Awareness and Use of Library Automation, Digital Library Software and Reference Management Software among LIS Postgraduate Students in South Indian Universities

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Abstract

This study examines the awareness and utilisation of automation, digitisation, and reference management tools among postgraduate Library and Information Science (LIS) students in South Indian universities. A structured questionnaire was designed and personally distributed by the researcher, yielding 493 completed responses. The data were coded using SPSS version 26, with statistical tests tailored to the study's research questions. The findings reveal that Koha is the most widely used library automation software, DSpace is the most utilised digital library software, and Mendeley and Zotero are the most popular reference management tools among the students. The study suggests that increasing awareness of available software tools and addressing infrastructure-related challenges are crucial to enhancing the utilisation of automation, digitisation, and citation management tools among LIS students in South Indian universities.

Keywords: CMS, Digital library software, Library automation, LIS students, RMS

1. Introduction

ICT rapidly changes people's lifestyles, influencing how they communicate, think, discuss, and engage with information, particularly in academia (Ray Ogbonna, 2022). ICT literacy correlates with higher academic achievement, especially among students (Lei et al., 2021). Postgraduate students heavily depend on electronic and print resources for academic writing, underscoring the importance of information access (Lonergan, 2017). Digital libraries, focusing on content quality and user-centric design, significantly shape information access (Gastelú et al., 2015). ICT and information literacy significantly impact academic literacy, yet there's a notable gap between digital competencies developed informally and those integrated into university practices (Guzmán-Simón et al., 2017). The widespread adoption of computers has rapidly transformed society, with library automation improving staff perception and enhancing user services (Mohamed et al., 2014). Moreover, institutional repositories and digital libraries are pivotal in managing and preserving digital assets and intellectual output.

The development of new technologies results in a requirement for the improvement of new human capacities. Different social and technological discoveries redesign almost

every aspect of human life, generating the need for new literacies such as ICT, digital, computer, technological, media, information, and others (Ivankovic´ et al., 2013). In this context, the present study has been undertaken to know how LIS postgraduate students use library automation software, digital library software, reference management software and content management systems for their academic activities.

2. Review of literature

The primary aim of a literature review is to analyse and compare previous theoretical and empirical research, providing an overview of existing knowledge in a field. It critically examines and summarises prior studies to gain insights into a specific topic.

Kari and Baro (2014) found that Nigerian university libraries predominantly used Koha (66.7%) and SLAM (50%), with other software like VIRTUA (33.3%) also in use. DSpace emerged as the most utilised institutional repository among Nigerian students (19.4%). The study highlighted ongoing experimentation with different software options as libraries seek optimal solutions for information services, with Koha, SLAM, and VIRTUA gaining popularity. Mohamed et al. (2014) examined the impact of ICT literacy competencies among Library and Information Science students, focusing on software and technologies like Koha, SOUL, Greenstone, Joomla and Drupal. They found that the majority preferred Koha (94%), followed by SOUL (33%), with fewer students using Greenstone (24.7%), Joomla (9.3%)and Drupal (5.2%). The study suggested allocating dedicated funds to promote ICT-supported education in Kerala's higher education sector.

Melles and Unsworth (2015) studied postgraduate students at Monash University regarding their use of reference management software (RMS). They found that the majority (71%) used RMS for reference management, with 29% not using any RMS. EndNote was the most popular RMS, while Zotero and Mendeley had low usage. Madhusudhan (2016) found that 60% of respondents occasionally used online citation tools, predominantly EasyBib (53%) and BibMe (22%). Most of these tools were used for research (78%) and literature reviews (40%), indicating awareness and primary use for academic and research purposes.

Bansode and Viswe (2017) found that most university library professionals in Maharashtra possess adequate basic ICT skills for daily operations. However, some areas, such as open-source library automation, digital library, and institutional repository software, needed improvement. Bugyei et al. (2019) found that among CSIR researchers in Ghana, Mendeley was the most widely used reference management software (RMS) at 32.8%, followed by EndNote at 25.5%. Other RMS packages included Zotero (14.5%) and Reference Manager (6.4%). Awareness of RMS mainly came from training workshops and seminars, with researchers primarily using these tools for research and literature review purposes.

