AN ALTMETRIC ANALYSIS OF RESEARCHGATE PROFILES OF LIS TEACHING FACULTY IN CENTRAL UNIVERSITIES IN INDIA

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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CERTIFICATE

This is to certify that the thesis entitled **"An Altmetric Analysis of ResearchGate Profiles of LIS Teaching Faculty in Central Universities in India"** submitted by **Dibanjyoti Buragohain**, Ph.D. Scholar for the award of the Degree of Doctor of Philosophy in Library and Information is carried out under my supervision and incorporates the student bona-fide research and this has not been submitted for the award of any degree in this or any other university or institute of learning.

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DECLARATION

I, **Dibanjyoti Buragohain**, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/Institute

This is being submitted to the Mizoram University for the degree of **Doctor of Philosophy in Library & Information Science.**

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LIST ABBREVIATION

Abbreviated Term	Description
ALM	Article Level Metrics
ALPSP	Association of Learned and Professional Society Publisher
AMU	Aligarh Muslim University
APA	American Psychological Association
ASCB	American Society for Cell Biology
ASIST	Association for Information Science and Technology
ASNS	Academic Social Networking Sites
AUS	Assam University
BBAU	Babasaheb Bhimrao Ambedkar University
BHU	Banaras Hindu University
CEO	Chief Executive Officer
CUG	Central University of Gujarat
CUH	Central University of Haryana
CUHP	Central University of Himachal Pradesh
CUP	Central University of Punjab
CUTN	Central university of Tamil Nadu
CV	Curriculum Vitae
DoRA	Declaration on Research Assessment
DU	University of Delhi
GGV	Guru Ghasidas Vishwavidyalaya
ICT	Information and Communication Technology
IGNOU	Indira Gandhi National Open University
JAMA	Journal of American Medical Society
LIS	Library and Information Science
MMCU	Mahatma Gandhi Central University
MU	Manipur university
MZU	Mizoram University
NEHU	North-Eastern Hill University

ORCID	Open Researcher and Contributor IDentifier
PDF	Portable Document File
PhD	Doctor of Philosophy
PU	Pondicherry University
R/D	Research and Development
RG	ResearchGate
SAARC	South Asian Association for Regional Cooperation
SNS	Social Networking Sites
SPSS	Statistical Package for Social Sciences
SSRN	Social Science Research Network
TU	Tripura University
USA	United States of America

Chapter 1 - Introduction

CHAPTER - 1
INTRODUCTION

1.1 Introduction

Scientific research is a significant aspect of academic activity, and its proper distribution, dissemination and utilization of resources are of utmost importance for the academic and research fraternity. Rapid changes have taken place in recent decades for scholarly communication. It has also affected many traditional and non-traditional methods of scholarly communication. The change that has affected the traditional method of scholarly communication includes the shift of access to online materials, online publishing, online subscription, and the open access movement. Repositories and open-access publications have dramatically changed people's perception of accessing scholarly materials. The social web has provided another means for the better visibility and impact of scholarly communication among intellectuals. It is found from the evidence that the majority of researchers are using social networking for locating, retrieving, sharing, and communicating their works and materials among the academic community for review and recommendations. Web 2.0 has added new insight to the new road of scholarly communication. Web 2.0 tools like blogs, wikis and social and academic communities have brought alternative scholarly access. Social networking sites have redesigned scholarly communication regarding sharing, disseminating and promoting research activities.

With the emergence of Web 2.0, the methodology of processing Information has changed, starting from the production of the Information to its dissemination, promotion and sharing of Information. Schmidt (2009) defined an SNS as one which allows members to create a "sophisticated personal profile" and contains Information such as members' interests, activities, etc. in a digital space that other users can only access after registering and becoming a member of that particular site. The SNS (social networking sites) are rich in grey literature. Some frequently used SNS includes Academia.edu, ResearchGate, Zotero, CiteULike, BibSonomy, etc., by researcher and the academic community for sharing, bookmarking, retrieving, collaborating, connecting and other purposes. It is found in several studies that most researchers and academicians are aware

of SNS and its productivity on several occasions. Academicians and researchers are using social networking to expand creative ideas and interaction among peers.Academia.edu and ResearchGate are two prominent SNS for the academicians that emphasize communication between researchers in terms of informal messages and sharing of research work among peers through the web. On the other hand, the online reference manager stresses acting as a reference manager tool and creating its digital library.

