



Exploring lifelong learning and knowledge management: Adult Education and Institutional Repositories in Maharashtra

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Abstract

In an era of rapid technological change and information proliferation, lifelong learning and effective knowledge management have become crucial for personal, professional, and societal development. In India, and specifically in the state of Maharashtra, adult education programs and institutional repositories are emerging as key components in addressing educational disparities and promoting equitable access to knowledge. This study investigates the intersection of lifelong learning initiatives and the role of institutional repositories in supporting adult education across Maharashtra.

The primary objective of the study is to evaluate how institutional repositories (IRs), typically hosted by universities and educational institutions, contribute to the knowledge needs of adult learners and educators involved in continuing education. The study also aims to assess the effectiveness of current adult education programs in fostering a culture of lifelong learning and their integration with digital knowledge platforms.

A mixed-methods approach was adopted, including qualitative interviews with adult learners, educators, and repository administrators, along with quantitative analysis of repository usage data from selected institutions across Maharashtra. Policy documents, educational frameworks, and digital literacy initiatives were also reviewed to contextualize the findings.

The research reveals that while adult education initiatives in Maharashtra are gradually expanding, they often lack integration with institutional repositories that could enhance access to relevant, localized, and open educational resources. Repositories remain underutilized due to limited awareness, digital literacy gaps, and infrastructural challenges, especially in rural areas. However, institutions that have effectively linked their repositories with community learning programs demonstrate improved learning outcomes and engagement among adult learners.

The study concludes that a strategic alignment between lifelong learning programs and institutional knowledge systems is essential for sustainable education in the region. Recommendations include increased investment in digital infrastructure, capacity building for repository management, and targeted outreach to adult learner populations. These measures can transform institutional repositories into powerful tools for inclusive and continuous education.

Keywords: Lifelong Learning, Adult Education, Institutional Repositories, Knowledge Management, Maharashtra, Digital Literacy, Educational Access, Continuing Education

Introduction

In today's dynamic and information-driven world, the concept of education has expanded far beyond the traditional classroom setting. Lifelong learning—the ongoing, voluntary, and self-motivated pursuit of knowledge for personal or professional development—has become essential in navigating rapid technological advancements, changing job markets, and evolving societal needs. This shift in the understanding of education demands not only new pedagogical approaches but also robust systems of knowledge management to ensure that information is accessible, relevant, and usable across all age groups. In the context of India, and more specifically the state of Maharashtra, adult education and institutional repositories (IRs) have emerged as crucial yet underexplored components of this transformation.

India's adult population represents a significant portion of its demographic profile. According to the 2011 Census, over 69% of India's population is aged 15 years and above, with a substantial number lacking access to formal educational qualifications. Despite several national initiatives such as the *Saakshar Bharat Mission* and *National Literacy Mission*, adult literacy continues to pose a serious challenge. Maharashtra, one of India's most industrialized and urbanized states, reflects a mixed picture. While urban areas

show commendable educational indicators, rural and marginalized communities still grapple with low literacy rates and limited access to continuous learning opportunities. As per the 2011 Census, the literacy rate in Maharashtra was 82.3%, but disparities persisted across regions and genders—with rural female literacy lagging behind at 65.6%.

This gap in lifelong learning is further complicated by the underutilization of digital knowledge systems, particularly institutional repositories hosted by universities, research organizations, and public institutions. Institutional repositories serve as digital archives where educational institutions store, preserve, and disseminate academic resources such as theses, research papers, teaching materials, and open educational resources (OERs). Ideally, these repositories should act as bridges between formal knowledge systems and informal learning communities, including adult learners. However, in the Indian context, the potential of IRs remains largely untapped outside academic and research circles. This limits the reach and impact of publicly funded educational content, especially in underserved regions.

The importance of this research lies in its attempt to examine the synergy between two significant, yet often siloed, components of the knowledge ecosystem: adult

education and institutional repositories. While both aim to enhance learning and knowledge dissemination, they operate in largely parallel spheres with minimal intersection. The implications of integrating institutional repositories into adult education initiatives are manifold. They could help democratize access to knowledge, promote regional and language-specific content creation, and reduce dependency on traditional educational infrastructures. In a state like Maharashtra—with its diverse geography, multilingual population, and technological capacity—the convergence of these elements offers promising pathways for inclusive and sustainable education.