Bajpai and Madhusudhan (2019) found that LIS professionals excel in automation software like LibSys (45%) and Koha (36.7%) but lack proficiency in content management software such as PHP Nuke (61.7%), Typo (60%), Joomla (45%), and Drupal (43.3%). Although they demonstrate exemplary skills in DSpace (33.3%), LIS professionals need improvement in information retrieval (IR) tools and content management software. The adoption of IoT in library automation, digitisation, web, social media, and email was reshaping the library landscape (Mondal, 2021).

Matonkar and Kumar (2021) evaluated

library students' awareness of automation software, revealing a solid familiarity with E-Granthalaya (32.39%) and NewGenLib (28.16%). However, fewer students were acquainted with D-Space (19.71%) and WordPress (14.08%), with Mendeley being the most widely used reference tool (21.12%). Nitsos et al. (2022) investigated reference management software usage, with Mendeley being the most popular (70.3%), followed by EndNote (22.1%) and Zotero (16.3%). They identified key factors influencing software choice: ease of use, free availability, and recommendations from professors, friends, and the central library.

Mhokole and Kimaryo (2022) examined postgraduate students' usage of reference management software, revealing that while the majority are familiar with it (52.8%), some remain unfamiliar (37.5%). The study noted awareness of various RMSs, such as EndNote and Reference Manager, with Mendeley being the most prevalent among university postgraduates. Hussain and Ameen (2023) found that Koha was the most used software in 27 universities, followed by SLIMS (14.8%) and LIMS (3.7%). They noted that most university libraries were in early automation stages, signaling substantial room for growth and enhancement in automation implementation.

3. Research questions

- Are students aware of and use various library automation and digital library software?
- Are students aware of and use various reference management software?
- Are students aware of and use various content management software?

4. Scope and methodology

The study is confined to postgraduate students in Library and Information Science (LIS) departments of South Indian universities, excluding those specialising in Medical Science, Agricultural Science, Engineering and Technology, Law, and open universities. South India includes the states of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana, and the union territory of Puducherry. The focus is on assessing second-year LIS postgraduate students' ICT literacy and competencies. Of 222 universities offering PG courses in South India, only 33 offer LIS programs. These include 11 central universities, 118 state universities, 53 deemed universities, and 40 private universities. The researcher personally distributed a structured questionnaire to collect data, and 493 duly filled questionnaires were received from 525 LIS postgraduate students admitted for the 2022-2023 academic year.

4.1 *Data collection tool*

The questionnaire aimed to gather information on students' awareness and use of library automation software, digital library software and reference management software. Collected data was coded using SPSS version 26.0, and appropriate statistical tests were applied.

4.2 *Selection of sample population*

The sample population for the study was determined by employing the formula outlined by Krejcie and Morgan (1970), considering a total of 525 postgraduate students across 31 universities for the academic year 2022-23. Calculations yielded a required sample size of 438.43, rounded to 438 for practicality, given a confidence level of 99% and a margin of error of 0.025. However, the final sample size exceeded this estimate, totaling 493 postgraduate students.

This increase was due to additional students expressing interest in participating in the questionnaire surveys, surpassing the initially calculated sample size.

Distribution of respondents by universities

Name of the Universities	Respondents	Percent
Akkamahadevi Women's University, Karnat aka	09	1.83
Bangalore University, Karnataka	31	6.29
Bangalore North University, Karnataka	12	2.43
Gulbarga University, Karnataka	11	2.23
Karnatak University, Karnataka	15	3.04
Kuvempu University, Karnataka	13	2.64
Mangalore University, Karnataka	11	2.23
Rani Channamma University, Karnataka	09	1.83
Tumkur University, Karnataka	10	2.03
University of Mysore, Karnataka	26	5.27
Vijayanagara Sri Krishnadevaraya University, Karnataka	06	1.22
Kannur University, Kerala	24	4.87
University of Calicut, Kerala	29	5.88
Mahathma Gandhi University, Kerala	12	2.43
Kakatiya University, Telagana	15	3.04
Osmania University, Telagana	30	6.09
Acharya Nagarjuna University, Andhra Pradesha	07	1.42
Andhra University, Andhra Pradesha	24	4.87
Dr, B R Ambedkar Univers ity, Andhra Pradesha	34	6.90
Dravidian University, Andhra Pradesha	08	1.62
Sri Krishnadevaraya University, Andhra Pradesha	19	3.85
Sri Venkateshwara University, Andhra Pradesha	14	2.84
Alagappa University, Tamilnadu	15	3.04
Annamalai University, Tamil nadu	07	1.42
Bharathiar University, Tamilnadu	10	2.03
Bharathidasan University, Tamilnadu	10	2.03
Madurai Kamaraj University, Tamilnadu	11	2.23
Periyar University, Tamilnadu	09	1.83
Central University of Tamilnadu, Tamilnadu	13	2.64
University of Madras, Tamilnadu	11	2.23
Pondicherry University, Puducherry	38	7.71
Total	**493**	**100**

