Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/21055
DOI URL: http://dx.doi.org/10.21474/IJAR01/21055

RESEARCH ARTICLE

DEVELOPING AN EDUCATIONAL RESEARCH DIGITAL REPOSITORY: STRATEGIC ALIGNMENT AND QUALITY ASSURANCE IN HIGHER EDUCATION

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Manuscript Info

Manuscript History
Received: 27 March 2025
Final Accepted: 30 April 2025
Published:May 2025

Key words:-
Digital Repository, Strategic Alignment, Quality Assurance, Educational Research

Abstract

This paper presents the design and implementation of a digital Educational Research Digital Repository (ERDR) for academic staff at a Polytechnic in Singapore. The repository, hosted on the internal Polytechnic Library platform, was developed through close collaboration with the Polytechnic's Library to ensure accurate metadata representation and user accessibility. It serves as a centralized and structured platform to capture and share scholarly research conducted by the polytechnic educators.To ensure strategic relevance and coherence, the repository's categorization framework was aligned to five key educational research themes in the polytechnic: Competency-Based Learning, Flipped Learning, Learning Analytics, Learning Experience Design, and Technology-Enhanced Learning. These themes reflect current global trends in educational innovation and are strategically mapped to the polytechnic's institutional goals, including Nurturing Future-Ready Learners, Engaging and Empowering People, Co-creating with Industry, Living Our Innovative Enterprising Culture, and Committing to Sustainability. This paper focuses on the alignment of digital repository strategies with broader institutional goals and quality assurance frameworks as well as the critical success factors and potential barriers in developing and maintaining a high-quality educational research digital repository in higher education settings. The paper also addresses quality assurance mechanisms and standards to ensure the reliability and sustainability of educational research digital repositories.

Introduction:-

Digital repositories have become essential tools for managing and disseminating educational research in higher education institutions. However, there remains limited understanding of how these repositories can be strategically aligned with institutional goals while maintaining academic rigor. This study addresses this gap by examining the development and implementation of an educational research repository at a polytechnic institution.

The objective of this project was to develop a centralized digital repository to house educational research outputs produced by academic staff at Nanyang Polytechnic (NYP), Singapore. The repository aims to foster a culture of scholarly practice, improve access to institutional knowledge, and align educational research efforts with NYP's

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strategic priorities. This initiative was driven by the increasing need to systematize knowledge management and make educational research more visible, accessible, and impactful across the institution.
In collaboration with the NYP Library, the educational research digital repository (ERDR) was integrated into the internal library platform to ensure ease of access and sustainability. This paper outlines the planning, implementation, and evaluation processes of the repository and highlights its alignment with institutional goals and educational research trends and quality assurance.

Research Aims and Questions:-

This paper investigates and analyses how higher education institutions can strategically develop and implement a digital repository for educational research that ensures quality assurance and aligns with institutional objectives.

Research Questions

1. How can higher education institutions effectively align their digital repository strategies with their broader institutional goals and quality assurance frameworks?
2. What are the critical success factors and potential barriers in developing and maintaining a high-quality educational research digital repository in higher education settings?
3. What quality assurance mechanisms and standards should be implemented to ensure the reliability and sustainability of educational research digital repositories?

Literature Review:-

Digital Repositories in Higher Education

Recent studies highlight the growing importance of digital repositories in knowledge management and scholarly communication (Swan et al., 2020). Specifically, the development of institutional digital repositories at higher education institutions (HEIs) strive to promote scholarly visibility, knowledge management, and academic collaboration (Crow, 2002; Lynch, 2003).
These systems serve multiple functions, including preserving institutional knowledge and supporting faculty development (Kim, 2021). Recent literature highlights their role in preserving institutional memory, enhancing academic visibility, and supporting faculty development (Swan et al., 2020; Kim, 2021). Repositories also promote open access to educational innovation and support communities of practice (Corrall, Kennan, & Afzal, 2022).Education-focused repositories remain underexplored compared to broader institutional repositories, with limited literature addressing their design for teaching and learning enhancement.

