LIBRARIES AS PILLARS OF SUSTAINABLE SOCIO-CULTURAL CAPITAL

SELECTED FULL RESEARCH PAPERS

INTERNATIONAL CONFERENCE ON LIBRARY & INFORMATION SCIENCE - 2025 (ICLIS 2025)

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Sri Lanka

Organized by
Library System of the University of Peradeniya
Sri Lanka Library Association (SLLA)
National Science Foundation (NSF) - Sri Lanka

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International Conference on Library and Information Science

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Message from the President of the SLLA

Dr. Preethi Liyanage
President, Sri Lanka Library Association 2024/2025

The Sri Lanka Library Association (SLLA), in collaboration with the Library System of the University of Peradeniya is organizing the International Conference on Library and Information Science (ICLIS-2025).

It is with great pride and heartfelt appreciation that I extend my warmest greetings to all authors, reviewers, coordinators, presenters, participants, and members of the wider library and information science community who have gathered for this distinguished occasion the *International Conference on Library and Information Science (ICLIS-2025)* hosted by the University of Peradeniya.

The theme of this year's conference, *"Libraries as Pillars of Sustainable Socio-Cultural Capital"* is both timely and thought-provoking. At a moment when our societies are shaped by unprecedented technological advancements, shifting socio-economic landscapes, and global challenges, libraries continue to stand as enduring institutions that safeguard cultural heritage, champion equitable access to information, and nurture lifelong learning. The carefully selected sub-themes-ranging from data privacy and open access to transformative leadership, tourism, and the role of AI-eloquently capture the complexity and dynamism of our field today.

On behalf of the Sri Lanka Library Association, I wish to express our deepest gratitude to Prof. W.M.T. Madhujith, Vice Chancellor, University of Peradeniya, Dr. R. Maheswaran, Conference Chair and Librarian University of Peradeniya and the organizers of ICLIS 2025 for their vision, commitment, and tireless efforts in bringing this important event to fruition. We are especially indebted to the University of Peradeniya for hosting this conference and providing an inspiring platform for scholarly exchange and professional dialogue. I also extend my sincere thanks to the authors and presenters for their valuable contributions to advancing our discipline; to the reviewers for upholding the highest academic standards; to the coordinators and organizing committee for their exemplary dedication; and to all participants for their active engagement and commitment to innovation.

ICLIS 2025 is not merely an academic gathering; it represents a vital opportunity for us to strengthen regional and international collaboration, share ideas, and collectively chart pathways for the future of libraries as transformative agents of sustainable socio-cultural development. I am confident that the deliberations and connections fostered through this conference will enrich our professional practice and contribute meaningfully to the advancement of library and information science in Sri Lanka and beyond.

I wish you all a productive, inspiring, and memorable conference.

Message from the Conference Chair

Dr. R. Maheswaran
Conference Chair – ICLIS 2025
Librarian, University of Peradeniya, Sri Lanka

It gives me great pleasure and privilege to pen this message for the abstract proceedings of the International Conference on Library and Information Science (ICLIS 2025), held under the compelling theme: "Libraries as Pillars of Sustainable Socio-Cultural Capital." This theme resonates profoundly in an era where libraries transcend their traditional roles and emerge as dynamic institutions that empower communities, safeguard knowledge, and uphold cultural identity while contributing significantly to the sustainable development goals of our societies. ICLIS 2025 marks a historic milestone in the 104-year history of our University Library, as an International Library and Information Science Conference is being organized here for the very first time. We are proud to join hands with the Sri Lanka Library Association in hosting this scholarly endeavor. As the conference chair of this prestigious conference, I am truly honored to lead the organization of this academic gathering in the serene and intellectually vibrant environment of the University of Peradeniya, which has always upheld the values of knowledge creation, dissemination, and service to society.

This international conference brings together scholars, professionals, academics, and practitioners from diverse regions and disciplines to reflect on the evolving role of libraries in shaping resilient, equitable, and inclusive societies. The sub-themes of the conference-ranging from transformative leadership, data privacy, open access, and digital innovation to library education and community empowerment-highlight the multifaceted challenges and opportunities faced by the global library and information science community today.

I am pleased to note that this conference has attracted a diverse range of research submissions from both national and international contributors. These contributions represent not only scholarly excellence but also a collective commitment to advancing the profession in a rapidly changing digital landscape. The abstracts included in this volume stand as testimony to the intellectual vigor and creativity of our profession, and I am confident that the knowledge shared through these research efforts will inspire new dialogues, collaborations, and innovations.

My sincere thanks are extended to our Chief Guest, Professor W.M.T. Madhujith, for his gracious presence and encouragement, and to our Guest of Honor, Rev. Dr. (Sr.) Isabella Rajakumari, Principal of Holy Cross College, Tiruchirappalli, whose participation further elevates the stature of this occasion. I also take this opportunity to thank the chairpersons of the plenary sessions, all technical session panel chairpersons, and the distinguished panel members whose expertise and thoughtful moderation play a crucial role in facilitating meaningful academic exchange throughout the conference.

It is a great honor to acknowledge Dr. R. Balasubramani, Professor in the Department of Library and Information Science at Bharathidasan University, Tiruchirappalli, India, for graciously accepting our invitation to deliver the keynote address. We are deeply grateful for his presence and scholarly contribution to this conference. I also wish to express my heartfelt appreciation to Professor Liyanage Amarakeerthi, Professor in Sinhala at the University of Peradeniya, and Dr. (Ms.) Pradeepa Wijetunge, the Librarian of the University of Colombo incumbent President of the University Librarians' Association for delivering the distinguished guest speeches and for their invaluable insights that enrich our proceedings.

Conferences such as ICLIS are never the work of a single individual but the result of collective dedication and teamwork. I take this opportunity to extend my sincere gratitude to the Council Members of the Sri Lanka Library Association, whose partnership and collaboration have made this joint conference a reality. A special word of appreciation goes to Dr. Preethi Liyanage, President of the Sri Lanka Library Association, for his unwavering commitment and leadership in fostering professional development among LIS professionals in Sri Lanka. I also take this opportunity to warmly acknowledge the Council Members of the Sri Lanka Library Association, including the President-Elect, the Immediate Past President, the General Secretary, the Treasurer, and all the committee members, whose collective efforts continue to strengthen the Association and uplift the profession.

I am especially grateful to the Conference Secretary, Mr. B.N.G.S. Premarathne, for his exceptional coordination and commitment to ensuring the seamless organization of this event. My heartfelt thanks also go to Ms. Sureni Weerasinghe, the Editor-in-Chief of the Abstract Proceedings, for her meticulous work in compiling and presenting the research contributions in this volume with clarity and precision. Further, I extend my appreciation to Ms. Chamilka De Silva, the Co-editor for her dedicated efforts throughout the editorial process as well as her support in registration and finance committees. Also, I'm highly grateful to the members of the organizing committee for their invaluable support: Dr. Champa Alahakoon for handling Registration, Dr. Chamani Gunasekera for smooth coordination of Food and Logistics as well as Financial matters, Ms. Harshani Dissanayake for her contribution in managing Technical Sessions, Mr. Ajantha Dharmarathne for coordinating Transport logistics, Ms. Niranjala Sarojini and Mr. Isuru Herath for overseeing Decorations and Cultural events, Mr. S.A. Jeewan for coordinating Accommodation arrangements, and Mr. B.E.S. Bandara for his excellent work in managing Web, Media, and Publicity.

In conclusion, I welcome all participants and delegates to this meaningful scholarly endeavor and wish everyone a successful and enriching conference experience. May the discussions and collaborations that emerge from ICLIS 2025 continue to shape the future of libraries as transformative pillars of sustainable socio-cultural capital.

Contents

Use of Search Engines and Search Strategies: A Comparative Study of Rural and Urban LIS Students in Universities of Karnataka, India

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Abstract**

Searching, accessing and evaluating digital content is crucial for postgraduate students. In order to effectively search the internet for information, the search strategies that make the process easier and faster must be understood. The search engine is used to retrieve relevant query-based information. It consists of crawling, indexing, ranking and querying modules and a page repository for temporarily storing web pages. This study investigates the usage patterns of search engines and the application of search strategies among rural and urban postgraduate Library and Information Science (LIS) students in universities across Karnataka, India. A total of 13 state universities were established and 11 universities offered library and information science programs. A structured questionnaire was designed and distributed among 153 LIS postgraduate students across 11 universities in Karnataka, India. The data was analyzed to identify usage trends, behavioural patterns and differences in search strategy application between rural and urban respondents. The data was analyzed using SPSS software. The findings showed that 94.11% of students used the Internet daily. Google was the most widely used search engine among rural and urban students (mean = 4.88), followed by Yahoo (mean = 3.47) and Bing (mean = 2.56). The study also found that Dogpile (mean = 1.67) is one of the most used meta-search engines. However, with regard to Boolean search techniques: 79.08% of rural students responded that they are using Boolean logic, compared to only 6.53% of urban students. Despite these disparities, both groups expressed a shared interest in learning search strategies, primarily through classroom instruction and online sources. The study highlights a critical need for structured user education programs within the LIS curriculum. Universities should incorporate specialized training modules, online tutorials, and webinars focusing on effective search strategies. By enhancing students' information literacy and search capabilities, these interventions can significantly improve academic performance and better equip future LIS professionals to meet the dynamic challenges of the digital information landscape.

Keywords: *Postgraduate students; Search engines; Search strategies; Search techniques.*

***** The above abstract is already published:***

Manjunatha, G., Sampath Kumar, B. T., & Shiva Kumara, S. U. (2025). *Use of search engines and search strategies: a comparative study of rural and urban LIS students in universities of Karnataka, India.* In ***Book of Abstracts: International Conference on Library and Information Science (ICLIS–2025)*** (p. 53). University of Peradeniya

Introduction

The Internet helps to satisfy people's desire for knowledge and supports further research. In order to effectively search the Internet for information, one must understand the search strategies that make the process easier and faster (Omekwu et al. 2014). Web search engines are used to retrieve relevant query-based information within seconds. Search engines consist of modules for crawling, indexing, ranking, querying and a page repository for the temporary storage of web pages (Dutta & Bansal, 2016). The web is a key resource for accessing learning-oriented documents and search engines are the most effective tools for locating such information online (Homte et al., 2022). People are spending more time accessing information via web search engines such as Google, Yahoo, AltaVista, HotBot and Infoseek are commonly used by people every day to find information online (Sudhier & Anitha, 2014). Nowadays, the academic community heavily depends on the web to seek information needs, leading to a significant change in the information-seeking behaviour of library users. This has made immediate access to information resources a top priority (Kumar 2012). It has been noticed that most of the students without knowing the search strategies of search engines, search information utilizing several search engines. LIS students often tend not use certain search strategies in various search engines such as "Wildcard," "Proximity search" and "Truncation" with many students indicating that these features are "Not Applicable" and this suggests that students do not perceive these features as helpful in their search strategies, possibly because they result in retrieving an excessive number of items, including unrelated documents (Othman et al., 2014).

Literature Review

Mostofa (2011) found that 85.4% of university students used Google, while 10.9% used Yahoo, showing that students primarily used Google, with few opting for Yahoo. Kumar (2012) identified that most respondents used simple search methods. In this study, it was revealed that 42.1% of urban and 25.1% of rural respondents were unaware of advanced search methods. Only 6.6% of urban and 1.3% of rural students used advanced searches regularly, while 8% of urban and 11.4% of rural students used them occasionally. Sampath Kumar & Kumar (2013) found that 91.9% of respondents used Google, 43.8% used Yahoo and 35.7% used meta-search engines like Dogpile and Ixquick. A considerable proportion of respondents (65.26%) employed search strategies, with Google and Yahoo being the most used for information retrieval. Othman et al. (2014) found that LIS students preferred search strategies such as "Subject search," followed by "Boolean operator," "Phrase searching," "Exact word/phrase match," and "Field-specific searches." They were most satisfied with subject searches for finding all related content within a subject. In a similar study, Fasae and Adegbilero-Iwari (2015) depicted that Nigerian private university science students frequently used social media, email and search engines for educational and communication purposes. Also, Bhat and Ganaie (2016) found that Google was the most popular search engine, used by all respondents, followed by Yahoo (25.96%) and Bing (8.65%). They further noted that most users preferred the "title" approach (79.80%), followed by "keyword/subject term" (58.65%) and "author" (45.19%). Only 43.62% used Boolean operators, 10% used quotation marks and 4.80% used wildcards. Buba and Muhammed (2017) surveyed 2,484 undergraduate students in Northern Nigeria and found that 99.4% were aware of search engines. Google was the most accessed (99.9%), closely followed by Yahoo (99.4%) and Bing

(98.3%). Most students used keyword (99.4%) and phrase searching (97.2%), with 68.5% using Boolean operators. The study emphasized a strong familiarity with search engines and basic search strategies.

In another study, Kurniasih et al. (2018) found that LIS students at Universitas Padjadjaran understood search engines' functions. Google was the most used, primarily for finding thesis references, assignments and daily information needs, as well as increasing knowledge, solving problems and entertainment. Ugwu and Opah (2023) observed that university libraries offered numerous online databases, including subscribed and free resources. Postgraduate students frequently used Boolean search techniques. Muneja (2024) found that 23% of postgraduate students had attended a literature searching workshop, while 77% of them had not. Additionally, 50.5% had never used subscribed databases such as EBSCO host, Emerald and Springer. Post-training, students showed improved skills in Boolean operations, phrase searches, truncation and search limits, enhancing their ability to locate scholarly literature.

