

1 Developing an Educational Research Digital Repository: Strategic Alignment and Quality Assurance in Higher Education

3 **Abstract**

4 This paper presents the design and implementation of a digital Educational Research digital
5 repository (ERDR) for academic staff at Nanyang Polytechnic (NYP), Singapore. The repository,
6 hosted on the internal NYP Library platform, was developed through close collaboration with the
7 NYP Library to ensure accurate metadata representation and user accessibility. It serves as a
8 centralized and structured platform to capture and share scholarly research conducted by NYP
9 educators.

To ensure strategic relevance and coherence, the repository's categorization framework was aligned to five key educational research themes in NYP: 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 NYP'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.

22 *Keywords* – Digital repository, Strategic alignment, Quality assurance, Educational research

23 **Introduction**

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

29 The objective of this project was to develop a centralized digital repository to house educational
30 research outputs produced by academic staff at Nanyang Polytechnic (NYP), Singapore. The
31 repository aims to foster a culture of scholarly practice, improve access to institutional
32 knowledge, and align educational research efforts with NYP's strategic priorities. This initiative
33 was driven by the increasing need to systematize knowledge management and make educational
34 research more visible, accessible, and impactful across the institution.

35 In collaboration with the NYP Library, the educational research digital repository (ERDR) was
36 integrated into the internal library platform to ensure ease of access and sustainability. This paper
37 outlines the planning, implementation, and evaluation processes of the repository and highlights
38 its alignment with institutional goals and educational research trends and quality assurance.

39 **Research Aims and Questions**

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

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44 Research Questions

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

51 **Literature Review**

52 Digital Repositories in Higher Education

53 Recent studies highlight the growing importance of digital repositories in knowledge
54 management and scholarly communication (Swan et al., 2020). Specifically, the development of
55 institutional digital repositories at higher education institutions (HEIs) strive to promote
56 scholarly visibility, knowledge management, and academic collaboration (Crow, 2002; Lynch,
57 2003).

58 These systems serve multiple functions, including preserving institutional knowledge and
59 supporting faculty development (Kim, 2021). Recent literature highlights their role in preserving
60 institutional memory, enhancing academic visibility, and supporting faculty development (Swan
61 et al., 2020; Kim, 2021). Repositories also promote open access to educational innovation and
62 support communities of practice (Corrall, Kennan, & Afzal, 2022). Education-focused
63 repositories remain underexplored compared to broader institutional repositories, with limited
64 literature addressing their design for teaching and learning enhancement.

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66 Strategic Alignment

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

78 Quality Assurance in Repositories

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

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88 **Methodology**

89 Research Design

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

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

- 100 1. **Internal Project Documents:** Planning briefs, design specifications, and communication
101 memos between CTLTD and the NYP Library provided insights into the rationale,
102 decisions, and constraints during the repository's development.
- 103 2. **Repository Architecture and Metadata Schema:** The system's structural design,
104 taxonomy, and tagging protocols were analyzed to understand how educational research
105 themes and institutional goals were encoded within the repository.
- 106 3. **Submission Screening Guidelines:** Quality assurance documents were reviewed to
107 understand the review criteria used to evaluate submissions for rigor, relevance, and
108 thematic alignment.

109 4. **Call-for-Paper Campaigns and Contribution Data:** Records of email campaigns,
110 faculty briefings, and statistics on submission trends informed the study's understanding
111 of engagement strategies and challenges.

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

114 **Result**

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

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

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131 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

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133 Second, the development of robust quality assurance mechanisms was central to the project. A

134 submission screening process was introduced to ensure that only high-quality, relevant research

135 artifacts were included. Submissions were reviewed by a small panel of teaching and learning

136 specialists who have specific expertise in Educational Research. They assessed the clarity of

137 research questions, alignment with NYP’s educational research themes, methodological

138 soundness, and potential for impact on teaching practices. To guide contributors, submission

139 guidelines and a visual infographic were created, clarifying expectations and processes. Metadata

140 tagging was standardized in collaboration with the NYP Library, improving the discoverability

141 and indexing of submissions. This focus on both content quality and metadata integrity was

142 essential in maintaining the repository’s credibility and usability. Table 2 shows the repository

143 architecture, and the metadata schema utilized. Table 3 shows the submission screening

144 guidelines which supported the quality assurance for the repository.

145 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

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147 Table 3 – Submission Screening Guidelines

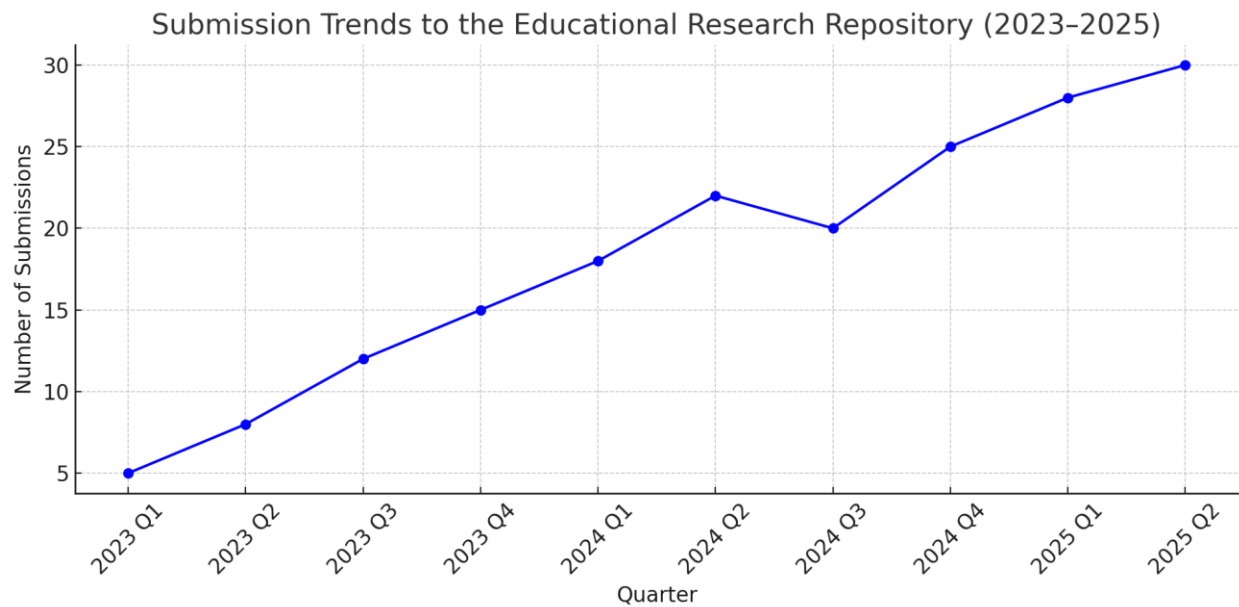
Criteria	Description
Relevance to Repository Theme	Must align clearly with one or more of the five NYP research themes
Educational Value	Should demonstrate clear implications for teaching and learning practice
Methodological Soundness	Should include a defined approach or methodology, even in exploratory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

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149 Finally, several challenges were encountered during implementation, particularly in encouraging
150 sustained participation from academic staff. Initial hesitance stemmed from a lack of familiarity
151 with educational research and concerns over the value or appropriateness of their contributions.
152 To address this, the team sent out school-wide email mailers and targeted faculty development
153 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.

Figure 1 – Submission trends to the Educational Research Repository



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.

189 Key takeaways include:

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

193 **Limitations and Future Research**

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

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

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

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