Landscape of Open Access Repositories with Special Reference to Electronic Theses and Dissertations (ETD) across SAARC and BRICS Nations: A Comparative Analysis

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Abstract:

Research Outputs stored as softcopy and archived through Open-Access is getting with momentum across the globe. Academic and Research Institutes, meticulously following the research guidelines and policies, are systematically producing and storing research results in sophisticated ETDs in almost every nation. In the digital age, global visibility of research is crucial, with Electronic Theses and Dissertations (ETDs) playing a vital role. Open Access Repositories (OARs) have gained traction, led by Europe, North America, and increasingly by Asia. Key repositories like ProQuest Dissertations & Theses Global and DART-Europe are instrumental in this movement.

Noteworthy ETD repositories in SAARC and BRICS nations which include Shodhganga in India maintained by INLFIBNET Centre, the Digital Archive on Agricultural Theses and Journals in Bangladesh, Pakistan Research Repository, and Biblioteca Digital Brasileira de Teses e Dissertações in Brazil. Starting little late in 2010, India gradually created its Repository and stands out for its substantial contributions to the ETD landscape. (Open ROAR). However, a few challenges remain in establishing comprehensive ETD repositories, given the diverse characteristics of these nations in terms of population size and higher education institutions. Structure and architecture of ETDs, workflow of submissions and authentication, Metadata Standards used, harvesting methods

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implemented, scalability and interoperability, DRM issues etc. are major concerns while comparing the ETDs across the globe. In order to find out the commonalities and differences, a detailed analysis of ETD repositories across SAARC and BRICS nations is essential.

Keywords: Open Access (OA), Electronic Theses and Dissertations (ETDs), Institutional Repositories, Shodhganga, SAARC, BRICS.

Introduction

The rise of Open Access Repositories (OARs) has greatly advanced academic growth and global knowledge dissemination. These repositories are particularly important for developing countries in SAARC and BRICS, ensuring broader access to their academic contributions. Electronic Theses and Dissertations (ETDs) play a vital role in this effort, as they often contain groundbreaking research that may not be published through conventional channels (Panneerselvam, 2015). Countries like India, with 1.45 billion people and 43.3 million students, and China, with 1.41 billion people and 41 million students, underscore the large academic pools in these regions (World Bank, 2022). Other nations like Bangladesh, Pakistan, and Russia also highlight the need for accessible platforms to share knowledge.

India leads in South Asia with its national ETD repository, Shodhganga, managed by INFLIBNET Centre, which has archived over 5,35,000 theses from more than 1,000 universities (Shodhganga, 2024). Supported by UGC regulations, this initiative has increased the global visibility of Indian research (Manojkumar & Arora, 2015). Despite such progress, significant differences in repository development persist across SAARC and BRICS countries. For instance, Bangladesh has 16 repositories, while India leads

with 109. In the BRICS group, Brazil has the highest number with 175, followed by India, China, South Africa, and Russia (OpenDOAR, 2024). The disparity in repository infrastructure reflects varying levels of resources and commitment to open access.

Technological infrastructure, such as platforms like DSpace and EPrints, has been instrumental in managing large academic outputs, though challenges remain, particularly in countries like Bangladesh and Sri Lanka, where centralized electronic thesis libraries are still developing (Gupta & Gupta, 2014). Ensuring global accessibility of scholarly work is essential, especially given the vast academic potential of these regions. This study aims to identify effective practices in repository development and explore how SAARC and BRICS nations can collaborate to enhance access, promote innovation, and contribute more effectively to global knowledge-sharing.

2. Literature Review

The rise of digital technologies has greatly transformed the dissemination of academic research, with Open Access Repositories (OARs), particularly Electronic Theses and Dissertations (ETDs), playing a vital role in archiving graduate research. This literature review explores the development and challenges of ETD repositories, focusing on six key themes: software infrastructure, metadata standards, copyright policies, subject coverage, language diversity, and challenges across SAARC and BRICS nations.

The Shodhganga initiative in India has been instrumental in enhancing ETD visibility. According to Panda (2016), by mid-2015, over 40,000 theses had been deposited from 217 universities. The repository has not only increased research accessibility but has also emphasized academic integrity through plagiarism detection tools like iThenticate and Turnitin (Manojkumar & Arora, 2015). Top contributors include Jawaharlal Nehru University and Anna University (Sivakumaren, 2015), and

significant contributions come from central universities across disciplines (Jhamb & Samim, 2017). Shodhganga also reflects India's linguistic diversity (Biswas, 2017), with regional participation notable, especially from Madhya Pradesh (Khode, 2020). However, challenges such as best practices in repository development remain (Lihitkar & Lihitkar, 2014).

