

**NATIONAL
LIBRARY
OF SRI LANKA**



PROCEEDINGS

“Building a Smart Nation through Smart Libraries”

**4th September, 2025
Colombo, Sri Lanka**

ICNATLIB 2025

**4th International Research Conference
of National Library of Sri Lanka**

**National Library & Documentation Services Board
Ministry of Buddhasana, Religious and Cultural Affairs**

**4th INTERNATIONAL RESEARCH CONFERENCE
OF NATIONAL LIBRARY OF SRI LANKA 2025**

**“BUILDING A SMART NATION
THROUGH SMART LIBRARIES”**

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MESSAGE FROM THE MINISTER OF BUDDHASASANA, RELIGIOUS AND CULTURAL AFFAIRS

I am pleased to send this felicitation message to the 4th International Research Conference 2025 of the National Library & Documentation Services Board (NLDSB). The theme, “Building a Smart Nation through Smart Libraries,” is timely and visionary, reflecting the critical role libraries must play in the era of digital transformation and knowledge-driven development.



Libraries have historically served as custodians of knowledge, safeguarding the intellectual and cultural heritage of societies across generations. In today’s world, their role has expanded beyond the tradition to become vibrant centres of digital access, lifelong learning, and innovation. A smart library is not only a technological advancement; it is also a commitment to inclusivity, efficiency, and service excellence. By empowering citizens with access to information and knowledge, smart libraries lay the foundation for a truly smart nation.

The Ministry of Buddhasasana, Religious and Cultural Affairs acknowledges and deeply values the efforts of the NLDSB in promoting a culture of research, preserving our documentary heritage, and embracing digital pathways for knowledge dissemination. This conference brings together experts, academics, and practitioners from across the globe to engage in meaningful dialogue that will inspire future-ready solutions and foster inclusive growth in our knowledge ecosystem.

I extend my best wishes for the success of this important academic gathering and commend all contributors for their commitment to strengthening Sri Lanka’s intellectual and cultural landscape. I also warmly congratulate the organizing committee of the NLDSB and all participants of the event for their unwavering dedication to advancing knowledge through this important forum.

DR. HINIDUMA SUNIL SENEVI

Minister of Buddhasasana, Religious and Cultural Affairs

MESSAGE FROM THE SECRETARY, MINISTRY OF BUDDHASASANA, RELIGIOUS AND CULTURAL AFFAIRS

It is a great privilege to extend my sincere congratulations to the organizers of the 4th International Research Conference (ICNATLIB 2025), hosted by the National Library and Documentation Services Board (NLDSB), under the timely and forward-thinking theme “Building a Smart Nation through Smart Libraries.”



In an era characterized by rapid technological advancements and an ever-growing need for accessible information, the role of libraries has evolved remarkably. Today, smart libraries are no longer mere custodians of books and manuscripts. Smart Libraries have become transformative institutions that leverage digital technologies, foster inclusive knowledge systems, and contribute significantly to national development. The theme of this year’s conference reflects an inspiring vision of libraries as catalysts for intellectual growth, cultural preservation, and digital empowerment.

As a nation deeply rooted in spiritual traditions and cultural diversity, Sri Lanka has recognized the importance of knowledge dissemination and preservation. The convergence of tradition and innovation, as envisioned through smart libraries, is essential in shaping an informed, responsible, and progressive society. The Ministry of Buddhasasana, Religious and Cultural Affairs is proud to support initiatives that uphold these values while embracing modern technological advancements.

I commend the NLDSB for creating this vital platform where scholars, librarians, researchers, and policymakers can engage in meaningful dialogue, share research findings, and cultivate collaborative partnerships. Academic forums such as this are crucial for building resilient, inclusive, and future-ready knowledge ecosystems aligned with the broader national vision of a smart and sustainable Sri Lanka.

I extend my best wishes for the success of ICNATLIB 2025. May this conference yield valuable insights and inspire transformative efforts that strengthen our libraries and empower our nation. I am confident that all presenters and participants will find this event both academically stimulating and professionally fulfilling.

PRINCE SENADEERA

Secretary

Ministry of Buddhasasana, Religious and Cultural Affairs

MESSAGE FROM THE CHIEF GUEST

It is an honour to be invited as the Chief Guest at the 4th International Research Conference hosted by the National Library of Sri Lanka. This gathering of scholars, librarians, researchers, and knowledge advocates is a powerful reminder of the central role libraries play in fostering intellectual growth, inclusivity, and evidence-based decision-making in our societies.



At the British Council, we are deeply committed to supporting research, education, and cultural exchange-values that align closely with the objectives of this conference. Libraries, as custodians of knowledge and platforms for learning, are vital in bridging gaps across generations, languages, and disciplines. They serve not just as repositories of books, but as dynamic spaces for collaboration, creativity, and critical thinking.

This year's conference theme 'Building a Smart Nation through Smart Libraries' and research contributions highlight the evolving challenges and opportunities in the information and knowledge landscape. I am particularly inspired by the focus on innovation, accessibility, and sustainability within the library and information sciences.

As we look ahead, I encourage all participants to continue building networks that transcend borders, disciplines, and institutions. Your work lays the foundation for a more informed, equitable, and connected future.

Thank you once again for the opportunity to be part of this important event. I wish the conference every success and look forward to the valuable insights and collaborations it will generate.

ORLANDO EDWARDS

Country Director

British Council, Sri Lanka

MESSAGE FROM THE GUEST SPEAKER

It is with great honour and deep appreciation that I extend my greetings to all participants, organizers, and partners of the 4th International Research Conference of the National Library of Sri Lanka 2025 (ICNATLIB 2025), held under the timely and visionary theme “Building a Smart Nation through Smart Libraries.”



In today’s rapidly evolving knowledge society, the role of libraries has transcended traditional boundaries. They are no longer mere storehouses of books but are transforming into dynamic, technology-driven ecosystems that empower individuals, foster innovation, and strengthen the foundations of a knowledge-based economy. A “smart library” is not defined merely by the integration of digital tools, but by its ability to anticipate user needs, personalize information services, and promote equitable access for all citizens. In this sense, libraries become active partners in national development, bridging knowledge divides and enabling inclusive participation in the digital era.

The theme of ICNATLIB 2025 resonates deeply with the aspirations of Sri Lanka as we navigate a future where information is a strategic resource. A smart nation thrives when its people are informed, creative, and capable of critical thinking. This transformation depends on institutions-like our libraries-that are committed to digital literacy, lifelong learning, and the ethical use of information. The convergence of smart librarianship, emerging technologies, and inclusive access policies will determine how successfully we can harness information for socio-economic advancement.

I commend the National Library and Documentation Services Board for its unwavering commitment to research, professional development, and innovation in the field of Library and Information Science. By providing a platform for scholars, practitioners, and policymakers to share insights, ICNATLIB 2025 is not only fostering professional excellence but also strengthening the collaborative networks essential for achieving our national vision.

This year’s conference is especially significant in its multidisciplinary approach, addressing themes from artificial intelligence in libraries and digital archiving, to cultural heritage preservation and the ethical frameworks that guide our work. Such diversity of focus ensures that we address both the technological and human dimensions of building a smart nation.

Moreover, the inclusion of international collaboration reflects our recognition that knowledge knows no boundaries; global partnerships enrich our local capabilities and perspectives.

As Vice Chancellor of the University of Jaffna, I am particularly aware of the transformative impact that accessible, intelligent, and inclusive libraries can have on education, research, and community development. Whether in urban centres or rural areas, libraries-when empowered by digital innovations- can become hubs of opportunity, creativity, and empowerment for all.

I congratulate the organizers, presenters, and participants of ICNATLIB 2025 for their dedication to advancing the frontiers of library and information services. Let us use this occasion to reaffirm our shared commitment to building a future where every citizen has the tools, skills, and opportunities to thrive in an increasingly complex world. Together, through smart libraries, we can indeed build a smart nation.

I wish the conference every success and look forward to the meaningful discussions, collaborations, and innovations that will emerge from this distinguished gathering.

PROF. S. SRISATKUNARAJAH

Vice Chancellor & Professor in Mathematics

University of Jaffna, Sri Lanka

MESSAGE FROM THE KEYNOTE SPEAKER

Today's social landscape reflects a complex web of interconnected problems that affect millions of lives. Many societal challenges, often tied to complex human-environment systems, remain insufficiently understood, and urgent solutions are needed.



Science has already provided valuable insights into the nature and causes of these challenges, and it is now being called upon to contribute to sustainable solutions - itself a demanding task for any society. To be effective, such problems must be addressed in light of the unique cultural features and historical contexts of the societies they affect. Solutions that overlook these cultural differences often fail, creating inequities or even undermining the very heritage they aim to protect. Therefore, culturally sensitive, community-centered approaches are essential to tackling socio-economic issues in diverse contexts.

Local wisdom is a foundational element in achieving sustainable development goals. Libraries play a vital role in preserving such wisdom by collecting, documenting, and digitizing oral histories, traditional practices, and cultural heritage, often in partnership with indigenous communities. By integrating local wisdom into development approaches, communities can design tailored, bottom-up solutions that are culturally relevant, strengthen social cohesion, and promote long-term well-being.

Libraries also drive national development by ensuring free access to information, serving as hubs for lifelong learning, and fostering civic engagement. In countries like Sri Lanka, they help bridge the digital divide and support local strategies. With culturally sensitive design, skilled librarians, expert collaboration, and digital tools, libraries can evolve into dynamic spaces that connect traditional wisdom with modern knowledge, enabling building a Smart Nations through Smart Libraries.

I warmly congratulate the organizers of 4th International Research Conference of National Library of Sri Lanka 2025 and participants of this conference and wish the event every success.

DR. SEPALIKA SUDASINGHE

Director General/CEO

National Science Foundation, Sri Lanka

MESSAGE FROM THE CHAIRMAN, NLDSB

As the Chairman of the National Library & Documentation Services Board (NLDSB), it is an honour to send this message on 4th International Research Conference (ICNATLIB 2025) that will be held on 4th September, 2025. Conducting and promoting research in the field of library and information science in Sri Lanka is one of the primary responsibilities of the NLDSB. To fulfill this responsibility, the Library Research Division of the NLDSB implements a number of projects annually. Conducting research and sharing findings are among our key activities. This conference represents an important milestone in promoting research among library professionals in Sri Lanka.



In an era where information and innovation define national progress, libraries are no longer passive repositories of knowledge but dynamic platforms that empower citizens, support research, and catalyze socio economic development. The evolution of smart libraries equipped with digital technologies, inclusive services, and user centered approaches is fundamental to shaping a smart nation that is informed, innovative, and inclusive.

The National Library of Sri Lanka stands firmly committed to this vision. As the apex body for library services and information management in the country, we recognize the indispensable role that libraries play in bridging knowledge gaps, promoting digital equity, and fostering a culture of lifelong learning. Our strategic initiatives increasingly focus on digital transformation, knowledge accessibility, and capacity building to align with global best practices and national development goals.

I believe that the 4th International Research Conference will provide an excellent opportunity to disseminate advanced knowledge among academics, researchers, professionals, graduates and postgraduate students. This forum will facilitate the sharing of research experiences and foster collaboration thereby strengthening partnerships among professionals.

I would like to extend my deepest gratitude to Hon. Minister of Buddhasasana, Religious and Cultural Affairs, Secretary to the Ministry of Buddhasasana, Religious and Cultural Affairs, Guest of Honour,

our esteemed Chief Guest, Keynote Speaker, Guest Speaker, session chairs and paper reviewers for their invaluable guidance and support in organizing this event. On behalf of the NLDSB, I also offer my heartfelt thanks to the Director General of the NLDSB, the Director (NLDC), the staff of the Research Division, and the organizing committee of the conference for their commitment and tireless efforts in making this event a success.

Finally, I wish all the paper presenters and participants every success in their endeavours.

DR. RATHNA SRI WIJESINGHE

Chairman

National Library and Documentation Services Board, Sri Lanka

MESSAGE FROM THE DIRECTOR GENERAL, NLDSB

It is with great pleasure I convey this message at the 4th International Research Conference (ICNATLIB 2025) of the National Library of Sri Lanka. The main theme of the conference is “ Building a Smart Nation through Smart Libraries” which will be conducted under various sessions including Emerging Trends and Technology in Smart Libraries and Enhance Access and Conservation & Preservation Measures of Smart Libraries and Smart Education, Citizenry and Smart Libraries.



As we move deeper into the 21st Century, the role of libraries is undergoing a transformative shift. No longer just custodians of books, libraries are becoming dynamic centres of innovation, learning and digital empowerment. In the vision of a smart nation one that leverages technology and data to enhance the lives of its citizens smart libraries are indispensable. These institutions bridge the digital divide, promote lifelong learning, and foster a culture of knowledge, creativity and inclusivity.

Smart libraries are not just about digitization or automation they are about reimagining access to knowledge, ensuring equity in information, and empowering communities through lifelong learning. As we aspire to build a smart nation, libraries must evolve into vibrant knowledge hubs that support research, creativity, and informed decision making at every level.

The objective of this conference is to provide an opportunity for library professionals to present their research findings and also to encourage them to conduct further research in the Library and Information Sciences and Social Sciences. I would like to extend my gratitude to our respected Chief Guest, Mr. Orlando Edwards, Country Director of the British Council, Sri Lanka. Also, I would like to extend my gratitude to our Keynote Speaker, Dr. Sepalika Sudasinghe, the Director General / CEO of the National Science Foundation (NSF), Sri Lanka and our Guest Speaker Prof. S. Srisathkunarajah, Vice Chancellor, University of Jaffna and Guest of Honour Mr. W. P. Senadheera, Secretary, Ministry of Buddhasasana, Religious and Cultural Affairs for their participation and valuable contributions.

Planning and organizing this annual conference was a long process for which many individuals have contributed, including Mrs. Padma Bandaranayake, Director, National Library & Documentation Centre, Mrs. Nimmi Deshapriya, Head of the Library Research Division, Mr. Uditha Gunasekara, Research Officer, staff of the Library Research Division, members of the organizing committee and the staff of NLDSB. I would like to express my gratitude to all of them. I take this opportunity to thank the Chairs of the three sessions, all presenters and participants of the conference. Finally, I would like to express my gratitude to Dr. Rathna Sri Wijesinghe, Chairman, NLDSB, for his guidance and support, without which it wouldn't be successful.

May this conference serve as a platform for collaboration, innovation, and inspiration. I wish ICNATLIB 2025 a great success and look forward to the continued growth and impact of our library and information services in building a smarter nation.

W. SUNIL

Director General

National Library and Documentation Services Board, Sri Lanka

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Integrating Multimodal Input for Advancing Inclusive Education: Focus on Autism Spectrum Disorder in Smart Libraries in Sri Lanka

M. H. M. Wickramasinghe¹

ABSTRACT

Libraries in Sri Lanka play a crucial role in the context of a national digital transformation, however, there are still barriers of integrating inclusivity for learners with diverse needs. Most traditional materials offer little to no benefit for students with visual impairments or reading disabilities. This study attempts to fill this gap by designing and testing a smart library access system based on Augmented Reality (AR) and Intelligent sound assistance to foster genuine inclusion. The goal of this study is to present an intervention aimed at achieving specific targets in sustainable development goal four, which focuses on ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for everyone. The primary objective of this study is to design and evaluate access to physical library materials through a prototype system. This innovative approach provides a specialized braille keyboard equipped with a scanner for book pages. The system uses AI to create accessible reading content from scanned book pages, providing text, descriptions, diagrams, captions, and relevant information on a tablet. It uses augmented reality for animation and audio for immediate descriptions, incorporating visual AR, audio, and braille to cater to various learning styles. This study uses a mixed-methods approach to evaluate inclusive education initiatives. It gathers quantitative data from 50 participants, including students, parents, and teachers through surveys aligned with Self-Determination Theory (SDT) to assess perceptions of autonomy and inclusion. Qualitative case studies with 15–20 individuals, including educators and experts, provide deeper insights via semi-structured interviews and observations. A mobile app prototype, “Let’s Talk When You Want,” is developed to facilitate communication for autistic children aged 6 and above, and it is tested using Agile methodology with feedback from therapists and educators. Data is analysed thematically and statistically to triangulate findings across educational and technological aspects.

Keywords: Augmented Reality, Inclusive Education, Smart Education, Smart Libraries

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Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition that influences social behaviour, communication abilities, and interaction skills. With the increasing rate of smart technologies, there are opportunities to address the educational needs of children with ASD through interactive tools. Digital education can positively impact their engagement and facilitate skill development (Maurizio et al., 2022).

Challenges in Learning - Despite initiatives aimed at "education for all," educating children with ASD using traditional methods remain difficult, with ICT-based tools often inadequate due to their unique interaction needs (Starcic and Bagon, 2013). There is a growing demand for inclusive education, integrating students with disabilities and those without.

Smart Libraries for Inclusion - This study explores how smart libraries can promote inclusive education for autistic learners in Sri Lanka. Smart libraries combine digital tools, community support, and adaptable infrastructure to foster inclusion, utilizing Augmented Reality (AR) and auditory support. The author presents a technology-enabled framework focusing on: Co-developing the app "Let's Talk When You Want" to enhance communication and social skills. Smart libraries as collaborative spaces for all abilities. Providing ICT training to empower educators. In the initial stage the study focuses on urban areas and autism-specific interventions to enable detailed exploration.

Objectives

The study aims to enhance inclusive education in Sri Lanka via smart libraries, with objectives to:

- Create a context-specific smart library framework to establish accessible ICT infrastructure to empower learner independence.
- Develop and pilot the "Let's Talk When You Want" app targeting language, social, and cognitive skills.
- Evaluate the impact of smart libraries on learning outcomes, stigma reduction, and peer inclusion.

Methodology

This study employs a mixed-methods approach to investigate how smart libraries and technology-enhanced tools can improve inclusive education for children with autism spectrum disorder (ASD) in Sri Lanka. The methodology is guided by Self-Determination Theory (SDT), focusing on autonomy, competence, and relatedness in evaluating educational inclusion.

Data Collection Methods

Quantitative Surveys

- **Participants:** A total of 50 participants. Consisting of 20 students, 15 parents and 15 teachers from both urban and rural educational settings.
- **Used self-determination theory (SDT)- aligned questionnaires** designed to assess perceived autonomy, Purpose: To evaluate general perceptions and the effectiveness of inclusive education initiatives.

Qualitative Case Studies

- **Participants:** Between 15-20 participants, including educators, special education experts, and community stakeholders, which will also encompass representatives from universities that actively support special-needs education through research and community outreach projects.
- **Methods:** data will be collected using semi-structured interviews and observational notes to capture in-depth perspectives and contextual understanding.
- **Purpose:** To gain detailed insights into the challenges and opportunities of implementing inclusive education.

App Prototyping and Testing

"Let's Talk When You Want", a mobile app for autistic children aged 6 and above. Process using Agile development with feedback from therapists, educators, and users.

Features:

- Language Skills: Conversation flow and rewording.
- Social Skills: Eye contact and empathy.
- Cognitive Skills: Emotion recognition through visual cues.

3.4 Theoretical Framework - The study's framework is rooted in Self-Determination Theory (SDT):

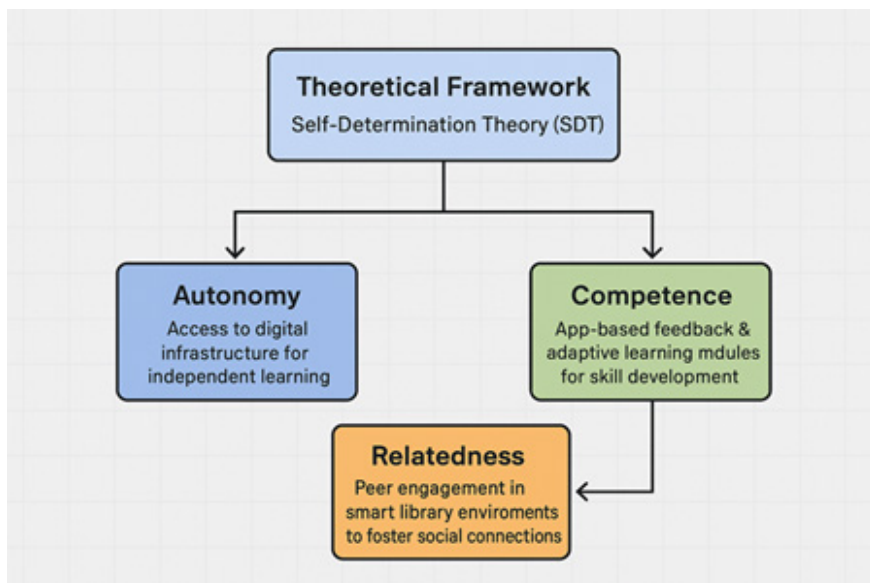


Figure 1: Self-Determination Theory, Source: Author, 2025

Data Analysis

Quantitative Analysis:

- Descriptive and inferential statistics using SPSS.

- Regression analysis to explore the correlation between ICT use and learning outcomes, autonomy, and social integration.

Qualitative Analysis:

- Thematic coding of interviews using SPSS Statistics data analysis software.
- Triangulation of emergent themes with survey data for a comprehensive underset



Figure 2: Low-Fidelity Prototype of the Proposed AI-Powered Accessible Library System. Source: Author, 2025

Results and Discussion

The findings help to validate that, while inclusive education has strong global theoretical and policy support, its practical implementation in Sri Lanka, particularly in disadvantaged areas remains limited. 23.5% of children with disabilities aged 5–14 years are excluded from mainstream education. Among youth aged 15–19 years, 55.4% are not enrolled in school or vocational training. This exclusion rate rises to 86% for young people aged 20–24 years. National census data shows visual impairments are the most common disability among Sri Lankan children. (UNICEF Sri Lanka, Dept. of Census & Statistics, 2019; Human Rights Report, 2024).

Approximately 1 in 93 children ($\approx 1.07\%$) aged 18–24 months are diagnosed with autism. This rate is consistent with global prevalence estimates. In the South Asia region, prevalence ranges from 0.09% to 1.07%. This systematic analysis of the study reveals that, a mobile app designed to support autistic students, exhibited hopeful signs of enhancing emotional recognition and coherent dialogue during game-based activities. The impact of digital tools on key psychological needs—autonomy, competence, and relatedness can be quantitatively assessed using questionnaires based on Self-Determination Theory (SDT). (Ryan, R. M., & Deci, E. L. 2017). These SDT- based tools assess how participants perceive their feelings of self-direction (autonomy), effectiveness (competence), and connection to others (relatedness) within educational settings. In this study, SDT- based questionnaires will be used to quantitatively evaluate whether the proposed digital tools and inclusive learning environments effectively support these fundamental psychological needs of autonomy, competence, and relatedness.

Digital tools, such as adaptive communication software, can support students with disabilities by enhancing both autonomy and competence through features like instant feedback and gamified social-emotional learning experiences. For instance, the MOSOCO mobile, which uses augmented reality to help children with autism in practicing social skills in real- life settings, demonstrated significant improvements in social interactions, reduced behavioural challenges, and better integration with neurotypical peers during a seven-week school-based study in Southern California. These findings provide empirical evidence for the potential of digital tools in fostering autonomy, competence, and social inclusion (Escobedo et al., 2012). Similarly, inclusive library environments can promote peer interaction and reduce isolation, particularly for students with autism, by creating opportunities for shared learning and social engagement.

Conclusion

In alignment with the United Nations Sustainable Development Goal 4 (SDG 4) which aims for inclusive and equitable quality education, this proposal establishes a model designed to bridge the gap in inclusive education, particularly in resource-constrained contexts like Sri Lanka. This study goes beyond the typical "education for all"

discourse by presenting a practical, replicable solution that leverage digital transformation and community outreach through smart libraries. Digital tools, such as adaptive communication software, cater to the specific needs, of students with disabilities by increasing autonomy and competence development through instant feedback as well as gamified social-emotional learning scenarios.