5. Data analysis and interpretation

Table 1: Demographic characteristics of the respondents

Demographic of Information		Frequency (N=493)	Percentage
Gender	Male	217	44
	Female	276	56
Social Background	Rural	390	79.1
	Urban	103	20.9

The table 1 summarises the demographic characteristics of the respondents, specifically focusing on gender and social background distribution. The table shows that 56% of respondents are female, while 44% are male. The table also shows that 79.1% of the students are from rural backgrounds, while 20.9% are from urban backgrounds. The table reveals that a significant proportion of female students have joined the LIS course.

Table 2: Awareness and use of library automation software

Library Automation Software	Aware and Use	Aware	Not Aware	f-value	P value
Koha	252 (51.1)	217 (44)	24 (4.9)	1.217	.271
LibSys	89 (18.1)	294 (59.6)	110 (22.3)	.771	.380
Libsoft	40 (8.1)	215 (43.6)	238 (48.3)	11.787	.001
NewGenlib	73 (14.8)	178 (36.1)	242 (49.1)	.033	.856
Easylib	70 (14.2)	179 (36.3)	244 (49.5)	6.368	.012
SOUL	120 (24.3)	256 (51.9)	117 (23.7)	3.191	.075
E Granthalaya	79 (16)	199 (40.4)	215 (43.6)	3.924	.048

The data in table 2 shows the awareness and utilisation of library automation software among LIS postgraduate students. The data indicates that Koha software is the most widely used among students (51.1%), followed by SOUL library automation software (24.3%) and LibSys (18.1%). However, LibSoft library automation software appears to have the lowest usage among students (8.1%). This table indicates that a more significant number of students are not aware of Easylib. NewGenlib and Libsoft.

The One-way ANOVA results indicate significant differences in opinions among LIS students for Libsoft (p=.001), Easylib (p=.012) and E Granthalaya (p=.048).

Table 3: Awareness and use of digital library software

Digital Library Software	Aware and Use	Aware	Not Aware
DSpace	160 (32.5)	261 (52.9)	72 (14.6)
Greenstone	141 (28.6)	231 (46.9)	121 (24.5)
E-prints	88 (17.8)	268 (54.4)	137 (27.8)
Fedora	31 (6.3)	163 (33.1)	299 (60.6)

The data presented in table 3 shows the awareness and utilisation of digital library software among postgraduate students. This table indicates that D-Space software is the most of the students aware and used (32.5%). Followed by Greenstone (28.6%) and E-prints (17.8%); interestingly, a notable percentage (6.3%) of the students expressed a lack of proficiency in using Fedora digital library software.

Table 4: Awareness and use of content management software

Content management software	Aware and Use	Aware	Not Aware
Drupal	42 (8.5)	238 (48.3)	213 (43.2)
Joomla	44 (8.9)	186 (37.7)	263 (53.3)
WordPress	57 (11.6)	190 (38.5)	246 (49.9)
Bluevoda	29 (5.9)	47 (9.5)	417 (84.6)
Atex	32 (6.5)	33 (6.7)	428 (86.8)
TYPO3	22 (4.5)	28 (5.7)	443 (89.9)
Kentico CMS	24 (4.9)	31 (6.3)	438 (88.8)

Table 4 shows the awareness and utilisation of content management software among postgraduate students. It indicates that WordPress is the most utilised content management software, with (11.6%) of students using it, followed by Joomla (8.9%) and Drupal (8.5%) usage. The study observed that WordPress, Joomla and Drupal are the most widely used content management software among LIS students.