Comparative perspectives across SAARC and BRICS nations show both similarities and differences in ETD repository development. Panneerselvam (2015) compares Shodhganga with similar repositories in Bangladesh and Pakistan, while Ardalan & Feyzbaksh (2011) highlight institutional involvement in Iran's ETD initiatives. Global benchmarks, as examined by Funamori (2015) and Nazim (2018), reveal challenges in metadata standards, copyright policies, and repository adoption in these regions.

Metadata standards and interoperability are crucial for enhancing research visibility. Indian repositories, as noted by Chatha (2016), have adopted Dublin Core, which aids in discoverability. However, variations in metadata across SAARC and BRICS nations, discussed by Das & Saikia (2014) and Nazim (2018), pose challenges to interoperability. A harmonized framework is essential to ensure seamless integration and global accessibility of research outputs.

Copyright policies also vary across these regions. Shodhganga enforces strict copyright policies, integrating tools like iThenticate and Turnitin to ensure research originality (Manojkumar & Arora, 2015). Ardalan & Feyzbaksh (2011) and Cayabyab (2015) note that different nations approach the balance between open access and intellectual property in various ways, highlighting the complexities of copyright management in ETD repositories.

In terms of subject coverage and language diversity, Shodhganga mirrors India's multilingual landscape, offering a broad range of subjects (Biswas, 2017). Regional language support in repositories like Shodhganga increases inclusivity (Khode, 2020), though the extent of coverage often depends on institutional resources (Rani, 2019).

Lastly, several challenges and opportunities exist in the development of ETD repositories. Gupta & Gupta (2014) identify issues such as ensuring widespread institutional participation and overcoming

technological limitations. Cayabyab (2015) stresses the need for advanced repository technologies to address these challenges, while Nazim (2018) advocates for expanding the reach of ETD repositories to foster broader academic collaboration across regions.

3. Objectives

1. To compare open access ETD repositories in SAARC and BRICS countries, focusing on subject coverage and regional language contributions.

2. To investigate the software used for open access ETD repositories across SAARC and BRICS nations.

3. To analyze copyright policies relevant to open access ETD repositories across SAARC and BRICS nations.

4. To evaluate persistent metadata standards within the open access ETD repositories across SAARC and BRICS nations.

The available Open-Access ETD repositories under Open ROAR/DOAR are examined for deriving the sample size for analysis. The study employs a systematic approach for ETD data collection and analysis. It identifies active ETD repositories based on accessibility and content relevance. Information on software platforms, copyright policies, metadata standards, and subject coverage are gathered. Both thematic analysis and quantitative methods are used to identify patterns and trends.

5. Research Limitations

The data for this research were sourced from OpenDOAR, using advanced search features to filter repositories by country, type (Institutional, Disciplinary, Aggregating, Governmental), and content (Theses and Dissertations). Information such as repository name, software platform, creation year, OAI-PMH availability, type, subject focus, and language was analyzed directly from OpenDOAR.

Additional critical data such as content size, copyright licenses, and metadata standards were analyzed based on accessibility status, categorized as "Restricted" or "Access." Countries included in

this study were India, Brazil, Sri Lanka, China, Nepal, Bangladesh, South Africa, Russia, and Pakistan. For example, India had 35 restricted and 26 accessible repositories, while Brazil had 42 restricted and 82 accessible repositories.

However, the research is limited by the data available on OpenDOAR, which may not fully reflect repository content size, copyright policies, and metadata standards across all regions. Accessibility data are based on the status at the time of analysis and may not capture recent changes in repository management.

Table 1: Repository Types, Software Usage, and Subject Coverage in BRICS and SAARC Countries

Category	BRICS (Count)	SAARC (Count)	BRICS (%)	SAARC (%)
Repository Types				
Institutional	305	76	94.13%	88.37%
Governmental	4	1	1.23%	1.16%
Disciplinary	10	5	3.08%	5.81%
Aggregating	5	4	1.54%	4.65%
Software Usage				
DSpace	256	49	71.11%	65.33%
EPrint	17	17	4.72%	22.66%
Greenstone	0	2	0%	2.66%
Open Repository	2	1	0.55%	1.33%
Subject Coverage				
Multisubjected	74	298	86.04%	91.97%
Specialized	12	26	13.95%	8.02%

Table 2: Language Distribution, Copyright Policies, and Metadata Standards in BRICS and SAARC Countries

Category	BRICS (Count)	SAARC (Count)	BRICS (%)	SAARC (%)
Language Distribution				
Regional Languages	71	5	21.91%	5.81%
Multilanguage	65	1	20.06%	1.16%
Copyright Policies				
Explicit Copyright	99	28	30.55%	32.55%
Creative Commons License	13	1	4.01%	1.16%
Metadata Standards				
Dublin Core	119	25	36.73%	29.07%
Other Metadata Standards	61	14	18.83%	16.28%

These tables summarize the key metrics comparing BRICS and SAARC countries in terms of repository types, software usage, subject coverage, language diversity, copyright policies, and metadata standards. They provide a clear view of the dominance of institutional repositories, the prevalent use of DSpace, and the notable differences in linguistic inclusivity and metadata practices between the two regions.