Existing literature on adult education in India largely focuses on literacy campaigns, community learning centers, and skill-based programs. Much of it has highlighted the persistent challenges faced by adult learners: social stigma, opportunity costs, gender bias, lack of motivation, and inadequate infrastructure. On the other hand, literature on institutional repositories in India tends to emphasize technical implementation, metadata standards, copyright issues, and digital preservation within academic institutions. Few studies have explored the potential of IRs to support lifelong learning or adult education at the grassroots level. Even fewer have examined this intersection in a regional context like Maharashtra.

For instance, research on adult literacy programs in rural Maharashtra often documents the role of government-sponsored centers, NGOs, and mobile learning initiatives. However, these studies typically overlook the role that universities and higher education institutions can play in supporting such initiatives through their digital repositories. Similarly, studies on Indian institutional repositories often assess their compliance with international metadata standards or their role in promoting open access, but rarely link their functions to broader societal education goals.

This disconnect represents a significant research gap. There is little to no empirical work exploring how institutional repositories can be leveraged to enrich adult education content, enable contextual learning, and facilitate community-based knowledge sharing. Moreover, the user demographics of IRs in India are rarely analyzed to identify non-traditional users such as adult learners, vocational educators, or community mentors. As India increasingly embraces digital education platforms—especially post-COVID-19—it becomes imperative to understand how these platforms can serve populations beyond the university walls.

Methods

This study was designed to explore the intersection between lifelong learning, adult education, and the use of institutional repositories (IRs) in Maharashtra. The research methodology was carefully structured to allow a comprehensive understanding of how institutional repositories are utilized in the context of adult education and what barriers or opportunities exist for expanding this integration. A mixed-methods approach was employed, combining both qualitative and quantitative techniques to capture rich, diverse data and ensure the results were robust and well-rounded.

Research Design

The research followed a mixed-methods design, integrating both qualitative and quantitative approaches to provide a balanced perspective. The quantitative component aimed to

collect numerical data related to usage trends, access frequency, and digital reach of institutional repositories. Meanwhile, the qualitative component aimed to gain in-depth insights into the experiences, challenges, and attitudes of adult learners, educators, and institutional administrators toward lifelong learning and digital knowledge platforms. This dual approach allowed for the triangulation of data and enhanced the validity of the study's conclusions.

Population and Sampling Method

The target population for this study included three main groups:

1. Adult learners (aged 25 and above) enrolled in non-formal education programs across Maharashtra.
2. Educators and facilitators involved in adult education, literacy missions, or continuing education programs.
3. Institutional repository administrators and academic staff responsible for digital knowledge management in higher education institutions.

To select participants, a purposive sampling strategy was employed. This approach was chosen because the study focused on specific individuals who had direct experience or involvement with adult education or digital repositories. In total, the study engaged with:

- 150 adult learners from 10 districts across Maharashtra, representing urban, semi-urban, and rural regions.
- 30 educators and facilitators from adult education centers and NGOs.
- 15 institutional repository administrators from universities and colleges across the state.

Care was taken to ensure gender, regional, and educational diversity in the sample to reflect Maharashtra's varied sociocultural landscape.

Data Collection Tools

To capture both objective and subjective data, the following tools were used:

1. Structured Surveys

A structured questionnaire was designed for adult learners to gather quantitative data on their access to institutional resources, familiarity with digital tools, frequency of repository use, and perceived barriers. This survey included both closed-ended and Likert-scale questions.

2. Semi-Structured Interviews:

In-depth interviews were conducted with educators and repository managers to understand their perspectives on how repositories are being used or could be better integrated into adult education. These interviews allowed for open-ended responses and followed a flexible question guide to encourage elaboration.

3. Document and System Analysis

Institutional repositories from six major universities were analyzed to gather usage statistics, content type distribution, language availability, and user engagement data. This included login frequency, document downloads, and keyword search patterns over a 12-month period.

4. Focus Group Discussions (FGDs)

Three FGDs were organized with groups of adult learners to probe deeper into challenges related to digital access, language barriers, and usability of online resources.

5. Field Observations

Researchers conducted direct observations at selected adult education centers and community learning spaces. These observations helped assess the availability of infrastructure such as internet connectivity, computer labs, and digital support staff.

Analytical Tools and Software Used

Quantitative data from the surveys were analyzed using SPSS (Statistical Package for the Social Sciences). Descriptive statistics such as frequencies, percentages, and means were calculated to summarize survey responses. Cross-tabulations were also used to explore relationships between demographic factors (age, location, education level) and digital repository usage.

For the qualitative data, NVivo software was used for thematic coding and analysis of interview transcripts, FGDs, and field notes. Thematic analysis helped identify recurring patterns, concerns, and sentiments related to digital engagement and adult education practices.

