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Skills and Competencies for Scholarly Communication: An Indian Perspective

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Abstract:

Rapid development of technology, coupled with changes in research practices have profoundly impacted scholarly communication. The system of scholarly communication is disrupted largely by the digital technologies which have also thrown up a plethora of novel options for communicating and establishing the scholarship. Along with the myriad opportunities that technology offers, researchers are also challenged to cope up with the overwhelming pace of these changes. Libraries play a pivotal role in the research process and respond to new trends in the field. For academic and research libraries, it is imperative to prioritize strategies responding to the emerging trends. User needs and expectations are driving them to develop new resources and service areas. Library professionals need to develop new skills and competencies to extend new services or to realign the old services to meet the needs of the researchers. While there have been studies in many countries investigating the knowledge and skills requirements for the scholarly communication, scanty literature is found with reference to Indian libraries. This paper presents results of comprehensive study drilling down the response of librarians to the nuances of scholarly communication in the Indian context. It attempts to ascertain the services extended by the libraries in the current context of scholarly communication and tries to identify and scale the corresponding skills and competencies possessed and required by the librarians.

Keywords: Skills and Competencies, Research Libraries, Scholarly Communication, Research support, training programs, University Libraries

1. Scholarly Communication: Changing Scenario

Scholarly communication is the process by which academics, scholars, and researchers create, share and publish their research so that it is available to the wider academic community. It is defined as ‘the system through which research and other scholarly writings are created, evaluated for quality, disseminated to the scholarly community, and preserved for future use.’ (Association of College and Research Libraries, 2002)

Modern digital scholarship requires researchers to traverse around complex research and publication world. The dynamic nature of the scholarly communication in the altered research environment has prompted librarians to take a fresh look at the libraries and librarians’ role. In order to be at the center-stage of the research process, libraries need to take up new roles which require developing new skills and competencies.

University libraries play a pivotal role in the research process and respond to new trends in the field. User needs and expectations are driving libraries to develop new resources and services. Library professionals need to develop new skills and competencies to extend new services to realign the old services. As the entire canvas of publishing has changed, librarians need to possess requisite knowledge and skills to advise faculty on new avenues of publishing modes and issues of publications along with criteria to evaluate journals. Institutional Repositories(IR) have become the cornerstone of library scholarly communication initiatives. Hence, the knowledge of IR software, skills to apply metadata schema and develop requisite policies are essential. With the issues of Digital Rights Management(DRM) and author rights, copyright have emerged as core components of academic scholarly communication. Funder mandates and competencies to assist faculty to fulfil the mandates like making publication open access and Research Data Management (RDM) are very important to support researchers. Librarians need to be aware and have skills to assess and utilize new and emerging research metrics associated with various novel forms of publications. The emerging environment calls for new skills and competencies and adequate professional training in many of these areas that will help the librarians navigate through the shifting patterns of the scholarly communication, intertwined with research. The present paper reports the survey of Indian university libraries and the skills and competencies required for librarians in the area of scholarly communication.

2. Scholarly Communication: Scenario in India

Parallel to the global developments, scholarly communication in India was also initially recognized through the society publications. Following the foundation of the Asiatick Society in 1784 their publication ‘The Asiatick Researches’ or ‘Transactions of the Society’ was instituted in Bengal. Scientific and scholarly research in modern India goes back to the establishment of universities during the British rule in the later half of the nineteenth century. Post-independent India saw the setting up of a very large number of research institutions, universities and professional societies, which in turn led to the publication of new journals. Various efforts at government level were initiated to support the scientific and scholarly information dissemination along with creating robust infrastructures and providing grants. The establishment of national level documentation centres such as National Social Science Documentation Centre (NASSDOC) and National Information System on Science and Technology (NISSAT), strengthening of the information provision along with the establishment of the National Information Centres (NIC) and further by the establishing Information and Library Network (INFLIBNET) were important milestones. As the publishing scenario became complex and the escalating costs of serials hindered the access to information restricting access to the research published elsewhere. Taking advantage of the technological advances the formation of various national level consortia like Indian National Digital Library in Engineering Sciences and Technology (INDEST) and University Grants Commission-

Information Network (UGC-INFONET) offered hope to the researchers and libraries struggling to fulfill information requirements. Libraries were quick to adopt Open Access (OA). Keeping pace with the research practices which have become information-intensive, collaborative and network-based, the Indian university libraries utilized available technological advances and offer value-added services.