Library spaces allow for peer interactions, build sense of relatedness, and reduce the feeling of isolation, especially among students with autism and other developmental disabilities. Recordation success stories from parental engagement workshops and noticeable student progress in such inclusive settings are powerful evidence to overcome stigma and recondition public perception about disability and education. By the inclusion of these components within Sri Lanka's education system, the proposed model not only addresses core barriers but offers a model that is imitable, capable of being transferred between similar developing contexts. Thus, contributes meaningfully to digital inclusion and sustainable educational reform discourse, ensuring that no child is left behind, whether able or disable.

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Enhancing Digital Literacy through Legal Research Skill: Evaluating the Impact on Law Undergraduates at International Islamic University Malaysia (IIUM)

Tuan Safa'at Tuan Ameri¹ and Nur Liyana Abdul Halil²

ABSTRACT

In higher education, digital literacy is essential for academic success and meaningful participation in a knowledge-based society. This paper examines the effectiveness of the Legal Research Skill Module implemented by the M. Kamal Hassan Library for undergraduate law students enrolled in the Legal Method (LAWS 1330) course at Ahmad Ibrahim Kulliyah of Laws (AIKOL), International Islamic University Malaysia (IIUM). The programme is designed to enhance students' information literacy and digital research competencies to equip them to navigate, evaluate, and apply legal information resources in a digital environment. Using a mixed-methods approach, the study measures changes in students' knowledge and skills through pre-and post-assessments, complemented by feedback on the module's content and delivery. The results show a high satisfaction rate of 96% (January to December 2024) and indicate substantial improvement in students' abilities to locate, access, and utilise credible legal sources. Students' self-assessments prior to and following the sessions revealed noticeable gains in knowledge, alongside increased confidence in using library resources effectively. Participants also expressed positive perceptions of the module's relevancy, acknowledging its importance for both academic learning and future legal practice. The study further explored students' expectations and learning objectives, revealing a strong alignment between instructional goals and learner outcomes. These findings highlight the critical role of academic libraries in fostering digitally literate, research-capable graduates who are well-equipped to engage as knowledgeable and responsible members of society. This study contributes to the broader discourse on digital literacy

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in higher education, offering practical insights for librarians and educators in designing impactful, learner-centred instructional programmes that support students' evolving digital and legal information needs.

Keywords: Digital Literacy, Information Literacy, Legal Research Skill, Legal Method, Law Students

Introduction

In the realm of legal education, digital literacy has become an essential skill. As legal practice increasingly relies on digital platforms, tools, and resources, it is crucial for law students to be able not only to understand legal concepts but also to navigate and evaluate digital legal information critically. Bhardwaj and Madhusudhan (2016) highlight that users of online legal information systems often encounter challenges such as complicated interfaces, inadequate search capabilities, and a lack of awareness about reliable legal resources. Although their study emphasizes the importance of proper training to help users in effectively utilizing legal databases, it does not evaluate the proficiency of legal research skills among law students, or its impact on their digital literacy skills. To address this need, the M. Kamal Hassan Library at the International Islamic University Malaysia (IIUM) introduced a structured Legal Research Skill Module for undergraduate law students. This study aims to evaluate the module's impact on students' skills in accessing, evaluating, and utilizing legal information using digital tools, and its relevance to their academic and professional development.

Objectives

This study examines the effect of Legal Research Skills on law students at the Ahmad Ibrahim Kulliyyah of Laws (AIKOL), IIUM. By assessing students' proficiency in digital legal research and analysing how these skills influence their academic performance and professional readiness, this study seeks to understand the broader significance of digital literacy within legal education.

Methodology

Utilizing a mixed-methods approach that includes surveys and evaluation analysis, this study explores the extent to which legal research skills have been developed and applied by AIKOL students, particularly in digital contexts. Furthermore, it evaluates how well these skills equip them to tackle legal issues and enhance their academic performance in law studies at the university. The evaluation form included both Likert-scale items and open-ended questions. It gathered data on students’ demographics, their self-assessed knowledge and perception before and after the session, the essentials of the module, level of confidence in utilising library resources (both printed and online), module expectations, their preferred sources for research materials, and their feedback on the course content and delivery.

Results

The Legal Research Skill Module, conducted by the M. Kamal Hassan Library, received strong participation and highly positive feedback from law undergraduates at the AIKOL. A total of 489 (72%) students attended the module in 2024, with the majority being first-year students, highlighting its role as a foundational training in legal information literacy.

Table 1: Number of respondents based on level of study

Module	Level of Study					Total
	Year 1	Year 2	Year 3	Year 4	Foundation	
Legal Research Skill	352	88	24	2	23	489

The significantly higher attendance among Year 1 students suggests that the Legal Research Skill Module is strategically introduced early in the academic journey to equip students with essential research competencies.

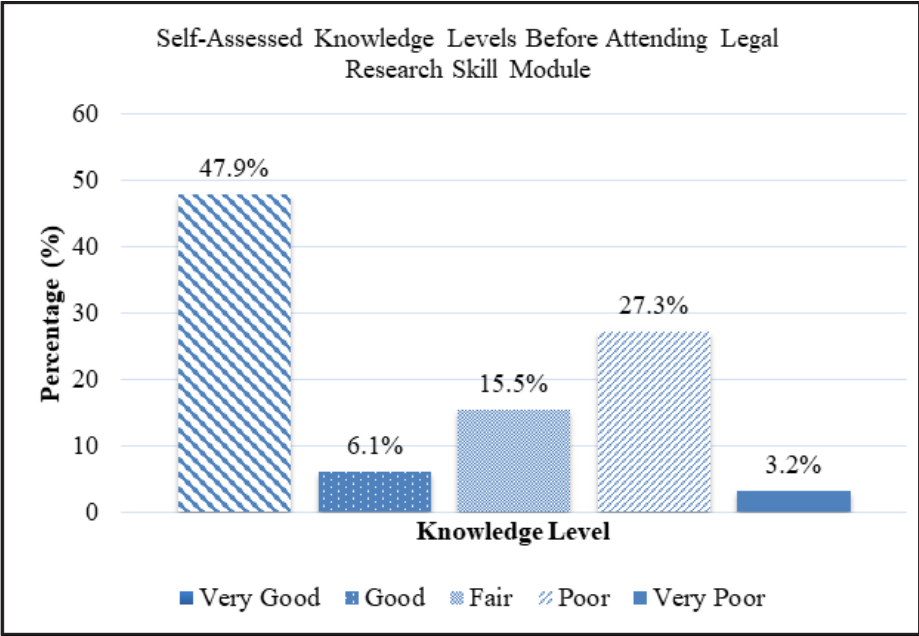


Figure 1: Self-assessed knowledge levels before attending the Legal Research Skill Module

Before attending the Legal Research Skill Module, participants were asked to assess their level of knowledge. As presented in Figure 1, 47.9% of the respondents rated their knowledge as *very good*, and 6.1% rated it as *good*. On the other hand, 15.5% of participants considered their knowledge *fair*, while a notable 27.3% indicated *poor* knowledge. A smaller group, 3.2%, assessed themselves as having *very poor* knowledge.

This distribution highlights that while nearly half of the students perceived themselves as having strong prior knowledge of legal research, a considerable proportion had limited confidence in their abilities. These results indicate the module plays a crucial role in bridging the knowledge gap among students, especially those who rated themselves in the lower categories.

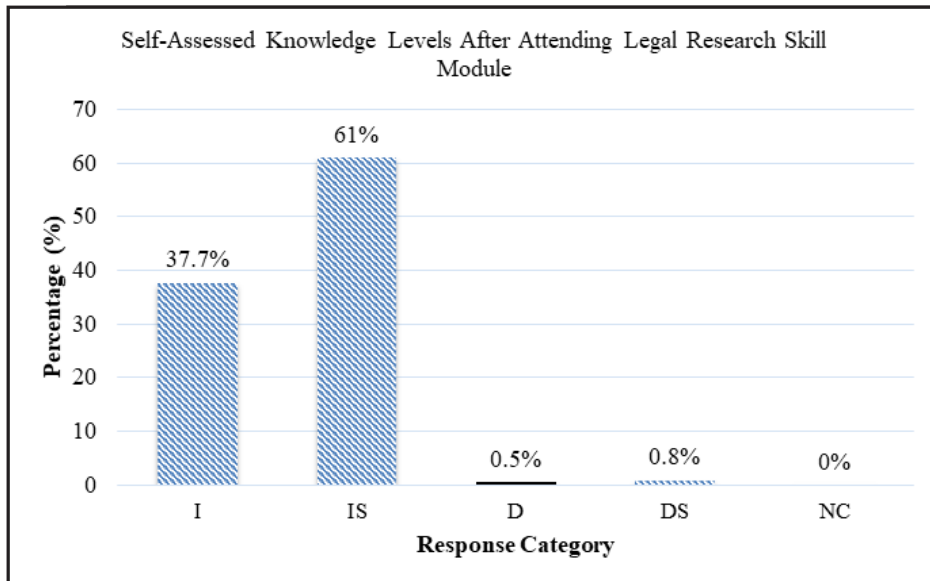


Figure 2: Self-assessed knowledge levels after attending the Legal Research Skill Module

The evaluation of students' knowledge levels after attending the Legal Research Skill Module revealed a significant positive impact. Out of the total respondents, 141 students (37.7%) reported that their knowledge had *increased (I)*, while a larger group of 228 students (61.0%) indicated their knowledge had *increased significantly (IS)*. This suggests that the module was highly effective in enhancing students' legal research capabilities. Only a very small minority reported negative outcomes, with 2 students (0.5%) stating their knowledge had *decreased (D)* and 3 students (0.8%) reporting it had *decreased significantly (DS)*. Notably, no respondents reported *any change (NC)* in their knowledge level, further supporting the effectiveness of the module.

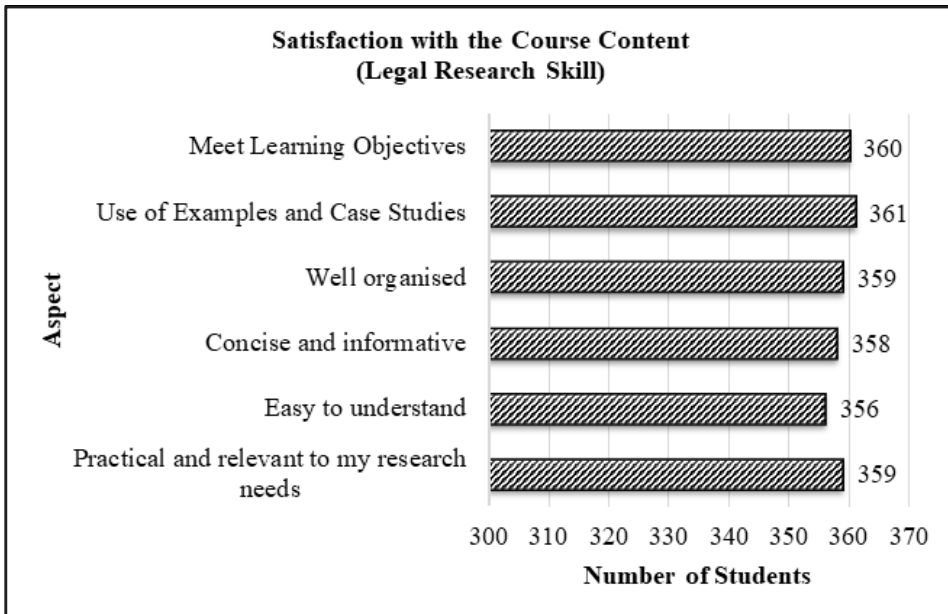


Figure 3: Satisfaction with course content for Legal Research Skill Module

Based on Figure 3, students' feedback for the Legal Research Skill Module shows strong satisfaction with the course content. Over 350 students agreed on all six (6) aspects evaluated, including relevance to research needs, clarity, conciseness, organisation, and the use of examples and case studies. The highest agreement was recorded for the use of examples (361 students) and achieving learning objectives (360 students). These findings suggest that the module was well-structured, easy to follow, and effectively met students' academic needs.

Discussion

The Legal Research Skill Module showed a strong positive impact on students' digital literacy and legal research skills. Through its contents covering various aspects including digital and Artificial Intelligence (AI), most students indicated an improved ability to locate, evaluate, and utilize legal information.

Table 2: Outline contents with the focus area for Legal Research Skill Module

No.	Module Content	Focus Area
1.	Introduction to legal research	Understand the concept, importance, and tools of legal research
2.	Understanding legal resources (printed and electronic)	Explore physical and digital law resources available at M. Kamal Hassan Library, IIUM
3.	Explaining legal citation and abbreviation	Learn what legal citation metadata is and why it matters
4.	Searching for law materials	Hands-on: Search for law materials using the Online Public Access Catalogue (OPAC) and IIUM Discovery Services
5.	Locating for law materials	Hands-on: Use the Smart Siddiq Directory to locate items by shelf
6.	Searching techniques	Hands-on: Practice different search techniques – Basic and Advanced Search
7.	Exploring subscribed law online databases	Hands-on: Explore legal research resources and the benefits of online databases
8.	Ethics in using AI	Hands-on: Learn how to use AI in legal research, including prompt creation and ethical considerations

Conclusion

The findings of this study demonstrate the strong impact of the Legal Research Skill Module in enhancing the digital literacy and legal research competencies of law students at IIUM. The results highlight not only significant improvements in knowledge and confidence but also reflect high levels of satisfaction regarding the module's content, delivery, and practical relevance. As digital research skills become increasingly essential in both academic and legal professional settings, structured and well-delivered library instruction like this plays a critical role in equipping future legal professionals with the necessary tools for success.

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From Agricultural Data into Knowledge Services: A Statistical Analysis of Paddy Yield Trends in Northern Sri Lanka (2004–2024)

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ABSTRACT

Understanding long-term yield trends and variability in paddy cultivation is crucial for enhancing agricultural productivity, ensuring food security, and guiding strategic policy interventions in Northern Sri Lanka. Despite the agricultural importance of this region, comprehensive district-level analyses of yield trends and irrigation scheme performance remain limited. This study aimed to analyze yield trends, stability, seasonal variability, and irrigation scheme performance, providing evidence-based insights for policy formulation and farmer support. Two decades (2004/2005–2023/2024) of district-wise paddy data (Vavuniya, Kilinochchi, Mullaitivu, Mannar, and Jaffna) covering both *Yala* and *Maha* seasons were statistically analyzed using linear regression to quantify yield trends and coefficient of variation (CV) to assess yield stability. Comparative analyses across irrigation schemes (major, minor, rain-fed) and seasons were performed using SPSS statistical software (version 26). The results were compared with the data of Anuradhapura; an adjacent district with a strong reliance on irrigation schemes for paddy cultivation. Findings revealed a significant upward yield trend in Mullaitivu district (55.1 kg/ha per year; $R^2=0.224$, $p<0.05$), while Vavuniya consistently exhibited the highest average yields (4478 kg/ha) with exceptional stability (CV=11.3%). Yield recovery post-2010 was notably strong in Kilinochchi (22.5%) and Mullaitivu (20.2%). Major irrigation schemes significantly outperformed minor schemes (4197 vs. 3781 kg/ha) and rain-fed cultivation (3158 kg/ha), displaying superior yield stability (CV=19.6%). Interestingly, the *Yala* season consistently achieved higher yields than *Maha* across all irrigation schemes, suggesting advantages in controlled irrigation conditions.

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Anuradhapura district data further contextualizes these findings, revealing consistently high productivity in major irrigation schemes (e.g., 4549 kg/ha in 2004/2005) and demonstrating the critical role of large-scale infrastructure in sustaining yields. The district's long-term trends highlight the resilience of irrigated systems compared to rain-fed cultivation when considering the trends in rainfall vary in terms of distribution and amount over the past decade. This study provides critical evidence supporting strategic investments in irrigation infrastructure and optimized seasonal management practices. It highlights the value of transforming open agricultural datasets into actionable insights, promoting sustainable agriculture, and informed decision-making in Northern Sri Lanka.

Keywords: Paddy Yield Trends, Statistical Analysis, Irrigation Schemes, Agricultural Policy, Open Data, Northern Sri Lanka

Introduction

An accurate understanding of agricultural yield dynamics is crucial not only for localized productivity improvements but also for addressing national and global food security goals. Like many countries in South Asia, Sri Lanka is facing mounting pressure due to climatic fluctuations changing rainfall patterns, and rising demand for staple foods such as rice. These challenges underscore the urgency for data-driven decision-making in agricultural planning. Within Sri Lanka, the Northern Province presents a distinct agroecological and socio-economic landscape. While it contributes significantly to the country's paddy production, especially in dry zone conditions, it has remained examined regarding long-term, district-specific yield analysis. National statistics often aggregate data, ignoring intra-regional disparities and the influence of water availability, irrigation schemes, and seasonal patterns. In this context, our study focuses on the Northern Province as a case study to explore how open-access agricultural data can be utilized to create actionable insights that support sustainable agriculture and smart policy formulation at both local and national levels for effective planning, policy formulation, and ensuring food security. In Northern Sri Lanka, despite its significant agricultural potential, comprehensive district-level analyses of paddy yield trends, especially concerning seasonal and irrigation scheme performance, remain sparse. Most national studies present aggregated trends without considering local discrepancies, seasonal yield variations, or the differential impact of

irrigation types. Furthermore, the limited use of open-access agricultural datasets restricts researchers' and policymakers' ability to generate evidence-based insights. Our study seeks to fill these gaps by providing a detailed statistical analysis of two decades of paddy cultivation data across five Northern districts. This research is particularly significant for understanding yield behaviour in dry zones, guiding future irrigation investments, and strengthening the use of agricultural open data in planning processes. The scope of this study is limited to secondary datasets provided by government sources; yield data for the Jaffna district being unavailable due to historical data disruptions.

Objectives

The primary objective of this study was to statistically analyze long-term paddy cultivation trends (2004–2024) across Northern Sri Lanka's five districts-Vavuniya, Kilinochchi, Mullaitivu, Mannar, and Jaffna. Specific objectives included:

- Identifying district-wise yield trends and stability.
- Evaluating performance variations across irrigation schemes (major, minor, rain-fed).
- Assessing seasonal differences in productivity between the Yala (dry) and Maha (wet) seasons.

Methodology

District-level secondary data on Gross Extent Sown, Extent Harvested, Average Yield (kg/ha), and Total Production (MT) were collected from government statistical databases (Department of Census and Statistics, Sri Lanka). Statistical analyses employed linear regression to quantify yield trends, with significance tested at $p < 0.05$. Yield stability was assessed using the coefficient of variation (CV). Seasonal and irrigation scheme performances were compared using descriptive and inferential statistics. Data analysis were performed using SPSS software (version 26). Limitations include a reliance on secondary sources, lack of complete yield data for Jaffna, and the exclusion of qualitative farm-level factors, such as pest outbreaks or and fertilizer use.

Results

Linear regression analyses revealed a significant positive yield trend in Mullaitivu (55.1 kg/ha per year; $R^2=0.224$, $p<0.05$), whereas Kilinochchi (64.0 kg/ha/year; $p=0.063$) displayed upward but non-significant trends. Vavuniya consistently reported the highest average yield (4478 kg/ha) with the lowest yield variability (CV=11.3%). Post-2010 yield analysis showed notable recovery and improvements in Kilinochchi (22.5%) and Mullaitivu (20.2%), aligning with post-conflict agricultural rehabilitation efforts documented by FAO (2018).

Table 1. Average Yield and Stability by District (2004–2024)

District	Average Yield (kg/ha)	Yield Trend (kg/ha/year)	R ²	CV (%)	Significant Trend
Vavuniya	4478	27.3	0.096	11.3	No
Kilinochchi	4050	64.0	0.189	21.0	No
Mullaitivu	4108	55.1	0.224	16.4	Yes
Mannar	4255	-1.6	0.000	20.3	No

Scheme-wise analyses highlighted major irrigation schemes consistently outperforming minor schemes and rain-fed areas, averaging yields of 4197 kg/ha (CV=19.6%) versus minor schemes (3781 kg/ha; CV=22.9%) and rain-fed areas (3158 kg/ha; CV=29.0%). Unexpectedly, Yala season yields consistently exceeded Maha yields across all schemes, likely due to improved water management and reduced pest pressure during controlled irrigation conditions (Ranasinghe et al., 2004).

Discussion

These findings clearly indicate the critical benefits of investing in major irrigation infrastructure, which aligns with national and international research. National-level data from Sri Lanka indicate that areas under assured irrigation consistently produce higher yields-often exceeding 5.0 t/ha-compared to 3.0–3.5 t/ha in rain-fed regions (Weerakoon et al., 2011). Globally, the role of irrigation in stabilizing rice yields has been widely documented, particularly in other South and Southeast Asian countries

where dry-season irrigation enables double cropping and mitigates monsoon variability (FAO, 2018). These comparative findings affirm that the observed yield enhancements in Northern Sri Lanka are not isolated but reflect broader patterns of irrigation-driven productivity gains, given their significantly higher yields and stability compared to minor and rain-fed schemes (Dhanapala, 2003). The seasonal productivity benefits observed during the Yala season suggests that controlled irrigation practices significantly enhance resource-use efficiency and reduce crop losses, offering valuable insights for regional agricultural management (Weerakoon et al., 2011). Our findings align with global trends emphasizing irrigation as a buffer against climatic variability (FAO, 2018; Ranasinghe et al., 2004). Furthermore, this study contributes to the growing body of research advocating for the integration of open agricultural data into smart farming practices. Initiatives like Sri Lanka's GeoGoviya platform illustrate the role of digital systems in disseminating timely, location-specific guidance to farmers and policymakers (Amarnath et al., 2025). The evidence provided here supports the design of district-specific intervention strategies and highlights the importance of seasonal crop planning using long-term data.

Conclusion

This study highlights the pivotal role of comprehensive statistical analyses of agricultural data in guiding strategic investments in irrigation infrastructure and optimizing seasonal management practices. It emphasizes the value of open agricultural data in transforming raw datasets into knowledge services that guide well-informed decision-making. By identifying regional yield patterns, quantifying stability, and highlighting seasonal performance disparities, the research provides practical insights to improve productivity and resilience in Northern Sri Lanka's paddy sector. From a policy perspective, the findings underscore the need for focused investments in irrigation infrastructure, particularly in districts and schemes with greater yield volatility. Additionally, the observed advantages of the Yala season suggests the importance of expanding dry-season irrigation capacity to enhance overall production. Future research studies should aim to integrate satellite-based environmental data, farmer-level socio-economic information, and climate projections to refine planning tools. There is also a need to explore digital literacy and institutional readiness to expand open data platforms like GeoGoviya in under-resourced districts.

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Transforming Education through Innovation: The Role of Emerging Technologies in Building Smart Nations

Nishreena Nisham¹

ABSTRACT

The role of educational technology (EdTech) in advancing national innovation agendas has received growing recognition, particularly as countries embark on Smart Nation strategies. In Canada, within the province of Ontario, the incorporation of digital tools in postsecondary education offers significant opportunities for promoting equity, fostering innovation, and building long-term capacity. This policy paper examines how strategic investments in research and development (R&D), alongside inclusive digital infrastructure and robust innovation ecosystems, can establish Canadian education as a fundamental element of smart nation development. The primary objective of this paper is to assess existing post-secondary education and innovation policies through the framework of smart nation goals and to identify key areas for policy improvement. The methodology includes a comparative review of national education strategies, EdTech implementation reports, and government R&D investment frameworks. The findings are categorized into three essential pillars: infrastructure and access, innovation and research, and institutional collaboration. The findings suggest that while Canada has made commendable strides in digitizing education, there is an opportunity to enhance these efforts by addressing the uneven distribution across provinces and improving national coordination. The analysis aims to identify areas where localized EdTech research and development can be more effectively integrated and where policy support can be strengthened to promote equitable scaling of innovation. Additionally, fostering more collaborative partnerships among government entities, academic institutions, and private EdTech developers could pave the way for creating more robust and sustainable innovative ecosystems. In conclusion, Canada's evolution toward becoming a smart nation will be significantly bolstered by policies that prioritize educational innovation, equity, and research. Coordinated efforts across the education, technology, and policy sectors are essential for achieving this vision.