Repository system usage data were exported into Excel and cleaned for analysis. Key metrics such as monthly visits, most accessed documents, and user interaction time were calculated to evaluate repository utilization.

Statistical and Analytical Techniques

Several statistical and qualitative techniques were applied:

- **Descriptive Analysis:** Used to summarize basic characteristics of the survey respondents and usage patterns.
- **Correlation Analysis:** Applied to explore associations between digital literacy levels and repository usage frequency.
- **Thematic Coding:** Used in NVivo to group qualitative data into meaningful themes such as “barriers to access,” “repository relevance,” “language limitations,” and “digital confidence.”
- **Comparative Analysis:** Conducted between urban and rural learners to identify disparities in access and usage.
- **Trend Analysis:** Usage data from institutional repositories was analyzed to identify patterns over time and understand content demand.

Ethical Considerations

Ethical compliance was prioritized throughout the research process. The study received ethical clearance from the internal review board of the lead research institution. The following ethical safeguards were implemented:

- **Informed Consent:** All participants were provided with a plain-language consent form outlining the study’s purpose, their rights, and how their data would be used. Only those who provided written or verbal consent were included.
- **Anonymity and Confidentiality:** Names and personal identifiers were removed during transcription and data analysis. Participants were assigned unique codes to maintain anonymity.

- **Voluntary Participation:** All participants were informed that their involvement was voluntary and that they could withdraw at any time without consequence.
- **Data Security:** All digital data were stored on encrypted, password-protected devices. Paper records were locked in secure storage.
- **Cultural Sensitivity:** Interviews and surveys were conducted in participants’ preferred languages (Marathi, Hindi, or English), and interpreters were used when necessary to avoid linguistic exclusion.

Limitations of the Methodology

While the research design was rigorous, a few limitations were acknowledged:

- **Access Constraints:** In some rural areas, limited internet access hindered real-time system analysis or participation in surveys.
- **Self-Reporting Bias:** Survey responses may be influenced by participants’ desire to give socially acceptable answers, especially regarding digital skills.

Interpretation of Findings

The data showed that institutional repositories, despite being rich in educational content, are significantly underutilized by adult learners in Maharashtra. Survey results indicated that only about 22% of adult learners had ever accessed an institutional repository, and those who did largely belonged to urban areas with better digital infrastructure and literacy. This low engagement contrasts sharply with the widespread acknowledgement among educators and repository administrators that IRs have the potential to provide valuable open-access resources tailored to adult education needs. The qualitative interviews revealed multiple barriers, including limited digital skills, lack of awareness, language challenges, and inadequate internet access, especially in rural regions.

These findings suggest a disconnect between the availability of digital repositories and their effective use within lifelong learning frameworks. The trend is consistent with prior studies in similar developing contexts where infrastructural and socio-economic factors limit the reach of digital education platforms. For instance, research on digital inclusion in India has repeatedly pointed out that digital literacy and access remain uneven, particularly for marginalized and rural populations. The current study reinforces these observations, highlighting that digital repositories alone cannot foster lifelong learning without complementary efforts to build capacity and awareness.

Comparison with Previous Research

The underutilization of institutional repositories aligns with findings from several earlier studies on knowledge management and adult education. Previous research has often highlighted the gap between resource availability and actual learner engagement in developing regions. For example, studies on e-learning adoption in adult education report that technology access does not guarantee effective use unless accompanied by supportive pedagogical frameworks and user training.

However, this study adds nuance by demonstrating how certain universities and educational centers in Maharashtra

have successfully bridged this gap by integrating IRs with community education programs. These cases reflect a positive shift, showing that targeted outreach and localized content curation can significantly enhance learner engagement. This finding supports emerging literature emphasizing the role of contextual relevance and community involvement in digital learning initiatives. Interestingly, while most prior studies focused on institutional or policy-level perspectives, this research foregrounded the voices of adult learners themselves. The learners' narratives revealed a strong desire for accessible, practical knowledge, yet also deep frustrations with the complexity and language barriers of existing digital repositories. This insight contrasts with some literature that assumes digital repositories are inherently user-friendly and accessible. Therefore, the study challenges assumptions about digital literacy levels among adult learners and calls for more user-centric design approaches.

Implications of the Results

The implications of these findings are multi-fold. First, they underline the critical need for integrating institutional repositories within the broader ecosystem of adult education, particularly through programs that emphasize digital literacy and tailored content. The study suggests that lifelong learning policies in Maharashtra should prioritize building digital infrastructure, especially in rural areas, and promoting repository awareness through community outreach.

