Research Assessment and Management: The narratives from academic libraries’ efforts

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Abstract

This paper explains various Research assessment methods, components, and management techniques. This paper looks at different research metrics across different fields and how they can help increase the quality and effectiveness of research. With the help of the Web of Science Core Collection database, the literature of the last five years were explored. Examines the different types of research management systems available within institutions and how the increasing use of quantitative indicators impacts various aspects of research. The assessment of research quality and accountability for research funding are significant issues in higher education. Research management encompasses a wide range of topics, including the ability and motivation of personnel to carry out research activities, the adequacy of the research to the requirements of stakeholders, including the host university, and the utilization of the results.

The paper has analyzed the literature in the context of responsibly using quantitative and qualitative indicators when assessing and managing research. To propose a framework, the study has explored various Research Portal of National and International Universities and studied the Research Data Software and applications used for framing the best indicators in research and management.

Keywords: Research Assessment, Academic Libraries, Research Data Management, Research metrics, Quantitative and qualitative indicators, Universities Research portals, Research funding
Introduction

Quality research is used to encompass all aspects of a study's design, including the assessment of the equivalence of methods and questions, the selection of participants, the quantification of results, and the prevention of adverse effects. High-quality research delivers reliable, ethical, peer-reviewed, and relevant evidence to policy-making while adhering to professional, transparent, accountable, and auditable standards. Webster's Dictionary defines Accountability as having four main components: responsibility, answerability, trustworthiness, and liability. The four pillars of Accountability mean that wherever and however we are, we need to do our part for what society is giving us, whether it's money, time, work, or research. It's far from what we know to what we don't. Accountability in research is concerned with reviewing and critically assessing procedures and systems for promoting integrity in research. It is an international, interdisciplinary forum for creating ethical practices, policies, standards, and concepts for promoting ethical conduct in research and improving the quality of research results. According to Shelby Martin, Accountability means being mindful, accepting, honest, and courageous to do what we do best.

Research Funding and Libraries

Research funding organizations are cognizant of the necessity of infrastructure and services for managing and preserving research data. Research libraries have been identified as the initial source of research data management services, encompassing data management planning, digital curation (selection, preservation, archiving, metadata creation), and conversion. Nevertheless, certain libraries are beginning to provide a framework for managing research data. As local data policies are developed, some services are beginning to record some success.

Benefits of Research Funding for Libraries

- Research funding can be used to purchase new materials and equipment for library users.
- It can be used to hire additional staff to support the research activities of library users.
- Research funding can be used to fund research projects and activities that are beneficial to library users.
Challenges of Obtaining Research Funding for Libraries

- Libraries may lack the expertise to apply for and manage research funding properly.
- Libraries may not have the resources to compete with other organizations for research funding.
- Libraries may be unable to access all available sources of research funding.

Research Metrics and Libraries

The purpose of research metrics is to measure and track the significance of published research. Citation metrics are also utilized in some university ranking methodologies and when benchmarking institutions. Measuring research performance is primarily driven by the need to make funding decisions. Research metrics have limitations, so there is a lot of discussion and activity about responsible metrics to ensure that measures are used responsibly and that stakeholders have a fair chance.

Research metrics are numerical indicators used to evaluate the quality and effectiveness of research results. These metrics can be used at the journal, article, and researcher levels. Quantitative indicators or measures are used to measure the impact of research output, such as a journal, journal article, book, book chapter, or overall research productivity. These metrics can be divided into bibliometrics (based on citation counts) and altmetrics (based on web-based metrics). Bibliometrics measure the number of times a publication is cited in another publication, while altmetrics measure the attention or interest a scholarly work has generated on various online platforms, such as social media, blogs, educational sites, news outlets, forums, and other online resources. Both metrics are essential for assessing and understanding the impact of research.

Research impact analysis services provided by libraries can be utilized in various ways. For instance, libraries can:

- Organized workshop dedicated to developing research techniques and resources for researchers.
- Assist in determining which tool will be most suitable for your analysis objectives.
- Indicate resources and methods to carry out a study at the author level.
- Make suggestions for tools and techniques to carry out article-level research analysis.
- Offer instruction and training on how to use citation analysis tools.
- Assist in the usage of citation databases with specialized content.
- Assist in using journal-level metrics, including Eigen factors, Journal Impact Factors, and Journal Ranking.
- Help with the application of particular Journal Ranking Tools.