Objectives of the Study

1. To know the frequency of use of the Internet among LIS postgraduate students in Karnataka universities.
2. To identify the frequency of use of search engines among rural and urban students for accessing information.
3. To examine the frequency of meta-search engine usage among rural and urban students for information retrieval.
4. To evaluate the use of advanced search techniques between rural and urban students.
5. To identify the preferred methods for learning search strategies among rural and urban students.

Research Hypothesis

H1. There is a significant association between the frequency of use of search engines and the social background of students.

H2. There is a significant association between the frequency of use of meta-search engines and the social background of students.

H3. There is a significant association between the use of search strategies and the social background of students.

Methodology

The study focused on postgraduate students of the Library and Information Science (LIS) departments of Karnataka State. A total of 13 state universities were established and 11 universities offered library and information science programs. Hence the study is confined to only the students of selected 11 universities. The study excludes the LIS students studying PG colleges, PG centers, Research Centers and Private Universities.

For data collection a structured questionnaire was developed. The questionnaire aimed to gather information on various aspects of the students' use of search engines, including meta-search engines, search techniques and preferences for learning search strategies. The researcher personally visited these universities to distribute questionnaires to the selected students. The sample was selected using convenience sampling method. A total of 167 postgraduate students across 11 universities were enrolled for the academic year 2022-23. Out of these, 153 duly filled questionnaires were collected from postgraduate students enrolled in LIS programs. The data collected through the questionnaires were analyzed to understand the current levels of use of search engines and search strategies skills among the LIS students. The data was analyzed using SPSS software.

Findings and Discussion

Table 1. Demographic Characteristics of the Respondents

Demographic of Information		Frequency (N=153)	Percentage
Gender	Male	57	37.2
	Female	96	62.8
Social Background	Rural	137	89.5
	Urban	16	10.5
Age group	20 to 24	128	83.6
	25 to 29	23	15.3
	30 and above	02	1.3

Table 1 summarizes the demographic characteristics of the respondents, specifically focusing on gender and social background distribution. Results indicate that 62.8% of students were female, while (37.2%) were male. It also reveals that (89.5%) of the students were from rural backgrounds, while 10.5% were from urban backgrounds. The students were between the ages of 20 to 24 years (83.6%), followed by the students between the ages of 25 to 29 (15.3%). The table It reflects that a significant proportion of female students had joined the LIS course.

Table 2. University-Wise Distribution of Rural and Urban Students

Name of the Universities	**Rural**	**Urban**	**Total**
Karnataka State Akkamahadevi Women's University, Vijayapura	09	00	09
Bangalore University, Bengaluru	24	07	31
Bangalore North University, Kolar	11	01	12
Gulbarga University, Kalaburagi	11	00	11
Karnatak University, Dharwad	13	02	15
Kuvempu University, Shivamogga	12	01	13
Mangalore University, Mangaluru	11	00	11
Rani Channamma University, Belagavi	09	00	09
Tumkur University, Tumakuru	08	02	10
University of Mysore, Mysuru	23	03	26
Vijayanagara Sri Krishnadevaraya University, Bellari	06	00	06
Total	137	16	153

The data presented in Table 2 shows the university-wise distribution of rural and urban students across various universities in Karnataka state. Of the 153 students, 137 were from rural areas (89.54%), while only 16 (10.46%) were from urban areas. Bangalore University had the highest number of students (31) and the University of Mysore had the second-highest total number of students (26) followed by Karnatak University (15) and Kuvempu University (13). Vijayanagara Sri Krishnadevaraya University had the lowest number of students (6). The data reveals that the highest numbers of students were from Bangalore University and the University of Mysore.

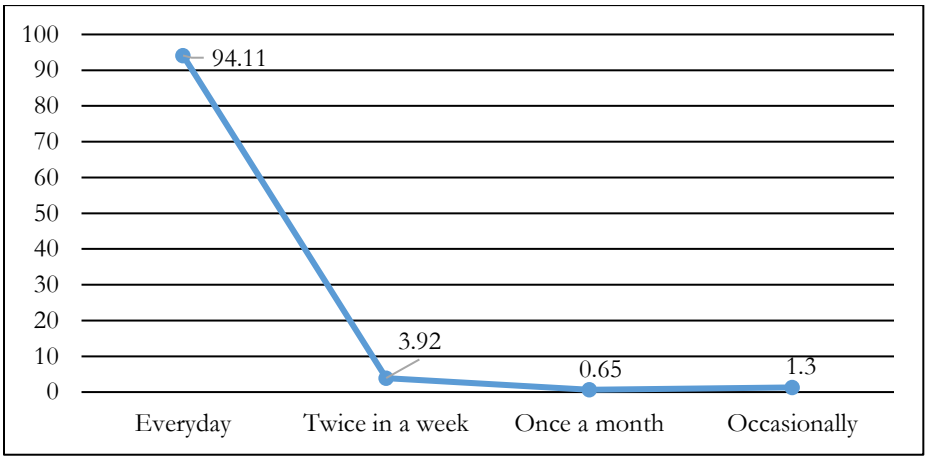

Figure 1. Frequency of Use of the Internet

Figure 1 presents the frequency of use of the Internet by LIS students. 94.11% of students used the Internet every day, followed by 3.92% of them using it twice a week. Findings show that a significantly lower percentage of LIS students used the Internet occasionally (1.30%) and once a month (0.65%). Also, it can be observed that almost all LIS postgraduate students frequently used the Internet and most of them use it daily.

Table 3. Frequency of Use of Search Engines by Rural and Urban Students

Search engines	Rural (n=137)		Urban (n=16)		Both (n=153)		f-value	p-value
	Mean	SD	Mean	SD	Mean	SD		
Google	4.87	.467	5.00	0.000	4.88	.443	1.260	.263
Yahoo	3.54	1.329	2.88	1.408	3.47	1.348	3.548	.062
Microsoft Bing	2.56	1.366	2.56	1.263	2.56	1.352	.000	.999
Baidu	1.82	1.212	2.31	1.493	1.88	1.248	2.206	.140
Yandex	1.78	1.293	2.00	1.317	1.80	1.293	.409	.523
DuckDuckGo	1.65	1.198	1.81	1.276	1.67	1.203	.261	.610
Infoseek	1.61	1.113	1.88	1.258	1.64	1.127	.772	.381
Hotbot	1.47	.986	1.69	1.195	1.49	1.007	.684	.409

Table 3 shows the frequency of use of search engines by rural and urban students. It can be seen that most students used the Google search engine (mean = 4.88). Yahoo was the second most popular search engine (mean = 3.47), followed by Bing (mean = 2.56). The table indicates that Google is the most widely used search engine among both rural and urban students. Baidu, Yandex, DuckDuckGo,

Infoseek and Hotbot showed very low usage among all groups, with some slight variation between rural and urban students. In order to know the significant difference between the use of search engines and the sociological background (rural and urban) of students, One-way ANOVA was applied. Results indicate that there was no significant difference (p>0.05) between the use of search engines and the sociological background of students.

Table 4. Frequency of Meta-Search Engines Used by Rural and Urban Students

Search engines	Rural (n=137)		Urban (n=16)		Both (n=153)		f-value	p-value
	Mean	SD	Mean	SD	Mean	SD		
Dogfile	1.67	1.138	1.63	1.204	1.67	1.141	.024	.878
Mamma.com	1.42	.960	1.56	1.094	1.43	.972	.324	.570
Metacrawler	1.42	.846	1.25	.775	1.40	.838	.561	.455
Ixquick	1.23	.653	1.31	.704	1.24	.657	.246	.621
Profusion	1.28	.783	1.31	.704	1.28	.773	.029	.864

Table 4 shows the frequency of meta-search engines used by postgraduate students. Most students always used the Dogpile meta-search engine (mean = 1.67), followed by the Mamma meta-search engine (mean = 1.43) and the Metacrawler search engine (mean = 1.40). The table indicates that Dogpile was the most frequently used meta-search engine, while the Mamma search engine was also used by a significant number of students. In contrast, a smaller number of LIS students used the Ixquick and Profusionmeta-search engines. The study found no significant differences ($p > 0.05$) in the use of meta-search engines based on students' sociological backgrounds, as determined by a one-way ANOVA test.

Table 5. Use of Advanced Search techniques by Rural and Urban Students

Advanced Search Techniques	Rural (n=137)		Urban (n=16)		Both (n=153)	
	Rural	%	Urban	%	Total	%
Boolean logic	121	79.08	10	6.53	131	85.62
Limiters	85	55.55	10	6.53	95	62.09
Phrase search	65	42.48	10	6.53	75	49.01
Proximity search	44	28.75	06	3.92	50	32.67
Wildcard /Truncation	39	25.49	03	1.96	42	27.45

Table 5 and Figure 2 present the advanced search techniques used by rural and urban LIS students. It shows that most students used Boolean logic (85.62%), followed by limiters (62.09%) and phrase search (49.01%). A relatively smaller number of students utilized proximity search (32.67%) and wildcard/truncation search techniques (27.45%). Findings clearly indicate that both rural and urban students preferred Boolean logic, limiters and phrase search for information retrieval, while a smaller proportion preferring proximity search and wildcard/truncation.

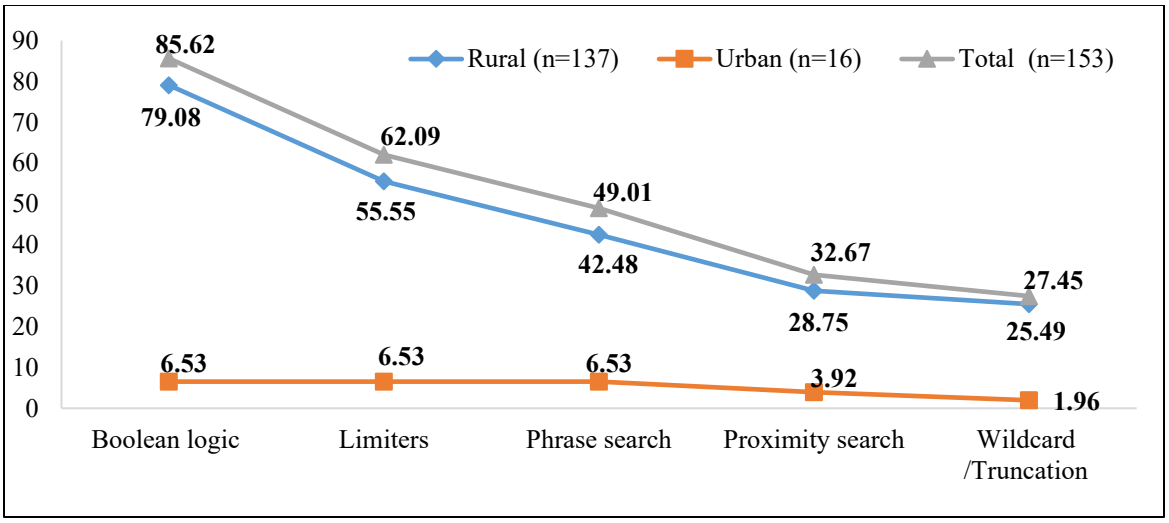

Figure 2. Use of Advanced Search Techniques by Rural and Urban Students

Data presented in Table 6 shows the preferred methods for learning search strategies by rural and urban students. Most students acquired search strategies with the help of teachers (mean = 3.82). The second most common source was the Internet (mean = 3.78), followed by assistance from friends (mean = 3.54). A smaller number of students learnt search strategies using the help menu of search engines (mean = 3.20) and by reading articles/books (mean = 3.07). The results highlight that the internet and teacher assistance are the primary sources for acquiring search strategies among rural and urban LIS students.

Table 6. Methods for Learning Search Strategies by Rural and Urban Students

Methods of learning	Rural (n=137)		Rural (n=16)		Both (n=153)		f-value	p-value
	Mean	SD	Mean	SD	Mean	SD		
The use of search engines helps the menu	3.14	1.405	3.75	1.238	3.20	1.397	2.775	.098
By reading articles/books	3.05	1.374	3.19	1.328	3.07	1.365	.142	.707
With the help of teachers	3.82	1.244	3.88	.957	3.82	1.215	.032	.859
With the help of friends	3.48	1.345	4.00	.894	3.54	1.313	2.250	.136
Through Internet	3.69	1.386	4.50	.816	3.78	1.358	5.191	.024

It was found that there was no significant difference ($p>0.05$) between the preferred method of learning the advanced search strategies of the search engine and the sociological background (rural and urban) of the students. However, it was noticed that there was a significant difference between the preferred method of learning the advanced search strategies of the search engines and the sociological background of students with respect to the preferred method of learning through the Internet ($p<0.05$).

Conclusion

The major study findings are as follows:

- 62.8% of students were female, while 37.2% were male. The data also shows that 89.5% of the students were from rural areas, while 10.5% were from urban areas.
- Bangalore University had the highest number of students (31), followed by the University of Mysore with 26 students.
- 94.11% of students used the Internet every day.
- Both rural and urban students used the Google search engine (mean = 4.88).
- Most students always used the Dogpile meta-search engine (mean = 1.67).
- Most students used Boolean logic (85.62%) and limiters (62.09%).
- A significant proportion of students reported acquiring search strategies with the help of teachers (mean = 3.82).

The study provides valuable insights into the technological engagement of postgraduate LIS students. It also highlights that a significant majority of LIS students are female and that most come from rural backgrounds. Most of these students engage with digital tools, particularly using the Internet daily, with Google being the most popular search engine. Advanced search techniques, such as Boolean logic, are widely used, and students primarily learn search strategies through teacher assistance and the Internet. Overall, these findings reflect the strong integration of digital resources into the academic lives of LIS students, especially those from rural areas.