Table 5: Awareness and use of the Reference management software

Reference management software	Aware and Use	Aware	Not Aware	F-value	P value
Mendeley	86 (17.4)	199 (40.4)	208 (42.2)	5.809	.016
Zotero	56 (11.4)	154 (31.2)	283 (57.4)	.273	.601
End Note	43 (8.7)	126 (25.6)	324 (65.7)	25.170	.000
ProCite	29 (5.9)	47 (9.5)	417 (84.6)	1.819	.178
EasyBib.com	31 (6.3)	55 (11.2)	497 (82.6)	.468	.494
RefWork	23 (4.7)	52 (10.5)	418 (84.8)	2.006	.157

Table 5 shows the awareness and utilisation of reference management software among postgraduate students. It indicates that Mendeley is the most utilised reference management tool by students (17.4%), followed by Zotero (11.4%) and EndNote (8.7%) usage. Additionally, the study reveals a lack of awareness among students about EasyBib.com, ProCite and RefWorks reference management tools.

The result of the One-way ANOVA, grouped by awareness and utilisation of reference management software, clearly shows a significant difference in the opinion among the LIS students. Only two variables exhibit substantial differences such as Mendeley (p=.016) and End Note (p=.000).

Table 6: Reasons for unawareness of library automation, digital library, reference and content management software.

Frequency	Male (n=217)		Female (n=276)		Both (n=493)	
	Male	%	Female	%	Total	%
Not included in the syllabus	72	33.2%	73	26.4%	145	29.4%
Lack of subject experts to teach	67	30.9%	56	20.3%	123	24.9%
Teacher has thought it, but I could not understand/learn	29	13.4%	37	13.4%	66	13.4%
Lack of availability of software	71	32.7%	77	27.9%	148	30%
Lack of computer and ICT lab facility	54	24.9%	67	24.3%	121	24.5%
Lack of information about the software	72	33.2%	65	23.6%	137	27.8%
I do not have smartphone, laptop/desktop	47	21.7%	34	12.3%	81	16.4%
I am not interested to learn	35	16.1%	21	7.6%	56	11.4%
Lack of time	35	16.1%	28	10.1%	63	12.8%

The data presented in table 6 shows the reasons for not knowing about the softwares. LIS students' primary obstacle was the lack of software availability (30%) of the respondents experiencing these challenges. Additionally, other major reasons were identified as follows: not being included in the syllabus (29.4%), lack of information about the software (27.8%), and lack of subject experts to teach (24.9%). Furthermore, the study reveals that most postgraduate students rated the lack of software availability.

6. Discussion

The study found that Koha is the most commonly used library automation software among LIS students, indicating its strong presence and acceptance in South Indian universities. However, it also revealed a significant lack of awareness about other automation tools such as Easylib, NewGenlib, and Libsoft. This suggests a need for broader exposure and training on various available software to ensure that students are well-versed with multiple tools. DSpace emerged as the most utilised digital library software, highlighting its effectiveness and popularity. On the other hand, there is a notable gap in awareness regarding content management software like Atex, Kentico CMS, and TYPO3 among the students. In terms of reference management, Mendeley and Zotero are the most widely used tools, but there is limited awareness of other tools such as EasyBib.com, ProCite, and RefWorks. These findings suggest that while some tools are widely adopted, there is a general lack of comprehensive knowledge about the full spectrum of available resources. Postgraduate students also reported challenges such as the unavailability of software, gaps in the syllabus, and insufficient information about software, which hinder their ability to fully utilise these tools.

7. Conclusion

The study underscores the need for improved infrastructure, expertise, and device accessibility to enhance the understanding and awareness of library automation and digital library software among LIS students. The findings highlight significant gaps in the curriculum and the availability of information about various software tools. To address these issues, the study recommends better information dissemination and access to knowledgeable instructors who can provide effective guidance on software utilisation. By improving curriculum design and ensuring the availability of diverse software tools,

universities can better equip LIS students with the necessary skills and knowledge to effectively use automation, digitisation, and reference management tools in their future careers.

8. Recommendations

a) Conduct needs assessments to identify relevant software skills and tools, and organise interactive training workshops or webinars with practical exercises.

b) Encourage and support all genders in pursuing technical roles by providing ample software training opportunities.

c) Integrate software tool training into the LIS curriculum with practical assignments to reinforce learning.

d) Prioritise investment in educational institutions' software and ICT lab facilities by allocating funds for hardware, software licenses, and maintenance.

e) Allocate funding to establish and maintain software and ICT labs, and implement training programs for educators and IT staff.

f) Design practical training modules within the LIS curriculum that provide hands-on experience with essential software tools.

g) Organisespecialised workshops or seminars on specific software applications, conducted by industry experts or experienced professionals.?

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