**Research Management and Libraries**

Research data is the information generated by researchers when they carry out research activities or projects. It can be in text, quantitative data, qualitative data, pictures, recordings, music, verbal communications, experimental data, simulations, codes, etc. Research data management services are services provided by university libraries to facilitate the management, organization, curation, and storage of research data produced by their divisions and laboratories for the purpose of re-utilization and distribution.

Research Data Management (RDM) is a set of best practices for the efficient and productive collection, storage, utilization, sharing, and preservation of research data. It encompasses the infrastructure, tools, and associated services associated with managing research data, which can vary significantly throughout its lifecycle (Schmidt & Shearer, 2016; Schmidt et al., 2016).

**Role of Libraries in RDM**

Research data management policies and programs have now become the responsibility of academic libraries as they are involved in storing, managing, and archiving data. Due to the increasing reliance on technology and research funding bodies’ mandates for data management and sharing, academic libraries must adapt to their faculty’s evolving needs and think about how best to engage with e-science through a library-based research data management solution (Tenopir, 2014). Academic libraries have been instrumental in managing research data, providing plans and tools to manage data, links to case studies and training materials, guides, and research data consultation groups. This has enabled researchers to keep track of data life cycles, publish and store data according to their needs, use metadata to describe data, and store data in the right file formats, ideally non-exclusive formats. (Tripathi; Sonkar & Shukla 2017).
Research Portals of Universities

University research portals are fundamental resources for students, faculty, and staff. They offer access to a broad array of research resources, such as databases, journals, and other sources, and the capacity to conduct research searches and generate personalized research profiles.

A research portal is a web-based collection of resources and information about a particular subject or study area. It provides researchers with a comprehensive and well-organized collection of data, documents, and other materials they can use to advance their studies. It can also provide users access to a range of services and resources that can assist them in the research process.

Benefits of research portals

The purpose of research portals is to make it simpler for researchers to accurately and quickly locate relevant data.

- A wide range of resources, including books, images, videos, articles, and more, are accessible through them.
- Users of research portals may also have access to specialized databases and software that can assist them in data analysis and conclusion-making.

Examples of Research Portals

- The National Institutes of Health's PubMed Central is an example of a research portal.
- Another example of a research portal is the Digital Library of the National Institutes of Health (NIH).
- Google Scholar is a popular research portal that provides access to various scholarly materials.

Method

With the help of Web of Science (WoS) Core Collection database, literature of last five years were explored. Another database, i.e., Google Scholar was searched to discern the studies and shared experiences from across the globe. With the following phrases/word strings, the literature were browsed, searched and finalized to be included for the study and analysis:

i. Research Quality And Accountability in universities
ii. Research Funding And Libraries
iii. Research Metrics And Libraries
iv. Qualitative And Quantitative Indicators In Research
v. Research Management And Libraries
vi. Research Portals Of Universities  

vii. Research Data Software And Applications  

**Scope**  
The databases explored are limited to WoS and Google Scholar, whereas the time frame was limited for both the databases, last five years and since 2000, respectively. Language limitations included the literature from English language publications. Few searches were made India-specific, as well. The duration of searches made was 12th of June, 2023, from WoS.  

**Data Analysis**  

*Research Quality and Accountability in universities*  

<table>
<thead>
<tr>
<th>Publications</th>
<th>Citing Articles</th>
<th>Times Cited</th>
</tr>
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<tbody>
<tr>
<td>143 Total</td>
<td>712 Analyze</td>
<td>771 Total</td>
</tr>
<tr>
<td>From 1969 to 2023</td>
<td>694 Analyze</td>
<td>745 Without self-citations</td>
</tr>
<tr>
<td></td>
<td>Without self-citations</td>
<td>5.39 Average per item</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 H-index</td>
</tr>
</tbody>
</table>

Illustration: 1  

Regarding the search made for the phase of the String research quality and accountability. It was observed that 143 publications were found which were 771times cited.  

*Publication cited over time*  

![Publication cited over time graph]
According to Fig. 1 during the last 5 years, publications and citations were observed at their peak during 2020.