Recommendations

a. Universities need to offer online courses or webinars on advanced search techniques like Boolean logic, limiters and phrase searches to enhance postgraduate students' information retrieval skills.
b. Universities need to conduct training sessions or workshops to help students master these techniques, bridging the knowledge gap between urban and rural students.
c. Accessible resources, such as video tutorials, quick-reference guides and FAQs, should be created to teach the effective use of search engines and Meta search engines, available on university websites or online learning platforms.
d. To improve search strategies, universities need to provide comprehensive digital literacy programs that address the needs of both rural and urban students while ensuring equal access to information.
e. Encouraging active student participation through incentives or integration into academic requirements will ensure wider engagement with these resources

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The Royal *Potgul* Tradition in the Rajarata Civilization and the Dambadeniya Period: a Study of Scholarly and Administrative Practices in Medieval Sri Lanka

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Abstract**

This study examines the institutional frameworks and socio-cultural significance of royal *Potgul* in medieval Sri Lanka during the Rajarata Civilization and the Dambadeniya period. Positioned near royal palaces, these repositories functioned as intellectual and administrative hubs, facilitating knowledge production, literary preservation and bureaucratic governance, thereby shaping the era's intellectual and administrative paradigms. The earliest evidence of *Potgul* traditions is traced to the reign of King Dutugemunu with the authorship of *Pin Poth* documented in the *MaraṇaMañcaka* chronicle. These texts, recited during Buddhist funerary rites, were systematically preserved in *Potgul*, reflecting their role under Buddhist doctrinal influence. Royal scribes affiliated with these institutions produced seminal works such as the *Sārārtha Saṅgrahaya*, *Jānakīharaṇa* and *Dampiya Aṭuvā Gæṭapadaya*, illustrating the repositories' capacity to house religious, linguistic and literary resources essential for advanced scholarship. Beyond Buddhist texts, *Potgul* archived Hindu Vedic scriptures, Kautilya's *Arthashastra*, legal codes like the *Manusmṛti*, underscoring their syncretic scholarly traditions. Historical records emphasized their administrative utility. King Dappula II archived judicial rulings for posterity, while Vijayabahu I commissioned the *Dhammasaṅgaṇī Prakaraṇa* within a *Potgul*. Parakramabahu I's dissemination of the *Arthashastra* to military commanders highlighted their strategic governance role. Archaeological evidence near Dambadeniya, including temple remnants in Sirigala and the site termed *Potgul Kanda*, corroborated their existence. Scholarly accounts, such as those by Ven. Sumaṅgalajoti Thero, affirmed the enduring legacy of these institutions in safeguarding state documents. The establishment of *Potgul Kanda* under monastic custodian Vācissara Thero further underscored their role in preserving administrative records. Monarchs like Parākramabāhu II utilized *Potgul* resources to compose works such as the *Kavisilumiṇa*, demonstrating their centrality to intellectual endeavors. In conclusion, royal *Potgul* were institutionalized centers of erudition and administration, synthesizing Buddhist and Hindu scholarly traditions. They enabled knowledge production, legal codification and military strategy, underpinning the cultural and bureaucratic achievements of Sri Lanka's medieval kingdoms. Their legacy, preserved through textual, epigraphic and archaeological evidence, underscores their enduring socio-cultural significance as pillars of medieval Sri Lankan governance and scholarship.

Keywords: *Dambadeniya period; Knowledge preservation; Rajarata civilization; Royal Potgul tradition; Siyabaslakara.*

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Introduction

The *Potgul* (Sinhala: පොත්ගුල්, derived from *pot* - book, and *gul*/*ge* - house), conceptually analogous to libraries or royal archives, represented a cornerstone institution within the sophisticated administrative and intellectual frameworks of ancient and medieval Sri Lankan kingdoms. This study focuses specifically on the evolution, structure, and functions of royal *Potgul* during the zenith of the Rajarata Civilization, centered at Anuradhapura and later Polonnaruwa, and its continuity into the Dambadeniya period, a critical phase of cultural reaffirmation following South Indian invasions. While global royal library traditions, from Mesopotamia (e.g., Nineveh) and Egypt (e.g., Alexandria) to India (e.g., Nalanda, royal *Sarasvati Bhandaras*), underscore the universality of knowledge curation by power centers, the Sri Lankan *Potgul* developed unique characteristics shaped by Theravada Buddhism, indigenous governance (*rajakariya*), and complex interactions with South Asian intellectual currents (Gunasekara, 1998; Weerasinghe, 2001).From the time of modern Homo sapiens to the present, the library has a unique place as a place where the entire body of human knowledge has been preserved for the benefit of itself and future generations. In Sinhala, the word library (puṣṭhāka - books) (ālaya - ugṛha) means a house where books are kept. (Muthukuda Jayasundara, 2014:23) This is known in English as the word libri (ṛhaṣirraha), which is derived from Latin. If this word is elaborated, a library can be simply identified as a place where printed and non-printed media are collected in an organized manner for the use of readers. (Muthukuda Jayasundara, 2014:23).

The library is the embodiment of universal education that brings understanding, progress and joy to all. (Muthukuda & Jayasundara 2014). Overall, the service expected from the library is immense. That is, with the aim of providing the members of a society with the information and resources they need for their social, economic, national and cultural advancement, the role of a library can be summarized as follows:

- Identifying, selecting and acquiring information sources.
- Organizing and managing information resources so that they can be used to their maximum advantage.
- Providing information services to readers. (Gunasekera 1998:4)
- Encouraging, directing, guiding and encouraging readers to make the most of information resources. (Gunasekera 1998:4)
- Information documentation or preserving valuable human knowledge

In addition to the above services, the services provided by national, educational, special, public libraries in the modern developed world include:

1. Organization of book collections
2. Book reference services
3. Document scanning services
4. Recommendation services
5. Special book preservation
6. Interlibrary loan services
7. Photocopying services
8. Provision of reading room facilities
9. Reader advisory services
10. Development of information literacy skills
11. Provision of index page services
12. Provision of newspaper reading facilities

13. Provision of newspaper clipping services
14. Provision of internet access
15. Functioning as a social and cultural center
16. Holding important current exhibitions
17. Organization of translation services
18. Serialization Conducting compilation services
19. Organizing important topical and thematic seminars and workshops
20. Developing a love of reading
21. Supporting the exploration of knowledge and the creation of new knowledge

While most of the library services mentioned above fall under the category of library services in the developed world, most libraries in the ancient world performed the following functions:

- Collecting documents
- Preservation of documents
- Allowing access only to selected readers
- Writing documents by scribes

The libraries that have emerged in the world during the 4500 years since the advent of human civilization to the present day can be classified into two main categories: secular and religious libraries. These include:

- Royal libraries
- Libraries of local leaders } Secular libraries
- Libraries of elites
- Libraries of educational institutions
- Libraries of crafts
- Domestic libraries
- Temples, monasteries, religious institutions } Religious libraries
- Affiliated educational libraries

Research Objective

The objective of this research paper is to examine the forms of the royal book tradition during the Rajarata civilization and the Dambadeniya period. This research attempts to investigate how the royal book tradition, structure, distribution, and special features existed during the Rajarata civilization and the Dambadeniya period.

Methodology

Historical research (Yasiedarasajka Rijaya Phaeda) method was used as the research method for this research and primary sources such as Mahavamsa, Poojavaliya, Rajavaliya and the works of Senarath Paranavithana, Indra Keerthi Siriweera, Degammadda Sumana Jyothi, A.M.B. Ariyapala, J.M.M. Sudharmawathi, Wimal P. Balagalle, Ananda Jayawardena, Mervyn Weerasinghe, R.S.I.S. were examined. The conclusion was reached using secondary sources from modern researchers such as

Ranasinghe and Mohan Prasad Kumara. Thematic analysis was applied to textual and archaeological data to reconstruct the *Potgul's* administrative structures, content holdings, functional roles, and socio-cultural embeddedness.

Findings and Discussion

Before examining the royal library tradition in Sri Lanka from the Rajarata civilization to the Dambadeniya era, the origin and spread of the royal library tradition in the world should be examined. The history of global royal libraries dates back to the Mesopotamian civilization, the world's first human civilization. Around 4000 BC, several ancient kingdoms ruled by Mesopotamian religious leaders emerged. These included:

- Assur (Riyamara)
- Ur (Mura)
- Kish (Nasi)
- Nippur (Bhaschachamara)
- Akkasa (Nana) (Weerasinghe 2001:09)
- Lagash (Khtiya)

The need to document and collect religious records to maintain the people in the ancient kingdoms ruled by priests was highlighted, and as a result, the royal libraries of kings, whether royal or religious, were the beginning of the world. However, the first royal library in the world to be built by a single ruler was the library created by King Hammurabi (3000–2600 BC). It contained numerous clay tablets containing religious information and royal records. However, the world's first organized royal library was the Library of Nineveh, built by the last important Assyrian king, Asura Binipala, who reigned in 750 BC. It is said that there were between 25,000 and 30,000 clay tablets in this library. This library was used to

- Royal events
- Religious records
- Magical works
- Epic poetry and literature
- Geography
- Medicine and short stories

It has been identified that many clay tablets belonged to the fields of public life, law and politics and ordinances. Furthermore, this library had been identified as the first in the world to have a staff consisting of scribes, keepers, tablet makers, editors, and Buddhist monks under the supervision of a librarian. Many clay tablets, including the ancient Mesopotamian epic poem, the Epic of Gilgamesh (Epic), had been identified. The Persian emperors who destroyed the Assyrian Empire in 6 BC maintained royal libraries, and in them it contains:

- Daily royal information
- Religious information
- Medical information
- Tax records
- Employee salary records

Postal services, such as clay tablet documents, stone letters, copperplate letters, gold leaf letters, wax tablet letters, papyrus letters, etc. Royal letters were not available. The world's first royal library was founded in Mesopotamia in 3500 BC. The last important Egyptian king, Ramses VI, created a royal library in the royal city of Thebes, Egypt, in 1250 BC, contained 20,000 papyrus scrolls. (Weerasinghe 2001:13) This royal Egyptian library was called the place where people's souls heal. In these Egyptian

royal libraries, royal records on the following subjects were written on papyrus by learned priests and scribes:

- Daily state information
- Religious affairs
- Local administration
- The afterlife
- Theology
- Tax collection
- Epic poems

These papyrus rolls were kept in the royal libraries of the temples and pyramids, and some of these papyrus scrolls were called the Books of the Dead (EidanaDafEyya) (Weerasinghe 2001:14). In addition, a royal library had been found in a place called Tell Amarna (Okprab) in Egypt. Among the royal libraries in the world, the Royal Alexander the Great Mortuary Library, built by Emperor Alexander the Great in the 3rd century BC, was very special. It contained between 700,000 and 100,000 papyrus scrolls, and Alexander the Great further developed the royal library by depositing them in the imperial library. The following were found in this library:

- Daily Royal Records
- Engineering Technology
- Medicine
- Martial Arts
- Religion and Magic
- Aesthetics and Arts
- Literature
- Geography and Geography
- Various Sciences

The papyrus scrolls belonging to various subject areas were stored in the vaults and were classified through some rudimentary indexing. The Alexandrian Royal Library was staffed by scribes, conservators, copyists, curators, and branch librarians, including translators, including Greek, Roman, Egyptian, Arabic, Hebrew, Celtic, Persian, Hindu, and Chinese, and was assisted by 70 scholars, including monks from India (Weerasinghe 2001:20). In addition to indexing, this valuable library appears to have been an organized royal library that included book classification, writing, and conservation. This valuable library, which was 700 years old, was last used by the Romans and the new Islamic invasion of Omar in 642 AD.

Some of the royal librarians at the Royal Library of Alexandria are listed below.

1. Xenodotus (285–270 BC)
2. Apollonius Trodias (270–245 BC)
3. Eratosthenes (245–204 BC)
4. Aritropinus (204–189 BC)
5. Apollonius Adigrams (188–175 BC)
6. Aristaclus (175–145 BC)
7. Chiadas (145–116 BC)

In addition to these, Greek Athens (A) Sparta (Echria) Corinth (Crete) Thebes (Osia) Arcadia (Pragias) must be noted. There were urban royal libraries in the book kingdoms, and Greek sources mention that Priscitratus (Caesar Emi), a king who lived in Greece from 560-527 BC, also had a royal library.

Furthermore, the Greek king Iumenus (Empepami) built his own royal library called Pergamum. According to Plutarch, this royal library preserved 200,000 papyrus rolls. Also, the library materials such as parchment and vellum were introduced to the world by the Pergamum Royal Library (Weerasinghe 200, 20). In addition, to the Greek royals, the Romans, who started the world's first public library system, also had advanced royal libraries. Among them, the Octarians, created by the Caesars were significant. The Royal Library, built by Emperor Constantine I in Constantinople in 3 AD, was also one of the most important of these. It is said that the Royal Library of Constantinople in particular contained 100,000 books (Weerasinghe 2001, 36). Roman and Byzantine emperors such as Justinian also maintained royal libraries. In particular, the Library of Constantinople preserved books on mathematics, science, law, architecture, art, and religion. In 570 AD, the Muslim Caliphate established libraries in Baghdad, Damascus, Coimbra, Cairo, Morocco, and Egypt to facilitate the teaching of Islam, which began in the world. In areas such as Central Asia, Muslim royal libraries were maintained (Weerasinghe 2001:36-37). In China, Japan, Korea, Thailand, the Khmer Empire, and the Sri Vijaya Empire in Indonesia, royal families also maintained royal libraries near their palaces. These royal libraries housed books on subjects such as:

- Religion
- Political records
- Military technology
- Medicine
- Literature and art
- Engineering
- Law
- Geography and geography

The libraries affiliated with the royal dynasties of ancient India, known as the Saraswati Treasury, were the royal libraries of the Mauryas, Guptas, Harsha, Palas, Cholas, Chalukyas, Mughals, Delhi, and Sulapatis, and the 1058 Raja Narayan (R. Bhrhba), a Chalukya king, stands out among them. (Weerasinghe, 2001:44) The Mughal emperor Akbar also established libraries throughout the Mughal Empire under the name of Rahim Chanam.