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Keywords: Canadian Education Policy, Smart nation, Educational Technology, Innovation Ecosystems, Research and Development

Introduction

As Smart Nations evolve, STEAM education-integrating Science, Technology, Engineering, Arts, and Mathematics has emerged as a key strategy for developing future-ready skills. By combining creative and technical disciplines, STEAM fosters innovation, problem-solving and essential employability traits such as communication and adaptability (Quigley et al., 2017; Root- Bernstein, 2015). Maker culture, a hands-on, collaborative model within STEAM, leverages digital tools to support experiential learning (Medeiros et al., 2022).

Emerging technologies such as AI, VR, and cloud computing are reshaping how knowledge is delivered and experienced, enhancing interdisciplinary learning and accelerating digital transformation in education (Su et al., 2022). UNESCO (2023) highlights the need to redesign learning environments to adapt to global technological shifts, ensuring equitable access and collaborative learning.

The COVID-19 pandemic intensified this shift, leading to widespread adoption of online learning and cloud-based platforms (Bojović et al., 2020). However, challenges remain, particularly regarding digital equity and pedagogical alignment. Policy studies from Ireland, the U.S., and other OECD countries reveal that EdTech adoption is shaped by national priorities and local cultures (McGarr & Johnston, 2021; Culp et al., 2005; Mao et al., 2019).

In Canada, despite significant investments in educational technology as part of the Smart Nation ambitions, persistent gaps in infrastructure and implementation necessitate closer policy analysis.

This policy paper examines how strategic investments in research and development (R&D), along with inclusive digital infrastructure and robust innovation ecosystems, can establish Canadian education as a cornerstone of smart nation development.

Objectives

1. Critically examine Canada's post-secondary education and innovation policies through the Smart Nation lens.
2. Identify existing gaps in digital infrastructure, educational equity, and policy alignment.
3. Assess the role of inclusive digital infrastructure and localized EdTech research in promoting innovation.
4. Propose policy actions for fostering stronger partnerships among government, academia, and EdTech developers.
5. Recommend strategies to position Canada's education system as a foundational pillar in the National Smart Nation development agenda.

Methodology

This policy paper adopts a qualitative, comparative approach to examine the link between educational technology (EdTech) and Canada's national innovation strategies within the framework of the Smart Nation initiative. The study is structured around three main analytical areas: digital infrastructure and accessibility, innovation and research, and institutional collaboration.

- **Policy Review:** A comprehensive review of federal and Ontario-specific documents on post-secondary education, digital infrastructure, and innovation, including strategic plans, budget reports, and legislation.
- **Comparative Analysis:** Evaluation of Smart Nation and EdTech strategies from selected OECD countries to identify global best practices that can guide Canadian policy decisions.
- **Implementation and R&D Analysis:** Analysis of EdTech implementation data, pilot programs, equity reports, and adoption metrics alongside trends in R&D funding to gauge support for innovation.
- **Stakeholder and Ecosystem Mapping:** Identification of key actors across government, academia, and industry to assess collaboration and uncover opportunities for stronger partnerships.

Key Stakeholder Actions

- **Government:** Create a national digital infrastructure fund, establish a central EdTech strategy agency, and enforce digital training programs for teachers.
- **Academia:** Lead local EdTech R&D projects, incorporate digital pedagogy training, and develop open-source platforms through cross-sector partnerships.
- **EdTech Developers:** Focus on universal design principles, pilot scalable solutions in partnership with universities, and participate in public-private funding collaborations

Through triangulation of these sources, the methodology seeks to generate a holistic understanding of how policy, infrastructure, and collaboration influence the potential of EdTech to support Canada’s Smart Nation goals.

Findings

1. Ongoing deficiencies in Digital Infrastructure and Educational Equity

Despite progress in the educational technology infrastructure, Canada continues to face with issues of digital equity, particularly among rural and Indigenous communities. In Ontario, uneven broadband access and institutional readiness hinder fair EdTech implementation (Council of Canadian Academies, 2021). The Ontario Digital Learning Strategy (2021) commits to improving equity through digital solutions and calls for better funding for under-resourced institutions. As part of this initiative, the province is investing \$50 million in virtual learning and EdTech to expand access to high-quality, globally competitive education labeled “Ontario Made”.

2. Fragmented Landscape of Local EdTech Research & Development

Despite ongoing federal and provincial governments support for research and development, innovation in educational technology remains fragmented and unevenly distributed across different regions. While institutions such as the University of Toronto are at the forefront, demonstrated through

initiatives like its EdTech Incubator, many others operate in isolation without coordinated support systems.

3. Insufficient Cross-Sector Collaboration

The success of Smart Nation strategies heavily relies on robust partnerships among government, academia, and industry. In Canada, however, these collaborative mechanisms remain underdeveloped. This lack of coordination hampers the effective scaling and deployment of EdTech solutions across the educational landscape.

4. Lack of coherence in National Policy Frameworks

Comparative analysis reveals that nation's leading in Smart Education, such as Singapore, Estonia, and Finland, benefit from centralized governance models that align educational technology policies across various jurisdictions. For instance, Sahlberg (2021) describes how Finland's integrated approach to educational innovation promotes national equity and superior learning outcomes.

In contrast, Canada's decentralized federal-provincial governance structure often results in overlapping initiatives and fragmented funding allocations.

Discussion

This study confirms that while emerging technologies can play a crucial role in equipping learners with the necessary skills needed for a smart nation, achieving this potential requires addressing deep-rooted inequities and policy inconsistencies. Johnston (2010) emphasizes the importance of aligning research and educational outcomes, a principle that remains to be vital today. Canada's future efforts should focus on promoting inter-sectoral collaboration and ensuring consistent funding for digital access and teacher training.

Conclusion

While Canada is well-positioned to harness the potential of emerging technologies in education, the pathway towards becoming a true Smart Nation requires addressing systemic issues in policy frameworks, promoting cross-sector collaboration, investments in Edtech research, and addressing gaps in digital infrastructure and educational equity, which cannot be accomplished solely through innovation. Bridging existing equity gaps requires enhancing the digital landscape, and fostering meaningful collaboration across sectors is a critical next step. Johnston (2010) argues that the full realization of EdTech's potential necessitates a deliberate alignment between educational objectives and R&D priorities; without this coherence, many communities may be left behind in the digital transformation. A unified national approach, built on equity and sustained investment, is essential to ensuring that every learner can reap the benefits of the digital transformation in education.

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Fuzzy C-Means Clustering of Work-Life Boundary Styles: Applications for Smart Library Workforces and User Behaviour Analysis

T. Satheeskumar¹, P. Selvarajan²

ABSTRACT

This study employs Fuzzy C-Means (FCM) clustering to analyze work-life boundary patterns, with direct applications in Library science and smart nation initiatives. By analyzing behavioural data, we identified three wellbeing profiles: socially fulfilled, high-stress/imbalanced, and balanced. Methodologically, we integrate dimensionality reduction techniques (PCA/t-SNE) and multivariate visualization to affirm the validity of clusters. Crucially, we reframe findings through the perspective of library science: Clustering techniques to enable personalized user services in smart libraries by categorizing information-seeking behaviours; identified patterns can guide staff wellness programs to mitigate burnout in digital library environments and financial security indicators correlate with digital literacy adoption. Results reveal stress ($r=0.78$), social support ($r=0.68$), and financial security ($r=0.72$) as key differentiators. Moreover, the methodological innovations include FCM parameter optimization (fuzziness $m=2.1$) and cluster validation by Fuzzy Partition Coefficient (FPC=0.709). This demonstrates how machine learning can transform library operations through data-driven user understanding and staff wellbeing management. The framework offers tools for libraries to segment users for tailored resource allocation, design workplace interventions, and promote national smart citizenry goals through behavioural informatics. While this study uses a general behavioural dataset as a proxy, in future study employing library-specific data to improve contextual relevance and operational applicability, thereby strengthening the research rigor.

Keywords: Smart Libraries, Fuzzy Clustering, Work-Life Balance, User Behaviour Analytics, Library Workforce Wellbeing

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Introduction

Modern libraries are pivotal role in national smart city initiatives, requiring flexible workforce management and user engagement strategies (Ketheeswaren, 2024). While clustering algorithms are used to analyze behavioural patterns (Farrahi and Rostami, 2024), their application to library science remains underdeveloped. This research intended to bridge this gap by investigating the impact of work-life boundary styles on library professionals' practices and user experiences. Specifically, this study examines how clustering techniques can be used to model stress patterns among library staff within the context of digital transformation (Latupeirissa et. al, 2024), explores the connections between user wellbeing profiles and their information-seeking behaviours, and investigates methodological frameworks that enable smart libraries to effectively operationalize behavioural data for strategic decision-making and service personalization. The study repositions psychological clustering in the field of library informatics, addressing the themes “smart service personalization” and “digital citizenry support.”

Objectives

The objective of this research is to explore and enhance wellbeing-centered strategies within the library environment through the application of fuzzy clustering techniques. This study aims to identify wellbeing profiles by using FCM clustering while analyzing key differentiating features such as stress, social support and financial security.

Methodology

This study reinterprets a Kaggle behavioural dataset (14 features) into library science constructs (e.g., workload, user engagement, digital access). The use of a general behavioural dataset is justified in its ability to captures fundamental aspects of wellbeing including stress, social support, and financial security which can be applied to library contexts. Libraries aiming to replicate this process can gather analogous metrics through user surveys, staff wellness assessments, digital service usage logs, and work schedule records, enabling the application of clustering models with institution-specific relevance. After Z-score normalization (Luo & Luo, 2024), FCM clustering (optimized at $m^*=2.1$, validated by FPC) identified (Velandia et. al, 2021)) wellbeing profiles. t-SNE visualized cluster separability.

The results were mapped to user/staff personas and service scenarios to enable library applications (Elsamani et. al, 2023): user segmentation, staff wellbeing initiatives, and performance metrics.

To contextualize the use of general behavioural data, the following mapping aligns the original dataset features with relevant constructs in library science. This mapping (Table 1) aids in interpreting the clusters meaningfully for practical applications in smart library environments.

Table 1: Mapping of Behavioural Dataset Features to Library Constructs

Original Feature (Kaggle Dataset)	Interpreted Library Construct
Stress	Workload/Transition Stress
Financial Security	Digital Access Equity
Social Support	Staff Collaboration/Team Dynamics
Sleep Quality	Schedule Flexibility/Work-Life Balance
Internet Usage	Digital Literacy Level
Leisure Time	Informal Interaction Opportunities
Family Time	Staff-User Interaction Capacity
Happiness Index	Job Satisfaction/User Satisfaction
Productivity Score	Service Delivery Efficiency
Communication Frequency	Team/Departmental Engagement
Daily Routines	Workday Consistency & Structure
Motivation Level	Staff Engagement
Time Management	Task Load Planning
Health Score	Overall Staff Wellbeing

Although the dataset originates from a general behavioural source, it was reinterpreted for library science purposes. Future studies are encouraged to collect and analyze data directly from library environments to enhance domain-specific accuracy and impact.

Results

Three distinct clusters were identified through Fuzzy C-Means (FCM) clustering, each with practical relevance to library service optimization and staff wellbeing.

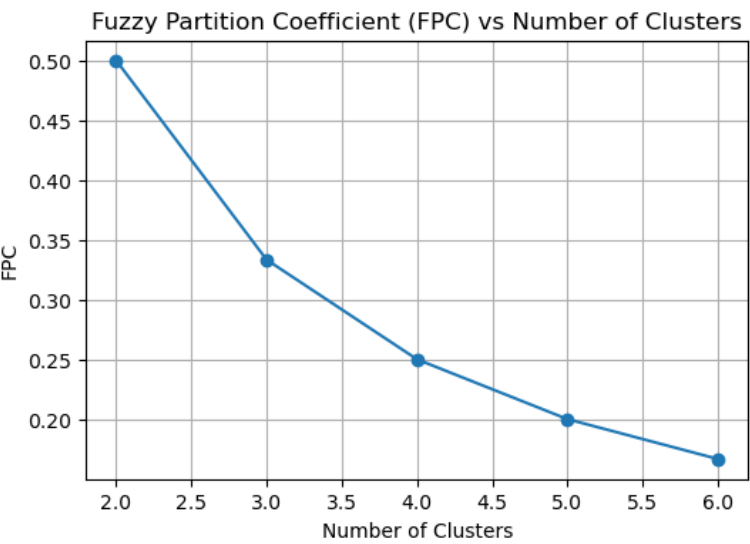


Figure 1: Fuzzy Partition Coefficient (FPC) vs. Number of Clusters

Figure 1 presents the FPC values across different cluster counts. The highest FPC value at three clusters confirms this as the optimal choice, balancing fuzziness and cluster quality. The three identified user clusters and their defining features are summarized in Table 2 below:

Table 2: Analysis of Validated Library User Clusters & Implications

Cluster	Size	Core Characteristic	Library Focus	Key Implication
High-Stress	35%	Digital service resistance	Staff Wellness	Targeted training for digital transitions
Socially Fulfilled	-	High e-resource access	User Personalization	Customized digital collections
Balanced	-	Self-service preference	Smart Infrastructure	Autonomous service investments

Figure 2 displays the t-SNE visualization of the clustered data. The clear spatial separation between clusters affirms the ability of FCM to distinguish behavioural profiles effectively.

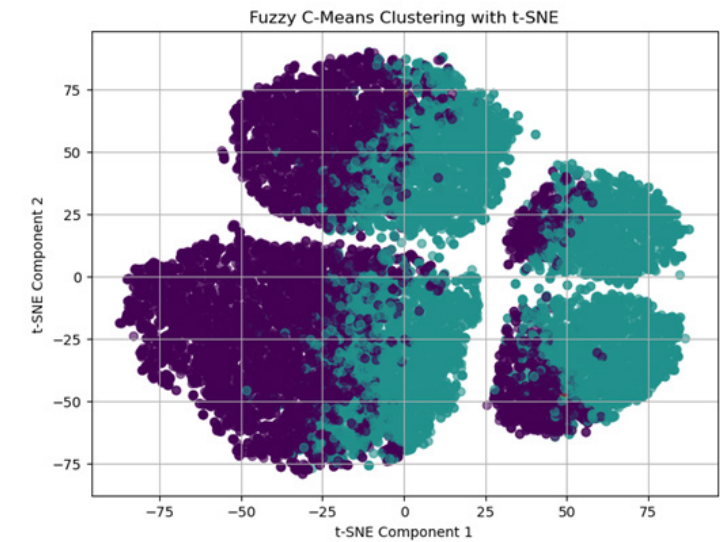


Figure 2: Fuzzy C- Means Clustering with t-SNE

In Figure 3, the Parallel Coordinates Plot visualizes these differences across multiple features, making inter-cluster comparisons more intuitive. These findings provide a foundation for personalized library services, stress-aware staff management, and infrastructure planning that align with behavioural tendencies revealed through clustering.

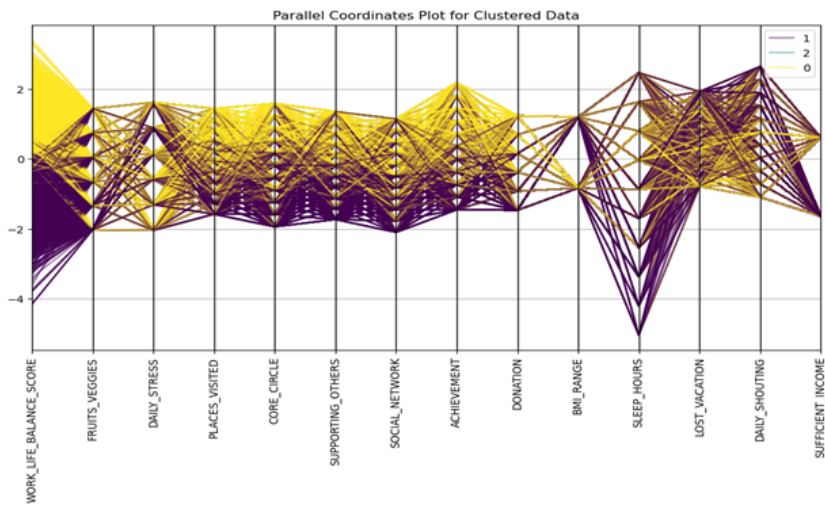


Figure 3: Parallel Coordinates Plot for Clustered Data

Discussion

Findings of the study offer practical applications in the field of library science. Clustering identified staff groups needing support during digital transitions and enabled personalized user service models. Traditional user segmentation in libraries often relies on static attributes such as age, membership category, or borrowing history. While these criteria are useful, they may overlook complex behavioural patterns and personal wellbeing factors. In contrast, FCM clustering enables a more dynamic understanding by capturing overlapping behaviours and flexible group boundaries. This allows for the identification of latent user personas such as those experiencing digital stress or high engagement which are not easily detectable through conventional segmentation methods. By using FCM, libraries can implement more adaptive and personalized strategies for service delivery and workforce management.

A strong link between financial security and digital literacy ($r=0.71$) highlights the role of wellbeing metrics in promoting digital inclusion. Unlike hard clustering methods, FCM accommodates ambiguity by allowing individuals belonging to multiple clusters with varying degrees of membership, making it well-suited for analyzing complex and overlapping behavioural traits in library contexts. Methodologically, FCM outperformed k-means in handling behavioural ambiguity. However, the use of a general dataset remains a limitation that future library-specific research need to address.

Implementing clustering techniques in libraries presents practical challenges such as limited access to behavioural data, the need for staff training in data analytics, concerns over user privacy and ethical data use, and constraints related to technical infrastructure and computational resources. Addressing these issues is essential for the sustainable adoption of data-driven decision-making in library environments.

A potential pilot project could involve a mid-sized public library using FCM clustering to monitor staff wellbeing. By collecting regular data on stress levels, digital workload, and work-life balance indicators, the library could identify at-risk staff groups and adjust schedules, training, or support resources accordingly. This would demonstrate the practical value of clustering analytics in a real-world library setting.

Conclusion

This study demonstrates the value of clustering analytics in advancing library science through data-informed decision-making. Based on the findings, libraries are recommended to adopt clustering techniques for proactive staff burnout prevention and user service personalization, enabling more responsive and equitable service delivery. Additionally, the development of smart wellbeing dashboards using cluster-derived indicators can provide real-time insights into user and staff wellbeing, supporting adaptive management strategies. Finally, integrating behavioural analytics into national digital literacy assessments can enhance the role of libraries within broader digital inclusion frameworks by aligning their services with policy goals and societal needs.

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User Satisfaction of Library Services at Colombo Tamil Sangam Library

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ABSTRACT

This study aims to evaluate the user satisfaction of services provided by the Colombo Tamil Sangam Library, Sri Lanka. The Colombo Tamil Association, also known as Colombo Tamil Sangam is a Tamil literacy institution in Colombo dedicated to developing and promoting Tamil culture and literature. The aim of this study was to assess the user satisfaction regarding library resources and services. The specific objectives included: (1) determining the purposes users visit the library; (2) measuring user satisfaction with library resources; (3) evaluating user perceptions of staff attitudes in service provision; and (4) analyzing user satisfaction with the physical arrangements and organization of the library. Both Quantitative and Qualitative research methods were used as the research design, using questionnaires and interviews as the research instruments. From a total of 985 (n = 985) registered readers in the year 2024, questionnaires were distributed to 169 users who visited the library in March 2025. Additionally, 20 student members and 5 adult users were randomly selected for structured interviews. The response rate for the questionnaire survey was 100%. Among the respondents, 76% were female and 24% were male. The interviews were conducted based on the convenience of the participants. The findings revealed that 80% of the users are satisfied with both collection and services, and 66.3% of them visited the library to borrow books. Further, 93% of the readers expressed a high level of satisfaction with the attitude of the library staff. The organization and physical arrangements of the library were appreciated by 86.3%. Users expressed concerns about the limited technological advancements in the library. Additionally, the library's infrastructure was reported as unsatisfactory. During the structured interviews, users highlighted several issues, such as the absence of user education programs, insufficient staff, inadequate technological facilities, the inability to conduct library extension

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services, and the need for a more conducive library environment. This study recommends increasing budget allocations to enhance the lending section. The library environment need to be regularly monitored and improved, and technological equipment such as computers and photocopy machines should be provided to modernize library facilities. Furthermore, the number of library cadre positions should be increased, and vehicles should be allocated to strengthen library extension services.

Keywords: Colombo Tamil Sangam, Library Collection, Library Services, User Satisfaction, Private Libraries

நூலக சேவையில் வாசகர் திருப்தி : கொழும்பு தமிழ்ச்சங்க நூலகத்தை மையப்படுத்திய ஆய்வு

அறிமுகம்

நூலகங்கள் நூல்களின் காப்பகங்களாக மட்டுமல்லாமல் தகவல்களைத் தேடும் மையங்களாகவும் விளங்குகின்றன. இவ்வாறான மாற்றங்களின் காரணமாக நூலகங்கள் தங்களது வாசகர்களின் தேவைகளைப் புரிந்துகொண்டு அவர்களுக்குத் தேவையான சேவைகளை வழங்க வேண்டிய கட்டாயத்துக்குள் தள்ளப்பட்டுள்ளன. ஆதலால் நூலகங்கள் வாசகரின் தேவையை நிறைவு செய்வதற்காக தமது சேவைகளை விஸ்தரித்துக் கொண்டுள்ளன. இவ்வகையில் இந்த ஆய்வானது கொழும்புத் தமிழ்ச்சங்க நூலகத்தால் வழங்கப்படும் நூலக சேவையில் வாசகர் திருப்தி பற்றி மதிப்பிடுவதை நோக்கமாகக் கொண்டுள்ளது.

ஆய்வுப் பின்னணி

கொழும்புத் தமிழ்ச் சங்க நூலகமானது இலங்கையில் வெளிவருகின்ற, மற்றும் உலகெங்கும் புலம்பெயர்ந்து வாழும் இலங்கைத் தமிழர்களால் வெளியிடப்படுகின்ற அனைத்துத் துறையிலுமான நூல்களையும், சஞ்சிகைகளையும் சிறு வெளியீடுகளையும் சேகரித்து ஆவணப்படுத்தி பாதுகாப்பதனை தனது தலையாய கடமையாக கொண்டு 1942ஆம் ஆண்டு மார்ச் மாதம் 22ஆம் திகதி 60 நூல்களுடன் உருவாக்கப்பட்டது. இந்நூலகத்தின் குறிக்கோள் தமிழியல் ஆய்வு நூலகமாக செயற்படுவதாக இருக்கின்ற போதிலும், நூலகத்தின் அமைவிடத்தினைக் கருத்தில் கொண்டு (தமிழ் மக்கள் செறிந்து வாழ்வதுடன் பொது நூலகம் எதுவும் இல்லாமை காரணமாக) பொது நூலகத்தின் சேவையினையும் வழங்கிவருகின்றது. இந்நூலகம் கொழும்பில் வாழும் பெரும்பாலான தமிழ் மக்களுக்கு பெரும் சேவையாற்றி வருகின்ற போதிலும் இதுவரைக்கும் இந்நூலகத்தில் வாசகர் திருப்தி பற்றி எந்த ஒரு ஆய்வும் செய்யப்படவில்லை என்பது கவனிக்கத் தக்கதாகும்.

ஆய்வின் முக்கியத்துவம்

வாசகர் திருப்தி தொடர்பாக கொழும்புத் தமிழ்ச் சங்க நூலகத்தில் மேற்கொள்ளப்படும் முதலாவது ஆய்வு இதுவாகும். இது இந்நூலகத்தின் வளர்ச்சிக்கு உந்து சக்தியாக அமையும் என்பது உண்மை. இவ் ஆய்வின் நோக்கமானது நூலகங்களின் மேம்பாட்டை இலக்காக முன்வைத்து இலக்கிய மீளாய்வுடன் பெறப்பட்டது. ஆதலால் ஆய்வின் முடிவுகளில் இருந்து பெறப்படும் தீர்மானங்கள் கொழும்புத் தமிழ்ச் சங்க நூலகத்தின் வளங்கள் சேவைகளை தரம் உயர்த்துவதில் முக்கிய பங்கினை வகிக்கும். அத்துடன் அடையாளம் காணப்படும் சவால்கள் அவற்றிற்கான பரிந்துரைகள் நூலக விருத்திக்கு மேலும் வலுச்சேர்க்கும்.