**Visualization: 1**

**Research quality and accountability**

The accountability of universities in higher education has been ascertained since the very past. Quality research and academic adaptations have come towards a long journey with many faces and facets (McInnis, Powles & Anwyl, 1995; Graham, 1995; Dill, 1999; Alexander, 2000; Dill, 2001). Monitoring, assessment, and altering the processes are a few of the steps taken by many institutions (Huisman & Currie, 2004; Brenneis, Shore & Wright, 2005; Brundrett & Rhodes, 2010; Kallio, Kallio, Huusko, Pyykkö & Kivistö, 2022). Universities have been trying to maintain multi-layered accountability with the procedure of performance-based funding and the changing role of academic boards (Frølich, 2011; Rowlands, 2012; Das, Holla, Mohpal & Muralidharan, 2016; Mukhopadhyay & Sarangapani, 2018). With the advent and multifarious implementations of digital technologies, there has been a demand and need for digital transparency, institutional values (Carnegie, Guthrie & Martin-Sardesai, 2022), and quality management in the context of public accountability and autonomy (Ramírez & Tejada, 2019; Pradeep & Aithal, 2022; Harvey, 2023; Al-Zoubi, Qablan, Issa, Batainesh & Al Kaabi, 2023).
Regarding the search made for the phase of the String Research Funding and Libraries. It was observed that 8,270 huge no.of publications were found, which were 91,636 times highly cited. An h-index of 98 was observed, which shows the popularity of this research topic and working area.

![Illustration: 2](image)

According to fig. 2 during the year 2012, most of the publications in this area have emerged.
Research Funding and Libraries

Whereas research data management has become a prominent area of concern in higher education, libraries are not far behind in assisting the awareness of research funding. Most recent studies reflect the experiences of various libraries. Data sharing, research funding and associated impacts are evaluated (Ashiq, Usmani & Naeem, 2022; Dresler, Buddeberg, Endesfelder, Haaker, Hof, Kretschmer & Schmidt, 2022; Thoegersen & Borlund, 2022; Shueb, Gul, Nisa, Shabir, Rehman & Hussain, 2022; Offorha, Walters & Jacques, 2022; Keith & Parnell, 2023).

Research Metrics and Libraries

Regarding the search made for the phase of the String Research Metrics and Libraries. It was observed that 744 publications were found, which were 7361 times highly cited. An h-index of 38 was observed, which shows the interest of the users of this research topic.
According to fig. 3 during the year 2021 most of the publications in this area have emerged.
Research Metrics and Libraries

Research metrics and web metrics are important components in the contexts of research-oriented learning, services, and usage (Khoo, Pagano, Washington, Recker, Palmer & Donahue, 2008, Kinman, 2009; Ochôa & Pinto, 2014; Stuart, 2014) of various research tools in libraries.

Illustration: 4

Regarding the search made for the phase of the String Qualitative and Quantitative Indicators in Research. It was observed that 1,686 publications were found, which were 11,945 times highly cited. An h-index of 40 was observed, which shows the popularity of this research topic and working area.

According to fig. 4 during the year 2022, most of the publications in this area have emerged.
Qualitative and Quantitative Indicators in Research

For qualitative and quantitative research, the measurements and indicators are significant. Such aspects are responsible for accounting for the sustainability and research approaches (Adcock & Collier, 2001; Ainley, Enger & Kennedy, 2008; Scerri & James, 2010; Leavy, 2022; Truijens, Van Nieuwenhove, De Smet, Desmet & Meganck, 2022; Zhang & Sivertsen, 2023; Hirose & Creswell, 2023).

Research Management And Libraries

Regarding the search made for the phase of the String Research Management and libraries. It was observed that 7261 huge no. publications were found of which 63,856 times were highly cited. An h-index of 75 was observed, which shows the popularity of this research topic and working area.
According to Fig. 5, during the year 2022, most of the publications in this area have emerged.
Research Management and Libraries

Most recent times have emerged as data management capabilities and innovative performances. The libraries were not far from implementing such techniques to level up the research-oriented services through research data management (Zotoo, ; Lu & Liu, 2021; Al-Jaradat, (2021; Hamad, Al-Fadel & Al-Soub, 2021; Andrikopoulou, Rowley & Walton, 2021). The research data and services contexts reflect activities in libraries ranging from showcasing and sharing the research to provisions of academic libraries Bishop, Orehek, Eaker & Smith, 2022; Sukula, Chand, Rani, Yadav & Raees, 2020; Singh, Bharti & Madalli, 2022; Xu, Zhou, Kogut & Watts, 2022; Rao, Sukula & Kumar, 2022). The academic libraries have been exploring (Plantin & Thomer, 2023; Chen, Chiu & Cline, 2023; Amanullah & Abrizah, 2023; Safdar, Rehman, Arif & Ashiq, 2023) the platforms, research data management and information discovery.