Royal Books of the Rajarata Civilization and the Dambadeniya Era

Royal Libraries However, it is not possible to say exactly when the first library in Sri Lanka was founded. Some scholars try to date the beginning of the library system in Sri Lanka and the beginning of the writing system in Sri Lanka to 3 BC. However, it is not possible to find thousands of inscriptions all over the islands at once after the arrival of Mahinda. The theory that the Brahmi script began after the Ashoka era, which was once a popular opinion even in neighboring India, has been revised. In particular, the Indian evidence such as the

- PiprowaKaruvu Letters
- Badli Letters
- Mahasthan Letters

South Indian Pre-Brahmi Inscriptions made it clear that the writing art of the country existed before the Ashoka era. Dr. Shiran Daranagala had found that the beginning of the writing art of Sri Lanka predated the arrival of Mahinda. A fragment of a clay jar and a bone tablet bearing the words 'Biya Anuradha - Taya Kutte' which have been carbon dated between 700-400 BC, were clear. It is

concluded that this Anuradha belongs to the time of Vijaya's minister Anuradha. According to these facts, it appears that a writing system and a library system must have existed in this country before the arrival of Mahinda. In addition, there are indications that there was a royal library during the Rajarata civilization. For example, the kings' Book cataloging, Book writing, Education and Verbalness were excellent examples that can be pointed out for this.

The history of the royal library in this country dates back to the Pandutabhaya era in 4 BC. In it, Pandukabhaya Pandula studied the sciences under his Brahmin and gave him an army. It is mentioned that here too, the prince would have gained the necessary knowledge from a library. Accordingly, after establishing the capital city of Anuradhapura, the king would have obtained a teacher and built a small royal library near the palace, as is currently the case. It was clear from the Picchandiya inscription that not only Pandukabhaya but also King Devanampiyatissa, who ruled this country from 250-210 AD, must have had a library. It mentions a donation from the king's royal teacher, a Brahmin named Gobutha. Strong evidence is found that the royal library came into existence during the reign of Dutugemunu from 161-187 AD. In front of the Ruwanweli Maha Seya in Anuradhapura, the royal scribe had penitential books written on his deathbed. Accordingly, other kings would have obtained royal scribes and written religious matters or penitential books for him to read on his deathbed. (Ranasinghe, 2006, p.118) In this way, the writing of the Pingpets may have come to this country under the influence of Buddhism. Those Pingpets may have been kept safe in the royal bookcases and were constantly written down for the use of future kings. These royal bookcases contained:

- Buddhist and religious records
- Political administration and laws
- Tax collection
- Engineering technology
- Medicine
- Agriculture and economic affairs
- Language and literature
- Urban administration
- Economics
- Royal life
- Rural administration
- People
- Astrology
- Citizen information
- Weapons manufacturing
- Yantra magic
- Kama Shastra
- Domestic and foreign trade
- Kidenka reports
- Intelligence services

Documents belonging to the subject areas of transportation, fine arts, geographical and meteorological records, festivals and entertainments, etc., must have been safely deposited.

Works such as the Sarartha Sangha, Janakiharana, Siyabasalakara, DampiyaAtuwaGatapada, written by kings including Buddhadasi, Kumaradasa, Sena I, and Pasana Kashyapa, respectively, indicate that the books required for composing the aforementioned works must have been available in the royal libraries. In addition to Buddhist religious texts such as the Tripitaka, Atuvagantha, Hindu Vedic texts, Hindu Kosha texts, Kaufilapa Artha Shastra, Manusamruthiya, Ramayana, Dandin's poetic philosophy, Kalidasa's works, etc. the Royal libraries also contained,

- Buddhist Hinayana works
- Buddhist Mahayana works

- Eighteen ancient sources
- Vatsayana's Kama Sutra
- Nakshaṇa works Varahamihiraya
- Charaka's Charaka literature
- Sushaṭhiṭa
- Vedanta
- Mahabharata
- Five hundred and fifty Jataka books

There is evidence that books such as Hindu grammar books may have existed. In addition, books such as mathematics, occult sciences, language, literature, religion, fine arts, economics, and nursery books such as the book called Athukada for royal children and Ganadevi Halla may also have existed. For further education, princes studied at universities with great libraries such as Taxila, Nalanda, Nagarpuna, Konada, and Vikramshila. Among them, many Buddhist sources The Indriya princes may have studied at the university where the royal libraries of Taxila were located, under the Persian Empire, and may have consulted the works of its libraries. The rulings of King Dappula II were written down and placed in the royal library for the benefit of future generations. (Ranasinghe 2006:118) King Dutugemunu appointed Dharma halls and Dharma speakers to each village and provided them with books of Dhamma to preach the Dhamma. This may have been a royal branch library similar to the royal libraries in the capital. It was recorded in Poojavaliya as follows.

"In each and every Dhamma hall, a canopy was erected, a Dharma seat, a blanket, a kneeling seat, a sermon seat, a kabaliyak, a vijinipataka, and a book of Dhamma" and thus the Dhamma was cared for. (Dhammakusala 2017:178)

Likewise, King Vijayabahu I composed the Dhamma Sangita Sukaranam from his library, while Maha Parakramabahu had two royal branch libraries in Ruhuna. It was mentioned in the Mahavamsa that it was built in 128 BC (Dhammakusala 2017:181). It is also said that King Parakramabahu the Great distributed the Artha Shastra of Kautilya to the military leaders who participated in the invasion of Burma and South India against Sugala Devi of Ruhuna. In addition, the Mahavamsa dealt with the reign of Parakramabahu in detail, specifically:

- Princely period
- Youth
- Treaty of defeating Gajabahu
- Battle against Sugala of Ruhuna
- Burmese invasion
- South Indian invasion

When the Mahavamsa was examined critically, it is reasonable to suspect that there were daily reports from the royal books about current war operations, future war operations, old war operations, and security organizations. The same view can be compared to the reign of Duttu Gemunu. There too, the king's princely period, youth, Elara war, Bhalluka war were recorded. The Mahavamsa had a subject area of Shasanika Seva. The Mahavamsa has been divided into 37 chapters. The Mahavamsa's report on the Sarawat War during the Parakramabahu era and the Dutugemunu era further showed that during the Rajarata civilization, works such as Kautilya and Artha Shastra were read in the royal bookcases for the benefit of future princes, and that daily war reports were recorded in those royal bookcases. Sometimes, during the war, the royal palace would have had the war victories sung by the Vanditas in the royal palace to please the kings. The kings would have read the reports of previous kings such as Dutugemunu from the royal bookcase. The only evidence that a royal bookcase existed

in Sri Lanka at present was the bookcase temple presented by Parakramabahu I during the Polonnaruwa era. Here, a bookcase in front of a bookcase was a copy of a past royal or a multi-year salary Statues are found. The royal library of the Dambadeniya kings is believed to have been located inSirigala, a village near Dambadeniya. There was a temple there that is believed to belong to the Dambadeniya period. According to the remains, a nearby hill is known as a library hill. According to Venerable Sumana Jyothi, the ancient royal library must have been located here. (Sumanajyothi, 2012:41) Therefore, the royal library, which was under the care of a monk named Chachssara, must have been established in the vicinity of a library hill specifically to protect the state documents contained therein. In particular, kings like King Parakramabahu II must have kept a large number of books needed to compose valuable works like the Kausilumina in these royal library buildings. During the Rajarata civilization, the royal library buildings were located. When examining the Nilabala system, the following officials served in the library buildings:

- Akasamana- Custodian of documents, property
- Atkaru- Handwriting/ Drafting of documents
- Attana Kanu Samma-Setting up of documents in Attana Kanu
- Arak Katuna/ Raki Katuna- Persons in charge of royal documents
- Kana Peedika- Record keepers and record keepers
- Kuda Sala- Chief officer who served in the royal secretariat
- Pothaki- Library custodian or bookkeeper
- Bodwaran/ Library Keerthi- Bookkeepers of the Polonnaruwa era
- The secretary's peers prepare state documents
- The secretary of the council drafts the constitution
- Sirita Raksha- Writer of characters
- Antara Liyana- Drafters of manuscripts
- Arika As- Scribes in the security service
- Secretaries, juniors, copyists of royal decrees
- Alaya- Document the income
- Lanka Jayamaha Lana- The royal family of the Sri Maha Bodhi era
- The main royal family is the secretary of the royal bookstore, etc.

According to this bureaucratic system, it is evident that a highly developed and organized royal bookstore existed in this country during the Rajarata civilization and the Dambadeni era.

Conclusion

The royal *Potgul* of the Rajarata Civilization and the Dambadeniya period were far more than passive storehouses for manuscripts. They were sophisticated, state-sponsored institutions integral to the intellectual, administrative, and cultural fabric of medieval Sri Lanka. Functioning as dynamic hubs, they:

i. **Preserved Knowledge:** They systematically archived a vast corpus spanning Theravada and Mahayana Buddhism, Hinduism, linguistics, literature, law (*dharmashastra* and indigenous codes), statecraft (*arthashastra*), sciences (medicine, astronomy, and engineering), history, and administration.
ii. **Produced Knowledge:** They provided the resources and environment for scholars and royal poets to compose seminal works of Sinhala literature, religious exegesis, and grammatical analysis, driving intellectual innovation.
iii. **Enabled Governance:** As central archives, they stored vital administrative records (tax rolls, land grants, and census data), judicial precedents, diplomatic correspondence, and military strategies, providing the informational bedrock for effective royal administration and legal processes. The dissemination of texts like the *Arthashastra* exemplifies their role in strategic governance.
iv. **Educated the Elite:** They served as key centers for the education of royalty and training of state officials, shaping the intellectual foundation of the ruling class.
v. **Legitimized Rule:** By preserving sacred texts, chronicling royal lineages and deeds (including *Pin Poth*), and associating kingship with learning and piety, the *Potgul* contributed significantly to royal legitimacy and the Buddhist cosmological order of the state.
vi. **Syncretized Traditions:** Their holdings reflected a syncretic intellectual environment, blending indigenous Sinhala knowledge with profound influences from Pali Theravada Buddhism and Sanskritic Hindu-Brahmanical traditions, as well as practical sciences from across South Asia.

The world royal library tradition has a history of 3000 years. Emperors and kings of ancient Asia, Africa, and Europe maintained royal libraries for various needs. The literary and archaeological sources on royal libraries during the Rajarata civilization and the Dambadeniya period confirm that there was a developed and organized royal library tradition in Sri Lanka, and accordingly, it can be concluded that there was a developed royal library tradition in ancient Sri Lanka.

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Artificial Intelligence Research Visibility as Reflected in the Web of Science: A Scientometric Approach

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Abstract**

This paper examines the research visibility of "Artificial Intelligence" in the Web of Science over a span of 20 years, from January 2005 to December 2024. The study is confined only to full-text articles included in the Web of Science database. The data were collected from the Web of Science database using the keyword "artificial intelligence." To identify the research productivity of "artificial intelligence," a total of 44,313 records were downloaded and recorded in the MS Excel spread sheets for further analysis. Furthermore, this study used VOS viewer software tools to create data visualization. Findings depicted a positive correlation between the number of articles and the year they were reflected in the Web of Science database; the correlation was significant (r=.796**, p=.000). The study found that most articles were published in 2005 (122, or 0.3%), while the highest number of articles were identified in 2024 (11,869, or 26.8%). It was noticed that 21,002 articles were identified as being related to artificial intelligence. The study found that Attia, ZachiItzhak, had the most publications (151) and ranked first among the top 20 researchers. Noteworthy findings included that Harvard University ranked first among the top 20 institutions, with 1,086 publications. It was found that the article entitled "Explainable Artificial Intelligence (XAI): Concepts, taxonomies, opportunities and challenges toward responsible AI", by Arrieta and others published in 2020 received 4,313 citations. In addition, USA led the global rankings with 11,306 (23.8%) published articles, securing the top position among the 20 leading countries. Further, results exhibited that overall, 9,031 articles were recorded in computer science subjects secured in rank one. The study provides insights into, the growth rate of research publications on "artificial intelligence" in terms of publications, citations, types of publications, author productivity, productive countries, and authorship patterns etc. The study recommends that the researcher needs to publish quality research articles in reputable journals in order to have more visibility. The study highlights that there are significant trends in publication patterns and citation impacts in recent years.