ஆய்வின் நோக்கம் மற்றும் குறிக்கோள்கள்

இவ்வாய்வானது நூலக சேவைகள் குறித்து கொழும்புத் தமிழ்ச்சங்க நூலகத்தின் வாசகர்களின் திருப்தி நிலையை மதிப்பிடுதலை முக்கிய நோக்கமாகக் கொண்டுள்ளது. மேலும் கொழும்புத் தமிழ்ச் சங்க நூலகத்தை வாசகர்கள் பயன்படுத்துவதற்கான நோக்கத்தினை இனங்காணல், நூலக சேகரிப்பு குறித்து வாசகர்களின் திருப்தி நிலையை மதிப்பிடல், நூலகப் பணியாளர்களின் சேவைத்திறனை மதிப்பிடல் மற்றும் நூலகத்தில் வாகர்களுக்கு செய்துகொடுக்கப்பட்ட வசதிகள் திருப்திகரமானதா என்பதனை ஆராய்தல் என்பன ஆய்வின் முக்கிய குறிக்கோள்களாகும்.

ஆய்வு முறையியல்

இந்த ஆய்வில் அளவு சார் மற்றும் பண்பு சார் ஆய்வு முறைகள் கலந்த ஒரு கலப்பு ஆய்வு முறையியல் பயன்படுத்தப்பட்டுள்ளது. 2024 ஆண்டு கொழும்பு தமிழ்ச்சங்க நூலகத்தில் பதிவு செய்த மொத்த வாசகர்கள் எண்ணிக்கை 985 ஆகும். இவர்களுள்; 2025ஆம் ஆண்டு பங்குனி மாதம் நூலகத்திற்கு வருகை தந்த 169 வாசகர்களிடம் வினாக்கொத்து வழங்கப்பட்டு தரவு சேகரிக்கப்பட்டது. நேர்காணலுக்காக 20 மாணவர்களும் ஐந்து (05) பெரியோரும் எழுமாதிரியாகத் தெரிவு செய்யப்பட்டனர். வினாக்கொத்து மூலம் பெறப்பட்ட தரவு புள்ளிவிபரமுறை மூலம் பகுப்பாய்வு செய்யப்பட்டது. நேர்காணல்கள் மூலம் பெறப்பட்ட தரவுகள் கருப்பொருள் பகுப்பாய்வு செய்யப்பட்டது.

ஆய்வு முடிவுகள்

அளவுசார் ஆய்வில் பங்குபற்றிய 169 பேரில் அனைவரும் பதிலளித்தமை(100%) சிறப்பானதாகும். இதில் 76% பெண்களும் 24% ஆண்களும் அடங்குவர்.

கொழும்புத் தமிழ்ச் சங்க நூலகச் சேர்க்கை மற்றும் சேவைகள் குறித்து 80% சதவீதமானவர்கள் திருப்தி அடைவதாகக் குறிப்பிட்டுள்ளனர்.

ஆய்வின் முடிவில் 66.30% சதவீதமானவர்கள் நூல்களை இரவலாகப் பெற்றுச் செல்வதற்கே நூலகத்தைப் பயன்படுத்துகின்றனர் என்றும் 70.30% சதவீதமானவர்கள் இரவல் வழங்கும் பகுதியையே அதிகமாகப் பயன்படுத்துகின்றனர் என்றும் முடிவுகள் பெறப்பட்டன.

அட்டவணை 1 : நூலகத்திற்கு வருகை தருவதன் நோக்கம்

நோக்கம்	சதவீதம் (%)	பதிலளித்தவர்கள்
நூல்களை இரவலாகப் பெறுவதற்கு	66.30%	110
கற்றல் தேவைக்கு	15.10%	25
பொழுது போக்கிற்கு	12%	20
படிப்பகப் பகுதியைப் பயன்படுத்துவதற்கு	6%	10
பத்திரிகைகள் வாசிப்பதற்கு	0.6%	1
மொத்தம்	100%	166

நூலகப் பணியாளர்களின் சேவைத்திறன் மதிப்பீடு தொடர்பில் 93% சதவீதமானவர்கள் நூலகப் பணியாளரின் சேவையில் திருப்தி அடைவதாகக் குறிப்பிட்டுள்ளனர். நூலகத்தில் வாகர்களுக்கு செய்து கொடுக்கப்பட்ட வசதிகளின் திருப்திகரத் தன்மையை மதிப்பிட்டதில் நூலகச் சூழலில் 86.3% சதவீதமானவர்கள் திருப்தி அடைவதாகக் குறிப்பிட்டுள்ளனர்.

தொழில்நுட்ப விருத்தி தொடர்பாக வாசகர்கள் அதிருப்தியை வெளியிட்டனர். நூலகத்தின் உட்கட்டமைப்பு வசதிகள் தொடர்பாகவும் வாசகர்களிடம் அதிருப்தி நிலவுகின்றது.

மேலும் நேர்காணலின்போது இந்நூலகம் தொடர்பில் வாசகர்கள் பல குறைபாடுகளைச் சுட்டிக்காட்டியிருந்தனர். அவையாவன: வாசகர் கல்வி இல்லாமை, பணியாளர் போதாமை, தொழில்நுட்ப சாதனங்களின் பற்றாக்குறை, நூலக விரிவாக்கற்சேவையை செய்ய முடியாமை மற்றும் சாதகமான நூலகச் சூழல் காணப்படாமை என்பனவாகும்.

சிற்தனையாடல்

ஒரு சமூகத்தில் நூலகம் ஒன்றின் பங்களிப்பு மிக மிக இன்றியமையாத ஒன்றாகும். இவ்வகையில் நூலகங்களில் வாசகர் திருப்தியை மதிப்பிடுவதும் மிக இன்றியமையாததாகும். ஏனெனில் வாசகர் திருப்தியை அறிவதன் மூலமே நூலகத்தின் சேர்க்கைகள் மற்றும் சேவைகளை வாசகர் தேவையை நிறைவு

செய்யும் வகையில் ஏற்படுத்திக் கொடுக்க முடியும். அவ்வாறான நோக்குடன் இந்த ஆய்வில் வாசகர்கள் கூடுதலாக வருகை தருவது நூலகத்தில் நூல்களை இரவல் பெறுவதற்காகவே என அறியப்பட்டுள்ளது. கமகே (2020) அவர்களால் செய்யப்பட்ட இதே போன்ற ஆய்வில் கூடுதலான பட்டதாரி மாணவர்கள் தமது குறிப்புக்களை படிப்பதற்கே நூலகத்திற்கு வருகை தருவதாகக் கூறப்பட்டுள்ளது. இந்த ஆய்வில் பொதுவாக நூலக சேர்க்கைகள் மற்றும் நூலக சேவைகள் பற்றி வாசகர்கள் திருப்தியை வெளியிட்டுள்ளமை, இதே போன்றதொரு ஆய்வு முடிவை வெளியிட்டுள்ள சுழல் மயற்றும் மன்டேல் (2021) ஆகியோருடைய ஆய்வு முடிவுடன் ஒத்துச் செல்வதை காண முடிகிறது. நூலகப் பணியாளர்களின் சேவைத்திறன் மதிப்பில் 93% திருப்தி நிலையைத் தெரிவித்துள்ளனர். இதே போல விஜயலட்சுமி (2015) மற்றும் அமரசேகர மற்றும் மாரசிங்க (2020) ஆகியோரால் மேற்கொள்ளப்பட்ட ஆய்வுகளில் நூலகத்திற்கு வரும் பட்டதாரி வாசகர்கள் நூலகப்பணியாளர்களிடம் மிகுந்த திருப்தியை வெளியிட்டுள்ளமை குறிப்பிடத்தக்கது.

ஆய்வு முடிவுகளும் பரிந்துரைகளும்

இந்த ஆய்வானது கொழும்புத் தமிழ்ச்சங்க நூலகத்தால் வழங்கப்படும் சேவைகளில் வாசகர் திருப்தியை மதிப்பிடுவதை முக்கிய நோக்கமாகக் கொண்டுள்ளது. மேலும் (1) கொழும்புத் தமிழ்ச் சங்க நூலகத்தை வாசகர்கள் பயன்படுத்துவதற்கான நோக்கத்தினை இனங்காணல், (2) நூலக சேகரிப்பு குறித்து வாசகர்களின் திருப்தி நிலையை மதிப்பிடல், (3) நூலகப் பணியாளர்களின் சேவைத்திறனை மதிப்பிடல் மற்றும் (4) நூலகத்தில் வாசகர்களுக்கு செய்துகொடுக்கப்பட்ட வசதிகள் திருப்திகரமானதா என்பதனை ஆராய்தல் போன்ற முக்கிய குறிக்கோள்களைக் கொண்டுள்ளது.

மேற்கொள்ளப்பட்ட ஆய்வின் முடிவுகளின்படி, பெரும்பாலான வாசகர்கள் நூலகச் சேர்க்கை மற்றும் சேவைகளில் தமது திருப்தி நிலையை வெளியிட்டுள்ளனர். எனினும், நூலகச் சூழல் மற்றும் உட்கட்டமைப்பு வசதிகள் தொடர்பாக அதிருப்தியை வெளியிட்டுள்ளனர். நூலகச் சேவையில் காணப்படும் சவால்களாக தொழில்நுட்ப சாதனங்களின் பற்றாக்குறை, பணியாளர் எண்ணிக்கை போதாமை, விரிவாக்கற் சேவையை நடாத்துவதற்கான வசதிகள் இன்மை போன்றவை குறிப்பிடப்பட்டுள்ளன.

இவ்வாய்வு முடிவினை அடிப்படையாகக் கொண்டு இரவல் வழங்கும் பகுதிக்கு சிறந்த சேர்க்கைகளை உள்வாங்கி விருத்தி செய்வதற்கான நடைமுறைகளை மேற்கொள்வதற்குரிய நிதியினை அதிகரித்தல், நூலகச்சூழலை தொடர்ந்து கண்காணிப்பு செய்வதன் மூலம் அதனை சிறந்த முறையில் பராமரித்தல், நூலக வசதிகளை நவீனமயப்படுத்துவதற்குரிய தொழில்நுட்ப சாதனங்களாகிய கணினிகள் மற்றும் போட்டோபிரதி சாதனங்களை பெற்றுக் கொடுத்தல், நூலக பதவி வெற்றிடங்களை அதிகரித்தல் மற்றும் நூலக விரிவாக்கற் சேவைகளை மேற்கொள்வதற்குரிய வாகன வசதிகளை செய்து கொடுத்தல் போன்ற பரிந்துரைகள் வழங்கப்பட்டுள்ளன.

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Reclaiming Memory through Digital Heritage: Noolaham's Oral History Archive as a Model for Community-Driven Preservation

Shathishni Mathiyalakan¹

ABSTRACT

Noolaham Foundation, South Asia's foremost Sri Lankan Tamil digital library, represents a transformative intervention in digital heritage preservation. This paper investigates Noolaham's oral history project, a community-driven program that has recorded and curated **751 oral histories** from diverse Tamil-speaking communities across Sri Lanka. Through regionally embedded projects in **Kilinochchi, Trincomalee, Ampara**, and among **indigenous groups**, Noolaham has recorded the experiences of **drama artists** (நாடக கலைஞர்கள்), **musicians** (இசைக்கலைஞர்கள்), **teachers, social activists, writers, Ayurvedic doctors, Veddas** (வேடுவர்), and **traditional performers** (நாட்டுக்கூத்து கலைஞர்கள்). These narratives offer deep insights into **regional histories, traditions, war-time displacement, cultural memory, and indigenous knowledge systems**. The **History of Medicine Collection** further traces the emergence and evolution of both allopathic and non-allopathic medical systems in Northern Sri Lanka, including the history of the region's earliest dispensaries. Using detailed, grounded examples and adhering to international digitization standards such as **ISO/TR 13028**, this study presents Noolaham's oral history project as a **replicable, ethical, and sustainable model** for community driven digital preservation. By foregrounding historically marginalized communities, oral history becomes not only as a preservation method, but as a powerful tool for reclaiming memory, asserting identity, and enabling inclusive digital knowledge production.

Keywords : Noolaham Foundation, Oral History, Community Documentation, Tamil Knowledge, Digital Heritage, ISO/TR 13028, Smart Libraries, Cultural Sustainability

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Introduction

The urgency of preserving intangible cultural heritage is especially acute for communities shaped by historical trauma, displacement, or marginalization. For Tamil-speaking populations in Sri Lanka whose narratives have often been fragmented, politicized, or erased, oral history offers a means to reclaim memory and assert identity through first-person voices and community-driven documentation.

The Noolaham Foundation was established to address this epistemic gap, functioning as a participatory digital library that democratizes access to knowledge and promotes cultural continuity. By prioritizing multilingual access, ethical consent practices, and public engagement, it has redefined the role of libraries in post-conflict and diasporic settings.

This paper situates Noolaham's oral history program within broader discourses on digital heritage infrastructures. It explores how community-centered documentation, ethical data stewardship, and open-access platforms not only preserve heritage but also empower historically silenced communities. Framed within the conference theme "Building a Smart Nation through Smart Libraries," this work contributes to reimagining digital libraries as dynamic, responsive, and inclusive knowledge systems.

Objectives

This paper aims to:

- Critically analyze Noolaham's oral history program as a model for digital heritage preservation.
- Examine the structure, accessibility, and ethical framework underpinning the collection.
- Evaluate the alignment of Noolaham's practices with international standard ISO/TR 13028.
- Assess the broader social, cultural, and epistemological impacts of oral history on marginalized Tamil communities.

Methodology

A qualitative case study methodology was employed, drawing from over 700 oral history interviews curated between 2020 and 2025 on Noolaham's Islandora platform. These interviews include a diverse range of Tamil-speaking individuals, educators, cultural custodians, traditional healers, war survivors, writers, and grassroots activists.

Primary data sources included:

- Audio and video recordings published on Noolaham's digital library platform
- Internal documentation detailing ethical protocols and consent frameworks
- Field notes and reflective journals from trained volunteers and community researchers

Field researchers received structured training in informed consent, interviews recording, and metadata entry using open-source tools. Local community organizations collaborated to identify potential interviewees, particularly elders and those with specialized knowledge.

Projects were assessed along thematic and regional lines, focusing on Trincomalee, Ampara, Kilinochchi, indigenous documentation, and medicinal collections using a framework that considered representativeness, ethical integrity, and technological robustness. The international guideline ISO/TR 13028:2010 on the digitization of records served as the primary benchmark for evaluation.

Results

Regional Documentation Projects

Narratives gathered from war-affected regions such as Trincomalee, Ampara, and Kilinochchi preserve localized histories of survival, resilience, and cultural revival. Interviewees shared their experiences of being displaced, school reconstruction, and community rebuilding.

For instance, in 2023, Mr. Vairamuththu Manikkavel, a retired principal, Justice of Peace, and respected elder from the Tamil-speaking indigenous community in Ampara, shared:

“Our society’s roots run deep. I have witnessed its struggles and resilience. I am always ready to serve my people -until my last breath.”

His oral history not only traces the evolution of indigenous life in the region but also reflects the intergenerational commitment to cultural preservation and community service.

Indigenous Knowledge and Lifeways

Through culturally respectful engagement, Noolaham has recorded the oral traditions, ecological practices, and belief systems of Tamil-speaking indigenous communities such as forest-based farming rituals and ancestral healing chants rarely recorded in mainstream institutions.

Traditional Medicinal knowledge and Healing Practices

The Collection of medicinal knowledge in Northern Sri Lanka features oral testimonies from Siddha and Ayurvedic practitioners, covering herbal formulas, diagnostic wisdom, and the passing down of knowledge through generations. These recordings are especially valuable as they represent non-written, orally transmitted knowledge systems.

Tamil Manuscript Contextualization

Interviews with elders and manuscript custodians help contextualize ancient palm-leaf manuscripts, linking historical writings to current cultural practices such as astrology, customary law, and vernacular literary traditions.

Every oral history is catalogued with multilingual metadata, including speaker name, region, language, theme, and project ID. The Islandora open-access digital library platform ensures public access while following digitization standards and ethical protocols.

Discussion

Noolaham's oral history initiative represents a paradigm shift from centralized knowledge preservation to participatory, community-led digital documentation. Unlike traditional institutions that retain authority, Noolaham decentralizes it, positioning community members as contributors, narrators, and curators of knowledge.

This community-driven framework fosters trust, encourages youth engagement, and strengthens intergenerational knowledge transfer. It also improves digital literacy and builds social connections within under-resourced communities.

Technologically, the collection is rooted in open-source platforms (Islandora), ensuring sustainability and adaptability. By aligning with ISO/TR 13028, it maintains global relevance while remaining rooted in local culture.

However, challenges remain, such as metadata consistency, platform scalability, and securing long-term funding which are ongoing areas of attention. Nevertheless, Noolaham addresses these issues through capacity-building, policy formulation, and new partnerships with academic institutions and diaspora networks.

Crucially, the collection is not just a static repository. It is being actively used in school curricula, cultural exhibitions, and diaspora heritage events, revealing that the knowledge preserved is also lively and applicable.

Conclusion

Noolaham Foundation's oral history initiative offers a compelling and replicable model for ethical, inclusive, and sustainable digital preservation. It proves that smart libraries are not merely repositories of data but dynamic cultural infrastructures that restore agency to communities and amplify silenced voices.

As a dynamic digital heritage collection, Noolaham challenges dominant preservation systems by placing marginalized narratives at the center of knowledge creation. It supports not only memory and identity but also resilience and justice.

By documenting memories at the margins, this initiative empowers Tamil communities-both local and global-to shape their futures with dignity, cultural continuity, and a restored voice.

Recommendations

To strengthen its oral history program, Noolaham Foundation should expand its representational scope by prioritizing the documentation of rural women, artisans, laborers, and displaced persons. This expansion would ensure a more inclusive and comprehensive archive. Structured training in oral history methodology, metadata creation, and ethical documentation practices should be implemented to enhance capacity building. The digital platform requires improvements in multilingual functionality, mobile accessibility, and user interface design to maximize public engagement. Additionally, partnerships with academic, cultural, and policy institutions should be fostered to amplify the archive's reach and long-term impact. Publishing Noolaham's documentation toolkits and workflows as open-access resources would support replication by other community archives worldwide. Finally, securing long-term investments in storage infrastructure, cyber security, and digital resilience is essential for sustaining and scaling the archive.

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The Use of Social Media in Marketing Libraries: An Analysis of Selected Management Institutions in India

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ABSTRACT

This study examines the utilization of social media for marketing academic libraries at the top five Indian Institutes of Management (IIMs) as per the NIRF 2024 rankings: Ahmedabad, Bangalore, Kozhikode, Calcutta, and Lucknow. The study employs interviews with librarians, surveys (400 questionnaires, 75% response rate, 300 analyzed: 60 from each IIM comprising 50 students, 10 scholars/faculty), and content analysis of 1,000 posts to explore platforms (LinkedIn, Instagram, Facebook, YouTube, Twitter/X), levels of engagement, challenges faced, and user perceptions. The library in Ahmedabad uses multiple platforms, while Kozhikode uses Facebook, the others rely on institutional accounts. One of the key challenges identified is the shortage of trained staff. Users prefer interactive content (e.g., quizzes). Establishing dedicated accounts, providing staff training, and creating dynamic posts can enhance outreach and user engagement.

Keywords: Academic Libraries, Social Media Marketing, IIMs, Library User Engagement, Digital Outreach, India

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Introduction

Academic libraries play a crucial role in research and education, and the social media revolutionized their outreach methods (Jones & Harvey, 2019). Social media platforms such as LinkedIn, Instagram, and Twitter/X enable resource promotion and enhance user interaction (Kumar & Tripathi, 2018). Despite their potential, However, Indian academic libraries, including those within esteemed Indian Institutes of Management (IIMs), face challenges such as limited resource and-lack of digital skills (Thanuskodi, 2019; Gupta & Sharma, 2022). Existing research does not adequately explore marketing strategies for libraries at IIMs (Madhusudhan, 2012). This study examines the utilization of social media within the libraries of IIM Ahmedabad, Bangalore, Kozhikode, Calcutta, and Lucknow to address this gap, using verified data (Vikram Sarabhai Library, 2025; IIM Kozhikode Library, 2025).

Objectives

The study aims to:

- Identify social media platforms used by IIM libraries for marketing.
- Analyze content and frequency of posts to assess engagement effectiveness.
- Examine challenges faced by librarians in social media marketing.
- Evaluate user perceptions and satisfaction regarding the library's social media outreach.

Methodology

A mixed-method approach was adopted, combining semi-structured interviews with librarians from each IIM to explore strategies, challenges, and constraints, and surveys distributed to 400 users (80 per IIM), with 300 valid responses (50 students, 10 scholars/faculty per IIM) analyzed for awareness, engagement, and satisfaction. Content preferences, barriers, and platform choices allowed multiple responses. Content analysis of library and institute posts on LinkedIn, Instagram, Facebook, YouTube, and Twitter/X (July 2024–June 2025) assessed type, frequency, and engagement. Quantitative data were analyzed using Excel for descriptive statistics, while qualitative interview data were thematically coded in Word. Ethical guidelines, such as obtaining informed consent and ensuring anonymity, were strictly followed.

Results

IIM Ahmedabad's Vikram Sarabhai Library maintains dedicated accounts on LinkedIn (1,200 followers, 25 posts/year), Facebook, X, Instagram, and YouTube (VSLIIMA, 2025; X, 2025; Instagram, 2025; YouTube, 2025). IIM Kozhikode's library has a Facebook page (IIMK Library, 2025). IIM Bangalore, Calcutta, and Lucknow rely on institute accounts (e.g., @IIM_Bangalore, @IIM_Calcutta, @IIMLucknow on X). Content analysis of 1,000 posts (200 per IIM) showed new resources (35%, 350 posts), events (30%, 300 posts), tutorials (20%, 200 posts), and testimonials (15%, 150 posts), with 2–3 posts/week on average. IIM Ahmedabad and Bangalore were most active (4 posts/week). Instagram led engagement (150 interactions/post), followed by Twitter/X (80), LinkedIn (60), Facebook (40), and YouTube (30). Interviews revealed 80% (4/5) reported single-staff management, 60% (3/5) lacked training, 60% (3/5) found content creation time-consuming, and 40% (2/5) cited budget constraints. Surveys (400 questionnaires distributed, 300 responses analyzed, 60 per IIM: 50 students, 10 scholars/faculty) showed 210 users (70%) aware of library-related content, with IIM Ahmedabad users most aware (48/60, 80%; 40 students, 8 scholars/faculty) due to dedicated accounts. Engagement was moderate (165 users, 55%), highest at IIM Ahmedabad (39/60, 65%; 32 students, 7 scholars/faculty). Satisfaction averaged 3.5/5, with interactive content (39 users, 10% of 387 responses) scoring 4.0/5. Lack of awareness (145 users, 35% of 413 responses) and irrelevant content (103 users, 25%) were key barriers. Platform preferences (429 responses) favored Instagram (150 users, 35%), LinkedIn (129 users, 30%), Twitter/X (86 users, 20%), Facebook (56 users, 13%), and YouTube (8 users, 2%).

Table 1: Social Media Platforms Used by IIM Libraries

IIM Library	Facebook	X	LinkedIn	Instagram	YouTube
IIM Ahmedabad	Yes	Yes	Yes	Yes	Yes
IIM Bangalore	No	No	No	No	No
IIM Kozhikode	Yes	No	No	No	No
IIM Calcutta	No	No	No	No	No
IIM Lucknow	No	No	No	No	No

Table 2: Engagement Metrics by IIM Library

IIM Library	Avg. Posts/Week	Avg. Interactions/Post	Most Engaging Platform
IIM Ahmedabad	4	140	Instagram
IIM Bangalore	4	150	Instagram
IIM Kozhikode	3	120	Facebook
IIM Calcutta	2	90	LinkedIn
IIM Lucknow	2	100	Instagram

Description: Frequency and engagement (likes + comments + shares + retweets) per post.