It is known from the fact that social networking sites and online reference managers are the most significant sources of metrics in terms of readership, aggregate tags, the total number of tweets, aggregate view of personal profiles, etc., which can be the most reliable sources to evaluate the researcher, research works, an organization and nation as a whole. These metrics are generally termed Altmetrics. The term "Altmetrics" it is dynamic. “Altmetrics" is an umbrella term for measuring the impact of research in social media through measuring online activity. A widely accepted definition of Altmetrics is" the study of scholarly impact measures based on activity in online tools and environments" (Priem and Heather, 2013)

1.1.1 Altmetrics: A Concept

The research evaluation is considered one of the essential components in research studies to measure the impact of research and its output. Scholars and experts have discovered various evaluation metrics and undertaken various studies on metrics. In the evaluation process, citation plays a vital role in judging the quality of the research work. The research studies have led to the creation of new metrics where the combination of modern and traditional metrics is found. Altmetrics is one of many new metrics which were being discovered. Altmetrics is a metric measuring the research impact by considering social networking sites, blogs, news, patents and many others. It set a new platform where the researchers can promote their research work using various social networking tools as Altmetrics measures the online impact of various research works and offer the Altmetrics score for the specific research publications.

Altmetrics is creating and studying new metrics based on the Social Web for analyzing and informing scholarship. According to Galligan, F. & Dyas-Correia, S

(2013),Altmetrics defined as" Altmetrics are new measurements for the impact of scholarly content, based on how far and wide it travels through the social web (like Twitter), social bookmarking (e.g. CiteULike) and collaboration tools (such as Mendeley)

The importance of Altmetrics in the world of scholarly communication is the insertion of Altmetrics badges which expresses the impact of research. In addition, the increasing demands of Altmetrics have led scientists and researchers to develop a keen interest in studying the correlation between citation and Altmetric scores.

1.2.1 **Altmetrics Tools and Software**

Altmetrics has different tools and softwares to measure the quality impact of the research activity. The following are some of the tools and software used in the evaluation process:

a) ORCID: ORCID provides a persistent digital identifier that distinguishes us from every other researcher and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between us and our professional activities, ensuring that our work is recognised.

b) Altmetric.com and Altmetric Explorer: Altmetric tracks what people say about papers online on behalf of publishers, authors, libraries and institutions. The Altmetric Explorer lets the researcher monitor, search and measure conversations about our publications and those of our competitors.

c) Academia.edu: It provides a platform to search for people, develop research interests and know the status of universities.

d) ResearchGate: ResearchGate helps the academic community to share publications, access millions of articles, promote their article, remain connected and have collaborative work with the peer group of their respective fields. It also helps the researcher to know their views, downloads and citation of the research work.

e) LinkedIn is considered the world's largest professional network, having members of 250 million across 200 countries. It served as a platform where professionals of different fields could increase their productivity and be successful in their fields. It also helps to get access to people, the latest job information, and other updated

news which helps the researchers and scientists to promote creativity and remain informed.

f) Publish or Perish (Including H-Index):Publish or Perish is a software program that retrieves and analyses academic citations. It uses Google Scholar and Microsoft Academic Search to obtain the raw citations, then analyses these and presents the metrics.

g) CiteULike: It is a free service for managing and discovering scholarly references.

h) Naymz: It measures and manages our social reputation.

i) Figshare: It helps to Store, share and discover research. It also serves as a gateway to manage our research in the cloud and provides the key to controlling the Information to whom to share or make it available for the public to cite in their research field.

j) Peer Evaluation: Peer evaluation is about giving Open Access to our primary data, working papers, articles, and media and having them all reviewed and discussed by our peers.

k) Research Scorecard: It is all about facilitating scientific collaborations. This database and data mining tools provide a unique way to assess biomedical scientific and technical expertise, helping researchers find and evaluate potential colleagues and staff.