Keywords: *Artificial Intelligence; Publications; Research visibility; Scientometric; Web of Science.*

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Introduction

The main task of bibliographic databases is indexing publications (e.g., articles, books, conferences). Each record in databases contains metadata repositories such as the author's name, title, year, publisher, author's keywords, and keywords that the publishers provide. For this reason, citation databases such as Scopus and Web of Science (WoS) have separate fields for entering this metadata. Web of Science Core Collection (WoSCC) is the world's leading scientific citation search and analytical information platform (Li, 2018; Shamsi et al., 2022). Measurable research outputs such as papers, patents, and innovations have been subject to high enduring growth rates over the last century. Yet, recent empirical evidence suggests that research productivity is ever falling, and new ideas are becoming increasingly harder to find (Bianchini et.al, 2022). Artificial Intelligence (AI) has emerged as a transformative force across various sectors, revolutionising industries and driving innovation. It transforms traditional practices by enhancing efficiency, accuracy and decision-making capabilities (Zhang and Chen, 2024). The rapid advancements in AI technologies, from machine learning and deep learning to natural language processing and computer vision, have led to an exponential increase in research activities worldwide. AI has been integrated into many facets of everyday life, such as computer gaming, Alexa, Google Assistant, and many others. In the past few decades, it has experienced enormous growth (Keshava and Shankar, 2024). The social and technological changes that society is undergoing in this century are having a global influence on important aspects such as the economy, health and education. An example of this is the inclusion of artificial intelligence in the teaching–learning processes.

In this context, the objective of this study is to analyze the importance and the projection that artificial intelligence has acquired in the scientific literature in the Web of Science categories related to the field of education (Moreno-Guerrero et.al, 2020). Keeping in view the importance the study has attempt the Artificial Intelligence Research Visibility as Reflected in the Web of Science databases.

Literature Review

Praveena et.al, (2021) conducted a scientometric analysis of research literature on Artificial Intelligence from the year 1999 to 2019. The main objective of this research was to explore the academic research/review publication contributed by the Scientists and Subject experts from the Engineering background. In a similar study, Sampathkumar et.al, (2023) investigated the research visibility of faculty members working at Tumkur University, India. It was observed that the number of articles published by them slightly increased during the last 10 years. Further, it was also observed that the citation counts increased during the last ten years in the Web of Science database. Das et.al. (2024) found that the top 100 most-cited papers published in the last 10 years were cited 3128 times. United States accounted for majority of the publications (30.7%), the Charite Medical University of Berlin had the most papers (10%) and Schwendicke F was the author with the highest number of papers (16%). Further, Journal of Dentistry (16%) published the highest number of papers. Calvo-Rubio and Ufarte-Ruiz (2021) showed that the research about the use of Artificial Intelligence applied to journalism had increased over the years. Research conducted in this field between January 2008 and December 2019 was analyzed to understand the contexts in which they had been developed, and the challenges were also detected. The findings indicated that the largest number of publications related to this topic were concentrated in the United States and that the rise of scientific production on

Artificial Intelligence in journalism took place in 2015, when the remarkable growth of these publications begun, until reaching 61 in 2019. In its own right, the Web of Science was described as the most trusted publisher independent citation database across the world and acclaimed as the search engine which affords researchers great access, reliable discovery and assessment (Web of Science Group, 2019). In this research, the concept of AI was analyzed from a bibliometric perspective of the documents indexed in the Web of Science (WoS) database. In this case, the novelty of this study focused on presenting a documentary analysis to the scientific community using an innovative technique such as scientific mapping (Belmonte, et.al, 2019; Rodríguez-García, 2019; Moreno-Guerrero et.al, 2020).

Objectives of the Study

This study focuses on the following objectives:

a) To analyze the growth and trends in Artificial Intelligence literature from 2005 to 2024
b) To identify the various types of documents published in the field of Artificial Intelligence
c) To determine the most prolific authors and leading academic institutions contributing to AI research
d) To evaluate the top 10 countries and publishers with the highest output in AI-related publications

Methodology

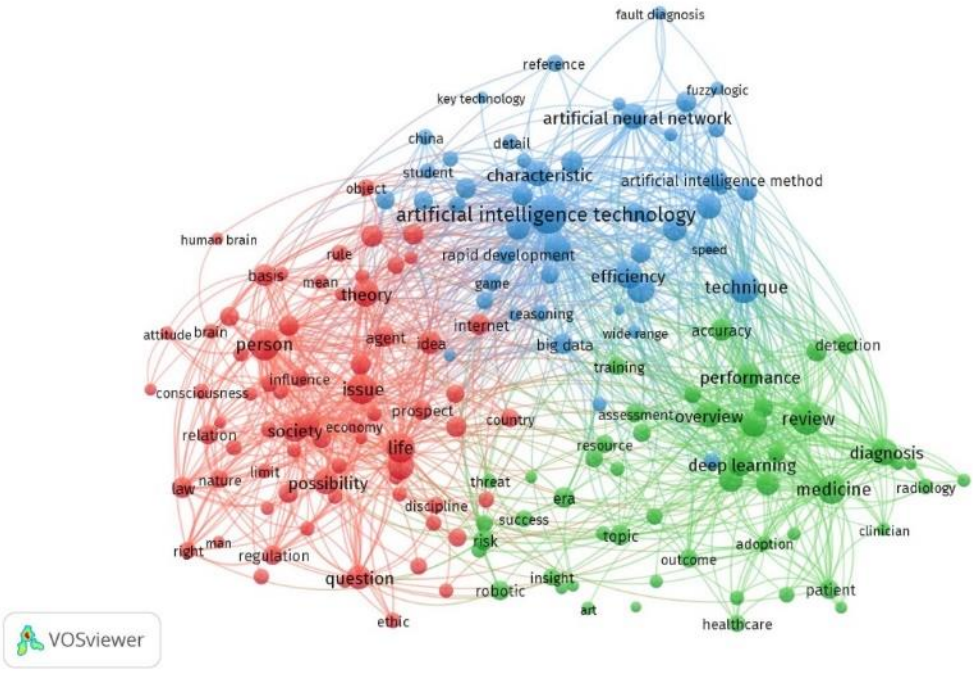

Figure 1: Network Visualization for the Keywords

Data were collected from the Web of Science database using the keyword "Artificial Intelligence." The number of records found against the word "Artificial Intelligence" in the Web of Science during the last 20 years (2005-2024). A total of 44,313 records have been downloaded and recorded in the MS Excel spreadsheets for further analysis, and VOS viewer software tools were used to create data

visualization. The study is confined to only full-text articles included in the Web of Science database. The search was conducted in the Web of Science to identify research on artificial intelligence. The following were taken into account as inclusion criteria: year-wise growth of AI literature, forms of document publications on AI, most profiled authors, most profiled universities/institutions, most productive countries in AI literature, most cited articles, research areas, publishers, and languages. Figure 1 exhibits the network visualization for keywords. The growth in AI literature each year is presented in Table 1. The table shows that 44313 records were available on the Web of Science between 2005 and 2024. It can be observed that most of the minor articles were located in 2005 (122, or 0.3%), while the greatest number of articles were identified in 2024 (11,869, or 26.8%). Pearson's correlation was used to determine the relationship between the year and the quantity of articles published over the last 20 years. The findings indicate that the year and record visibility had a significant positive association (r=.796**, p=.000).

Findings and Discussion

Table 1: Year-Wise Growth of Artificial Intelligence Literature from 2005 to 2024

Years	Visibility of Records	% of Visibility of Records	Cumulative Records Received	% of Cumulative Records	r	p-value
2005	122	0.3	137	0.3	.796**	.000
2006	137	0.3	259	0.6		
2007	142	0.3	401	0.9		
2008	149	0.3	550	1.2		
2009	171	0.4	732	1.7		
2010	180	0.4	903	2.0		
2011	182	0.4	1083	2.4		
2012	190	0.4	1273	2.9		
2013	206	0.5	1479	3.3		
2014	267	0.6	1746	3.9		
2015	272	0.6	2018	4.6		
2016	366	0.8	2384	5.4		
2017	576	1.3	2960	6.7		
2018	1247	2.8	4207	9.5		
2019	2642	6.0	6849	15.5		
2020	3887	8.8	10736	24.2		
2021	5614	12.7	16350	36.9		
2022	7434	16.8	23784	53.7		
2023	8660	19.5	32444	73.2		
2024	11869	26.8	44313	100		
Total	44313	100				

***** Correlation is significant at the 0.01 level (2-tailed).***

Table 2 shows the forms of documents and publications on AI. The study also attempted to determine which documents were the most productive. According to the table, most of the documents were articles (21002, 47.4%), followed by review articles (5426, 47.4%) and proceedings papers (5356, 12.2%). Pearson's correlation had been applied to determine the relationship between the document types and the visibility of records published over the last 20 years. The study found a significant association between the most productive documents and the number of records.

Table 2: Various Types of Documents Published in the Field of Artificial Intelligence

Document Types	Records	% of Visibility of Records
Articles	21002	47.4
Review Articles	5426	12.2
Proceedings Papers	5356	12.1
Meeting Abstracts	5001	11.3
Editorial Materials	4071	9.2
Letters	1072	2.4
Early Access	1000	2.3
Retracted Publications	475	1.1
Corrections	298	0.7
Book Reviews	260	0.6
News Items	181	0.4
Retractions	133	0.3
Book Chapters	16	0.04
Data Papers	7	0.02
Meetings	7	0.02
Publication with Expression of Concern	4	0.01
Biographical Items	2	0.0
Item Withdrawals	1	0.0
Reprints	1	0.0
Total	44313	100

Table 3 shows the visibility of the most productive author profiles reflected in the Web of Science database. Accordingly, Attia, ZachiItzhak, had the most publications (151) and was ranked first among the top 20 researchers. Furthermore, Friedman, Paul (140), and Noseworthy, Peter A. (103) had published articles and ranked second and third, respectively.

Table 3: Most Prolific Authors Contributing to Artificial Intelligence Research

Name of the Researchers	No. of Articles	Percentage	Rank
Attia, Zachi Itzhak	151	11.5	1
Friedman, Paul	140	10.7	2
Noseworthy, Peter A.	103	7.9	3
Lopez-Jimenez, Francisco	94	7.2	4
Mori, Yuichi	78	6.0	5
Hassan, Cesare	74	5.7	6

Ting, Daniel Shu Wei	72	5.5	7
Ock, Chan-Young	62	4.7	8
Saba, Luca	62	4.7	9
Misawa, Masashi	61	4.7	10
Repici, Alessandro	58	4.4	11
Wiwanitkit, Viroj	45	3.4	12
Kapa, S.	42	3.2	13
Tada, T	41	3.1	14
Wong, Tien Yin	40	3.1	15
Macedo, Manuel Guilherme	39	3.0	16
Yaseen, ZaherMundher	38	2.9	17
Nourani, Vahid	36	2.8	18
Denniston, Alastair	36	2.8	19
Keane, Pearse	36	2.8	20
Total	1308	100.00	

The top 20 most productive profiles of the universities/institutions are presented in Table 4. Noteworthy findings included that Harvard University ranked first among the top 20 institutions, with 1,086(10.4%) publications, followed by the University of California System (895, 8.6%) and Harvard University Medical Affiliates (823, 7.9%).

Top-10 most cited articles reflected in the Web of Science is presented in the Table 5. It was found that the article entitled "Explainable Artificial Intelligence (XAI): Concepts, taxonomies, opportunities and challenges toward responsible AI, by Arrieta and others published in 2020 had received 4,313 citations. Further, another highly cited article was "High-performance medicine: the convergence of human and artificial intelligence" by Topol, E.J., published in 2019 received 3,174 citations.

Table 6 presents the top 20 most productive countries in AI literature. The study found that the USA led the global rankings with 11,306 (23.8%) published articles, securing the top position among the 20 leading countries followed by China (8,060, 16.9%), England (3,467- 7.3%) and India (2659, 5.6%), secured 2nd, 3rd and 4th ranks respectively.

Table 7 demonstrates the top 20 research areas. It was observed that the overall 9,031 articles were recorded in computer science subjects securing in 1st rank, followed by engineering (8,156, 18.7%), science and technology (2,243, 5.1%) and also radiology nuclear medicine medical imaging (2,093, 4.8%) subjects secured 2nd, 3rd and 4th ranks respectively.

Table 8 shows the visibility of the top 20 publishers in the Web of Science database. Elsevier publisher ranked first among the top 20 publishers worldwide, with 8,829 (25.3%) published records, followed by Springer Nature (5,726, 16.4%), IEEE (3,543, 10.1%), and MDPI (3,316, 9.5%).

Table 4: Most Prolific Academic Institutions Contributing to Artificial Intelligence Research

Name of the Universities/Institutions	No. of Articles	Percentage	Rank
Harvard University	1086	10.4	1
University of California System	895	8.6	2

Harvard University Medical Affiliates	823	7.9	3
University of London	785	7.5	4
Mayo Clinic	627	6.0	5
Harvard Medical School	624	6.0	6
Stanford University	522	5.0	7
University of Texas System	512	4.9	8
University of Toronto	467	4.5	9
University College London	443	4.2	10
State University System of Florida	419	4.0	11
Egyptian Knowledge Bank EKB	412	3.9	12
University System of Ohio	396	3.8	13
National University of Singapore	379	3.6	14
University of Oxford	378	3.6	15
Massachusetts General Hospital	358	3.4	16
Chinese Academy of Sciences	331	3.2	17
Imperial College London	331	3.2	18
Johns Hopkins University	331	3.2	19
Pennsylvania Commonwealth System of Higher Education PCSHE	331	3.2	20
Total	10450	100.0	

The visibility of artificial intelligence records in the Web of Science database published in different languages is presented in Table 9. It was revealed that, among the top 10 languages, 94.6% of the artificial intelligence records were published in the English language. Furthermore, very few of the articles were published in other languages (3.8%).