Table 3: User Satisfaction with Social Media Aspects (Scale: 1–5)

Aspect	Mean Score	Standard Deviation	Number of Users (N=300)	Percentage
Awareness of Accounts	3.8	0.9	210	70%
Content Relevance	3.6	0.8	195	65%
Engagement Level	3.4	1.0	165	55%
Overall Satisfaction	3.5	0.7	180	60%

Table 4: Librarian-Reported Challenges

Challenge	Percentage of Librarians	Number of Librarians (N=5)	Key Insight
Limited Staffing	31%	4	Single staff leads to inconsistent posting
Lack of Training	23%	3	Reliance on self-learning for skills
Content Creation Issues	23%	3	Time-intensive to produce engaging posts
Limited Budget	15%	2	Lack of funds for tools or promotions
Total Responses		13	

Note: Multiple responses were allowed.

Table 5: IIM-Wise Comparison of Social Media Usage and User Distribution

IIM Library	Platforms Used	Avg. Posts/Week	Avg. Interactions/Post	Users Aware (N=60)	Users Engaged (N=60)
IIM Ahmedabad	Facebook, X, LinkedIn, Instagram, YouTube	4	140	48 (80%; 40S, 8SF)	39 (65%; 32S, 7SF)
IIM Bangalore	None (institute accounts)	4	150	45 (75%; 38S, 7SF)	36 (60%; 30S, 6SF)
IIM Kozhikode	Facebook	3	120	42 (70%; 35S, 7SF)	33 (55%; 28S, 5SF)
IIM Calcutta	None (institute accounts)	2	90	39 (65%; 33S, 6SF)	30 (50%; 25S, 5SF)
IIM Lucknow	None (institute accounts)	2	100	36 (60%; 30S, 6SF)	27 (45%; 23S, 4SF)
Total				210 (70%)	165 (55%)

Description: This table compares social media platforms, posting frequency, engagement, and user distribution (50 students [S], 10 scholars/faculty [SF] per IIM).

Table 6: User Preferences for Content Types

Content Type	Number of Users (N=387 responses)	Percentage of Responses	Mean Satisfaction Score (1–5)	Standard Deviation
Event Updates	147	38%	3.9	0.7
New Resources	116	30%	3.7	0.8
Tutorials	77	20%	3.5	0.9
Interactive Content	39	10%	4.0	0.6
Total Responses	387			

Note: Multiple responses were allowed.

Table 7: Barriers to User Engagement

Barrier	Number of Users (N=413 responses)	Percentage of Responses	Most Affected User Group
Lack of Awareness	145	35%	Students (121/250, 48%)
Irrelevant Content	103	25%	Students (86/250, 34%)
Infrequent Posts	83	20%	Students (69/250, 28%)
Technical Issues	41	10%	Scholars/Faculty (17/50, 34%)
Other (e.g., time)	41	10%	Students (30/250, 12%)
Total Responses	413		

Note: Multiple responses were allowed.

Table 8: User Platform Preferences

Platform	Number of Users	Percentage of Responses	User Breakdown (N=300)
Instagram	150	35%	125S, 25SF
LinkedIn	129	30%	107S, 22SF
Twitter/X	86	20%	72S, 14SF
Facebook	56	13%	47S, 9SF
YouTube	8	2%	7S, 1SF
Total Responses	429		

Note: Multiple responses were allowed.

Discussion

This study evaluates users’ perceptions and satisfaction regarding the social media outreach of IIM library (Objective 4), as well as the utilization of platforms, levels of engagement, and the challenges encountered.

Surveys (N=300, comprising 250 students, 50 scholars/faculty) revealed 70% awareness (210 users), with the highest rate observed in Ahmedabad (80%, Table 5) attributed to its multi-platform approach (Madhusudhan, 2012). Engagement was moderate (55%, 165 users), driven by students (Table 5). Satisfaction averaged 3.5/5, with interactive content (e.g., quizzes) scoring highest (4.0/5, Table 6) (Kumar & Tripathi, 2018). Instagram led preferences (35%, 124 students, Table 8) (Statista, 2025). Barriers such as a lack of awareness (35%, Table 7) and irrelevant content (25%) suggest targeted strategies (Gupta & Sharma, 2022). Low YouTube use misses tutorial potential (Chu & Du, 2013).

Conclusion

This study aligns results with its objectives: (1) Ahmedabad’s library uses multiple platforms, Kozhikode relies on Facebook, while others depend on institutional accounts (Table 1). (2) High posting frequency (4/week, Ahmedabad/Bangalore) and Instagram’s engagement (150 interactions/post) enhance outreach (Table 2).

(3) Staffing and training shortages impede progress (Table 4). (4) Users report moderate satisfaction levels (3.5/5), favouring interactive content and Instagram (Tables 6, 8). These findings highlight the importance of dedicated accounts, staff training, and interactive posts (e.g., quizzes) as key factors in boosting engagement. IIM libraries can leverage YouTube and Twitter/X to expand reach, driving impactful marketing strategies.

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Echoes of the Past: Time to Preserve Lullabies in Northern Region, Sri Lanka

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ABSTRACT

Lullabies play a significant role in folklore. Especially in the northern region, the daily life of people is interwoven with art, culture, rituals and beliefs. Nearly three decades ago, mothers used to sing lullabies to help their children fall asleep. However, the practice of singing lullabies has declined, and it is hardly seen among young mothers to sing lullabies in domestic settings. This research closely examines the reasons for this decline and aims to propose recommendations to empower the folk songs that reflect the rich cultural background of the northern region. This qualitative research, based on semi-structured interviews, examines the perspectives and interpretations of twenty mothers, including young mothers, from ten families in Jaffna as well as migrated Tamil families in the U.K. Using qualitative methods, this research focuses on the influence of the social, economic and cultural factors on the practice of singing lullabies. Critically reflecting upon the narratives of the women gathered via interviews, this research argues that the urban lifestyle, education, impact of war, displacements, economic strength of the family, trauma, and social factors like class and gender, migration, alienation, influence of social media and technology, friends, relatives, personal attitudes, ambitions and beliefs play crucial role in including folk lore in their day-to-day life. Mothers who have experienced trauma directly or indirectly due to the war, perhaps influenced by previous generations, may possess different emotional states, priorities, or support systems that affect their engagement with traditional practices like singing lullabies. In addition, this study offers some recommendations to preserve this aspect of folklore that should be passed down to future generations with its melodic structure, lyrical content and performance context. Community-based initiatives, digital archiving of the lullabies and including the content in educational programmes would help in safeguarding this tradition for the future.

Keywords : Culture, Gender, Lullabies, Sri Lanka, Trauma, Displacement

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Introduction

Singing serves as a universal form of expressing emotions and feelings. According to many researchers' exposure to this mode of expression begins in early childhood with lullabies found in many cultures. Lullabies, '*Thalattu*' in Tamil, are considered one of the ancient musical genres in Tamil literary tradition. As Aubinet (2024) notes lullabies are widely accepted as a "universal musical genre among humans and a likely source of insights into the origins of music" (p.411). Lullabies, as a basic form of oral tradition, are specifically sung to soothe babies in most cultures all over the world. Research of Shafiei et al (2020) "observed the soothing effect of a mother's voice, which can calm a baby by decreasing sympathetic nervous system activity and improving physiological parameters like respiratory rate, pulse, blood pressure, oxygen consumption etc" (p.49). Their findings emphasize the soothing power of a mother's voice on her child. This form of oral tradition is more than just songs to soothe a child; they are great repositories of cultural memory, transmitting values, narratives, and linguistic nuances across generations. In the Northern Region of Sri Lanka, a community whose daily life has historically been deeply intertwined with its unique art, culture, rituals, and beliefs, lullabies once held a central position in the domestic sphere. They were an integral part of the maternal routine, a comforting presence that underscored the bond between mother and child. Namjoo et al (2022) observed pre-term infants in the intensive care unit and highlighted "music reduces stress symptoms and the duration of the infant's cries, improves vital signs, and improves feeding behaviours and sucking patterns in the infant" (p.2). They also mentioned how a rhythmic pattern of music causes deeper sleep and faster weight gain in the infant. In every culture, many practices ensure physical health as well as the mental health of younger generations.

Objectives

It has been a common practice that not only a mother but also all members and relatives of a family sing lullabies while putting babies to sleep or soothing them in the past. However, contemporary observations indicate a stark decline in this practice, raising concerns about the potential loss of a significant cultural artifact. This research delves into the complexities surrounding this decline, seeking to understand its root causes and to propose actionable strategies for the revitalization and preservation of these invaluable folk songs.

Research Questions

1. What are the primary socio-cultural, economic and psychological factors that contribute to the decline in the practice of singing lullabies among mothers in the Northern region of Sri Lanka and among migrated Tamil families?
2. How do personal experiences, particularly those related to trauma, war, and displacement, influence mothers' engagement with traditional practices like singing lullabies?
3. What effective strategies can be recommended to preserve, promote, and transmit the rich tradition of lullabies to future generations, ensuring their melodic, lyrical, and performative integrity?

Materials and Methods

This study employs a qualitative research approach, primarily utilizing semi-structured interviews to gather in-depth perspectives. It examines the perspectives and interpretations of singing lullabies among ten families in Jaffna as well as ten Tamil families in the U.K. This research focuses on the influence of the social, economic and cultural factors on practices regarding lullabies. The research includes ten families from Jaffna and ten migrated Tamil families residing in the U.K. representing mothers of varying age groups, including young mothers. In addition, this study ensures that all these twenty families encompass mothers representing various age groups. This dual-location approach allows for a comparative analysis of the factors influencing lullaby practices in both the homeland and diaspora contexts. The interviews were designed to elicit narratives and interpretations concerning the role of lullabies in their lives, the perceived reasons for their decline, and their attitudes towards cultural preservation. Using thematic analysis, the qualitative data collected via interviews were analyzed, and recurring patterns were identified. The respondents were anonymized, and ethical considerations were strictly adhered to throughout the research process.

Findings

The decline of lullabies is influenced by a complex interplay of socioeconomic, psychological and cultural factors.

Socioeconomic and Lifestyle Factors: An urban, fast-paced lifestyle was a common reason cited for the decline. For example, one respondent 01 stated, “As we moved to an urban area, our daily routines have become more complex. I had to do multiple tasks at the same time. I did not sing any lullabies to my kids.” This sentiment was echoed by mothers in the U.K. For instance, respondent 01 and respondent 03 noted, “We had to go to work after one month of delivery based on a shift. We never sang any songs to put our babies to sleep.” Respondent 04 added that with both parents working, the responsibility of child-rearing has changed, challenging the traditional expectation that only mothers sing lullabies.

Impact of War, Trauma and Displacement: The profound trauma of nearly three decades of civil war has reshaped family structures and priorities. As respondent 05, a mother displaced by the conflict, explained, “As a mother, my focus was on survival. During that time, I did not think about any traditional cultural practices like singing lullabies. We began living like machines and neglected many practices in our society.” This highlights how the struggle for survival and the need to adapt to a new environment can make traditional practices seem less valid. For migrated Tamil families, the experience of living in a different cultural environment can also lead to a sense of alienation from traditional roots. respondent 06 states “My child was born during the final days of war. We were hopeless about our future, and I lost my parents on the same day by shell.” Her focus was on survival, not on nurturing cultural heritage. The immense stress of war, the loss of her parents, and the uncertainty about the future consumed her emotional and mental energy. In this state, a comforting, traditional act like singing a lullaby became a luxury she could not afford, both emotionally and psychologically. The act is rendered meaningless when her own and her child’s immediate physical safety and future are in doubt.

Attitudinal and Technological Shifts: Generational and attitudinal shifts were also a key factor. respondent 07, a mother in the U.K., considered lullabies “outdated” and less relevant, preferring cinema songs. Respondent 08 also favored playing cinema songs on her phone, as it allowed her to enjoy her favorite music while soothing her child. The pervasive presence of social media and digital entertainment provides alternative forms of engagement, often overshadowing traditional bonding rituals.

Another respondent, also named respondent 09 , shared a personal insecurity, “My voice is not nice... I could not imagine that my voice works.” This indicates how individual attitudes, and self-perception can influence the practice. Moreover, young mothers often lack exposure to lullabies from their own childhoods, making them less likely to continue the tradition.

Table 01 : Summary of the key findings from the interviews

Respondent	Location	Reason
Respondent 01	Jaffna/Urban Area	Urban, fast-paced lifestyle; multiple tasks at once
Respondent 01 & 02	U.K.	Had to go to work a month after delivery
Respondent 03	U.K.	Shared child-rearing responsibility with both parents working
Respondent 04	Displaced	Focus was on survival due to war; traditional practices were neglected
Respondent 05	Displaced	Emotional and mental energy consumed by the trauma of war, shell shock, and loss of parents
Respondent 06	U.K.	Considered lullabies “outdated” and preferred cinema songs
Respondent 07	Jaffna	Preferred playing cinema songs on phone for soothing children
Respondent 07	U.K	To use the time to listen to her favourite music
Respondent 08	Jaffna	Personal insecurity about her voice (“My voice is not nice...”)

Recommendations and Conclusion

The declining nature of lullabies in the Northern region raises many questions regarding significant cultural concerns. At the same time, it reflects broader societal shifts and the unavoidable impact of historical trauma. To preserve this invaluable folklore, this research has suggested some recommendations. This research recommends creating digital archives of reordered lullabies that should consist of lyrical content, melodic notations and contextual information to ensure their accessibility and longevity. Using an online platform to spread lullabies to younger generations is also suggested. In addition, this research recommends the inclusion of lullabies into the early childhood education and the primary school curriculum as well. It helps to familiarize children with their heritage from a young age. This research also recommends that the Department of Cultural Affairs conduct competitions for singing lullabies at divisional and district level competitions to preserve these intangible cultural heritages. Local cultural centres or community groups can initiate some programmes to teach and promote lullabies to create spaces for intergenerational learning and foster a renewed appreciation for these songs. Storytelling sessions for kids and cultural events centered around lullabies can encourage participation as well as preserve lullabies for the future generations.

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Concept of Smart Citizens' Self-Library: A Conceptual and Applied Study in the Sri Lankan Context

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ABSTRACT

Every person has a wide range of knowledge and resources. When this personal knowledge is properly structured and shared, it creates a “self-library”, which is unique to the individual. If more people adopt this practice, the collective outcome becomes a significant repository of knowledge and resources, which is conceptualized in this comprehensive study as the self-library of smart citizens. With the advent of new technologies that facilitate information sharing, the modern citizen has digital access and rights, which empower them as “smart citizens” who can contribute and share with such a system and utilize their knowledge for production. This study presents the conceptual framework of the Smart Citizens Self-Library and explores its feasibility and implementation strategies. The main objective is to develop and organize people’s procedural, experiential, and conceptual knowledge along with physical and digital resources in digitally indexable and shareable formats within the contemporary digital platforms that are accessible through public digital devices such as smartphones, computers, smartwatches, etc. This organized digital platform will serve as an information and resource distribution hub, enabling people to connect, disseminate, and access knowledge and resources efficiently. Using suitable software applications and digital platforms, users will be able to access the content based on their preferences, using famous delivery services that are affiliated with digital platforms (e.g., Uber, PickMe), conventional postal services, and courier services, and integrate income-generating tools through digital marketing strategies. Other enterprises can also be included as stakeholders to align with their commercial interests on seasonal promotions, and product advertisements can be incorporated as revenue-generating tools.

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The primary objective of this study was to determine optimal methods for indexing and classifying different types of knowledge and resources. Secondary objectives included identifying user groups interested in sharing and learning from such content and determining popular categories of shareable content.

Keywords: Smart, Library, Digital, Knowledge, Resources

Introduction

The ways and means of scattered information sharing are paramount in the digital era. As digital literacy improves, every individual is enabled to share their expertise for the benefit of a wider community. Each individual has a considerable collection of information and resources gained through formal education, employment, and life experiences. However, a large portion of that knowledge remains unorganized and inaccessible to others who might find it valuable. The present digitalization and the proliferation of smartphone usage, particularly in nations like Sri Lanka, create a business opportunity to harness this latent potential. The Sri Lanka Department of Census and Statistics (2022) reports, that digital literacy and mobile connectivity are progressively improving in the country.

The Smart Citizens' Self-Library (SCSL) concept enables individuals to organize, digitize, and disseminate their knowledge via a common digital platform. The SCSL concept promotes access to information and motivates individuals to share the untapped intellectual resources within their community. It will also derive a microeconomic potential by facilitating grassroots information exchange and community-oriented business that emphasize sharing, learning and empowerment, transforming individual experiences into shareable intellectual assets.

Objectives

The main objective of this study is to develop a concept for a Smart Citizens' Self-Library in Sri Lanka and see if it can be done. Some of the specific objectives are:

1. To find out the types of personal knowledge (procedural, experiential, and conceptual) and personal resources are suitable for a digital knowledge-sharing platform.

2. To determine which types of information sharing are most popular with different groups of people.
3. To identify effective ways to sort and index citizen knowledge and resources.
4. To explore potential methods for utilizing digital technology and e-commerce to create a microeconomy through the implementation of citizens' smart self-libraries.

Methodology

The study employed a constructive research method to generate a valuable concept and test its practicality. The research design used a mixed-methods strategy, signifying that it included both qualitative and quantitative data collection.

Sample and Data Collection

- **Method of sample:** Random stratified sampling across five age groups: 15 to 25, 26 to 35, 36 to 50, 51 to 65, and 66 and older.
- **The sample size** was 125 people from five districts in Sri Lanka, including urban, semi-urban, and rural areas (Colombo, Gampaha, Kandy, Hambantota, and Jaffna).
- **Qualitative data:** Semi-structured interviews were conducted to find out what kind of knowledge each person has and how they want to share it.
- **Quantitative data:** a structured questionnaire that inquired about digital preparedness, desire to share information, and preferred content categories.

Data Analysis

The study used NVivo to do a thematic analysis of the qualitative data. The study processed quantitative data using SPSS, incorporating descriptive statistics and cross-tabulations to examine demographic differences.

Results

Many people were interested in sharing and accessing categorized citizen-created content, the study found. Some of the most important points are as follows:

Table 1: Respondents’ Most Popular Shareable Content Types

Content Type	Percentage (%)
Recipe content	42%
Flower gardening tips	36%
Self-written short stories/novels	32%
Childcare techniques	28%
Traditional medical remedies	24%

Source: Field survey, 2025

- **Demographic insights:** The group that was most interested in providing and consuming information was housewives and retired people between the ages of 36 and 65.
- **Digital readiness:** 72% of the people who took part had basic digital abilities, and 56% had smartphones and data plans.
- **Interest in making money:** 47% said they were interested in making money by sharing content on e-platforms.

Discussion

The results effectively support the concept of a Smart Citizens’ Self-Library in Sri Lanka, particularly for individuals who infrequently use libraries, such as housewives and senior citizens. This evidence aligns with previous research on the potential advantages of community knowledge hubs in Asia (UNESCO, 2021). People typically overlook many resources in society, as evidenced by their interest in informal topics such as gardening, traditional medicine, and recipe collections.

The Smart Citizens' Self-Library can consist of four main operational levels:

1. **Knowledge Structuring Layer:** Categorization and indexing of citizen-generated content, employing metadata standards comparable to Dublin Core (Weibel, 1997).
2. **Technology Layer:** A digital platform that works on mobile devices and can be accessible both online and offline. It has modular interfaces for posting, tagging, and retrieving content.
3. **Economic Layer:** Mobile wallets (e.g., eZ Cash, mCash) integrate micro transactions and electronic marketing, enabling profit sharing.
4. **Delivery Layer:** Delivering the products to people through digital formats and services like Uber Connect or PickMe Flash.

The SCSL model considers Sri Lanka's specific technology infrastructure and promotes digital citizenship for everyone by incorporating these layers. The concept also promotes SDG 4 (Quality Education) and SDG 9 (Industry, Innovation, and Infrastructure) (United Nations, 2023).

Conclusion

Smart Citizens' Self-Library (SCSL) is a conceptual framework that describes a feasible micro-scale knowledge economy in which individuals can share their experiences, informal skills, and expertise using digital platforms. By empowering housewives, retirees, and underserved groups to act as both contributors and beneficiaries, the SCSL will facilitate a culture of collaborative learning, mutual support, and micro-entrepreneurship. Its social and economic value lies in broadening access to knowledge while creating opportunities for marginalized communities to participate in Sri Lanka's digital transition.

During the Implementation phase, the deployment of low-cost digital kiosks with offline functionality in rural areas, complemented by mobile USSD/SMS interfaces for users with limited internet access, can help address the digital divide in the country. The telecom providers (eg, Dialog, Mobitel) would be required to sponsor data costs for SCSL platforms under Sri Lanka's "Digital Island" initiative to build a solid infrastructure.

To build a convenient platform design that fosters trust, it could develop a multilingual (Sinhala/Tamil/English) interface with AI-driven content tagging (eg: farming tips, handicraft tutorials) and blockchain-based verification to ensure credibility. Also, integrating micropayment gateways (eg: Genie, FriMi) to reward contributors and participation etc.

To motivate the community, launch “SCSL Champions” programs to train local volunteers (eg: teachers, youth leaders) in digital literacy and content curation. Furthermore, incorporating SCSL modules into village libraries, vocational training centers, and CSR projects of companies (eg: MAS Holdings, John Keells) would be very effective

Future Sustainability & Scalability

- **Policy Integration:** Aim to get SCSL included in Sri Lanka’s National Digital Literacy Framework and make sure it fits with SDG 4 (Education) and SDG 8 (Decent Work).
- **Ecosystem Partnerships:** Collaborate with universities (like the IT department at the University of Colombo) on research and development, and get local businesses to fund “Knowledge Hubs” in areas that don’t have enough of them.
- **Grassroots Impact Metrics:** Conduct tests in Gampaha (urban) and Batticaloa (rural) to assess their impact on people’s lives, like women’s involvement and the ability to earn a living.

Every individual can contribute to and benefit from a knowledge hub as the SCSL develops into a widespread movement. To bridge the gap between policy goals and grassroots realities, Sri Lanka could establish the SCSL as a national paradigm for community-driven digital empowerment by utilizing technology and collective expertise.

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Human-Centered Digital Literacy for Smart Citizenry: Ethics, Access, and Social Responsibility in Smart Societies

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ABSTRACT

As our society becomes more and more influenced by digital technology, digital literacy is key to ensuring that everyone can participate equitably, fulfill their roles as responsible citizens, and engage socially. However, the majority of existing digital literacy frameworks are still mainly operational (e.g., accessing the internet, using devices) and ignore the ethical, emotionally powerful, and civic competencies required for meaningful engagement in the digital realm, while neglecting the moral, emotional, and civic aspects of human-in-the-loop digital engagement. This paper asserts the need for a human-centered approach to thinking, acting, and being that aligns with values of symbiotic citizenship. This study utilized a narrative review of 45 academic and policy sources, identified from Google Scholar, JSTOR, and UNESCO repositories. Thematic synthesis, guided by the principles of human-centered design and digital ethics, was used to identify the three main gaps in digital literacy models. (1) Lack of ethical foundation, including misinformation, surveillance capitalism, and algorithmic bias. (2) Access beyond connectivity, including anxious users, language issues, and exclusionary design. (3) Human-centered competencies, for instance: empathy, civic engagement, and critical thinking. If these challenges are left unaddressed, digital inclusion efforts could exacerbate structural inequalities in subtle ways. We aim to intentionally redefine digital literacy as a civic and ethical practice, focusing on agency, emotional resilience, and ethical consciousness, rather than just the acquisition of technical skills. The findings offer critical implications for educators, policymakers, and researchers aiming to shape socially responsible and inclusive digital futures.

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Our conceptual framework outlines an approach to socially responsible digital inclusion - promoting digital inclusion from a position that attempts to build individuals' confidence, their sense of ethical responsibility, and their capacity to participate in their civic life. This work contributes a foundational step toward a digital citizenship model that reflects the sociotechnical realities of life in the 21st century life.