3. Literature Review

While there are studies in USA, UK, Australia, South Africa, Nigeria, Pakistan, investigating the knowledge and skill requirements for the scholarly communication, scanty literature has been identified with reference to Indian libraries. There are lists and documents of competencies and skills for scholarly communication prepared by associations and regional consortia like CARL, CILIP, NASIG and SLA. But Indian library association or consortium have not yet published such a list of skills and competencies for scholarly communication. In Sewell's (2017) study of people involved in scholarly communication, institutional repository and copyright were the skills most used, closely followed by OA, content discovery and understanding metrics (55%).

Listing the core competencies required by the scholarly communication librarians, the task force of North American Special Interest Group (NASIG) proposed the toolbox, associated with the scholarly communication librarians and core competencies divided in following areas: (NASIG, 2017)

- Institutional Repository Management
- Publishing Services
- Copyright Services
- Data Management Services
- Assessment and Impact Metrics
- Personal Strengths

The Special Libraries Association (SLA) listed various competencies for information professionals. These guidelines include a wide range of library services. (Special Library Association, 2016)

Schmidt, Calarco, Kuchma, and Shearer (2016) detailed new competency profiles for librarians and further classified library activities in scholarly communication and open access. Raju (2014) carried out a study on the knowledge and skills required by the academic librarians in the technology-based environment in South-Africa.

An exhaustive study by Auckland (2012) found that liaison roles are changing and research libraries are grappling with defining the scope of these new roles. Stressing the need for librarians to acquire new skills in relation to scholarship, particularly e-scholarship. The ARL Strategic Plan 2010-2012 advocates that librarians need to gain better understanding of the research process and develop a research mindset to embrace new roles particularly with recent areas such as open access and funder mandates, data management, and bibliometrics.

Hashim and Mokhtar (2012) studied issues, trends and challenges and identified professional and personal strengths in preparing new era librarians and professionals. Mazumdar (2007) studied the skills required for the borderless academic libraries in India

Thus the literature reviewed indicated that librarians must possess and develop skills and competencies to meet the challenges thrown open by the new scholarly ecosystem.

4. Objectives

The survey was conducted with following objectives:

- To examine the current research support services extended by the university libraries in India
- To identify skills and scale the level of proficiency of the skills and competencies needed for scholarly communication services among the LIS professionals in the University Libraries in India
- To examine the ways in which LIS professionals in higher education update their skills
- To ascertain the training needs of the LIS professionals in the area of scholarly communication.

4.1 Research Methodology

Considering the above-mentioned objectives, the descriptive research design was used. Survey method with a questionnaire was deemed to be appropriate. Based on the research lifecycle model having four stages of research, (I-Idea Discovery, II-getting prepared, III-conducting research, IV-publication and dissemination) corresponding services were listed for participants to identify which of these were extended by their libraries. Skills listed for participants to scale their level were based on CILIP and NASIG guidelines. The questionnaire was administered for University Librarians /Deputy Librarians. Ascertaining that the sample represented all parts of India: North, West, Eastern India and Southern India, it was administered using online survey software 'Survey Monkey.'

4.2. Profile of Universities.

The respondents included 45 universities with 23 state universities (52%), 8 deemed universities (17%), 7 central universities (15.5%) 5 national institutes of Importance (11%) and 2 state private universities (5.5%).

4.3 Findings of the Study

The findings of the study have been primarily represented in two parts. In the first it describes the services extended by libraries based on the research life-cycle model and in the next it results of the levels of the skills and competencies are presented.