Table 5: Top-10 Most Cited Articles in Artificial Intelligence Literature

Authors	Article Title	Name of Journals	Publication Year	Citations	Rank
Arrieta et.al.	Explainable Artificial Intelligence (XAI): Concepts, taxonomies, opportunities and challenges toward responsible AI	Information Fusion	2020	4313	1
Topol, EJ	High-performance medicine: the convergence of human and artificial intelligence	Nature Medicine	2019	3174	2
Adadi, A; Berrada, M	Peeking Inside the Black-Box: A Survey on Explainable Artificial Intelligence (XAI)	IEEE Access	2018	3025	3
Miller, T	Explanation in artificial intelligence: Insights from the social sciences	Artificial Intelligence	2019	2543	4
Hosny et.al.	Artificial intelligence in radiology	Nature Reviews Cancer	2018	2111	5
Jiang et.al	Artificial intelligence in healthcare: past, present and future	Stroke and Vascular Neurology	2017	1822	6
Liu et.al.	Artificial intelligence for fault diagnosis of rotating machinery: A review	Mechanical Systems and Signal Processing	2018	1503	7
Huang et.al.	Artificial Intelligence in Service	Journal of Service Research	2018	1487	8
Yu, KH; Beam, AL; Kohane, IS	Artificial intelligence in healthcare	Nature Biomedical Engineering	2018	1452	9
Dwivedi et.al.	Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy	International Journal of Information Management	2021	1388	10

Table 6: Top 20 Most productive Countries in Artificial Intelligence Literature

Countries/Regions	Records	Percentage	Rank
USA	11306	23.8	1
Peoples R China	8060	16.9	2
England	3467	7.3	3
India	2659	5.6	4
Germany	2518	5.3	5
Italy	2381	5.0	6
Canada	1984	4.2	7
Australia	1820	3.8	8
South Korea	1762	3.7	9
Spain	1673	3.5	10
France	1524	3.2	11
Japan	1346	2.8	12
Saudi Arabia	1185	2.5	13
Netherlands	1089	2.3	14
Taiwan	954	2.0	15
Iran	901	1.9	16
Switzerland	853	1.8	17
Brazil	766	1.6	18
Singapore	678	1.4	19
Turkiye	670	1.4	20
Total	47,596	100.0	

Note: The number of articles excludes 44,313 since many authors have contributed articles collaboratively.

Table 7: Areas of Research in Artificial Intelligence (Top 20)

Research Areas	Records	Percentage	Rank
Computer Science	9031	20.7	1
Engineering	8156	18.7	2
Science, Technology, Other Topics	2243	5.1	3

Radiology, Nuclear Medicine, Medical Imaging	2093	4.8	4
General Internal Medicine	2061	4.7	5
Business Economics	1905	4.4	6
Telecommunications	1855	4.3	7
Oncology	1699	3.9	8
Chemistry	1520	3.5	9
Environmental Sciences Ecology	1423	3.3	10
Materials Science	1377	3.2	11
Surgery	1351	3.1	12
Cardiovascular System Cardiology	1315	3.0	13
Neurosciences Neurology	1284	2.9	14
Gastroenterology Herpetology	1254	2.9	15
Health Care Sciences Services	1170	2.7	16
Physics	1086	2.5	17
Education Educational Research	1017	2.3	18
Medical Informatics	934	2.1	19
Energy Fuels	855	2.0	20
Total	43,629	100.0	

Table 8: Top 10 Publishers with the Highest Output in Artificial Intelligence Related Publications

Publishers	Records	Percentage	Rank
Elsevier	8829	25.3	1
Springer Nature	5726	16.4	2
IEEE	3543	10.1	3
MDPI	3316	9.5	4
Wiley	3023	8.6	5
Lippincott Williams & Wilkins	1602	4.6	6
Oxford Univ Press	1307	3.7	7
Taylor & Francis	1243	3.6	8
Frontiers Media Sa	1100	3.1	9
Sage	1005	2.9	10

Nature Portfolio	810	2.3	11
Hindawi Publishing Group	706	2.0	12
Assoc Computing Machinery	596	1.7	13
Bmj Publishing Group	381	1.1	14
Wiley-Hindawi	330	0.9	15
Emerald Group Publishing	313	0.9	16
Assoc Research Vision Ophthalmology Inc	295	0.8	17
Amer Chemical Soc	281	0.8	18
Amer Medical Assoc	280	0.8	19
Thieme Medical Publishers	263	0.8	20
Total	34,949	100.0	

Table 9: Top 10 Languages with the Highest Output in Artificial Intelligence-Related Publications.

Languages	Number of Records	Percentage	Rank
English	41920	94.6	1
German	367	0.8	2
French	134	0.3	3
Spanish	97	0.2	4
Portuguese	29	0.1	5
Turkish	28	0.1	6
Russian	27	0.1	7
Chinese	17	0.0	8
Czech	13	0.0	9
Other Languages	1681	3.8	10
Total	44,313	100.0	

Conclusion

The present study found various interesting results regarding the research visibility of AI literature. It was revealed that the authors had published many AI-related research articles in various journals over the last 20 years. The growth rate of AI literature increased every year from January 2005 to December 2024, with a total of 44,313 publications downloaded from the Web of Science database. In this context, it was observed from the study that there was a significant positive correlation between the year and publications. Further, the study found that most of the documents were articles (21,002,

47.4%), followed by review articles (5,426, 47.4%) and proceedings papers (5,356, 12.2%). The notable finding of the study was that more 'articles' were published compared to other bibliographical documents. The study found a significant positive correlation between the most productive documents and the number of records. Based on the results, the study recommends that authors publish more articles from other bibliographical documents from reputable publishers. In addition, it is suggested that researchers need to continue publishing quality research articles in reputable journals to have more visibility.

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Awareness and Use of Open Courseware (E-Pg Pathshala) among the Students of Periyar University, Salem

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Abstract

Open Courseware is a term applied to course materials created by universities and shared freely with the world via the internet. Open Courseware is primarily the repository of study and learning materials in digital form on the web, which is open to every user, i.e., Open Access. These repositories are envisaged to store, index, preserve, distribute, and share digital learning resources with any time access, offering interoperability. On the other hand, e-learning covers a myriad of applications and processes, such as computer-based learning, web-based learning, virtual classrooms, etc. The present study investigates the awareness and use of open courseware (e-PG-Pathshala) among the Postgraduate (PG) students of Periyar University, Salem. This is a survey-based study in which a structured questionnaire was prepared and distributed randomly among 110 PG students of Periyar University, Salem, for the collection of primary data, out of which 96 (87%) questionnaires were received and analyzed for data interpretation. The study revealed that 67% of the respondents were aware of e-PG Pathshala, while 33 % were not aware. 12.5% of the students were most satisfied, 64.6% of the students were satisfied, 20.8% were moderately satisfied, and only 0.2% of the students were not satisfied with the PG-Pathshala. The majority of the students felt that e-PG Pathshala had an easy browsing and searching facility, and they benefited from it. It is recommended that universities should conduct awareness programs for students to make them more aware of e-PG Pathshala, and teachers should also be involved in this awareness program.

Keywords: *E-PG-Pathshala; E-Learning; Open courseware; Periyar University; PG students.*

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Introduction

Open courseware

Open Course Ware (OCW) is a free and open digital publication of high-quality College and University level education material. These materials are organized as courses and often include course planning materials and evaluation tools as well as thematic content. The Open Course Ware movement began at the Massachusetts Institute of Technology (MIT) in 2002 and has now spread to over 120 other universities worldwide. MIT first announced its Open Courseware Program in 2001.

- It is a free and open digital publication of high-quality educational materials organized as courses.
- Under an open license, it is available for use and adaptation.
- It typically does not provide instructors with certification or access.

Open courseware in India

The revolution in Information and Communication Technology (ICT) has bridged the knowledge gap by providing a free flow of information. With this technology-driven revolution, the delivery of information started in digital format with greater speed and economy, which triggered the development of digital libraries. It has provided wider opportunities for archiving, digitizing, and preserving traditional knowledge. The open-source software movement added weight to the proliferation of digital libraries worldwide. Networks of digital archives are exploring, documenting, preserving, and making accessible traditional knowledge in various forms. This module elaborates on initiatives taken in India to promote open courseware. Open courseware in India includes:

- CEC Learning Object Repository.
- E-Gyankosh
- Indo-German Gurukul on Digital Libraries
- National Programme on Technology-Enhanced Learning (NPTEL)
- NCERT Online Textbooks
- UNESCO-SALIS e Learning Portal
- Vidyavahini
- Sakshat
- e-PG Pathshala

e-PG Pathshala

The Ministry of Human Resource Development (MHRD) under its National Mission on Education through ICT (NME-ICT) has allocated funds to the University Grants Commission (UGC) for the development of e-content in 77 subjects at the postgraduate level. The content and its quality being the key components of the education system, it is proposed to create high-quality, curriculum-based, interactive content in different subjects across all disciplines of social science, arts, fine arts and humanities, natural and mathematical sciences, linguistics, and languages under this initiative named e-PG Pathshala. The Learning Management System for e-PG Pathshala (http://epgp.inflibnet.ac.in/)

is available in open access and hosted on the INFLIBNET server, as well as accessible through the Sakshot Portal.

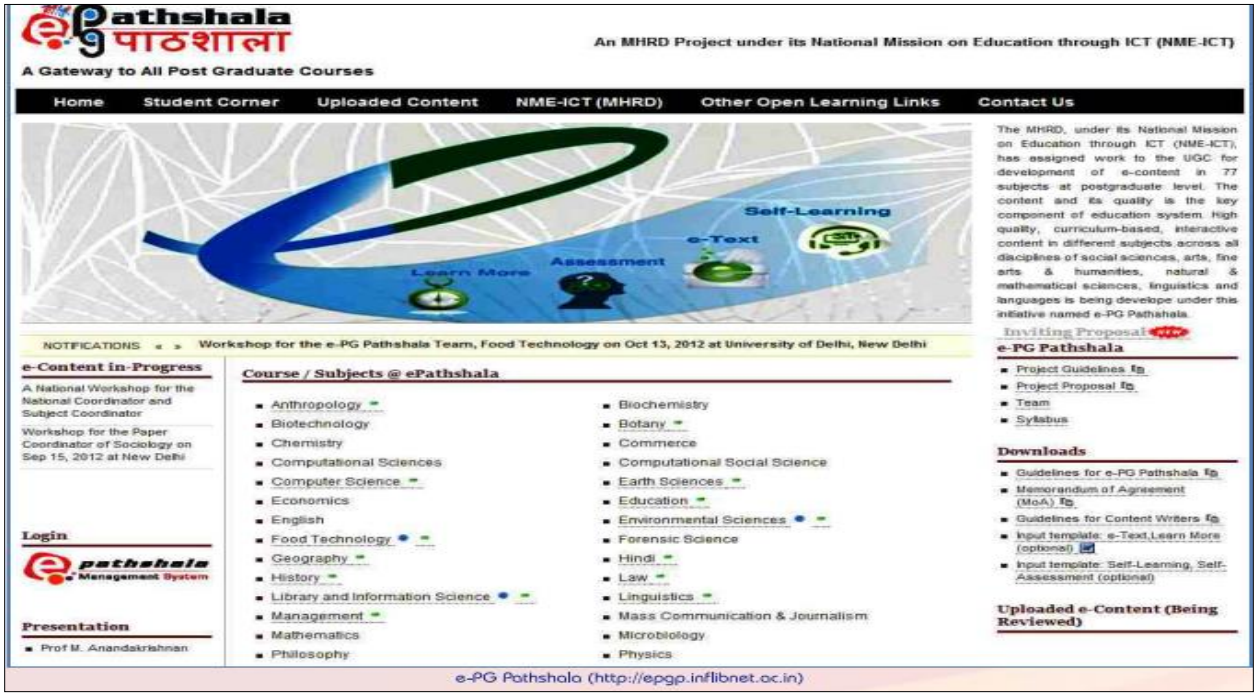

Figure 1: e-PG pathshala

The UGC's role in e-PG Pathsahala

a) For the execution of the project, the UGC shall be reliable and shall furnish extensive advertising to the online content program and the e-PG Pathshala.
b) The UGC shall allocate the funds to the Anchor, as per the suggestion of the Standing Committee, e-PG Pathshala, UGC.
c) e-PG Pathshala shall be disbursed to the Anchor Institute in advance, where the PI or Co-PI is working, the funds to the tune of 10% of the funds approved for the project by the Standing Committee.
d) The payment by the UGC to the Anchor Institute of the PI shall be disbursed upon receipt of the utilization certificate from the Anchor Institute on the project and the advice of the Standing Committee, e-PG Pathshala.
e) For wide dissemination, the e-content developed by the PI shall be hosted on the e-PG Pathshala website, with links to UGC, Sakshat, CEC, etc. websites.

Literature Review

Sonkar and Srivastava (2017) investigated the use of open courseware by PG students of Babasaheb Bhimarao Ambedkar University (BBAU), Lucknow with special reference to e-PG Pathshala. The study visualized that 46.10% of the total respondents belonged to the male category, 53.90% of the respondents were from the female category, 61.6% of respondents were aware of e-PG Pathshala while 38.3% were not aware, regarding the source of awareness of e-PG Pathshala of maximum

respondents (36.36%) gained awareness through the library staff, maximum respondents (42.20%) preferred web-resources as material preference to read e-resources, 51.29% respondents searched by subject, maximum respondents (79.22%) were satisfied with e-PG Pathshala and the maximum number of students (41.55%) of BBAU revealed that e-learning was speedy, flexible and saves money. Similarly, Singh, Garg and Sharma (2021) conducted a study that revealed the awareness and use of e-PG Pathshala among postgraduate students at Kurukshetra University. This study was based on a survey method; a web-based structured questionnaire was designed and randomly distributed through e-mail to collect primary data. The results revealed that 53.62% of respondents were aware of e-PG Pathshala. Further, 67.56 % of respondents used e-PG Pathshala for the contents related to their program syllabus, and 40.54% of respondents responded that the quality of e-content was good. This study recommended that the university conduct training and awareness series for students to raise further awareness regarding e-PG Pathshala.