Keywords: Digital Ethics, Digital Literacy, Human-Centered Design, Inclusive Education, Smart Citizenry

Introduction

In this, rapidly evolving digital world, digital literacy is essential for equitable participation and informed citizenship. However, dominant frameworks have primarily defined digital literacy in terms of technical skills and access to technology, ignoring human-centered elements such as ethics, emotional safety, and civic responsibility, especially for marginalized and underserved populations (Livingstone & Helsper, 2007; UNESCO, 2021). This narrative review aimed to address that gap in the literature and proposed a more inclusive model of digital literacy that aligns with the aims of smart citizenry. While some studies have explored areas related to digital skills and behaviours (Ng, 2012; Park, 2017), few have explored the interconnectedness of various fields for promoting ethical awareness, behavioural inclusion, and social equity. The recommendations of scholars and their institutions (Floridi, 2016; UNESCO, 2021) to advance the understanding about human-centric digital literacy is echoed in this study. The human-centered digital literacy model is presented not as a skillset, but as a framework for civic and ethical capacity model; while it does not contain empirical evidence, it serves as a critical base for future research and policy reforms.

Objectives

1. To explore how ethical considerations, access-related issues, and civic elements are addressed in current digital literacy discourse.
2. To identify gaps in existing digital literacy models concerning user-centered and socially inclusive design.

Methodology

This study employed a narrative review approach to explore gaps in digital literacy models. A total of 45 academic and policy sources were selected using Google Scholar, JSTOR, UNESCO portals, and official government websites. The documents were reviewed through thematic synthesis, focusing on ethics, access-related barriers, and human-centered competencies. The analysis was guided by theoretical perspectives from human-centered design and digital ethics.

Table 1 presents a structured summary of the narrative review methodology, including the research design, data sources, focus areas, and theoretical lens.

Table 1: Summary of methodology

Component	Description
Research Design	Narrative review (qualitative synthesis)
Data Sources	Academic journals, policy papers, UNESCO reports
Source Selection Tools	Google Scholar, JSTOR, UNESCO portal, government websites
Review Sample	45 documents (peer-reviewed and policy reports)
Thematic Focus	Ethics, access, and human-centered skill
Analysis Approach	Thematic synthesis
Theoretical Lens	Human-centered design, digital ethics

Results

1. Absence of Ethical Frameworks in Operational Literacy Models

Digital literacy efforts often focus on technical skills but ignore ethical issues such as algorithmic discrimination, data harvesting, and disinformation (Ng, 2012; Floridi, 2016; UNESCO, 2021). This overlooks the user’s perspective and leaves users poorly positioned to scrutinize how their data is used and manipulated (van Dijick, 2014; Marwick & Boyd, 2014). These gaps raise concerns regarding internationally recognized aims to include digital rights and ethics in the element competencies (Council of Europe, 2019).

Otherwise, it appears that learners will technically be able to navigate areas once thought of as safe, but remain ethically vulnerable - this could be in danger of undermining a well-informed smart citizenry (Couldry & Mejias, 2019).

2. Structural and Emotional Access Inequities

These points are often emotional and cognitive obstacles, such as digital anxiety, language barriers, and designs that are not user-friendly, all of which inhibit meaningful participation. (Livingstone & Helsper, 2007; Park, 2017; van Dijk, 2005). Digital literacy strategies rarely consider these dimensions of exclusion. Numerous marginalized groups, such as those living in rural areas or elderly individuals or who have low incomes, experience functional exclusion despite being limited to the technical aspect of connection (Selwyn, 2004; Eynon & Geniets, 2016; van Deursen & van Dijk, 2014). This becomes increasingly apparent with the concept of the “second-level digital divide” that highlights access in terms of form versus access in terms of function. Addressing deeper, underlying inequities in digital access is necessary to avoid exacerbating exclusion rather than resolving it through digital inclusion initiatives (Srinivasan, 2006; Helsper, 2012).

3. Lack of Human-Centered Competencies in Pedagogical Approaches

Digital literacies curricula focus on technical skills and ignore human-centered competencies and human interactions, such as empathy, civic engagement, and digital reflexivity (Ng, 2012; Rheingold, 2012). As a result, learners have a functional fluency but lack the ethical and social awareness to negotiate issues of digital manipulation and polarization (Belshaw, 2011; Hinrichsen & Coombs, 2013). Although we witness in education and HCI an increasing recognition of the role of emotional intelligence and perspective-taking in digital citizenship, these human competencies are broadly absent from the digital literacies curricula (Bannon, 2011; Vallor, 2016). Without human competencies, users may be connected and part of the digital community, but they lack ethical preparedness, a reality which undermines the aspiration of cohesive, smart societies.

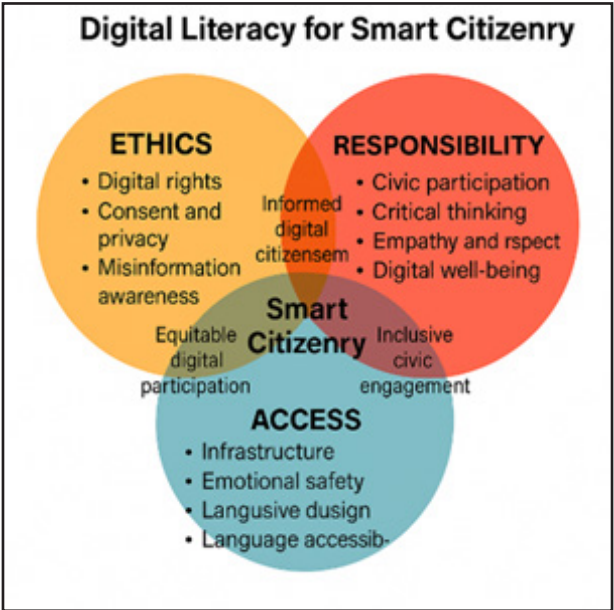


Figure 1: Key pillars of human-centered digital literacy

Discussion

The review has highlighted a gap between the existing models of digital literacy and the actual experience of users in smart societies. Existing models prioritize technical access and skills but do not take into consideration the ethical, emotional, and civic dimensions of digital participation and what is essential for responsible digital engagement (Couldry & Mejias, 2019; van Dijck, 2014). The identified gaps relative to the lack of ethics, non-technical access, and lack of human-centered competencies demonstrate the need to rethink digital literacy as a civic and holistic practice, as suggested by some authors. The purpose of such a shift should be linked to broadening access and including ethics and responsibility (Livingstone & Helsper, 2007; Rheingold, 2012). If we do not include human-centered (design) and ethical awareness, we run the risk of implementing digital literacy initiatives that knowingly or unknowingly reinforce exclusion and disempowerment (Floridi, 2016; Vallor, 2016).

The framework proposed here has users positioned as socially embedded, ethically aware actors and refers to the notion that meaningful inclusion does not just require connectivity, but also ethical agency, empathy, and civic action.

Conclusion

This research highlights the need for re-defining digital literacy as an ethical and culture-based practice, removing the focus on a set of technical skills. The literature review identified several gaps, such as the missing concept of ethics, a lack of awareness regarding access issues, and the absence of human-centered competencies, such as civic awareness and empathy. The new brokering framework we proposed, arose from a focus on ethics, access and responsibility, offering a multidimensional approach to developing an informed and inclusive smart citizenship, while emphasizing that ‘meaningful digital inclusion will only occur based on how citizens contribute, with what interpretations or awareness and, toward what social outcome’. Overall, these findings provide useful implications and next steps for educators, policymakers, and researchers to develop equitable, socially connected future citizens in the context of digital citizenship.

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Gurukul Education as a Model for Preserving India's Intangible Cultural Heritage

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and Snigdha Pandey⁵

ABSTRACT

This study explores the role of the Katyayani Devi Gurukul as a living repository of India's intangible cultural heritage, where ancient Vedic traditions are preserved through immersive, non-commercial education. Blending oral traditions, ritual practice, ecological stewardship, and spiritual discipline, the Gurukul sustains a centuries-old pedagogy that nurtures holistic development while addressing contemporary challenges. Students engage in daily recitations, meditative practices, and the study of Vedic Karamkaand, Jyotish, and classical scriptures, enabling the direct transmission of liturgical and philosophical knowledge. These practices are not only educational but also function as cultural rituals that reinforce collective identity. The Gurukul's integration of Nakshatra-based tree planting and sustainable living further extends its role in preserving ecological beliefs associated with Vedic cosmology. Through participatory observation and psychological assessment, the study reveals how this traditional model fosters emotional stability and self-reliance among students from marginalized backgrounds. In an era when intangible heritage is at risk of erosion, the Gurukul emerges as a resilient, community-based model of preservation. It demonstrates that safeguarding heritage does not have to rely solely on digital means; embodied practices and oral traditions, when lived and taught with integrity, are equally vital to building a culturally grounded and spiritually intelligent nation.

Keywords : Oral Traditions, Holistic Education, Ethnographic Study, Cultural Preservation

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Introduction

The Gurukul education system represents an ancient Indian model of residential learning where students live with an *Acharya* to receive holistic training that integrates spiritual, intellectual, and ethical development. This model emphasizes oral transmission, disciplined living, and cultural continuity. Although its practice has declined in mainstream education, the Gurukul system continues to play a vital role in preserving India's Intangible cultural heritage (ICH), including Vedic rituals, philosophies, and ecological beliefs.

This study focuses on the Katyayani Devi Gurukul, a contemporary embodiment of this tradition. Here, students are immersed in Vedic studies such as *Karamkaand* (Shukla Yajurveda), *Jyotish*, and classical texts like the *Bhagavad Gita* and *Durga Saptashati*. In addition to academic learning, the Gurukul instills self-discipline, sustainable living practices, and cultural identity. Unlike modern educational institutions, the Gurukul emphasizes lived experience and oral learning over digital or textual reliance. This study aims to bridge that gap through a case study approach, highlighting how the Katyayani Devi Gurukul functions as a living repository of ICH.

Objectives

- To document the pedagogical and cultural practices of the Katyayani Devi Gurukul.
- To analyze the curriculum and its role in preserving Vedic traditions.
- To explore student routines, responsibilities, and community living.
- To assess the Gurukul's contribution to ICH preservation through oral and ecological practices.
- To evaluate its relevance and impact in today's socio-cultural context.

Methodology

To understand the educational, cultural, and psychological aspects of the Katyayani Devi Gurukul, the researchers used a simplified mixed method approach that combined qualitative observation, interviews, psychological testing, and visual documentation.

Data collection took place over two weeks. During this period, researchers conducted unstructured interviews with Gurukul Acharyas, students (n=7), and parents to gain insights into their daily routines, beliefs, and teaching practices. These interviews helped capture the lived experience of the Gurukul community in their own words.

In addition, structured observations were carried out to document the learning environment, daily rituals, and ecological activities such as tree planting. These observations helped identify recurring patterns and behaviours in the Gurukul's educational system.

To explore psychological differences between educational settings, the Big Five Personality Test was administered to two groups of male students:

- Group 1: Gurukul students (n=6)
- Group 2: Students from formal schools (n=6)
All participants were aged 15 to 23. The test measured five personality traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism to assess the influence of traditional versus modern education.

Visual ethnography was used to document key aspects of the Gurukul, such as rituals, Nakshatra tree planting, and student activities. Photographs supported the written data and offered additional cultural context.

All qualitative data were organized into themes, while quantitative test results were summarized and visualized using graphs for comparison. This clear, multi-dimensional approach provided a well-rounded understanding of how the Gurukul supports both cultural preservation and student development.

Results

The Katyayani Devi Gurukul preserves intangible cultural heritage through immersive education rooted in oral transmission, ritual practices, and ecological consciousness. Students participate in daily Vedic chanting, Karamkaand rituals, and Jyotish learning. These are taught using the method of *dohrai* (oral repetition), allowing students to memorize and perform mantras without



relying on written texts. Communal living fosters self-discipline, while tasks like cleaning, cooking, and ritual organization reinforce a sense of responsibility and cultural values.

Ecological practices, such as *Nakshatra*-based tree planting and the cultivation of sacred species, highlight the Gurukul's integration of environmental and spiritual learning. This model sustains cultural knowledge alive as a practical experience, not just preserved content.

Quantitative data from the Big Five Personality Test revealed that Gurukul students demonstrated lower levels of neuroticism (70.42) and higher levels of extraversion (80.14) than school students (76.14 and 75.71 respectively), indicating greater emotional stability and social confidence. This was supported by observations of students conducting rituals in front of large groups with composure and engaging confidently with visitors. However, it's important to note that the test results from Gurukul can be somewhat inaccurate due to technical gaps and potential language understanding issues among the students, which might underestimate traits like agreeableness and conscientiousness that are typically higher in such environments.

In contrast, school students scored higher in openness (82.42), agreeableness (83.00), and conscientiousness (78.71), aligning with traits nurtured in formal academic settings. These contrasting results underscore the different developmental outcomes influenced by traditional versus modern educational environments.

Discussion

Findings show that the Gurukul functions as a living archive of intangible heritage. Daily rituals, oral recitation of sacred texts, and ecological symbolism are not supplementary but central to the transmission of Vedic knowledge. This distinguishes the Gurukul from conventional educational institutions, which often rely on textual instruction or digitized archives. In contrast, students here learn by doing: reciting mantras aloud, preparing ritual offerings, planting sacred trees, and living within a spiritually structured routine.

This lived, embodied form of learning fosters deep cultural internalization, as seen in students' ability to conduct full ceremonies from memory and their active knowledge of cosmological ecology. These practices illustrate how oral pedagogy and nature -based learning can function as sustainable modes of heritage conservation.

The psychological results further strengthen this view. Higher emotional stability and extraversion among Gurukul students suggest that their environment cultivates resilience, confidence, and social ease, traits often eroded in high-pressure academic settings. In an age where youth mental health concerns are rising, the Gurukul offers an emotionally grounded, value-based alternative that supports both personal as well as cultural development.

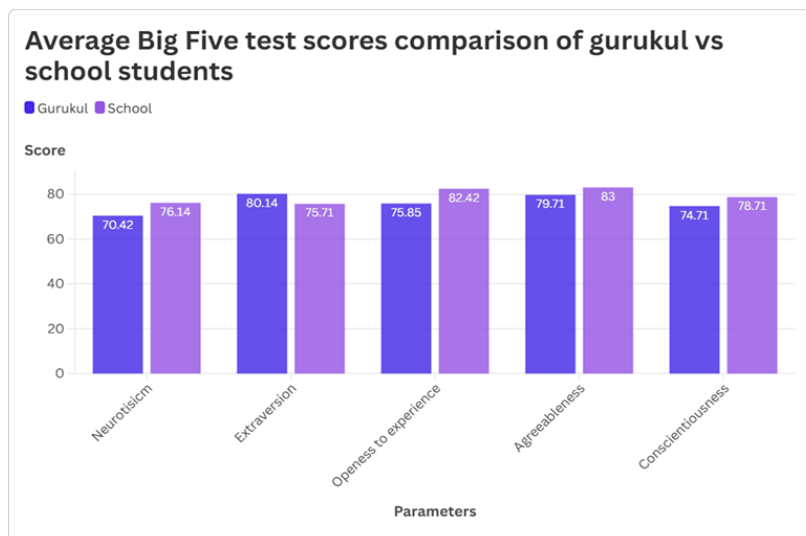


Figure 2: comparison graph of the test

Moreover, as we envision Smart Libraries within a Smart Nation framework, the Gurukul provides an alternative: a model that is not digital first but culture first, where heritage is dynamic, participatory, and inclusive. It invites rethinking of how cultural knowledge can be curated, accessed, and embodied beyond screens or formal syllabi. Thus, the Gurukul does not merely resist modernity; it reframes it by showing how education systems rooted in tradition can still evolve to serve present and future needs.

Conclusion

The Katyayani Devi Gurukul exemplifies how heritage can be preserved through practice, not just preservation. It bridges ancient wisdom with current needs by fostering spiritual intelligence, emotional well-being, and ecological ethics. As India builds a Smart Nation, such grassroots models are essential to ensure that digital advancement goes hand in hand with cultural continuity. The Gurukul's model is not a return to the past, but a path forward, grounded, holistic, and enduring.

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The Role of the Noolaham Foundation in Digitally Preserving Sri Lankan Tamil Knowledge

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ABSTRACT

Digital preservation entails digitizing and conserving rare and delicate materials to maintain their authenticity and prevent data loss. It improves longevity, optimizes space, and provides rapid and precise global accessibility. As a digital library, the Noolaham Foundation, established in 2005 as a nonprofit organization, plays a vital role in preserving and archiving Tamil knowledge in Sri Lanka. Governed by a volunteer board of directors, it ensures accessibility and safeguards Tamil cultural heritage. This study aims to examine the historical context that led to the need for Tamil digital preservation in Sri Lanka and the pivotal role played by the organization in addressing this need. It aims to critically assess the organization's digital archiving practices and conservation methods while also exploring the challenges faced during this process. Additionally, the research focuses on the extent of community participation and proposes practical solutions to enhance the sustainability of digital archiving efforts. The study uses a mixed-method approach, combining both quantitative and qualitative methods. Data were obtained through structured interviews with key individuals and questionnaire surveys targeting selected board members, officials, professionals, and beneficiaries across the country, as well as through a systematic inventory. The analysis utilizes descriptive methodology, including synthesis and thematic approaches. The findings reveal that, by the first half of 2025, approximately six million pages-including 21,422 books, 17,921 magazines, 71,566 newspapers, 2,919 commemorative publications, 3,435 biographies, 23,276 open educational materials, 6,626 pictures, 784 oral histories, and 233,636 palm-leaf manuscripts - had been digitized. The Foundation collaborates with communities through pipeline initiatives in Tamil-speaking areas.

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Identified challenges include a shortage of trained personnel and technical resources, the absence of a permanent location, limited funding, weak policies, digital security risks, and inadequate backup standards. The study emphasizes the importance of integrating modern technology, developing sustainable policies, enhancing government collaboration, and ensuring dedicated annual budgeting to strengthen digital preservation efforts.

Keywords: Preservation, Noolaham Foundation, Digitalization, Archive

Introduction

Traditional library preservation techniques have been transformed in the digital era to include digital versions of physical records for a multitude of services (Michael, 2018). Accordingly, digital preservation is the formal process of converting diverse physical content into digital formats to preserve rare and delicate objects (Shimray & Ramaiah, 2018). Digital preservation of written materials involves the active safeguarding of informational materials to ensure their integrity, authenticity, and to prevent data loss from the medium in its original form (Atanda et al., 2017). It is one of the crucial concerns in the digital information age, as it helps maintain historical information, reduce deterioration, save space and time, ensuring information longevity, providing global accessibility that is both fast and accurate, and serving as a backup (Barman, 2020; Parmar et al., 2021).

Digital libraries are online collections of documents in digital format, with older content being digitized using digital preservation techniques (Hazarika & Librarian, 2020). Since 2005, the **Noolaham Foundation** has become a cornerstone in the digital documentation and archiving of Tamil creations in Sri Lanka. Its mission is to preserve the knowledge of Sri Lankan Tamils, make such knowledge accessible, and encourage community engagement in knowledge building.

Sri Lankan Tamil traditions have been recorded on various materials such as stone, palm leaves, and paper. Historically, all information was stored in tangible formats, and preservation efforts focused solely on protecting physical materials. A notable historical event that underscores the need for digital preservation is the burning of the Jaffna Public Library in 1981 by Sri Lankan police and protesters on the eve of the District Development Council elections. Once regarded as one of the finest libraries in South Asia, it housed approximately 97,000 priceless books and irreplaceable Tamil manuscripts over 150 years old.

The entire collection was destroyed when the original two-storeyed building was demolished (Selvarajah, 2021). The Noolaham Foundation operates as a digital library to safeguard Sri Lankan Tamil creations and to prevent such cultural catastrophes in the future.

This study delves into the historical context that sparked the urgent need to preserve Sri Lanka's Tamil heritage in digital form. It highlights the pivotal role of the Noolaham Foundation in preserving cultural memory through innovative digitization and archiving practices. By exploring the foundation's methodologies, resource collections, and community-driven efforts, the study sheds light on both the achievements and the challenges in Tamil digital preservation. Finally, it offers strategic recommendations to strengthen digital archiving for future generations.

A major limitation of this study lies in the scope and method of data collection, particularly regarding interviews. Due to time and resource constraints, stakeholder engagement was limited, which may have affected the depth and diversity of perspectives gathered.

Objectives

1. To explore the historical need for Tamil digital preservation in Sri Lanka and examine the role of the Noolaham Foundation in addressing this need.
2. To assess the organization's methodologies for digital archiving and conservation.
3. To identify the challenges in digital preservation, analyze community engagement, and propose practical solutions.

Methodology

This study examines the Noolaham Foundation's contribution to the digital documentation and knowledge preservation of Tamil communities in Sri Lanka using a mixed-methods approach that includes both quantitative and qualitative methods. The framework focuses on three key objectives, supported by relevant data and analytical tools.

To understand the historical context of Tamil digital preservation and the Noolaham Foundation's role in addressing these needs, primary data were obtained through structured key-person interviews (n=6) and a structured

questionnaire survey (n=30). The participants included Noolaham officials, donors, inventory officers, scholars involved in preservation, and beneficiaries across the country. This phase of the study followed a descriptive research method.

The organization's digital archive and conservation procedures were evaluated using both primary and secondary data sources. Primary data included observations and interviews related to the organization's current practices, inventory, tools, and infrastructure. Secondary data were acquired by reviewing Noolaham's inventories and annual performance reports. This phase used a mixed-methods approach incorporating synthesis, allowing for a comprehensive overview of the Noolaham Foundation's archival operations, including their depth and efficiency.

Structured interviews and a questionnaire survey were conducted to gather data on digital archiving challenges and levels of community engagement. Volunteers, community members, and officials collaborated to identify obstacles in technological, financial, legal, and human resource dimensions. Thematic analysis was used to analyze the data and identify emerging issues and patterns. The study also gathered community suggestions and proposed practical solutions to address these concerns.

Purposive sampling was used to recruit informants with direct involvement or knowledge of the Foundation's activities. Tools such as interview guidelines, checklists, and questionnaires were employed to collect and analyze data. Ethical norms-such as obtaining informed consent, participant confidentiality, and data security were strictly observed throughout the research process.

Results

The Noolaham Foundation began as Project Noolaham in 2005 and institutionalized in 2008. It is a non-profit, charitable organization dedicated to locating, digitally preserving, and providing open access to the knowledge resources of Sri Lankan Tamil-speaking communities. It is officially registered in Sri Lanka, the UK, Canada, Australia, and Norway. The Foundation is governed by a volunteer Board of Directors comprising professionals from various fields. It is primarily funded through monthly donations from over 250 supporters across 12 countries and operates with a team of 32 staff members based in offices throughout Sri Lanka.

The investigation into the historical setting and emergence of digital presence in Sri Lanka's Tamil-speaking communities revealed the impact of civil conflict and displacement. The demolition of the Jaffna Public Library in 1981 severely hindered the preservation of written and oral traditions. Community-led documentation efforts were spurred by the lack of institutional archiving-particularly in the Northern and Eastern provinces restricted access to educational resources, and cultural marginalization, as reported in interviews. The Noolaham Foundation emerged in response to these needs, evolving from a volunteer-based initiative into a formal organization committed to archiving and sharing Tamil knowledge through digital platforms.

The assessment of the organization's digital archive and conservation procedures revealed an organized and expanding strategy of digital archiving. The review of inventory records and performance reports showed a consistent increase in the volume of digitized materials, particularly from community-based sources. As of mid-2025, the archive contains 21,422 books, 17,921 magazines, 71,566 newspapers, 2,919 commemorative publications, 3,435 biographies, 23,276 open educational materials, 6,626 pictures, 784 oral histories, and 233,636 palm-leaf manuscript pages. The Foundation relies on open-source digital tools and metadata standards but faces challenges related to consistency and technical infrastructure. Data analysis emphasized inclusivity but also highlighted limitations in language diversity, categorization accuracy, and digital sustainability.

The exploration of challenges and community engagement revealed several recurring themes. Key challenges included a shortage of trained personnel, lack of a permanent location and building, unstable and limited funding, inadequate policy frameworks, digital security threats, absence of standardized backup systems, insufficient research, and a lack of technical resources. However, a notable strength of the Foundation is its grassroots engagement model, which encourages volunteering, intergenerational knowledge transfer, internship opportunities for university students, and partnerships with state universities. The organization engages with communities through pipeline projects such as regional documentation in Tamil-speaking areas, including villages and schools.