4.3.1. Stage 1 services- Facilitating discovery of resources has always been the prime role of the library. Majority of the Libraries facilitate in-depth discovery services (85%) and many of the libraries provide research guides/tutorials to the users. (71%). Scholarly communication training is imparted by more than half the libraries (51%). But only 31% provide research commons. One of the respondents mentioned about having a compulsory non -credit course for post graduate students and researchers.

4.3.2. Stage 2 services -63% of Libraries help their researchers to be prepared for research by providing information on funding sources and policies. Libraries have taken moderate steps to help researchers with RDM plans (24.5%) and help with respect to compliance with OA mandates is low (38%). These are new requirements which researchers are expected to comply gradually. Librarians have been upgrading themselves to extend services in these areas. 20% librarians did not extend any support in this preparatory stage of research.

4.3.3 Stage 3 services -Most of the libraries (91%) provide services for managing citations. Many of the libraries provide guidance on ethics in research (65%) and requisite software for research (65%). Some libraries also provide service for preservation of long term data (38%). A couple of libraries provided information on OER and IPR.

4.3.4 The services provided by the libraries for the dissemination stage presented in following table: (Stage 4 services)

Table 1: Services for Dissemination of Research Stage

Services	Responses	Percentage
Anti-plagiarism software	42	93.33%
Assisting in publication process	36	80.00%
Style Guidance and Reference Management Software	35	77.78%
Building and maintaining IR	30	66.67%
Identifying predatory publishers	27	60.00%
Building and maintaining ETD	27	60.00%
Assisting with OA publication	25	55.56%
Compliance with Copyright conditions laid down by publications.	23	51.11%
Improving visibility of the publications	23	51.11%
Helping researchers with their author profiles	19	42.22%
Assisting with research evaluation and Metrics	19	42.22%
Any Other		0.00%
	Total Responses	45

Most of the libraries (93.3%) provide anti-plagiarism software, assist in publications (80%), and render help with style guides and reference management software (77.78%). 2/3rd (66.67%) of the libraries have built and maintained IR while 60% have built ETDs. Less than half of the libraries were helping creating researchers' profiles and understanding research evaluation metrics. The availability of the anti-plagiarism software in majority of the libraries is a result of consortia subscription through India's national consortium e-Shodhsindhu facilitating access and has enabled libraries to extend this service.

4.2.5. Before analyzing the specific skills and competencies for scholarly communication, a personal skill set is discussed

Table 2: Personal Strengths and Competencies

Skills for Services	None		Basic		Intermediate		Advance		Total	Wt.Avg
Awareness about changes in technology and application to scholarly communication	2.22%	1	17.78%	8	44.44%	20	35.56%	16	45	3.13
Knowledge about changing scholarly publishing patterns and policies of publishers, licensing, and DRM	6.82%	3	13.64%	6	50.00%	22	29.55%	13	44	3.02
Knowledge of emerging and social media platforms	0.00%	0	26.67%	12	44.44%	20	28.89%	13	45	3.02
Skills to develop programs online and offline in Information Literacy for novice researchers	2.22%	1	28.89%	13	42.22%	19	26.67%	12	45	2.93
Ability to communicate and engage with all stakeholders, contribute to policy documents	6.67%	3	24.44%	11	37.78%	17	31.11%	14	45	2.93
Ability to build positive relationships and collaborate with different members of the institution	4.44%	2	28.89%	13	35.56%	16	31.11%	14	45	2.93
Ability to deal with dynamic nature of research environment.	4.55%	2	36.36%	16	40.91%	18	18.18%	8	44	2.73
							Total Responses		45	

Awareness about changes in technology and its application to scholarly communication topped in the personal strengths of the professional staff in universities (wt. average 3.13) Knowledge about changing scholarly publishing patterns and policies of publishers, licensing, and digital rights management was on the second (WA= 3.02). Librarians have scored low on their ability to deal with dynamic nature of research environment and also in the ability to engage and communicate with all their stakeholders. (WA=2.73)