1.2 ResearchGate

ResearchGate is a social media platform where scientists and academicians can simultaneously disseminate their work and boost their scientific reputation. It is found that ResearchGate has more than 12 million users with a novel motto to help the scientist connect with their peers, share their knowledge and expertise and build their status in their respective fields of research study. This is accomplished by "following" other scientists who can follow us back, uploading and sharing manuscripts, presentations, and project-related materials, and asking and answering research-related questions. The researcher's reputation can be measured quantitatively by one's publications, likes, dislikes, comments, views, downloads, cites, answers, and followers, which all together form a number and it is displayed publicly on the respective RG profile, which is common term as the "RG Score".

1.3 Altmetrics and Librarianship

Librarianship is a noble profession which has attracted wholesome people to serve the community by providing education (Information). This noble profession carries a lot of responsibilities to make society knowledgeable and, at the same time to provide relevant Information at the minimum time and effort. But with the advancement of ICT, the evaluation methods have changed, leading to the creation of new metrics. Among many of the metrics discovered, Altmetrics is accepted as one of the prominent sources for evaluating research output. Therefore, modern librarianship has accepted "Altmetrics" as the prime source to run the librarians. Altmetrics facilitated the librarians to track the sentiment, reads, downloads, and previews, which helps them to upgrade and remain informed about the needs and requirements of the users. It also helps in building the collection development of the library. It also has helped the academic community, particularly scholars, to accept the change and help them to explore new areas of research. It also acts as a tool for promotional and marketing strategy. Therefore, Altmetrics and librarianship are to be considered complementary to each other in this rapidly changing world of Information.

1.4 Significance of the Study

Bibliometrics decades earlier is considered the essential source of metrics to evaluate the status and position of any research output or work. However, several studies revealed that Bibliometrics cannot be considered a prominent evaluation source. The researcher and academicians firmly believe in the need for reliable metrics where accurate evaluation can be implemented for better research output. After several studies and research, Altmetrics can be considered one of the sources of metrics in recent decades. Altmetrics seek to meet the drawbacks of all other metrics. Very few studies have been conducted on Altmetrics. The current generation most extensively uses Social Networking sites and online managers to access, locate, share, disseminate, promote and for other purposes. They are considered the most significant source of metrics to evaluate the status of the research work. Academia.edu and ResearchGate are some major social networking sites widely used by academicians and researchers for locating, accessing, retrieving, sharing, connecting, collaborating etc. The library and Information

as a discipline have continuously contributed immensely to the growth and betterment of academics and research. Department of Library and Information Science in different universities are rigorously working to develop new concepts and theories. The study has attempts to evaluate the faculties of the Department of Library and Information Science in different universities with particular reference to the Indian context. The study has considered ResearchGate as a source of Altmetrics for evaluating research. The study has helped in understanding the validity of ResearchGate as a significant source of Altmetrics for the research evaluation. The study is an attempt to evaluate ResearchGate Scores (RGScores) in depth and their relation with other ResearchGate metrics.

1.5 Scope of the Study

There are several metrics which occupies a significant role in the evaluation of any research output put forward by researcher and academicians. Altmetrics can be considered a critical source of metrics for the research evaluation. Academia.edu, ResearchGate, Zotero, CiteULike, BibSonomy, etc., are social networking sites that academicians prominently use for tagging, bookmarking, connecting, expanding their ideas and for other purposes. Finally, an online reference Manager like Mendeley is a popular reference manager and can be considered the source of the most critical metric.