Objectives of the Study

- To study the use and awareness of e-PG Pathshala.
- To investigate the time spent on accessing e-content.
- To explore the search approach and the type of materials preferred by the users.
- To discover the reasons and purposes for using e-content
- To study the problems users face while accessing and using the e-content
- To investigate the level of satisfaction and perception with e-PG Pathshala.

Hypotheses

1. There is no significant difference between the gender of the respondents and their awareness of the e-PG Pathshala.
2. There is no significant difference between the years of study-wise respondents and their awareness of the e-PG Pathshala.
3. There is no significant difference between the gender of the respondents and the sources of search techniques used by students using e-PG Pathshala

Methodology

The survey method was used in this study. Data was collected using questionnaires. The questionnaire was prepared and distributed among the PG students of Periyar University, Salem. The collected data was codified, classified, and tabulated for analysis and interpretation. 96 filled-out questionnaires were received from PG students in selected departments of the university (Table 1). Based on the collected data, findings and suggestions have been drawn.

Statistical techniques serve the fundamental purpose of descriptive and differential analysis. The following techniques were used in the study: Chi-Square test, Standard deviation, T-Test and Mean. The questionnaires were analyzed and tabulated with SPSS 29.0.10exe.

Table 1: Questionnaire Distribution and Responses from PG Students

S.NO	Name of the Department	No. of Students	Questionnaire distributed	Received Questionnaire
1	Library and Information Science	15	15	13
2	Computer Science	60	20	17
3	Mathematics	72	30	26
4	Statistics	60	30	28
5	English	30	15	12
	Total	232	110	96

Findings and Discussion

Table 2: Gender-wise Respondents

S.No	Gender	No. of Respondents	Percentage
1.	Male	29	30.2
2.	Female	67	69.8
	Total	96	100.0

Table 2 represents the gender distributions of the respondents. The total population included 29 (30.2%) male and 67 (69.8%) female respondents.

Table3: Year-wise Respondents

S.No	Year of Study	No.of.Respontents	Percentage
1.	I year	22	22.9
2.	II year	74	77.1
	Total	96	100.0

Table 3 demonstrates the distribution of year of study of the respondents; the total number of respondents was 96. Results indicate that 22 (22.9%) belonged to I Year, while 74 (77.1%) students belonged to II Year.

Table 4: Awareness about the e-PG Pathshala

S.No	Awareness	No.of Respondents	Percentage
1.	Yes	64	66.7
2.	No	32	33.3
	Total	96	100.0

According to Table 4, the majority of students, 64 (66.7%), were aware of e-PG Pathshala, which is highly appreciable because it enhances the use of online resources developed for PG students, while 32 (33.3%) were not aware.

Table 5: Sources of Awareness

S.No	Source of awareness	No. of Respondents	Percentage
1.	Library staff	8	8.3
2.	Internet, social network	38	39.6
3.	Friends	38	39.6
4.	Others	12	12.5
	Total	96	100.0

Table 5 shows the sources of awareness of e-PG Pathshala, where 8 (8.3%) students were aware of Library staff, 38 (39.6%) by the Internet, 38 (39.6%) by Friends, and 12 (12.5%) users were by other sources. It reflects that most of the students at Periyar University are aware of e-PG Pathshala through the Internet and Social Networking.

Table 6: Place of Accessing E-Resources/Content

S.No	Place of access	No. of Respondents	Percentage
1.	Department	20	20.8
2.	Library	30	31.2
3.	Hostel/ home	18	18.8
4.	Any other place	28	29.2
	Total	96	100.0

Table 6 exhibits that the place to access e-resources/content was the Library 30 (31.2%), followed by Department 20 (20.8%), the Hostel and Home 18 (18.8%), and 28 (29.2%) other places. It shows that most of the users accessed E-Resources/content from the Library.

Table 7 reveals the search terms used while accessing e-resources: 21 (21.9%) respondents searched by Title, 41 (42.7%) by Subject, 23 (24.0%) by Keywords and 11 (11.5%) by Author.

Table 7: Search Terms Used while Accessing E-Resources

S.No	Search term	No. of Respondents	Percentage
1.	Title	21	21.9
2.	Subject	41	42.7
3.	Keyword	23	24.0
4.	Author	11	11.5
	Total	96	100.0

Table 8: Time Spent on E-Content Accessed Daily

S.No	Time on Access	No. of Respondents	Percentage
1.	At least one hour	53	55.21
2.	2 to 3 hour	18	18.75
3.	More than 3 hours	25	26.04
	Total	96	100.00

It is observed from Table 8 that 53 (55.21%) respondents spent at least one hour, followed by 18 (18.75%) users who spent 2 to 3 hours, and more than 3 hours were spent by 25 (26.04%), It means that most of the students spent 0 to 1 hour accessing E-Content daily

Table 9: Reasons for using E-Learning Courseware

S.No	Reasons	No.of Respondents	Percentage
1.	Speed, flexibility and save money	26	27.1
2.	Anyone, anywhere, any time	26	27.1
3.	Convenience and self-assessment	34	35.4
4.	Multimedia interactive content	10	10.4
	Total	96	100.0

Table 9 shows the reasons for using **e-**learning courseware, where 26 (27.1%) were using it for speed, flexibility, and saving money. 26 (27.1%) for access to anyone, anywhere, anytime; 34 (35.4%) for convenience and self-assessment; and 10 (10.4%) for multimedia interactive content. These results indicate that the majority of students at Periyar University (35.4%) believe that e-learning courseware is convenient and facilitates self-assessment.

Table 10 presents the reasons for using e-content over print materials by students. Accordingly, most of the students 44 (44.8%) accessed it for convenience, 22 (22.9%), for multiple user access, 20 (20.8%) for 24/7 availability, as well as for easy browsing and searching 11 (11.5%).

Table 10: Reason for Using e-content over Print Articles

S. No	Reasons	No.of Respondents	Percentage
1.	24/7 availability	20	20.8
2.	Multiple user access	22	22.9
3.	Convenient	43	44.8
4.	Easy browsing and searching	11	11.5
	Total	96	100.0

Table 11: Problems Faced by Respondents while Accessing E-Content

S.No	Problems	No.of Respondents	Percentage
1.	Internet speed	54	56.2
2.	Inadequate resources	11	11.5
3.	Lack of training	17	17.7
4.	Any other	14	14.6
	Total	96	100.0

The above table (Table 11) reveals that 54 (56.2%) students faced the main problem of slow internet speed, followed by 11(11.5%) users facing inadequate resources, and a lack of training 17(17.7%) finally 14(14.6%) facing other reasons.

Table 12: Perception about e-PG Pathshala

S.No	Perceptions	No.of Respondents	Percent
1.	Most relevant	21	21.9
2.	Relevant	58	60.4
3.	Not relevant	4	4.2
4.	No opinion	13	13.5
	Total	96	100.0

Table 12 highlights the perception of e-PG Pathshala, with 21 (21.9%) respondents stating it was most relevant, followed by 58 (60.4%) students stating it was relevant, 4 (4.2%) students mentioning it was not relevant, and finally 13 (13.5%) users expressing no opinion. According to the findings, respondents perceived e-PG Pathshala as relevant.

The satisfaction of e-resources/content through e-PG Pathshala was examined (Table 13), where 12 (12.5%) were most satisfied, followed by 62 (64.6%) who were satisfied, 20 (20.8%) moderately satisfied, and 2 (2.1%) were not satisfied. It indicates that the majority of the university students are satisfied with the e-resources.

Table 13: Satisfaction of E-Resources/Content through e-PG Pathshala

S.No	Satisfaction level	No. of Respondents	Percent
1.	Most satisfied	12	12.5
2.	Satisfied	62	64.6
3.	Moderate	20	20.8
4.	Not satisfied	2	02.1
	Total	96	100.0

Hypotheses Testing

Hypothesis 1
Ho (Null Hypothesis): There is no significant association between the gender of the respondents and the awareness about the e-PG Pathshala.

Table 14: Difference between the Gender of the Respondents and the Awareness about e-PG Pathshala.

Gender	Awareness about e-PG Pathshala		Total	Sig	Result
	Yes	No			
Male	26	3	29		
Female	38	29	67	.002	Rejected
Total	64	29	96		

Table 14 shows distribution of respondents based on their gender and their awareness about e-PG Pathshala. In the awareness about the e-PG Pathshala section, the Sig value of .002 indicates that there was a significant relationship between gender and awareness about e-PG Pathshala. Since the Sig value is less than the significance level of 0.05, the null hypotheses is rejected and it is concluded that there was a significant relationship between gender and awareness about e-PG Pathshala.

Chi-Square Test

Hypothesis 2
Ho (Null Hypothesis): There is no significant association between the year of study and the awareness about the E-PG Pathshala.

Table 15 shows the distribution of respondents based on their year of study and their awareness about the e-PG Pathshala. In the awareness about the e-PG Pathshala section, the Sig value of 0.540 indicates that there was no statistically significant relationship between the year of study and the awareness about the e-PG Pathshala, because the sig value (0.540) is greater than the typical significance level (e.g.,0.05), so the null hypothesis was not rejected.

Table 15: Difference between the Year of Study of the Respondents and the Awareness about e-PG Pathshala

Studied Year	Awareness about E-PG Pathshala		Total	Sig	Result
	Yes	No			
I Year	15	7	22		
II Year	49	25	74	0.540	Accepted
Total	64	32	96		

T-Test

Ho (Null Hypothesis): There is no significant difference between the gender of the respondents and the sources of searching techniques used by students.

Table 16: Difference between the Gender of the Respondents and the Sources of Searching Techniques used by Students

	No. of. Total Respondents	Mean	Std. Deviation	t-value	Sig	Result
Gender	96	1.7708	.42250			
Sources of searching technique	96	2.2500	.92906	-4.532	0.000	Rejected

The paired sample t-test was conducted on a sample of 96 participants to compare their mean rating and Table 16 demonstrates the results. The mean rating before the intervention was 1.7708 with a standard deviation of 0.42250, while the mean rating after the intervention was 2.2500 with a standard deviation of 0.92906. The calculated t-value was -4.532, and the associated p-value was 0.000. Since the p-value is less than the typical significance level of 0.05, so the null hypothesis was rejected.

Conclusion

The major study findings are as follows:

- Majority of the respondents were female compared to male and majority were final year students
- Majority of the students, 64 (66.7%), were aware of e-PG Pathshala, which is highly appreciable because it enhances the use of online resources developed for PG students.
- Most of the students at Periyar University were aware of e-PG Pathshala through the Internet and Social Networking.
- Majority of the students used the library to access e-resources and content.
- Most of the respondents searched by subject.
- More than half the respondents, 53 (55.21%), spent at least one hour. It means that most of the students spend at least 1 hour accessing E-Content daily.
- Most of the students (35.4%) felt that e-learning courseware was convenient and self-assessment
- Reason for using e-content over print materials was that most of the 44 (44.8%) students accessed it for convenience.
- More than half of the students 54 (56.2%) faced slow internet speed.
- Regarding the perception of e-PG Pathshala, most students perceived it as relevant
- Majority of the university students were satisfied with the e-resources via e-Pathsahala

The study concludes that there was a good level of awareness and use of the open courseware e-PG Pathshala among the PG students of Periyar University. The majority of the respondents were familiar

with the open courseware**,** and a high proportion of respondents had an awareness of e-PG Pathshala at the University Library which indicates students were interested in using the platform. It is also noteworthy that a large proportion of respondents sought support from their faculties for adequate awareness facilities. Overall, awareness and use of the open courseware e-PG Pathshala among the PG students and meeting their expectations may further enhance its effectiveness as a learning tool.

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The Role of Buddhist Monastic Libraries in Cultural Heritage Conservation

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Abstract**

Buddhist monastic libraries, since time immemorial, have been custodians of cultural heritage through conservation of holyscripture, palm-leaf manuscripts and historical papers underpinning tradition and education for Buddhism. As much as these libraries contain religious literature, these are dissemination centers for philosophy and ethics as well. This study brings to light how Buddhist monastic libraries safeguard cultural heritage, both through traditional and modern technologies to underpin calls for an integrated conservation process. Using a qualitative research process, textual research, site monitoring at large centers of monasticism such as Sri Dalada Maligawa, surveys and interviews with Buddhist scholars and custodians underpin the research. The study showed that methods of conservation historically utilized, including herbal treatments of palm-leaf manuscripts, word-of-mouth memorization to safeguard textual remembrance and housing to protect textual material, continued to be utilized. However, climate, pest attack and unavailability of resources raised serious issues. Many of these libraries offset these with adoption of digital technology: digital repositories creation, AI script recognition utilization, metadata cataloging and utilization of blockchain for digital provenance. With these developments, issues with digital obsolescence, ethical issues with open-source provision of holy literature and loss of tangible heritage were identified as challenges. The research justifies an equilibrium approach to conservation balancing harmoniously traditional expertise with probable technologies. It calls for enhanced partnership for action between centers of monasticism and academic or archival bodies and training programs for custodians with specific targets for sustainable governance of heritage.