Table 3: Skills related to Collection and Retrieval

Knowledge and skills	None		Basic		Intermediate		Advanced		Total	Wt Avg
Information retrieval (Databases)	0.00%	0	4.44%	2	22.22%	10	73.33%	33	45	3.69
Information retrieval (Search Engines)	0.00%	0	8.89%	4	17.78%	8	73.33%	33	45	3.64
Budgetary Management for escalating prices	6.82%	3	11.36%	5	36.36%	16	45.45%	20	44	3.2
Negotiation with Publishers	2.22%	1	17.78%	8	40.00%	18	40.00%	18	45	3.18
To decipher licensing agreements of the publishers	6.67%	3	15.56%	7	40.00%	18	37.78%	17	45	3.09
DRM	13.64%	6	25.00%	11	36.36%	16	25.00%	11	44	2.73
							Total responses		45	

Averages in Table no. 2 indicate that knowledge and skills of information retrieval from databases and search engines are adequately acquired by the professional staff. According to university librarians, 73% staff is having advanced level skills in this area. Hence most of the libraries provided in-depth discovery as seen earlier in 4.3.1

The skills like budgetary management for escalating prices negotiations with publishers and DRM are on lower side. Knowledge and skills to decipher licensing agreements of the publishers and skills for negotiations with the publishers are among the most desirable skills. But for these, basic, intermediate and advanced skills are possessed by less than 50% staff., DRM being the lowest (average 2.7) Thus, DRM emerges to be the most needed skill to be updated.

Table 4: Skills for Funder Mandates and RDM

Knowledge and Skill	None		Basic		Intermediate		Advanced		Total	Wt Avg
	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count		
About mandates from Int and national funding agencies	13.33%	6	55.55%	25	23.26%	10	8.88%	4	45	2.16
SHERPA/JULIET	23.26%	10	53.49%	23	20.00%	9	6.66%	3	45	2.0
RDM practice	34.15%	14	48.78%	20	17.07%	7	6.66%	3	44	1.83
Basic training to researchers on RDM	33.33%	15	44.44%	20	15.56%	7	6.66%	3	45	1.82
Tools and software available (DMP Tool)	33.33%	15	44.44%	20	15.56%	7	6.66%	3	45	1.8
Skills to impart advance RDM training	33.33%	15	50.00%	22	13.64%	6	4.44%	2	45	1.77
Other	0.00%	0	0.00%	0	0.00%	0	0	0	0	0
					Total responses				45	

Though the averages in these areas of skill seemed to be lower compared to other skills and most of the librarians did not possess skills for RDM. They did have basic and intermediate knowledge of funder mandates and ways to find mandates.

Table 5: IR/ETD

Knowledge and skills	None		Basic		Intermediate		Advanced		Total	Wt. Average
To select and implement IR/ETD software	2.22%	1	24.44%	11	42.22%	19	31.11%	14	45	3.02
To collect store and preserve the intellectual output of the researchers	2.22%	1	24.44%	11	44.44%	20	28.89%	13	45	3.00
Policy development for campus with respect to sharing and deposit and preservation considering funder and publishers' requirements	8.89%	4	20.00%	9	44.44%	20	26.67%	12	45	2.89
Ability to apply publishers' policies about archiving in IR	8.89%	4	24.44%	11	35.56%	16	31.11%	14	45	2.89
To select appropriate metadata schemata for interoperability	8.89%	4	26.67%	12	33.33%	15	31.11%	14	45	2.87
Licensing agreements with various publishers for different forms of electronic resources	11.11%	5	26.67%	12	42.22%	19	20.00%	9	45	2.71
							Total Responses		45	

Most librarians possessed skills related to IR and ETD. Some of them possessed advanced knowledge and skills to select and implement appropriate software for IR/ETD and skills to collect store and preserve the intellectual output of the researchers. There were less than 2.5% of the researchers who did not possess any skills in this area.