7. Results and Findings:

Metric	BRICS	SAARC
Institutional Repositories (%)	94.13	88.37
Disciplinary Repositories (%)	3.08	5.81
Aggregating Repositories (%)	1.54	4.65
DSpace Usage (%)	71.11	65.33
EPrint Usage (%)	4.72	22.66
Regional Language Support (%)	21.91	5.81
Multilanguage Repositories (%)	20.06	1.16

Explicit Copyright Policies (%)	30.55	32.55
Creative Commons Licenses (%)	4.01	1.16
Dublin Core Usage (%)	36.73	29.07
OAI-PMH Interoperability (%)	62.34	55.81
ETD Coverage Index	14.59	7.06

Results and Findings:

The analysis compares BRICS and SAARC countries across key repository metrics, including repository types, software usage, language distribution, subject coverage, copyright policies, and metadata standards.

BRICS countries display a strong dominance in institutional repositories, with 94.13% managed by academic institutions, underscoring their reliance on structured academic frameworks for scholarly outputs. In comparison, SAARC countries also prioritize institutional repositories (88.37%) but have a more diverse repository landscape, with higher proportions of disciplinary (5.81%) and aggregating repositories (4.65%), indicating a broader approach to research dissemination.

DSpace emerges as the preferred software in both regions, used by 71.11% of BRICS repositories and 65.33% of SAARC repositories, due to its flexibility and robustness. However, SAARC demonstrates a significantly higher usage of EPrint (22.66%), likely reflecting the region's multilingual needs and institutional preferences.

BRICS countries show greater inclusivity in language support, with 21.91% of repositories supporting regional languages and 20.06% offering multilingual options. In contrast, SAARC lags behind, with only 5.81% offering regional language support and a mere 1.16% supporting multiple languages, limiting accessibility for diverse linguistic groups.

Both regions favor multisubjected repositories, with BRICS at 86.04% and SAARC at 91.97%. BRICS, however, maintains a more balanced repository structure with 13.95% specialized repositories, compared to SAARC's 8.02%, which focuses primarily on broader subject coverage.

Explicit copyright policies are common in both regions, with BRICS at 30.55% and SAARC at 32.55%. Yet, the adoption of Creative Commons licenses is low, with only 4.01% in BRICS and 1.16% in SAARC, showing limited engagement with open access frameworks.

In terms of metadata standards, Dublin Core is the most widely used in both BRICS (36.73%) and SAARC (29.07%), but BRICS exhibits a broader adoption of alternative standards (18.83%), enhancing their interoperability. BRICS countries also demonstrate a stronger commitment to OAI-PMH interoperability (62.34%) compared to SAARC (55.81%), indicating a more advanced approach to ensuring metadata accessibility and integration with global systems

Conclusion:

The analysis highlights the dominance of institutional repositories in both BRICS and SAARC regions, with DSpace being the most popular software. BRICS countries, particularly Brazil and South Africa, show higher ETD development. SAARC countries, while more diverse in repository types, need to enhance language inclusivity and metadata standards. Both regions could benefit from adopting Creative Commons licenses and additional metadata standards to improve global research visibility.

Recommendations for Enhancing Repository Systems:

To enhance repository systems in BRICS and SAARC countries, exploring alternative software platforms like EPrint and Greenstone can provide varied functionalities tailored to regional needs. Developing governmental and aggregating repositories, especially in SAARC, will improve research accessibility and foster cross-border collaboration. Supporting multilingual and regional repositories is crucial for BRICS, given their linguistic diversity, while SAARC countries should focus on increasing language inclusivity. Expanding niche repositories that cater to specialized research fields would

benefit both regions, with BRICS leveraging their advanced infrastructures. Promoting Creative Commons licenses will further open access to research, encouraging global knowledge sharing. Finally, adopting additional metadata standards, such as MODS, METS, and PREMIS, can improve interoperability and enhance the discoverability of research outputs.

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