ResearchGate and Academia.edu are some of the popular social networking sites used by the academic community for communicating with each other in terms of informal messages, locating, disseminating, sharing etc. The study mainly focuses on the ResearchGate as a source of Altmetrics for the evaluation of research output of the faculties of the Department of Library and Information Science of different Central Universities with particular reference to the Indian context. It is a member of academic social networking sites. Moreover, the study seeks to explore Research Interest Score, which is believed to be the unique feature of ResearchGate. Although there is a total of 49 central universities functional in India, the central universities having Department of Library and Information Science, along with the total number of faculty members, are given, a list of which were covered under the study, as follows:

Table 1.1: Total number of LIS faculties in Central Universities

S.No.	Name of the Central University	Establishment Year	Establishment Year(Dept.)	No. of Faculty
1.	Banaras Hindu University	1915	1941	9
2.	Aligarh Muslim University	1920	1950	8
3.	University of Delhi	1922	1946	7
4.	North-Eastern Hill University	1973	1985	6
5.	Manipur university	1980	-	6
6.	Guru Ghasidas Vishwavidyalaya	1983	1985	1
7.	Pondicherry University	1985	2007	7
8.	Indira Gandhi National Open University	1985	1989	6
9.	Tripura University	1987	2016	3
10.	Assam University	1994	2009	4
11.	Mizoram University	2001	2002	8
12.	Central university of Tamil Nadu	2009	2017	6
13.	Central University of Haryana	2009	2014	2
14.	Central University of Punjab	2009	-	5
15.	Central University of	2009	-	6

	Himachal Pradesh			
16.	Central University of Gujarat	2009	-	4
17.	Mahatma Gandhi Central University	2014	2019	4
18.	Babasaheb BhimraoAmbedkar University	1996	1997	5
	Total			**97**

(Source: https://en.wikipedia.org/wiki/Central_university_(India))

1.7 Research Gap: The literature review depicts the research area undertaken for the study. It can be observed from the literature that quite a good number of papers have been published by scholars on "Altmetric" in different parts of the world by considering different platforms like Facebook, Google scholar, Twitter etc., using different parameters. But, no scholar, particularly in India, has taken the area as part of research that has resulted in a significant gap on account of full-fledged research that has created an enormous gap in the proposed area. The present study is believed to be an attempt to fulfill this research gap in the proposed area and will open a new path for other scholars to conduct research in the area selected for the study.

1.8 Research Design

1.8.1 Statement of the Problem

The experts are adopting several metrics to evaluate the research output. Bibliometrics, scientometrics etc., are some of the measuring metrics tools extensively adopted across the globe for their productivity in research evaluations in the past years. The advancement in the evaluation of research output has led to the creation of alternative metrics, which is named "Altmetrics", to overcome the drawbacks found in traditional metrics. This metrics tool, i.e. Altmetrics, has found this metrics tool to be most trustworthy in evaluating research productivity. However, only very little research

is being carried out in the area of Altmetrics especially using ResearchGate as a source of Altmetrics. The research in this area shall help in understanding the validity of ResearchGate as the source of Altmetrics for the evaluation of research, especially in a developing country like India. So far as the study of the area is concerned, no studies have attempted to evaluate the ResearchGate indicators such as Research Interest Score in depth with particular emphasis on evaluating the faculty of various central universities of the Department of Library and Information Science. The above reason cited has encouraged the researcher to take the initiative in resolving the issues concerning the study.

1.8.2 Objectives of the Study

The present study is to be carried out with the following objectives:

i. To analyze the publication of faculty members uploaded at ResearchGate;
ii. To study the diverse contributions made by the faculty member in the development of the ResearchGate profile in full-text format;
iii. To investigate how many times the research works of a researcher have been cited or read by other researchers;
iv. To study the impact points received by the faculty in publications of scholarly work; and
v. To analyze the number of followers a researcher had and the number of researchers the researcher is following.

1.9 Research Methodology

The methodology can be considered one of the essential elements for the systematic evaluation of any research study. It helps researchers to have a deep understanding of the area of study. The present study is exploratory, and the prime objective of the present study is to apply the Altmetrics application to faculty profiles and find out the nature of relationship and metrics correlations. The researcher in the present study named "An Altmetric Analysis of ResearchGate Profiles of LIS Teaching Professionals in India" has undertaken the following methodologies for the smooth running of the research work.