Table 6: Skills to assist with Publications

Knowledge /Skills	None		Basic		Intermediate		Advanced		Total	Wt. Average
To use different citation styles and citation management software	0.00%	0	17.78%	8	37.78%	17	44.44%	20	45	3.27
Criteria of evaluation of various journals	0.00%	0	20.00%	9	37.78%	17	42.22%	19	45	3.22
Various Publishing avenues	6.67%	3	20.00%	9	31.11%	14	42.22%	19	45	3.09
About publishing policy development for university	4.55%	2	22.73%	10	43.18%	19	29.55%	13	44	2.98
Understanding and imparting information about sources like COPE and SHERPA/ROMEIO	24.44%	11	26.67%	12	31.11%	14	17.78%	8	45	2.42
Various options for licensing works using Creative Commons and its types	15.56%	7	40.00%	18	31.11%	14	13.33%	6	45	2.42
To providing publishing services via local or hosted digital publishing platforms for journals or conferences	17.78%	8	37.78%	17	28.89%	13	15.56%	7	45	2.42
Author rights	25.00%	11	34.09%	15	31.82%	14	9.09%	4	44	2.25
							Total	Responses	45	

Knowledge and skills to use different citation styles and citation management software (Commercial and Open) and criteria of evaluation of various showed the highest average in the area of publications whereas knowledge about author rights showed lowest average.

Table 7: Skills related to visibility and Metrics of publications

Knowledge /Skills	None		Basic		Intermediate		Advanced		Total	Wt. Avg
To use social media for increasing visibility	6.67%	3	35.56%	16	28.89%	13	28.89%	13	45	2.80
Indicators of research impact	4.44%	2	37.78%	17	33.33%	15	24.44%	11	45	2.78
To help researchers create and manage their Author profile	6.67%	3	40.00%	18	28.89%	13	24.44%	11	45	2.71
Emerging alternative measures of impact	13.33%	6	31.11%	14	37.78%	17	17.78%	8	45	2.60
							Total	Responses	45	

Averages show that skills for the social media are highest. Knowledge of emerging alternative measures of impact are the highest ranked competencies at intermediate level. The author profiling area is a new and emerging area and librarians have acquired knowledge and skills to extend service in this area too.

Table 8: Areas of Training

Areas	Responses	Percentage
RDM	38	84.44%
Licensing and DRM	37	82.22%
Copyright and author rights	33	73.33%
Digital Scholarship	29	64.44%
Upgradation in Technology usage	24	53.33%
E-Science	21	46.67%
Total Responses	45	

The highest needed training area specified by the participants is research data management. Co-relating the percentage of participants' opinions with the table 4, which reflects that 35% do not possess RDM skill and more and 48% possess only basic skills. It is therefore justified that the participants have scored RDM as the most needed area for training. Looking at the spread of percentages for digital rights management (table 3), viz., None 13.64%, Basic 25%, Intermediate 36% and Advance 25% also corroborate these findings that the participants have preferred it as second preferred area for training. Copyright and author right is the most preferred area of skills among the top five skills. One of the universities mentioned that the vibrancy of the library and the librarian can be seen from the enhanced research output and h-index of the university during the last five years.

Table 9: Expertise from allied fields

Allied Fields	Response	Percentage
Information Technology	41	91.11%
Legal (IPR)	38	84.44%
Research Methodology	28	62.22%
Academic Writing	21	46.67%
Other	3	6.67%
Total Responses	45	

Most of the respondents have prioritized ICT, followed by knowledge of legal issues like IPR, as areas of expertise from allied fields necessary in providing services related to scholarly communication. Academic writing and research methodology score low probable reasons for the same is the research experience of the librarians.

Table 10 Methods of Knowledge/Skill Development

Twelve areas of competencies were listed as seen in Table 10 and asked the participants as to how did they and their team members develop their knowledge about these areas.