Discussion

The findings highlight the Noolaham Foundation's crucial involvement in addressing the urgent need for Tamil digital preservation in post-conflict Sri Lanka. Historical evidence reveals that Tamil-speaking communities—particularly in the Northern and Eastern regions experienced significant information loss due to civil conflict, displacement, and the destruction of knowledge centers.

Structured interviews indicated that digital preservation was both a technical and social response to marginalization. The mixed-method analysis underscores both the strengths and limitations of the Foundation's archiving methods. Noolaham has made commendable progress in collecting, categorizing, and making thousands of documents accessible. It has adopted open-source platforms, metadata standards, and community volunteerism, which promote transparency and participation. However, challenges related to maintaining consistency, metadata standardization, and technological sustainability indicate a need for capacity building.

The thematic analysis of challenges and community engagement reveals important dynamics. While technical and financial constraints remain major barriers, the Foundation's ability to mobilize local and diaspora volunteers demonstrates strong potential for collective knowledge-building. This suggests that future strategies should focus on enhancing digital inclusion and multilingual access to ensure broader audience.

Respondents suggested improving digital content for future generations by utilizing modern technology, enhancing document standards, creating multilingual metadata frameworks, implementing sustainable digital management policies, and collaborating with the government. Additionally, it was recommended that an annual budget be allocated for digital preservation strategies and resources.

Conclusion

This research explores the Noolaham Foundation's contribution to the digital preservation of the Tamil heritage of Sri Lanka's Tamil-speaking communities. The Foundation was established in response to the loss of knowledge caused by civil war, displacement, and marginalization. Using interviews, document analysis, and thematic review, the study highlights Noolaham's participatory and open-access approach to building a digital archive. Despite limited resources, the Foundation relies on volunteers,

local contributors, and diaspora support. However, it faces challenges such as limited funding, technical barriers, inconsistent metadata practices, and low digital literacy within communities. To ensure long-term impact, the study recommends enhancing institutional capacity, adopting global archiving standards, improving digital literacy, and expanding access through multilingual and mobile-friendly platforms.

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Evaluation of the Role of Sri Lanka Law College Library in Legal Education: A Comprehensive Analysis

M. G. H. K. Wijerathne¹

ABSTRACT

The main aim of this study is to examine the resources, services, and student engagement at the Sri Lanka Law College Library and to conduct a comprehensive assessment of its contributions to legal education. The research focuses on evaluating the extent to which students utilize library resources, the impact of these resources on academic success, and the areas requiring enhancement to better support the learning community. The population for this research consists of 1,200, with a sample size of 181 determined using Krejcie and Morgan's table and selected through a simple random sampling method. The study employed a mixed-methods research approach, combining quantitative data from systematic surveys with qualitative insights from focus groups and interviews. The results indicate that 85% of students regularly use digital resources for academic assignments, positively correlating with their academic performance. Additionally, qualitative findings reveal a strong reliance on the library for information literacy, though there is a pressing need for more up-to-date materials and advanced training in digital tools. This research underscores the critical role of the library in supporting academic success and highlights key areas for development. To further enhance the library's impact, it is recommended to update the library's collection, improve digital infrastructure, provide advanced instruction on digital resources, and develop ethical guidelines for digital tool usage. These improvements will ensure that the library continues to play a vital role in the evolving landscape of legal education at Sri Lanka Law College.

Keywords: Sri Lanka Law College Library, Legal Education, Digital Resources, Information Literacy, Library Services, Academic Performance

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Introduction

The Law College Library plays a crucial role in supporting legal education by providing essential tools and materials required for students' progression in legal knowledge and practices. In light of rapidly evolving technological advancements and pedagogical methods, this study aims to conduct a comprehensive evaluation of the Sri Lanka Law College Library's role and effectiveness in enhancing students' educational outcomes. This research investigates whether the library adequately meets the professional and academic needs of its patrons. Specifically, the study aims to:

1. Assess if the library effectively serves the professional and academic requirements of its users.
2. Identify the primary resources and services provided by the library and evaluate their usage.
3. Analyze how the availability of library resources and services influences the development of research skills and learning outcomes of law students.

This research is relevant and critical in that it will ensure that the library remains a core element of legal education in Sri Lanka, adapting with the changing needs of its users. Based on a blend of qualitative and quantitative research methodologies, this study aims to provide insights that will help the library continue to serve its patrons effectively and enhance its contribution to legal education.

Objectives

The main objective of this study is to conduct a comprehensive analysis of the Sri Lanka Law College Library's role in supporting legal education. The specific sub-objectives of this research are:

1. To evaluate how effectively the library meets the professional and academic needs of its patrons.
2. To identify and assess the principal resources and services provided by the library and determine their usage among students.
3. To analyze how the availability and use of library resources and services contribute to the development of research skills and learning outcomes for law students.

Methodology

The research evaluates the role of the Sri Lanka Law College Library in legal education, focusing on all students enrolled at the college, the population for this research consists of 1,200, with a sample size of 181 determined using Krejcie and Morgan’s table and selected through a simple random sampling method. The study employed a mixed-methods approach, combining quantitative and qualitative research methods. Quantitative data were collected via a structured online questionnaire that explored library usage patterns, student satisfaction, and the impact of library resources on academic and professional development. Qualitative insights were gathered through semi-structured interviews and focus groups. The data were analyzed using statistical software for descriptive and inferential statistics. This comprehensive methodology provides an in-depth analysis of the library’s contributions to legal education and highlights areas for potential enhancement

Results and Discussion

The online survey carried out for this research on 181 students at Sri Lanka Law College has highlighted several key trends related to the use of library resources and their impact on students’ academic performance.

Table 1: Sample Size of the study

Academic Year	Number of Respondents	Percentage
Preliminary Year	60	33.15%
Intermediate Year	60	33.15%
Final Year	61	33.70%
Total	181	100%

The survey included representation of students across different academic years and genders. Out of the 181 respondents, 44.75% were male students, and 55.25% were female students. This distribution ensured that

the perspectives and experiences of both male and female students were adequately captured in the study. The respondents were evenly distributed across the academic years, with 33.15% from the Preliminary Year, 33.15% from the Intermediate Year, and 33.70% from the Final Year. This balanced distribution across different years and genders provided a comprehensive understanding of the library’s role in supporting legal education at Sri Lanka Law College.

Evaluate How Effectively the Library Meets the Professional and Academic Needs of Its Patrons

The data indicated that the Sri Lanka Law College Library is largely effective in meeting the professional and academic needs of its users. The survey results showed that 80% of students felt that the library adequately supports their academic requirements, particularly in accessing essential legal resources. Furthermore, 75% of respondents indicated that the library’s collection of legal texts and journals is satisfactory for their research and study purposes. However, 25% of the students noted that certain key resources, particularly recent legal publications, are lacking and need updating.

Table 2: Evaluation of the Sri Lanka Law College Library’s Effectiveness in Supporting Academic and Professional Needs

Evaluation Criteria	Percentage
Library adequately supports academic requirements	80%
Satisfaction with the collection of legal texts and journals	75%
Need for updating key resources (particularly recent legal publications)	25%

Identify and Assess the Principal Resources and Services Provided by the Library and Determine Their Usage Among Students

The survey revealed that students frequently utilize both digital and physical resources available at the library. Around 85% of respondents reported regular use of the digital resources, such as online databases and e-books, particularly for preparing assignments and conducting legal research. In comparison, 70% of students regularly accessed physical resources like books and case law reports. Services such as research assistance and access to legal databases were highly appreciated, with 78% of students finding these services integral to their academic success.

Table 3: Usage and Appreciation of Library Resources and Services

Resource/Service	Percentage
Digital resources (e.g. online databases, e-books)	85%
Physical resources (e.g., books, case law reports)	70%
Research assistance and access to legal databases	78%

Analyze How the Availability and Use of Library Resources and Services Contribute to the Development of Research Skills and Learning Outcomes for Law Students

The library’s resources significantly contribute to the development of research skills among law students. The study found that 65% of respondents experienced a notable improvement in their research skills due to the availability of comprehensive legal databases and research tools provided by the library. Additionally, 70% of students attributed their enhanced understanding of legal research methodologies to the training and guidance received from library staff. The correlation between the use of library resources and improved academic performance was also evident, with 68% of students reporting better grades and a deeper comprehension of legal concepts as a result of using the library’s resources and services.

Table 4: Contribution of Library Resources and Services to Research Skills and Learning Outcomes

Impact of Library Resources and Services	Percentage
Improvement in research skills due to legal databases and research tools	65%
Enhanced understanding of legal research methodologies due to training and guidance	70%
Improved grades and deeper comprehension of legal concepts as a result of using library resources	68%

The results of this study underscore the significant role that the Sri Lanka Law College Library plays in supporting the academic and professional development of its students. The library's resources, including digital and physical materials, are crucial for students' research and study, significantly contributing to their academic success and the development of research skills. The data reveal a high level of utilization and appreciation for the library's resources and services, indicating their effectiveness in enhancing students' legal research capabilities and overall academic performance. However, challenges remain, particularly concerning the need for updated resources and improved training. A substantial portion of students highlighted the necessity for more recent legal publications and advanced training in utilizing digital tools. To address these issues, it is recommended that the library updates its collection to include more current resources and offers additional training workshops to enhance students' proficiency with digital tools. By addressing these areas, the library can further strengthen its support for legal education and ensure that all students have equitable access to the resources and services they need to succeed.

Conclusion

The investigation into how the Sri Lanka Law College Library supports legal education has highlighted the library's pivotal role in the academic and professional growth of students. The research demonstrates that the library's collection and services, encompassing both digital and physical resources, significantly enhance students' research capabilities and overall academic performance. The majority of students appreciate the library's existing resources, which have proven integral to their learning experiences.

However, the study also identifies key areas for improvement, such as the need for updated legal resources and more advanced training in digital tools. Addressing these gaps is essential for the library to continue meeting the evolving needs of its patrons effectively. Recommendations include updating the library's collection to include more recent legal publications and providing additional training sessions to improve students' proficiency with digital resources.

By introducing these improvements, the Sri Lanka Law College Library will more effectively support its students' in achieving their academic and professional goals, ensuring that they are well-equipped to excel in their legal studies and future careers. A proactive approach to updating resources and broadening training opportunities will foster a more robust and supportive learning environment, thereby reinforcing the library's role as a cornerstone of legal education at Sri Lanka Law College.

Recommendations

To enhance the role of the Sri Lanka Law College Library in supporting legal education, several key actions are recommended. Foremost, the library should maintain a regularly updated collection that include the latest legal publications, journals, and digital resources, ensuring students have access to current and relevant information essential for their academic and research needs. Additionally, the introduction of comprehensive training programs is essential to equip students and faculty with the skills needed to effectively utilize digital tools and resources available at the library. These programs should focus on areas such as advanced legal research techniques, effective use of digital databases, and information literacy skills.

Improving the library's digital infrastructure is crucial to support technological advancements, including high-speed internet access, upgraded computer facilities, and modern software tools that enhance research capabilities. Strengthening research assistance services by offering personalized support for legal research projects will further benefit students, with one-on-one consultations, research guides, and tailored workshops. Establishing a systematic feedback and evaluation mechanism will enable continuous assessment of library services and identify areas for improvement based on input from both students and faculty.

Developing and promoting guidelines on the ethical use of library resources is essential, particularly regarding citation practices and the responsible use of digital tools. These guidelines should address academic integrity and ethical research conduct. Ensuring inclusivity by making library resources and services accessible to all students, including those with disabilities is also vital. This could involve implementing assistive technologies and provision of training on accessible research practices.

Establishing partnerships with other academic institutions and legal organizations can enhance the library's resources and services, by providing access to additional materials, collaborative research opportunities, and professional development for both students and staff. Investing in innovative resource development tailored to law students' needs, such as specialized legal databases or interactive learning tools, will further support their academic endeavors. Finally, encouraging continuous professional development for library staff is essential to keep them abreast with the latest trends and technologies in legal research and library management, ensuring they continue to provide the highest level of support to students.

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Bridging the Innovation Gap: Assessing Digital Access and Library Use among Tea Research Scientists in Sri Lanka

W. H. T. C. Silva¹

ABSTRACT

The capacity for research scientists to efficiently access and use information is essential for fostering innovation in the context of rapidly increasing scientific output and digital advancement. This study examines how scientists at the Tea Research Institute of Sri Lanka (TRISL), a specialized institution in tea science, use library resources, overcome obstacles, and seek information. The study investigates the types of information they search for, their preferred sources and search techniques, library service usage, and perceived barriers in accessing scientific information through a mixed-methods survey involving 27 TRISL scientists. The results reveal that a limited use of institutional resources such as the library catalog and repository, with a preponderance of reliance on digital information sources, especially online databases and search engines. Datasets, research reports, and scientific articles are the most sought-after information types by the scientists. Challenges faced by the scientists include limited digital infrastructure, out dated information, and restricted access to subscribed journals. Despite moderately positive satisfaction with printed materials and the physical library environment, a significant 66% of respondents rarely use TRISL library services, indicating that 4% users actually engage with the library, revealing low library usage level. The study highlights the necessity of improving information dissemination channels, increasing institutional subscriptions to scholarly journals, digitizing archival materials, and improving digital accessibility. In order to improve support for scientific inquiry, suggestions are made to reorient TRI's information services towards a more user-centered, digitally equipped model.

Keywords: Digital Access, Information Behaviour, Institutional Libraries, Library Usage, Research Scientists, Sri Lanka, Tea Research

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Introduction

In the field of tea research, having prompt access to credible and peer reviewed information is important for research and technological development. The Tea Research Institute of Sri Lanka (TRISL), serve as Sri Lanka's unique and only research body, hosts a cadre of scientists whose expertise spans agronomy, plant breeding, soil science, biochemistry, plant pathology, entomology and nematology, and extension services. Despite the critical role of information systems, lack of empirical data regarding how scientists at TRISL seek and use information, especially concerning institutional library services.

This study addresses this gap by examining the information seeking behaviour, preferences, and challenges faced by the tea science researchers. It also evaluates the impact and efficiency of the TRI library in the context of meeting the needs and growing demands for digital access and up-to-date scientific information.

Objectives of the study

The objectives of the study are to

1. Identify the information needs and seeking behaviours of TRISL research scientists.
2. Examine challenges in accessing and retrieving relevant information.
3. Assess usage patterns and satisfaction with existing library resources.
4. Evaluate the awareness and effectiveness of TRI library services.
5. Recommend enhancements for more effective information access and service delivery.

Methodology

A quantitative descriptive survey method was employed in this study to assess the information seeking behaviour and library usage among tea research scientists and extension officers at the TRISL. The target population comprised the entire cadre of tea scientists employed at TRISL, which includes Principal Research Officers, Senior Research Officers, Research

Officers, Experimental Officers, Principal Advisory Officers, Senior Advisory Officers, Advisory Officers and Extension Officers involved in scientific research. At the time the study was conducted, the total population was 86 and we selected 27 scientists as a sample. A stratified random sampling technique was used to select the sample.

A structured questionnaire was given to all 27 participants to collect data regarding their information needs, preferred search methods, library usage patterns, satisfaction levels and suggestions for improving library and information services.

The collected data was analyzed using descriptive statistical techniques, allowing for the identification of trends and patterns within the response. The responses were categorized thematically into key areas of analysis to formulate recommendations and draw conclusions. To facilitate the interpretation and presentation of findings, visual tools such as bar graphs and pie charts, along with tables were employed to represent the frequency distributions and thematic categorization of the variables assessed.

Results

Demographic Information: The survey findings reveals that the gender distribution among scientists is almost balanced (Figure 1), predominantly consisting of individuals aged between 31-50, with a strong representation from the 31-40 age, followed by the 41-50 age group. This group is characterized by high levels of educational attainment, as a substantial proportion possess Master's and Doctoral degrees, and they are actively engaged in research activities (Figure 2). This demographic profile suggests a sample deeply embedded within the research community, whose insights into information needs and accessibility challenges are particularly relevant.

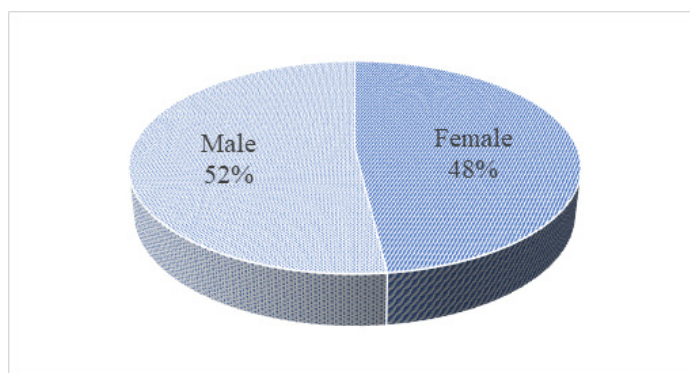


Figure 1: Gender Distribution

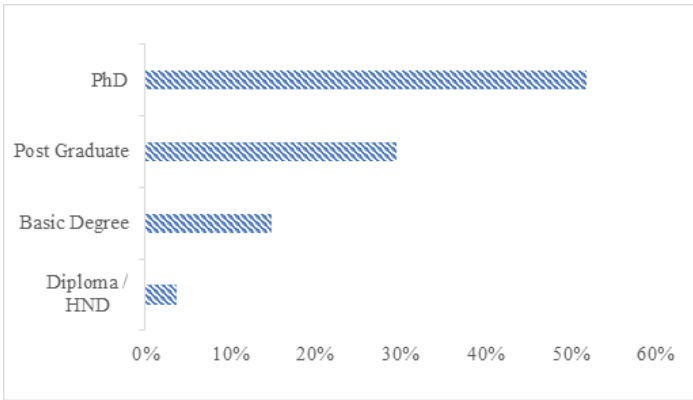


Figure 2: Academic Qualifications of the Respondents

Information Needs and Behaviour: Out of the sample, 24 participants preferred Scientific articles, 20 preferred research reports, and 15 preferred datasets as the most compelling information types within the library. Only 14 mentioned that they are seeking the marketing/ industry trends in the field of tea science.

Most of the tea scientists, specifically 27 individuals, preferred online materials as their reference sources. 11 preferred printed materials, and 5 preferred digitized materials (Table 1).

Table 1. Preferred Information Sources

Information sources	No. of Respondents	Percentage (%)
Printed materials (Books, Journals, Indexes, Encyclopaedia, Newspapers, <i>etc.</i>)	11	41%
Online Materials (E-Books, Journals, Databases, <i>etc.</i>)	27	100%
Digitalized Materials (Repository, Scanned documents)	5	19%

Source: Sample Survey, 2025

Primary search tools used by the scientists are search engines (20), online databases (16) and secondary search tools are the library catalogue, peer recommendations and conference papers.

Challenges in Access: with reference to the responses prioritized by the respondents, it is noted that the most challenging task faced by the tea scientists were limited access to journals (93%), followed by lack of access to digital databases (70%). Outdated or insufficient recent research (48%) and the difficulty finding specific data (37%) are the third and fourth challenging tasks. Time constraint (22%) is the least challenge mentioned by the respondents (Table 2).

Table 2. Challenges Faced by the Respondents

Challenge	No. of responses	Percentage (%)
Limited access to relevant academic journals	25	93%
Lack of access to the databases / digital resources	19	70%
Difficulty in finding specific research data/ reports	10	37%
Outdated information or lack of recent research data	13	48%
Time constraints in accessing information	6	22%

Source: Sample Survey, 2025

Library Usage and Satisfaction: Among the sample, only one respondent (4%) mentioned using the library on a weekly basis. 08 respondents (30%) recorded as monthly readers, and 18 respondents (66%) were categorized as rare users of the library. It indicates that most of the research scientists are not visiting the library to fulfill their information needs.

Twenty-one scientists (78%) indicated that their first preference is the printed books/reports when visiting the library, 17 (63%) used scientific journals and only 06 individuals (22%) indicated their preference to use e-resources as the first priority. 10 scientists (37%) preferred to use the Institutional repository as source of information to fulfill their information needs.

Table 3. Preferred Sources of Information

Response	No. of Responses	Percentage (%)
Printed Books / reports	21	78%
Scientific journals and periodicals	17	63%
E resources (E – Books/ databases)	6	22%
Special / Institutional collections	10	37%
Institutional repository	6	22%
Social media	4	15%

Source: Sample Survey, 2025

Online Database Preferences: Google Scholar (85%) and the Research Gate (74%) are the dominant online databases used by the research scientists, and SLJOL (33%) and the NSF Repository (4%) are the least utilized digital sources of information.

Table 4. Online Resource Usage

Source of Information	No. of responses	Percentage (%)
Google scholar	23	85%
Research Gate	20	74%
SLJTS	9	33%
NSF Repository	1	4%

Source: Sample survey, 2025

Suggested improvements by the respondents: Top recommendations given by the respondents included improving digital infrastructure (85%), increasing access to more online journals (74%), acquiring digital resources (67%), providing more training and workshops to improve knowledge in information management (48%), enhancing data management support (37%), upgrading in digital resource (67%) and updating the library resources (4%) (Table 5).

Table 5. Suggested Improvements for the TRISL Library

Additional Service / Resources	No. of responses	Percentage (%)
Access to more academic journals online	20	74%
Improved digital infrastructure	23	85%
Training / Workshops on information management	13	48%
Increased support for data management and analysis	10	37%
Extended library hours	0	0%
Improvement in digital resources	18	67%
Updating the library resources	1	4%

Source: Sample survey, 2025

Discussion

According to the study, scientific community of the TRISL's is highly focused on research and is distinguished by its digital learning approaches, yet it faces challenges in accessing the TRI library resources due to limited infrastructure. A weakness in institutional database access and training is highlighted by the preference for Google Scholar and Research Gate.

The physical library environment has received good reviews, but its digital resources are hardly used. The low usage of library catalogues and institutional repositories indicates both functional limitations and a lack of awareness.

The need for full text journal access, centralized digital platforms, and better internet connectivity, is in line with global trends in academic research requirements.

It's interesting to note that the majority of the respondents, mid-career researchers (age 31-50) effectively balance traditional library practices and digital openness, which explains why people continue to prefer printed materials and why there is a need for better e-resources.

Conclusion

The study reveals critical gaps in the information-seeking behaviour and library resource utilization among research scientists at TRISL. While there is a clear and growing demand for access to high-quality, digital academic content, structural limitations, such as inadequate access to international journals, underutilized library services, and lack of awareness about available digital resources leads to the challenging task of collecting information required *i.e.* literature for the scientists. These challenges directly impact the abilities of researchers to, engage in the management, dissemination, and access of scientific information, which ultimately hinders the innovative Research and Development, and the advancement of Sri Lanka's tea industry.

Recommendations

Based on the study, it is recommended to expand access to digital resources, develop a centralized digital platform, implement awareness campaigns, enhance infrastructure and digitization efforts and imitate information marketing strategies within the library to ensure its self-financing. These actions will significantly enhance the library's role in supporting research and maximize the dissemination of scientific knowledge within the tea sector in Sri Lanka.

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Application of Artificial Intelligence (AI) Tools in Academic Activities: A Case Study of Lanka Nippon BizTech Institute

Malsha Weerasinghe¹

ABSTRACT

Artificial Intelligence (AI) has become increasingly influential in various fields. This study explores the application of AI tools among final-year undergraduate students at the Lanka Nippon BizTech Institute. The study aimed to identify the most frequently used AI tools and to examine their purposes in academic activities. A mixed-methods approach was employed incorporating both qualitative and quantitative data. A sample of 100 students was selected using a simple random sampling technique. Data were collected through structured questionnaires and analyzed using Microsoft Excel. Findings reveal that ChatGPT (92%), Grammarly (83%) and Quill-Bot (76%) are the most commonly used tools. Students reported that they primarily use AI tools for grammar checking (65%), content summarization (54%), assignments writing (40%), presentation preparation (20%) and for paraphrasing (20%). The study highlights the growing reliance on AI to enhance academic productivity and writing quality. It also recommends expanding digital literacy programs, promoting ethical awareness regarding AI use and offering expert-led training on incorporating AI tools in academic research.