Strategic Alignment

Research by Huang and Yang (2020) emphasizes the need for alignment between digital repository systems and institutional strategies to maximize impact. This alignment ensures relevance and maximizes impact across the organization. Additionally, the integration of metadata standards and categorization schemes facilitates discoverability and interoperability (Stvilia et al., 2019). As educational institutions increasingly emphasize research-informed teaching, digital repositories serve as a bridge between scholarly research and pedagogical practice (Sharples et al., 2016).Strategic alignment in higher education has been discussed in the context of digital transformation (Kettunen, 2015), suggesting that institutional technologies should reflect broader educational, cultural, and strategic objectives. For repositories, this includes mapping research themes to institutional goals and ensuring long-term sustainability through quality assurance protocols (Tenopir et al., 2012).

Quality Assurance in Repositories

Quality assurance in repositories includes metadata accuracy (Park &Tosaka, 2010), peer review mechanisms (Krier & Strasser, 2014), and adherence to open standards (SPARC, 2019). While technical design is crucial, human factors such as staff buy-in, training, and continuous engagement are equally critical for repository sustainability (Palmer et al., 2007).Studies indicate that maintaining academic rigor through structured quality assurance protocols is crucial for repository success (Corrall, 2022).

Methodology:-

Research Design

This study employed a design-based research (DBR) methodology to explore and document the development of an educational research digital repository (ERDR) at NYP. DBR is a research approach that focuses on the iterative design and systematic study of practical educational interventions in real-world settings (Wang & Hannafin, 2005). In this context, the ERDR was conceptualized, developed, and implemented through an ongoing collaborative process involving the Centre for Teaching and Learning Development (CTLD), the NYP Library, and academic staff across different schools.

Rather than involving primary data collection through surveys or interviews with users, the study relied on qualitative and documentary sources that captured the repository's conceptual, developmental, and operational phases. These sources of data included:

1. **Internal Project Documents**: Planning briefs, design specifications, and communication memos between CTLD and the NYP Library provided insights into the rationale, decisions, and constraints during the repository's development.
2. **Repository Architecture and Metadata Schema**: The system's structural design, taxonomy, and tagging protocols were analyzed to understand how educational research themes and institutional goals were encoded within the repository.
3. **Submission Screening Guidelines**: Quality assurance documents were reviewed to understand the review criteria used to evaluate submissions for rigor, relevance, and thematic alignment.
4. **Call-for-Paper Campaigns and Contribution Data**: Records of email campaigns, faculty briefings, and statistics on submission trends informed the study's understanding of engagement strategies and challenges.

Together, these sources formed a comprehensive narrative of the repository's evolution and the institutional processes that underpinned its strategic alignment and quality assurance.

Result:-

The results of the study are organized into three main themes: strategic alignment with institutional goals, quality assurance mechanisms, and challenges encountered during implementation.

First, the repository was designed with deliberate alignment to NYP's institutional goals. Early in the project, five educational research themes—Competency-Based Learning, Flipped Learning, Learning Analytics, Learning Experience Design, and Technology-Enhanced Learning—were identified through internal consultation and a review of global educational trends. These themes were selected not only for their relevance to teaching and learning innovation but also for their direct mapping to NYP's five institutional thrusts: Nurturing Future-Ready Learners, Engaging and Empowering People, Co-creating with Industry, Living Our Innovative and Enterprising Culture, and Committing to Sustainability. The metadata structure and tagging system in the repository were designed to ensure that each submission could be categorized according to one or more of these themes, thereby ensuring thematic coherence and strategic relevance. Table 1 shows the Internal Project Documents used in this research.

Table 1:- Sample of Internal Project Documents Used in the Research.