Areas of Development	Formal education		On the job training		Self-directed learning		Attending CEPs		Total
	%	Count	%	Count	%	Count	%	Count	
Databases and Search Strategies	11.11%	5	22.22%	10	48.89%	22	17.78%	8	45
Innovations in academic publishing	2.27%	1	13.64%	6	65.91%	29	18.18%	8	44
IR management	2.27%	1	25.00%	11	15.91%	7	56.82%	25	44
E-resource pricing/subscription models	6.82%	3	34.09%	15	52.27%	23	6.82%	3	44
Social media to support users	0.00%	0	18.18%	8	68.18%	30	13.64%	6	44
Open Access (content discovery)	0.00%	0	18.60%	8	53.49%	23	27.91%	12	43
Open Access Management (APC)	0.00%	0	16.28%	7	67.44%	29	16.28%	7	43
Research Assessment Metrics	2.44%	1	19.51%	8	48.78%	20	29.27%	12	41
Post-cancellation access and archiving (LOCKSS, Portico)	2.56%	1	20.51%	8	64.10%	25	12.82%	5	39
Copyright and IPR	10.81%	4	16.22%	6	51.35%	19	21.62%	8	37
Author Profiling Systems	2.78%	1	13.89%	5	52.78%	19	30.56%	11	36
RDM	2.86%	1	25.71%	9	37.14%	13	34.29%	12	35

It is interesting to note that maximum percentage of participants opined that they developed the competencies in most areas, except IR management through self-directed learning like reading or practicing online discussions. Development of IR, being skill oriented activity, the requirement was fulfilled through available training programmes workshops (56.82%) and next by on-the-job training (25%). In presence of training in the area of IR and ETD we can also see from earlier Table 5 that many librarians possessed advance skills in these areas.

Table 10: Top five areas

Participants were also asked to select the top five areas important to provide scholarly communication services

Services	Responses	Percentage
Copyright and Author rights	37	82.22%
Research Data Management	29	64.44%
Research Assessment Metrics	28	62.22%
Licensing /Pricing of E-resources	26	57.78%
Open Access	25	55.56%
Institutional Repositories	21	46.67%
Innovations in scholarly publishing	19	42.22%
Innovations in Research	16	35.56%
Facilitating In-depth Search	14	31.11%
Post cancellation Access	10	22.22%
Funding Options	7	15.56%
Management/Leadership	6	13.33%
Total Responses	45	

The emerging results bring forth copyright and author rights, Open Access, RDM, research assessment matrix and IR as topmost five areas getting maximum percentage. It is pertinent to note that area of management and leadership, though accepted as universal skill area has got low scoring.

Open ended responses from the participants were eloquent to suggest that scholarly communication is possible only with multi-faceted and knowledgeable librarians with good communication skills. They also remarked that in spite of having required expertise, continuous training is required in areas such as legal and data science and training in digital scholarship. Staff crunch is also sensed by the librarians.

Recommendations

Today, the scholarly communication process has advanced and researchers are at cross-roads with focus on both achievements and challenges at every step. The study revealed the significant trend of changing services according to the changing expectations of scholarly community and helped identifying priority areas for upskilling and reskilling for these services. It brought forth the requirement of skills in the areas of copyright and author rights, RDM, digital scholarship and OA mandates. Accordingly, the training needs in the same areas were underlined.

Librarians need to inculcate personal strengths and attributes like thinking critically and dealing with dynamic nature of research environment. The ability to communicate and engage with all stakeholders, contribute to policy documents and to build positive relationships, work with diverse groups and collaborate and with different members of the institution are crucial to the new age role of the librarians.

Indian LIS associations should adopt a leading role by releasing a definitive list of skills and competencies for scholarly communication. Further, they should try to foster training culture taking up the areas suggested. The schools and departments of Library Science can design skill oriented training programmes on the latest cutting edge technologies and above-mentioned subject areas. They should also conduct continuing education programmes focussing these areas. Library Science curricula should incorporate the developments in the areas of scholarly communication. The Human Resource Development Centres of UGC (Academic Staff Colleges) can also take initiatives in conducting short courses for University Librarians.

Thus the overall picture of university libraries in India for the delivery of scholarly communication services and skills and competencies is bright and promising and is in sync with international developments. Further research on expectations of researchers if conducted will be beneficial and will give a definitive path for upskilling in the area of scholarly communication.

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