)	34 (49.3%)	23 (33.3%)	4.07	0.913
University library employed institutional repositories and websites that support digital learning	2 (2.9%)	3 (4.3%)	7 (10.1%)	32 (46.4%)	25 (36.2%)	4.09	0.951
The library adopted general and global repositories to supporting direct instruction	2 (2.9%)	3 (4.3%)	14 (20.3%)	23 (33.3%)	27 (39.1%)	4.01	1.022
The library adopted general and global repositories to supporting Virtual interactions	6 (8.7%)	4 (5.8%)	14 (20.3%)	23 (33.3%)	22 (31.9%)	3.74	1.221
The library adopted general and global repositories to supporting digital resources	2 (2.9%)	4 (5.8%)	10 (14.5%)	33 (47.8%)	20 (29%)	3.94	0.968
Strategies	1	2	3	4	5	Mean	Std. Dev.
The institution collaborates with international organizations like the AVU	2 (2.9%)	6 (8.7%)	13 (18.8%)	29 (42%)	19 (27.5%)	3.83	1.028
The institution partners with top distance learning institutions in Africa and worldwide	3 (4.3%)	3 (4.3%)	11 (15.9%)	35 (50.7%)	17 (24.6%)	3.87	0.984



As shown in Table 3, a majority of the participants agreed (agree and strongly agree) that all the strategies were critical for the successful integration of OERs in BL environments; 65 (94.2%) agreed that the library uses modern ICT to ensure access to local and global OERs (Mean=4.43; Std.Dev=0.717). Similar patterns were evident for the other factors, where at least 70% in all the other strategies, indicated that they agreed the strategies facilitate the successful integration of OERs in BL environment. The lowest mean (3.83) and the highest standard deviation (1.221) indicated a tendency toward agreeing that these strategies were important for successful integration of OERs in BL environments.

The qualitative responses echoed the quantitative findings; Library Staff 12 and Library Staff 28 identified the use of digital institutional repositories as one of the strategies for integrating OERs. Library Staff 52 and 63, and Librarian 1 identified collaborations with faculty as key contributors to the successful integration of OERs in BL environments. The importance of technology was articulated by Librarian 1, who observed, “*The university ensures awareness about OER and implementing the required infrastructure, such as ensuring continuous availability of internet connectivity.*” These sentiments are echoed by Librarian 3, who said, “*The library has set up relevant ICT infrastructure.*” Training and capacity development were also a key theme that emerged from a content and thematic analysis of findings from the qualitative responses. For example, Librarian 2 and 3 articulated the importance of libraries and institutions providing training to foster the integration of OERs in BL environments.

## V. DISCUSSION OF FINDINGS

These findings on the strategies for integration of OERs and successful integration of these resources in BL environments, are in line with current studies and reports. For example, the findings on the importance of collaborations as a part of the strategies to foster successful integration of OERs are also captured by de Hart et al. (2015) and Ntaga (2022), who concluded that collaboration with faculty can foster libraries’ efforts to integrate OERs. Similarly, the findings on the significance of integration of OERs into existing resources are backed by the findings by the conclusions drawn by Ntaga (2022) and Ellis et al. (2014), while Ishtiaq et al., (2020) and Saliu et al. (2022) articulated the importance of leveraging technology and ICT infrastructure to foster the successful integration of OERs in BL environments.

The findings that a majority of the respondents agreed with different strategies for integration of OERs in BL environments can be interpreted from the perspectives of the DOI theory and TAM. Through this lens, the findings imply that library staff and librarians embraced new ideas and technology and other related innovations, such as local and global repositories. These findings are in line with the observations in other studies that new technologies, innovations, and ideas support endeavours to improve

services delivery in libraries (Antwi-Boampong, 2020; Shanmugapriya et al., 2023).

Through institutional theory lens, a combination of different factors, norms and values, contribute to the successful adoption of new ideas. For example, fostering collaboration and training and capacity development, also significantly contribute to the successful implementation of OERs (Antwi-Boampong & Bokolo, 2022). While a majority agreed with the identified factors, some of the participants disagreed, which indicates gaps in the use of the identified strategies in fostering the successful integration of OERs in BL environments, implying a need for libraries to continue improving on instituted strategies (Nyamboga et al. AI, 2024)

## VI. CONCLUSION

University libraries in Nairobi County have instituted and implemented various measures to foster the successful integration of OERs in line with global trends. To successfully integrate OERs in BL environments, libraries are currently using relevant strategies, but should continue investing in innovative technologies, including social media platforms, foster collaboration between library staff and faculty and other institutions, and expand online repositories. More specifically, HEIs administrators and librarians should focus on benchmarking and working with institutions that have successfully implemented OERs in BL environments.

## VII. IMPLICATIONS OF FINDINGS

These findings have significant practical implications. Primarily, the findings provide an understanding of the current strategies instituted by university libraries, which librarians can leverage to improve current strategies to foster the successful integration of OERs in BL environments. Further, university administrators and leaders can use the findings to make resources allocation to improve library services and ensure better experiences for different categories of library users, particularly learners and members of faculty. Policy-makers can use the findings to develop standards, regulations, and policies to guide the adoption and use of OERs in universities to support the continued use of BL. Finally, the findings contribute to growing development of knowledge, theories, and further research to understand how specific factors contribute to the successful integration of OERs in BL environments.

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