Research Portals of Universities

Illustration: 6

Regarding the search made for the phase of the String Research portals of Universities. It was observed that 4,629 publications were found, 4,837 times highly cited. An h-index of 32 was observed, which shows the interest of the researchers.

According to fig. 6 during the year 2022, most of the publications in this area have emerged.
Visualization: 6

Research Portals of Universities
In the past, there has been a steady progression in the development of a web-based university research knowledge portal, as well as efforts to assess the effectiveness of the portal and the factors that contribute to its success (Jones, Provost, & Pascale, 2006; Noorman bin Masrek, 2007; Mansourvar & Yasin, 2010; Zhang & O'Halloran, 2013). Web portals emerged as research and knowledge management systems in the universities. There are several examples relating to the rating of student satisfaction with university portals and the strong correlation between information quality of online services web portals and ICT proficiency (Shaltoni, Khraim, Abuhamad, & Amer, 2015; Khwaldeh, Al-Hadid & Alrowwad, 2017; Pandey & Sukula, 2017).

Few studies have come forward to express how efficient are university library portals in India (Kumar & Yadav, 2020; Dangwal & Mishra, 2020; Rani & Aswath, 2020). as well. There are many perspectives to check upon the quality and interactive faces of such portals (Borrelli & Perrella, 2021, Dadhich, Hiran & Rao, 2021; Alatawi, Miskon, Abdullah, Ghabban, Saeed, Alfadli & Ameerbakhsh, 2021 Duvaud, Gabella, Lisacek, Stockinger, Ioannidis & Durinx, 2021). These qualities and features enhance the learning experiences. The roles and impacts of learning and research portals are increasing. Few examples (Pinho, Franco & Mendes, 2022; Sedlmayr, Sedlmayr, Kroll, Prokosch, Gruendner & Schüttler, 2022; Badaru, & Adu, 2022) reflect that university performance and education standards are augmented by the
implementation of web portals. Such impacts are possible due to technology impressions and data discoverability (Chiu, Chen & Cline, 2023; Chen, Chiu, Cline, 2023).

Research Data Software and Applications

Visualization: 7

Citation records are available for 10,000 records or fewer as per WOS Core collection policy.

Discussion

Librarians are well-versed in the process of organizing library resources systematically. They are responsible for various tasks, such as document, record, resource, and metadata management. The emergence of open access and research has revolutionized the roles of libraries, where research output is managed through institutional repositories and research-based information is further managed through research-based repositories. Research funding is the financial support provided to research projects and activities. It is used to cover the costs of research materials and labor costs. Governments, universities, foundations, and other organizations generally provide research funding. Libraries rely on external grants, endowments, and donations to upgrade their collections and services and provide research support for their patrons. In the Indian state of Shodhaganga, libraries and Information Centers of the various world universities with research data repositories have been at the forefront of collecting, maintaining, and granting access to
research data. Similarly, Indian university libraries can expect to play a similar role in initiating research data management. Research funding for libraries is essential for keeping libraries up to date with current research and providing the materials and services needed to support the research of library patrons.

**Conclusion**

Managing research data has become a top priority in every research institution. Most research favors publicly available research data, and research may advise researchers to publish RDM. Many researchers routinely share and incorporate the study data of their colleagues into their work. Researchers' positive attitudes towards sharing and archiving research data show they encounter challenges while attempting to adhere to the research council's obligation. Ensuring that data can be stored safely, is still accessible, and does not impede researcher careers will be the task. It might be challenging for academics to do data management tasks for various reasons. Libraries and academic librarians should assist RDM in some way. Research Data management (RDM) is a pressing issue across all research institutions. Studies have highlighted the need for researchers to document their research data, and most researchers support sharing research data openly. Additionally, many researchers actively utilize and benefit from the research data of their peers.

**References:**