Keywords: Artificial Intelligence, Artificial Intelligence Tools, Undergraduate Students, Academic Activities, Lanka Nippon BizTech Institute

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Introduction

Academic libraries play a significant role by offering a wide range of resources that support teaching, learning, and research. With Artificial Intelligence (AI) tools become a regular part of education, there is growing interest in regarding the ways undergraduate students are using these technologies. Golen (2023) mentions several AI tools suitable for academic purposes, such as Semantic Scholar, Penelope.ai, Elicit for literature reviewers, ChatGPT for writing, Cohere for combined literature reviews and writing. However, research on this topic remains limited.

Students are increasingly using AI tools for their academic activities, raising interest in their effectiveness, the challenges involved, and the ethical implications of their usage. This study examines how final-year undergraduate students at the Lanka Nippon BizTech Institute (LNBTI) utilise AI tools for their academic activities.

The objective of the study is to identify the most frequently used AI tools by these students in their academic work and to evaluate the benefits gained from their use. By investigating these aspects, the study highlights the important role AI tools play in increasing efficiency, improving academic writing, reviewing literature, and identifying research topics. The findings indicate a need to enhance digital literacy programs and promote stronger ethical awareness regarding the use of advanced AI tools.

Objectives

- To evaluate the frequency and purposes of AI tools usage among final-year undergraduate students at the Lanka Nippon BizTech Institute.
- To explore the barriers to the effective use of AI tools and ethical concerns in academic activities.

Methodology

This study employed a mixed-methods approach, combining both qualitative and quantitative data to provide a comprehensive insight into AI tool usage among students. Primary data were collected through structured surveys and secondary data were gathered from academic literature and relevant online platforms. The study focused on final-year undergraduate

students at the Lanka Nippon BizTech Institute (LNBTI). A sample of 100 students was selected using a simple random sampling technique, to ensure equal participation opportunities and to enhance the representativeness of the sample. Microsoft Excel was used to analyze the quantitative data collected through questionnaires, while qualitative data were analyzed using Thematic analysis.

Results

Table 1: Cross-Tabulation of AI Tool Usage by Gender

Frequency	Male	Female	Total
Never	4%	5.5%	9.5%
Rarely	10%	20%	30%
Often	28%	23%	51%
Always	8%	1.5%	9.5%
Total	50%	50%	100%

This cross-tabulation table 01, highlights gender-based differences in the frequency of AI tool usage. A higher proportion of male students (36%) reported using AI tools often or always, compared to (24.5%) of female students, indicating that male students are more frequent users of AI tools in academic activities. In contrast, (25.5%) of female students reported rarely or never using AI tools, compared to (14%) highlighting potential barriers like limited access, lack of awareness and insufficient technical skills.

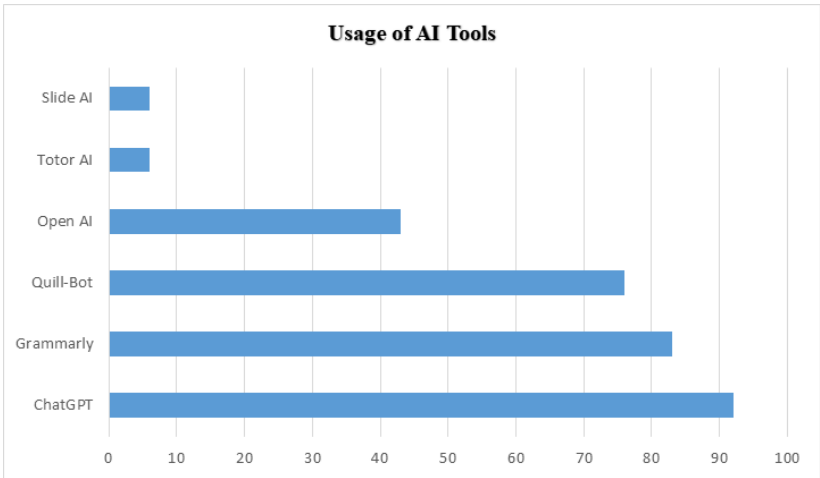


Figure 1: Types of AI tools commonly used for academic activities

Based on Figure 1, ChatGPT is the most widely used AI tool as indicated by 92% of respondents. Grammarly follows as the second most popular tool at 83%, while Quill-Bot ranks third with 79%. In contrast, tools such as Tutor AI and Slide AI are used very little or not at all.

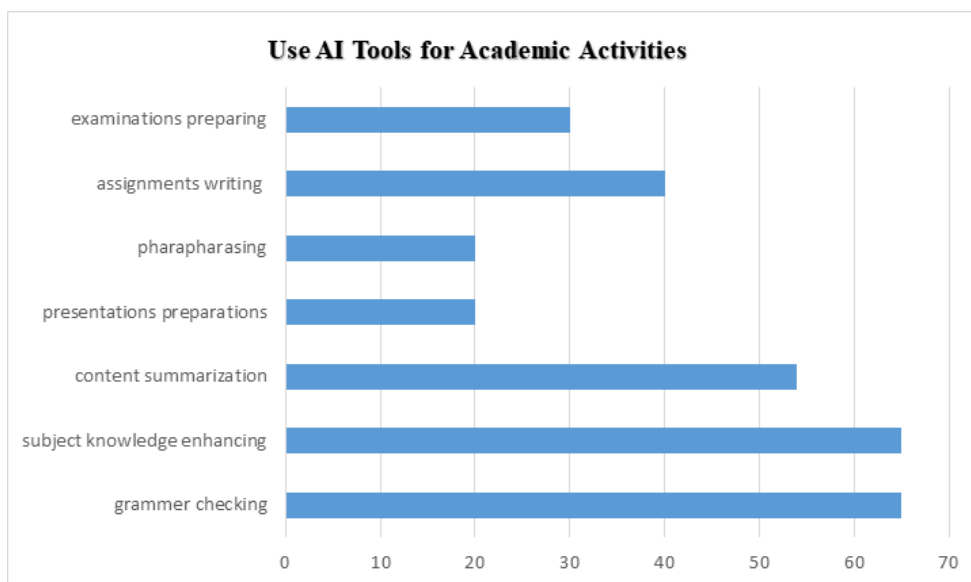


Figure 2: Purposes of using AI tools for academic activities

According to Figure 2, the most common uses of AI tools among students are, checking grammar and subject knowledge enhancing (65%). Many students also use AI tools to summarize content and write assignments. The percentages are, 54% and 40% respectively. These findings indicate that AI is widely utilized for academic exploration, content summarization and improving the quality of academic writing. AI-based applications are increasingly integrated into learning as valuable academic tools. The use of AI for generating presentations and paraphrasing content is comparatively infrequent among students.

Recommendations

The study on the use of Artificial Intelligence (AI) tools among final-year undergraduate students at Lanka Nippon BizTech Institute highlights several key patterns in students' engagement with AI in academic contexts. Based on the findings, specific recommendations can be made to ensure the effective and ethical integration of AI tools in higher education. First, the expansion of digital literacy programs is essential.

Institutions should implement systematic training programs focused on academic writing, research methodologies and data analysis using AI technologies. Educational institutions should organize regular workshops to introduce students with diverse AI technologies and their relevance in academic work. Secondly, although the use of AI tools for paraphrasing is relatively limited, it raises concerns related to academic integrity. Targeted ethical training should be implemented to address issues such as plagiarism, data privacy and responsible AI use. These training sessions will help students in understanding both the appropriate applications and the limitations of AI in academic work. Furthermore, introducing mentorship programs can support students in developing appropriate strategies for using AI in academic settings. Through guidance from experienced peers, students can learn to responsibly integrate AI alongside established research methodologies.

Conclusion

This study explores the increasing integration of Artificial Intelligence (AI) tools within the academic practices of final-year students at Lanka Nippon BizTech Institute. This finding supports Albayati's (2024) prediction that ChatGPT would become widely used, especially among undergraduate students. The study highlights prevalent usage of AI platforms such as ChatGPT, Grammarly and Quill-Bot for tasks like assignment writing, literature summarization, research topic exploration, and knowledge enhancement. While AI significantly supports academic workflows, it also raises ethical and practical challenges. The study has its limitations; the small sample size and reliance on self-reported data may limit the validity of the findings. Future research should incorporate more diverse participant groups and adopt mixed-method approaches to provide a more comprehensive analysis of AI tool usage in academic contexts. Moreover, further research is needed to explore the long-term impacts of AI on student learning and the development of effective frameworks for ethical AI use in higher education.

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A Study on the Current Status of University Library Automation in Sri Lanka

A. K. G. Senevirathna¹

ABSTRACT

The advancement of information and communication technology has directly impacted all sectors. The libraries also play a significant role in this transformation. These institutions are expected to provide high quality and efficient services to their patrons. Over the past five years, no formal study has been conducted on the automation of university libraries in Sri Lanka. Therefore, this study aimed to fill that gap. Accordingly, this study aimed to examine the current level of automation in university libraries in Sri Lanka and identify the associated challenges. A quantitative research methodology was used for this study. The sample consisted of 17 university libraries operating under the University Grants Commission (UGC) of Sri Lanka. Data was collected using a survey method via questionnaires (online and printed). Responses were received for 6 out of the 17 questionnaires distributed. Data analysis revealed that Sri Lankan university libraries are not fully automated but have partially automated their functions. Cataloguing and circulation functions have been automated in all university libraries, and the Koha software has been used to automate these library operations. Additionally, the study found that users are highly satisfied when working with the KOHA software. However, several challenges were identified, including insufficient resources for automation, inadequately trained staff with automation expertise, inadequate infrastructure, and restrictive policies from the parent organization. To mitigate these issues, recommendations include securing additional resources from the parent organization, providing staff training, and fostering mutual understanding and collaboration with the parent organization.

Keywords : University Libraries, Library Automation, Automation Software, Sri Lanka

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Introduction

Libraries have become very complex institutions today. This is because libraries are developing rapidly and are integrated with information and communication technology (ICT). According to Gorman, libraries are “a place dedicated to the acquisition, organization, preservation and dissemination of information in all its forms and providing services that help people use that information effectively.” (Gorman, 2000). In particular, the services provided to the reader by libraries are currently being automated. According to Grover “Automation is the technology by which a process or procedure is performed without human assistance”(Groover, 2015). Therefore, many activities done manually in the past are now being automated. McDonald defines library automation as “the performance of traditional library activities such as acquisitions, cataloguing, and circulation using automatic and semi-automatic data processing machines” (McDonald, 2017).

Library automation worldwide began around the year 1930. The introduction of automation in the university library sector in Sri Lanka was 1990. The University Grants Commission provided IBM 286 computers and Epson LX printers to seven universities in Sri Lanka (Rathnayake, 2015).

According to the literature review conducted by the researcher, it has been identified that the amount of research conducted on university library automation in Sri Lanka in the last 7 years is minimal. This study has identified the gap in the status and problems of university automation in Sri Lanka during the last seven years. Therefore, this research aims to determine the current state of university library automation and challenges facing university libraries in Sri Lanka.

Objectives

This study aimed to examine the current state of automation in university libraries in Sri Lanka and identify the associated challenges.

Methodology

A quantitative research methodology was used, utilizing the survey method. The study focused on Sri Lankan university libraries. Among them, 17 UGC university libraries were selected through the non-probability sampling techniques, based on the purposive sampling method. Data was collected using a survey method including both online and printed questionnaires.

Microsoft Excel software was used to analyse the data. The gathered data was evaluated using spreadsheets and the results were presented using tables and graphs.

Results

Responding to the sample

Table 01: Responding to the sample

Sample	Sample size	Responding to the sample	Response rate for the sample as a percentage	Non-response to the sample	Non-response rate for the sample as a percentage
State University Libraries in Sri Lanka	17	6	35.29%	11	64.71%

The sample consisted of 17 university libraries regulated by the University Grants Commission (UGC) of Sri Lanka. Responses were received for 6 out of the 17 questionnaires distributed. Therefore, the response rate of university libraries was 35.29%. The number of university libraries that did not respond was 11, which is 64.71%.

Current status of library automation

According to the data analysis, Table 2 provides the current status of university library automation in Sri Lanka.

Table 02: Current status of library automation

Current status of library automation	Percentage
Fully automated	0%
Partially automated	100%
Not automated	0%
Intended to be automated	0%

Source: Survey Data, 2024

According to Table 02, Sri Lankan University libraries have not achieved complete automated status as previous studies found. All university libraries are only partially automated. Its percentage value is 100%. This means that all libraries have undergone some level of automation. It appears that various challenges related to automation have prevented all university libraries that responded from the sample from being fully automated.

Library automation software usage

Table 03: Library automation software used by libraries

Software	Percentage
KOHA	100%
Others	0%

Source: Survey Data

According to Table 03, all university libraries use Koha software. Its percentage value is 100%. This information shows that all university libraries that responded to this study have increasingly focused on the use of open source software.

Table 04: Challenges related to library automation

Challenges	Strongly agree	Agree	Strongly disagree	Disagree	No opinion
The amount of money allocated to the library is not sufficient.	33%	50%	17%	0%	0%
There are no local training programs related to library automation.	17%	33%	33%	17%	0%
The library does not have enough staff with the knowledge and ability to handle automation.	17%	50%	17%	17%	0%
The rules and regulations of the parent organization hinder the purchase and maintenance of library automation tools.	33%	50%	0%	17%	0%
There is no support from other departments of the parent organization for the library's computer and related automation activities.	17%	33%	17%	33%	0%
Having a large collection for automation	17%	33%	17%	33%	0%

Lack of tele-communication facilities.	33%	33%	0%	33%	0%
Infrastructure takes longer to complete	17%	50%	0%	33%	0%
The views of the parent organization and other departments regarding library automation are very negative.	17%	50%	0%	33%	0%
The fact that vendors are far apart is a barrier when it comes to purchasing and maintaining library automation tools.	17%	33%	33%	17%	0%

Source: Survey Data

According to Table 04, the main challenges related to library automation are insufficient funding allocation, Parent organization rules and regulations hindering the purchase and maintenance of library automation tools and lack of telecommunication facilities. Other challenges include the lack of sufficient library staff with skills and the lengthy process needed to complete the infrastructure and the knowledge required to handle automation.

Discussion

This study reveals the current status of university library automation in Sri Lanka and the problems that have arisen. In particular, the investigator's research identified that none of the university libraries included in the sample were fully automated. Lack of telecommunication facilities, insufficient funds allocated for library automation, and parent organization rules and regulations that hinder the purchase and maintenance of library automation tools could be identified as significant problems. In addition, the long time to complete the infrastructure and the lack of sufficient library staff with the

knowledge and skills to handle automation are among the other problems. Finding more effective solutions to address these problems is emphasised here.

Suggestions such as encouraging more library staff to participate in Information and Communication Technology courses, focusing more on developing Information and Communication Technology infrastructure in university libraries, and seeking support through discussions with the parent institution and the government for the complete automation of university libraries can be recommended as solutions to the problems that have arisen regarding university library automation.

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Assessing the Impact of Digital Transformation and Innovation on User Engagement and Service Delivery in Academic Libraries: Concept Paper

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ABSTRACT

This concept paper aims to critically examine the impact of digital transformation and Innovation on user engagement and service delivery in academic libraries. As institutions increasingly adopt advanced technologies such as AI driven learning systems, integrated library management platforms, cloud computing and AI related data analytics, libraries are now transitioning from physical data storages to digital, user centered online information providers. Recent statistics and observations indicate a decline in physical visits, book borrowing, and in-person interactions within academic libraries. In contrast, there has been a significant increase in the demand for digital information resources. The main objectives of this concept paper would be to investigate how digital transformation initiatives influence user behaviour, user satisfaction, and access to information resources in academic libraries. It also seeks to identify the challenges encountered during this transition, including digital infrastructure disparities, cybersecurity issues, the need for continuous staff upskilling, and the resistance to technological change. The proposed methodology involves a mixed– method approach which combines the quantitative data gathered from the library user surveys with qualitative insights from the library staff. The study hopes to develop a conceptual framework to assess the effectiveness, sustainability and user-friendliness of the adopted digital strategies in the academic libraries. The expected outcomes will include identifying the preferred digital innovations among the users, evaluating the impact of these technologies on user engagement and the quality of the delivery of the services, and highlighting the identified barriers towards digital transformation.

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The key findings will provide valuable recommendations for academic libraries on whether to enhance their digital service provision or to continue with what they are practicing currently in line with the user expectations.

Keywords: Digital Transformation, Innovation, Academic Libraries, User Engagement, Service Delivery

Introduction

In today's techno driven world similar to all other fields, academic libraries are also adopting new technology and moving with digital transformation and innovations in serving their users. Libraries of the current millennium are not the same as libraries of yesteryears. This is because libraries now operate in a digitally sensitive environment (Kari, 2020). While the technological advancements have enhanced the accessibility and efficiency of the services provided by the academic libraries, most of the academic libraries have moved away from the traditional methods they used to deliver the service to the library users.

Digital Transformation is an important process to integrate digital solutions into our everyday lives. It affects different sectors, for example businesses, industry or healthcare. However, digital transformation not just enhances traditional solutions, it can lead to innovative approaches. There was also a demand to integrate digital solutions into education (Bogdandy et al, 2020).

Accordingly, digital solutions and innovations are much needed for education sector; hence libraries too should embrace new technologies and innovations if they are to provide valuable services to the users. In academic libraries, technological advancements have compelled libraries to adopt comprehensive, user centric, and technology-driven approaches to service delivery (Saibakumo, 2021).

Existing literature has explored various aspects of digital transformation and innovations within academic libraries due to the influence of emerging technologies and shifts in information-seeking behaviour. Digital Transformation has become a defining aspect of the contemporary library landscape, reshaping the way information is accessed, stored, and disseminated (Soni, 2023). But there is a significant lack of research on how digital transformation and innovation affect user engagement and service delivery quality in academic libraries. Hence, this study aims to explore how

digital transformation and innovation are reshaping user engagement and service delivery in academic libraries by assessing the extent to which the adopted digital changes and innovations influence the user behaviour, user satisfaction, ease of information access and usage of digital resources. By analyzing relevant literature and the collection data from academic library users and staff, this research aims to propose a conceptual framework that evaluates the user-friendliness, sustainability, and efficiency of digital strategies in academic library environments.

Research Problem and Objectives

Despite the increasing investment in digital technologies by academic libraries, there is limited empirical evidence regarding the impact of these initiatives on user engagement and satisfaction. Observations indicate a decline in physical library visits and an increased demand for digital services, but it is unclear whether these shifts meet user expectations or improving service quality.

This concept paper, therefore, aims to:

Examine how digital transformation influences user behaviour, satisfaction, and engagement with academic library services.

1. Evaluate the effectiveness and usability of digital strategies adopted by academic libraries.
2. Identify key challenges in digital adoption, such as infrastructure disparities, cybersecurity risks, and the need for ongoing staff upskilling.
3. Recommend evidence-based best practices for inclusive and sustainable digital service models.

Proposed Methodology

A mixed method approach would be proposed to carry out the study on the impact of Digital Transformation and Innovation on User Engagement and Service Delivery in Academic Libraries.

Saunders et al. (2019) identify that “the full set of cases from which a sample is taken is called the population”. The study population is the entire number of users of all Academic Libraries, which is impossible to quantify. Hence, the sample will be selected based on the convenient sampling technique.

Quantitative data will be collected through an online semi-structured survey aimed at 384 individuals, who are already active members of academic libraries. These participants will be selected through convenience sampling based on Krejcie and Morgan’s model. The data collected will focus on user engagement, satisfaction, and patterns of service usage.

Quantitative data will be gathered through open-ended questions during individual interviews to understand the challenges encountered in digital transformation initiatives, and perceived impacts on service delivery.

The quantitative data will be analyzed using SPSS, applying descriptive statistics and the qualitative data will be analyzed using thematic coding. This dual approach ensures a comprehensive understanding of both user and staff experiences.

Limitations include the use of a non-probabilistic sampling method and limited generalizability across all academic libraries because of their varying cultures, resistance to technology, and volume of data involved.

Anticipated Results

The expected results of the analysis could be as follows,

1. It could identify the preferred digital innovations among the users so that the best or most useful innovative strategies could be revealed.
2. An evaluation could be done of the impact of the innovations and new technologies on user engagement and the quality of the delivery of the services.
3. Offers an opportunity to highlight the identified barriers faced by academic libraries in adopting the digital transformations and innovations.
4. Provides valuable recommendations for academic libraries on whether to enhance their digital service provision or to continue their current practices in alignment with the user expectations.

Discussion

It is expected that the proposed study will contribute significantly to understanding the dynamic relationship between digital transformation, innovation, and user engagement in academic libraries. As a result of the anticipated conceptual framework, libraries will be able to assess the effectiveness, sustainability, and user-friendliness of their digital strategies. Further, this study will offer practical recommendations to academic libraries on how to enhance, modify, or sustain their current digital service delivery models based on user expectations and satisfaction levels.

Conclusion

This study would be beneficial to present the impact of Digital Transformation and Innovation on User Engagement and Service Delivery in Academic Libraries, providing a foundation for these libraries to understand about their stance in the digitalized environment and allowing them to enhance their digitalization strategies. Accordingly, this study could provide useful insights to academic libraries and their users regarding the advantages of Digital Transformation and Innovation on user engagement and service delivery within these Libraries.

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An Analysis of Service Quality in Grade Two Public Libraries in Colombo District in Relation to National Library Standards

Iromi Wijesundara¹

ABSTRACT

This study attempts to analyze the service quality of Grade 2 public libraries within the Colombo District of Sri Lanka, examining their similarities and differences relation to standards set by the National Library of Sri Lanka. Utilizing mixed methods that includes observation, field surveys, questionnaires and secondary data analysis, the study assesses essential elements of library resources, services, key components of the libraries, staffing levels, readership statistics and annual financial allocation. The findings reveal that while many libraries comply with national standards concerning physical resources (average book collection 27,500– 33,000), there is a shortage of qualified staff (86% do not have a qualified head librarian) and shortcomings in technological implementation (only 33–43% use automated systems such as Koha). It was also found that many libraries limited readership and do not meet the standards (about 48% of registered readers). The national standards in Sri Lanka are still mainly based on input. Accordingly, the study recommends the following as reform proposals: (1) adopting a basic output ranking system, (2) designing services according to user needs, (3) incorporating automated systems such as Koha in every library, (4) recruiting and training staff, and (5) addressing regional imbalances in library resources. By implementing these proposals, public libraries in Sri Lanka can evolve into community hubs aligned with the Sustainable Development Goals (SDGs) mainly focusing on SDGs 4 and 16, thereby improving the quality of services. In conclusion, this research serves a useful resource for policy development, and will provide basic information for the future advancement of the Sri Lankan public library sector.

Keywords: Public Libraries, Service Quality, National Library Standards, SDGs

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A Survey on Digital Literacy among First Year Undergraduate Students at the University of Kelaniya, Sri Lanka

W. D. G. Peiris¹

ABSTRACT

This study investigates the level of digital literacy among first-year undergraduate students of the Faculty of Social Sciences at the University of Kelaniya, Sri Lanka, and explores its relationship with academic performance. The research specifically examines competencies such as information literacy, technical operations, communication, collaboration, critical thinking, and digital safety, while also analyzing gender-based differences. The study adopts the Technological Pedagogical and Content Knowledge (TPACK) framework as the theoretical lens to assess and interpret students' digital literacy. TPACK provides a structured approach for evaluating the integration of technology, pedagogy, and subject content knowledge in educational settings, making it suitable for examining undergraduate digital competencies. A structured questionnaire based on a five-point Likert scale was administered to a sample of 80 first-year students selected through simple random sampling. The study employed a quantitative methodology and descriptive statistics, including mean, standard deviation, and correlation analysis. The results indicated that while students demonstrated moderate levels of digital literacy overall, competencies in communication and collaboration were relatively low. No statistically significant gender differences were found. However, a positive correlation between students' digital literacy and academic performance was observed. The findings emphasize the need to integrate targeted digital literacy training programmes into the university curriculum, especially focusing on communication, teamwork, and digital safety.

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It is recommended that future research utilize the TPACK framework more comprehensively to validate findings and further explore the dynamic interaction between digital literacy and academic success. This study contributes to understanding the current digital skills landscape of undergraduate students.

Keywords : Digital Literacy, TPACK Framework, University of Kelaniya, Undergraduate Students

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