Keywords: *Buddhist monastic libraries; Cultural heritage conservation; Digital archives; Manuscript preservation; Religious knowledge management.*

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Introduction

The monastic libraries of Buddhism constitute some of the earliest and most durable institutions of knowledge preserved in the South and Southeast Asia region. From the earliest years of Buddhism in Sri Lanka, these libraries have provided to safeguard the intellectual and spiritual fabric of the island's civilization. Although these libraries have preserved many different types of texts including history, rituals, commentaries, and other palm-leaf manuscripts, they represent and sustained not only the preservation and transmission of Buddhist teachings to the island, but also the cultural identity of Sri Lankan society. Every Buddhist monastery, referred to as a Pansala-Granthalaya, was organized to facilitate the functioning of monastic education especially for the Pirivena system of education emerged and flourished which was devoted to learning and interpreting texts (Gunawardana, 1979).

The importance of these monastic libraries extends well beyond their religious role; they are fundamental sites of cultural continuity. Buddhist monasteries have safeguarded records depicting, for hundreds of years, not just the religious lifestyle but also language, medicine, architecture, and political systems (Bandaranayake, 1986). In the age of globalization, technological change, and influence, the significance of monastic library practices related to cultural heritage preservation has become even more meaningful. These contemporary digitization efforts, environmental sustainability programs and knowledge management initiatives are being integrated into a dynamic process that is transforming the once completely custodial practices of cultural heritage preservation. This study explores Buddhist monastic libraries at the emerging intersection of both a modern and more traditional understanding of preservation as they continue to serve their spiritual and cultural missions.

Research Objectives

This research evaluates the role Buddhist monks played in preserving the Cultural Heritage of Sri Lanka. In particular the study has four major areas of focus:

1. To investigate how monastic libraries have evolved over time and to explore the ways in which manuscripts were traditionally protected prior to colonialism.
2. To explore how monastic libraries have adapted to the digital age and to explore how current digital preservation techniques can be utilized alongside existing professional workflow models.
3. To identify what challenges and barriers exist when trying to merge historical sacred practices with contemporary conservation techniques.
4. To develop a sustainable model of preserving Buddhist Literature that incorporates Indigenous Knowledge Systems, Scientific Systems and provides continued access to preservation of Buddhist Literature Heritage.

Theoretical Considerations

The theoretical foundations of this study are two major theoretical frameworks: Cultural Heritage Conservation Theory and Knowledge Management Theory. Cultural Heritage Conservation Theory asserts that heritage consists of both tangible and intangible aspects that must be conserved not only as material but as living expressions of culture (Smith, 2006). This based, the Buddhist monastic

libraries can be understood as "living heritage institutions" that continue to provide a cultural context due to their incorporation in ritual practice, education, and ethical transmission (UNESCO, 2015).

Supplementing this is the Knowledge Management Theory (Nonaka& Takeuchi, 1995), which concerns the process of knowledge creation, storage and distribution. Monastic libraries demonstrate these processes, in that knowledge can be imparted through both texts and oral teaching. The intersection of these approaches supports an understanding of Buddhist monastic libraries as an institution that does not just conserve fixed texts, but creates and distributes cultural knowledge, fostering collective identity and spiritual continuity.

Literature Review

A large body of research highlights the important role Buddhist monastic institutions played in the safeguarding of intellectual traditions in Sri Lanka. Bandaranayake (1986) explains that temple complexes operated as centers for education where people studied the scriptures, engaged in artistic work, and guided the community. The historiography of written tradition in Buddhism traces back to an event that occurred at the Aluvihara Monastery, where scriptures and the Tipiṭaka were inscribed on palm leaves for the first time under the patronage of King VattagaminiAbhaya in the first century BCE (Rahula, 1956).

Paranavitana (1995) and Karunaratne (2014) continue to emphasize indigenous environmental knowledge was fundamental to the preservation of manuscripts. Palm leaves were cured, polished, and anointed with herbal oils to deter insects and inhibit decay. Ritual practices aided in the care and housing of manuscripts to affirm their physical preservation and spiritual sanctity. Examples of this custodianship culture may be seen within the Vattakaṭikā, Atthakathā, and PansiyaPanasJātakaPota collections preserved across the temples.

Contemporary research also highlights the shift from traditional preservation systems to electronic preservation techniques. Wijesuriya (2007) and the Central Cultural Fund (2021) indicate the increased use of digitization projects to preserve manuscripts and provide access for research. However, conservators were navigating many technical and ethical dilemmas including data authenticity, intellectual property, and whether the dissemination of sacred texts online is spiritually feasible (IFLA, 2020).

The literature therefore indicates that while technological improvement of conservation processes is critical, it should not supplant the ritual and ethical frameworks which have traditionally governed Buddhist monastic custodianship. Preserving heritage within this framework must be understood as an ongoing and collective process of straddling ancient wisdom and contemporary creative processes.

Methodology

This research utilized a qualitative research design incorporating textual analysis, field observation, and semi-structured interviews. Primary data were collected through visits to the most well-known Buddhist monastic libraries, specifically Sri DaladaMaligawa located in Kandy, Aluvihara Monastery located in Matale, and a selection of Pirivena libraries located in the Central Province. Observations

concentrated on the storage conditions it was in, cataloguing practices of palm-leaf manuscripts, and the conservation environment of the manuscripts.

To gain insight into the usual conservation practices utilized by various institutions, monks, librarians, and archivists were interviewed about their conservation practices, any challenges they faced as an institution, and their views on digitization. Secondary data was collected through scholarly literature, government reports, and documents issued by UNESCO. Thematic analysis highlighted patterns related to traditional and contemporary methods of conserving manuscripts. Ethical issues were addressed with respect for the spiritual status of the manuscripts and by obtaining informed consent from participants.

Findings

These findings proved that Buddhist monastery libraries continue to function as living repositories of cultural heritage. The findings are discussed below in reference to the major objectives of this study.

1. Historical Evolution and Traditional Conservation Methods

The above research confirmed that monastery collections used extensively embedded traditional knowledge in a preservation process. This became evident in the use of herbal treatments in palm leaf preservation, particularly nelli juice from the Phyllanthusemblica tree and kokum extracts from the Garciniaindica tree. Apart from using traditional preparations in preserving ancient knowledge, the manuscripts were kept insulated in cotton cloth covers and in lacquered or wood boxes placed away from direct ground contact to prevent humidity and insects from damaging them. Another preservation aspect was the ritualistic recitation as a method of intangible preservation of the manuscripts.

2. Integration of Digital Preservation and Professional Workflows

In recent times, monastic organizations were finding ways of integrating modern technology into conventional stewardship. For instance, conservators at the Sri DaladaMaligawa (Temple of the Tooth Relic) were using both preventive and curative approaches coupled with high-resolution digitization of rare materials. The innovation of interest in this regard was referred to as the DaladaMaligawa Library Digitization Project, completed between 2019 and 2023, which created an electronic repository using metadata and blockchain technology for thousands of scanned images of high cultural and historical significance. In similar fashion, Aluvihara Monastery and different Pirivena Libraries associated with Peradeniya University used conventional catalogs and small databases of digitized materials.

3. Issues in Matching Sacred Practices with Modern Times

Despite these successes, there were major challenges that exist to a large extent. Environmental challenges, especially humidity and temperatures that exist in tropical regions, remain a challenge to the preservation of manuscripts because of the growth of fungus or pests that attack the manuscripts. Some of the structural challenges that exist were funding, a lack of experts to preserve the work, and a lack of digital framework infrastructure. There were also philosophical challenges associated with the propagation of the sacred texts in digital format to the general public.

Discussion

The dual function of Buddhist monastic libraries as religious and educational institutions generates unique tensions and possibilities for heritage preservation. The sacred status of the library collections creates ethical responsibilities and norms around ritual use and respect. The educational mission of libraries calls for open access and dissemination of knowledge. The challenge, therefore, is how to balance the two within a framework that respects the manuscripts' spiritual-ness and promotes their cultural and academic significance. Conventional conservation practices involving ecological knowledge and monastic discipline represent exemplary models of sustainable resource management. Indigenous practices incorporate wisdom of environmental balance analogous to modern constructs of ecological conservation. However, the diminishing stability of the manuscripts and limited availability of naturally preserved materials requires the use of scientific methods that are contemporary in approach. The digitization of the manuscript is a viable solution, within the constraints of ethical considerations, to preserve information content while allowing for research to occur, without harming the object. However, the digital technology integrated into a monastic context must consider the importance of calibrating its benefit to communities and not merely to artifacts separated from a community. Conservation, as Wijesuriya (2007), argues should be benefiting communities rather than work separated from a community. Therefore, any form of a digital archive should have the input and agreement of a monastic authority with emphasis on the texts' spiritual context. Carefully calibrated networks are valued within the communities of monasteries and heritage for continued technical and financial support through their respective universities and partners such as the Central Cultural Fund (CCF) and Department of National Archives respectively. An important finding of this research is that heritage conservation should not be regarded as an exogenous intervention - it is a continuation of the stewardship that monastics have practiced. The balance between traditional craft and digital innovation can be utilized to turn monastic libraries into sustainable and living spaces of knowledge where the past and future can be joined.

Conclusions

Buddhist monastic repositories in Sri Lanka play a pivotal role in the preservation of both the spiritual and cultural dimensions of Sri Lankan heritage. They are not only responsible for the stewardship of manuscripts but also for the propagation of moral philosophy, historical consciousness, and the understanding of a common identity. The research confirms that, while traditional conservation continues to be effective and culturally appropriate, that traditional conservation practice on its own can and should be complemented through the use of technology and institutional partners. The coexistence of two cultural paradigms - indigenous and modern - exemplifies a holistic approach to heritage management that is cognizant of the importance of both authenticity, and public access.

The research finds that monastic libraries ought to be viewed as fundamental partners in national heritage preservation policies. Working to integrate these institutions into the core framework of national policies related to conservation means their unique collections can progress from being preserved for use to being shared for global scholarly advancement of knowledge in an ethically responsible context. The preservation of monastic libraries is therefore a preservation of Sri Lankan civilization’s intellectual and ethical premise.

Recommendations

On the basis of the empirical evidence about the structural, environmental, and ethical questions that challenge monastic libraries, the following suggestions are put forward for ensuring the sustainable preservation of this cultural heritage.

1. Creation of a National Consortium for Resource Allocation

It seems from this study that individual monasteries often do not have the means to effectively address these threats. In light of this, it is recommended that a national program be put in place, where monasteries should be at the forefront of formulating policies. A formalized national consortium, involving monasteries, Department of National Archives, Central Cultural Fund, and universities, will ensure a consolidated means of accessing collective knowledge. This body should implement a national preservation plan which will identify individual risk factors, which in this study involve particular biological factors identified under risk of damage (UNESCO, 2015).

2. Capacity Building and Professional Training

The study points to a serious deficit of professional conservators in Pirivena libraries. Accordingly, building capacities for the librarians could and should be along-term focus of the library system as a whole. Professional training workshops for the librarians on a regular basis, focusing on preventive conservation, pest control, and digitization processes, could be jointly formulated by conservation scientists and heritage educators. Workshops focusing on handling skills and digital literacy (metadata input and file organization) could immediately remedy the technological gaps identified in the field observations. According to Wijesuriya (2007), such exchanges point to conservation as a trade and a science.

3. Ethical Governance of Digital Preservation

Findings indicate that the custodians concern themselves with the "spiritual authority" of the texts when digitized. To ensure that the ethical concerns are addressed when digitizing texts, open and ethical standards and strong governance systems should be adopted in digitization projects. In cases where the emphasis is on authenticity and provenance, for instance, metadata describing chain-of-custody for digital files is recommended where provenance and authenticity are a concern. Most importantly, ethical protocols for digital dissemination initiated by monastic custodians in terms of levels and limitations on what constitutes holy texts should be followed (IFLA, 2020).

4. Community-Based Decision Making

As the practices of rituals and oral traditions are forms of intangible conservation, the conservation strategies in these practices must depend on community-led decision-making strategies. The community must be involved in the process of what information is digitized and how the heritage story is to be narrated. Documentation strategies through participation in oral history and custodianship will secure the identified intangible heritage in this research. This will ensure the appropriate treatment of the information in these practices (UNESCO, 2015).

5. Emergency Preparedness and Environmental Adaptation

Given the fact that palm-leaf manuscripts are demonstrated to be extremely sensitive to dampness and fungal infestation in tropical regions, emergency preparedness needs to be formalized. Assistance needs to be given to the monastic libraries regarding the adoption of effective and less expensive means of protection, such as improved air flow and elevated storage, in order to counteract the imminent dangers revealed during site monitoring. Moreover, climate-based strategies should incorporate future patterns in temperature, including the effect of such temperatures on organic support materials.

6. Collaborative Research Ecology

Lastly, to bring together the best of the past and the best of modern scientific research, the academic community will therefore focus on interdisciplinary projects. Studies will compare the traditionally prepared herbal mixtures detected in this research, such as nelli oil and kokum oil, to modern benchmarks in order to legitimize the sustainable resources. The dissemination of local best-practice guides, the result of said research findings, will therefore create a learning ecology within the institutional context.

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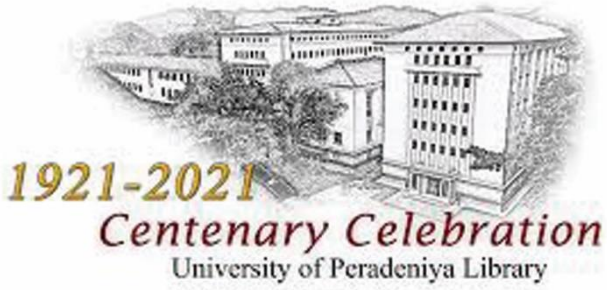

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