Document Title	Purpose	Date Created	Key Contributors
Repository Design Brief	Outlined objectives, scope, and design rationale	Jan 2023	CTLD, NYP Library
Metadata Mapping Guidelines	Specified metadata fields and tagging conventions	Mar 2023	NYP Library, Metadata Specialist
Strategic Theme Alignment Matrix	Mapped repository themes to NYP's strategic goals	Apr 2023	CTLD, Planning Office
Submission Workflow SOP	Detailed procedures for submitting and reviewing entries	May 2023	CTLD, QA Team
Outreach and Engagement Plan	Described faculty engagement strategies	Jun 2023	CTLD, School Reps

Second, the development of robust quality assurance mechanisms was central to the project. A submission screening process was introduced to ensure that only high-quality, relevant research artifacts were included. Submissions were

reviewed by a small panel of teaching and learning specialists who have specific expertise in Educational Research. They assessed the clarity of research questions, alignment with NYP's educational research themes, methodological soundness, and potential for impact on teaching practices. To guide contributors, submission guidelines and a visual infographic were created, clarifying expectations and processes. Metadata tagging was standardized in collaboration with the NYP Library, improving the discoverability and indexing of submissions. This focus on both content quality and metadata integrity was essential in maintaining the repository's credibility and usability. Table 2 shows the repository architecture, and the metadata schema utilized. Table 3 shows the submission screening guidelines which supported the quality assurance for the repository.

Table 2:- Repository Architecture and Metadata Schema.

Component	Description
Repository Platform	NYP Library's digital asset management system (customized interface)
Metadata Fields	Title, Author(s), School, Year, Keywords, Abstract, Research Theme
Categorization Scheme	Based on 5 themes: CBL, FL, LA, LXD, TEL (as shown above)
Access Permissions	Internal NYP access (staff only); Admin-level moderation enabled
Tagging Protocol	Predefined keyword list aligned with research themes and teaching outcomes
File Types Supported	PDF, PPT, DOCX
Search and Filter Tools	Keyword search, filter by theme, date, and school

Table 3:- Submission Screening Guidelines.

Criteria	Description
Relevance to Repository Theme	Must align clearly with one or more of the five NYP research themes
Educational Value	Should demonstrate clear implications for teaching and learning practice
Methodological Soundness	Should include a defined approach or methodology, even in exploratory work
Clarity and Presentation	Submission should be clearly written and appropriately formatted
Ethical Compliance	Any classroom-based research must indicate ethical approval (if applicable)