Second, the results point to the importance of language and cultural localization in repository content. The predominance of English in many repositories restricts access for Marathi-speaking learners, highlighting the necessity of multilingual platforms to ensure inclusivity. Additionally, repository administrators should collaborate with adult educators to curate resources that align with the practical learning needs of adult learners, such as vocational training materials, health education, and legal literacy.

Third, the positive outcomes observed in institutions that have successfully linked repositories with community programs provide a replicable model for other regions. These initiatives demonstrate how institutional commitment and localized engagement can transform digital repositories from passive archives into active learning hubs.

Possible Explanations for Unexpected Outcomes

One unexpected outcome was the relatively higher engagement of some rural adult learners compared to their urban counterparts in specific contexts. This anomaly appeared in areas where local NGOs or educational institutions had implemented targeted digital literacy workshops combined with repository access training. These pockets of success indicate that when structural barriers are mitigated through active intervention, adult learners can quickly adopt and benefit from digital knowledge resources. Another surprising finding was the hesitance of some educators to fully embrace institutional repositories despite recognizing their value. Interviews revealed concerns about the relevance of repository content to adult education curricula and the perceived complexity of repository management. This suggests a need for capacity building not just among learners but also among educators and repository administrators, emphasizing training that aligns repository content with pedagogical goals.

Study Limitations

Several limitations impacted the study's scope and generalizability. The sample size, while diverse, was limited to 150 adult learners and 45 educators and administrators, which may not fully represent the entire adult education landscape in Maharashtra. Additionally, data access from institutional repositories was constrained to six universities, limiting the breadth of system analytics. Internet and digital access issues restricted some participants' ability to engage fully with online surveys or repository platforms, potentially biasing results toward more digitally literate individuals. Furthermore, the study focused primarily on institutional repositories within higher education settings and did not extensively cover other digital knowledge platforms such as government portals or private e-learning resources. This narrowed focus, while intentional, limits the understanding of how adult learners might engage with other knowledge management systems.

Recommendations for Future Research

Building on this study, future research could expand the sample size and geographical coverage to include a wider variety of institutional repositories and adult education contexts, including government and NGO-led programs. Longitudinal studies would be valuable to track changes in digital literacy and repository use over time, especially as infrastructure improves and policy interventions take effect. Further investigation into the design and usability of institutional repositories from the learner's perspective is recommended, including user experience testing and participatory design approaches. Research could also explore the potential of mobile-based repository access, given the high penetration of smartphones even in rural areas.

Additionally, comparative studies between different states or regions in India could shed light on contextual factors influencing repository integration in adult education. Finally, more in-depth analysis of the content relevance and pedagogical alignment of repositories with adult learning objectives would help optimize these platforms for lifelong learning purposes.

Despite these limitations, the methodological framework was robust and replicable. The combination of quantitative rigor and qualitative depth enabled a holistic exploration of how institutional repositories can support adult education and lifelong learning in Maharashtra.

In summary, this methodical approach provided the groundwork for analyzing complex, interrelated issues in digital education access. It allowed for the collection of both objective data (such as system usage statistics) and subjective insights (such as learner experiences), resulting in a well-rounded understanding of the current landscape and challenges in knowledge management and adult learning.

Conclusion

This study highlights the significant potential of institutional repositories to enhance lifelong learning and adult education in Maharashtra, while also revealing the current gaps in their effective utilization. The main conclusion is that although repositories contain valuable educational resources, their impact is limited by factors such as low digital literacy, lack of awareness, inadequate infrastructure, and language barriers among adult learners, particularly in rural areas. The research contributes to the field by

providing a nuanced understanding of these challenges from both the learners' and educators' perspectives, emphasizing the need for a more integrated and user-centered approach to digital knowledge management.

Practically, the findings suggest that policy-makers and educational institutions should prioritize investments in digital infrastructure and capacity-building initiatives to empower adult learners and educators alike. Multilingual repository content, localized outreach programs, and stronger collaboration between repository managers and adult education providers are essential steps to maximize the benefits of these knowledge systems.

Ultimately, this study underscores the importance of viewing institutional repositories not just as digital archives but as active, accessible tools that can drive inclusive and continuous education. Strengthening this link is vital to fostering a culture of lifelong learning that can contribute to personal development, social equity, and broader educational progress in Maharashtra and similar contexts.

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