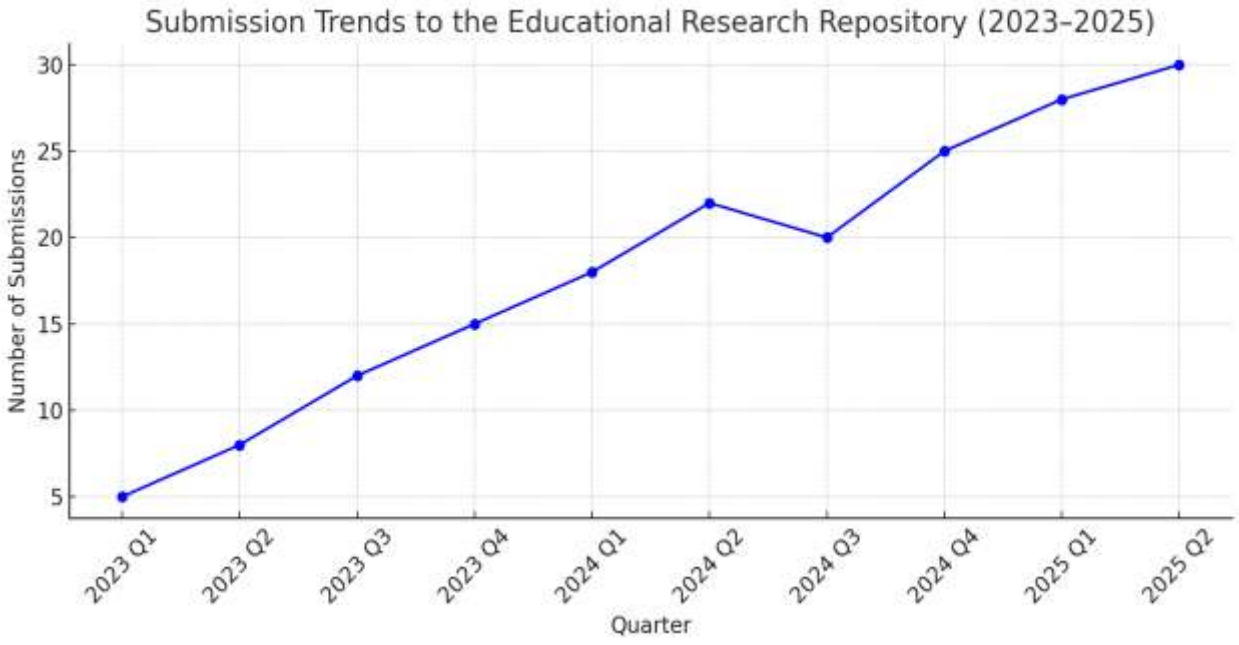

Figure 1:- Submission trends to the Educational Research Repository.

Finally, several challenges were encountered during implementation, particularly in encouraging sustained participation from academic staff. Initial hesitance stemmed from a lack of familiarity with educational research and concerns over the value or appropriateness of their contributions. To address this, the team sent out school-wide email mailers and targeted faculty development sessions, emphasizing the repository's role in professional development and institutional knowledge sharing. Recognizing the importance of momentum, CTLD initiated

targeted calls for papers, scheduled around webinars on educational research, and publicly highlighted high-quality contributions in the polytechnic's internal education seminars. Flexibility was also built into the submission categories to accommodate a range of research artifacts, including classroom-based innovations, learning analytics projects, and cross-disciplinary collaborations. Figure 1 shows the submission trends to the repository from the time it was first set up in 2023 till now.

These design and implementation choices collectively contributed to a strategically aligned, high-quality digital repository that reflects the institution's vision for research-informed teaching and collaborative knowledge-building.

Discussion:-

The findings highlight the importance of strategic alignment in building digital infrastructure in HEIs. By anchoring repository themes to institutional priorities, NYP ensured relevance and buy-in from stakeholders. This alignment also positioned the repository as a platform not just for storage, but for institutional learning and professional development.

Quality assurance emerged as a multidimensional construct, requiring both technical systems (metadata) and social systems (peer review, submission guidance). Unlike traditional repositories focused on open-access publishing, the repository's purpose-driven curation required a deliberate balance between inclusivity and academic rigor.

The study also reinforces that the success of repositories in higher education depends not only on technological affordances but also on institutional culture. Engaging educators in a research-informed teaching paradigm is a long-term effort that requires sustained leadership and recognition structures.

Conclusion:-

This paper illustrates how a higher education institution can strategically design an educational research digital repository that aligns with broader institutional goals while maintaining quality standards. Through a collaborative design process, the NYP ERDR demonstrates how repositories can evolve from passive archives into dynamic tools for professional learning and institutional knowledge building.The repository not only supports the professional development of academic staff by fostering a research-informed teaching culture but also enhances institutional knowledge management and promotes scholarly collaboration. This initiative demonstrates how intelligent design and strategic alignment can be harnessed to build research capacity within a higher education institution.

Key takeaways include:

- The importance of thematic and strategic alignment.
- The need for flexible yet rigorous quality assurance mechanisms.
- The role of outreach and recognition in sustaining engagement.

Limitations and Future Research:-

This study is limited by its focus on a single institutional case and the absence of direct user data or usage analytics. Future research could explore:

- User engagement and impact on teaching practices.
- Comparative studies of educational repositories across institutions.
- Longitudinal analysis of repository contributions and thematic shifts.

Additionally, integrating learning analytics into the repository could offer insights into how research dissemination influences practice across disciplines.

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