1.9.1 Method of Data Collection and Analysis

The observation method has been used for the study. The data was collected manually by visiting the ResearchGate profile pages of all the LIS teaching professionals of central universities in India. The researcher has begun collecting data from 1st August 2020 to July 2022 where time to time upgrading of data was made trimonthly. The last data up gradation was made on 31st July, 2022. The parameters for the study were publications, reads, profile views, citations, impact points, Research Interest, followers and the following from the members' profile pages. In addition, correlations have been being calculated amongst the metrics provided by ResearchGate to explore the nature of relationships amongst various ResearchGate metrics. For the analysis and interpretation part, the MS- Excel and SPSS 20.0 has been used.

In addition, various internet sources have been used for getting additional Information. And to maintain uniformity in citation and reference, the latest version of the APA (7th Ed.) manual has been used.

1.10 Hypotheses

The hypotheses for the present study are as follows:

H^1- The majorities of the faculty members under study are well aware and have their ResearchGate profile

H^2- Most of the Assistant professors among the faculty members have their ResearchGate profile.

1.11 Chapterisation:

The research study has been divided into the following chapters:

Chapter 1: This chapter deals with the introductory part of the whole of research study. The chapter is further classified into area such as significance of the study, research gap, and objectives of the study, Hypotheses, research methodology and method of data collection and analyze of data.

Chapter 2: This chapter deals with the numerous sorts of literatures that are published in various forms that have relations with the subject of study. There are 58 pieces of literatures in the chapter.

Chapter 3: This chapter basically deals with introduction of Altmetrics and its different variables associated with the metrics.

Chapter 4: This chapter is more likely discuss about the ResearchGate and its various functionalities associated with this platform. Various applicability of this platform has also been highlighted.

Chapter 5: This chapter deals with data Analysis and Interpretation of the study. The findings were based on the several objectives that has been laid down during the course of research study. The findings are been discussed elaborately and minutely reacted to the study.

Chapter 6: This chapter is the final outlook of the proposed area of study. Along with the concluding notes, it has also provided some of constructive suggestions that shall be highly beneficial for the academic fraternity. In addition, it has also provided a note of future scope of study.

This chapter has highlight or rather provide a brief summary about the outlook of the research study. The next chapter deals with the various pieces of literatures that are undertaken for the course of study.

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Chapter 2 - Review of Literature

CHAPTER - 2
REVIEW OF LITERATURE

2.1 Introduction

It is a very evident fact that the scientist's work is never ending even if some last observation is made, a new theory is discovered or invented, or a patient responds to a new therapy. The result of these findings and analysis need to be communicated to provide a breeding ground for assessments and put forward for further development in their respective field of study. The principal channel for proper communication is the scientific journal article which provides ample opportunity for researchers to the rapidly dissemination of information for highly specialized research results to information seekers who are in a position of information seekers, understanding them, evaluating their merits, evaluating their significance and showing a mark of recognition of the other author contributions in their discipline. It is fair to state that scientists need to disseminate their scientific results and findings to their fellow researchers whereby they can develop a statement piece. A statement quoted by Ziman in 1968 said that "A scientist does not merely rely upon his apparatus, his eyes, and his logical powers; to an enormous extent, he relies upon other people, through their published work, through the results of their experiments, through the techniques that they have initiated and tested, through the theories that they have originated and developed. The bibliography of a scientific paper is a clear and explicit recognition of this dependence".

Since 1955, there has been a flood of publications in bibliometrics and scientometrics studies as several researchers have to carry forward their further studies. These experimental studies have resulted in some deficiencies, such as the squeak of documents, some data collected by hand, and license fees being levied upon the users for retrieving documents. The emergence of online databases has created blessings in disguise for many such studies since the 1990s, as stated by Glanzel in 2003. As the discovery of altmetrics happened in the later 2010s, the development of this area is still in a nascent stage where the dissemination of information about alternative metrics needs to be imparted and taught among the scholarly community.

The set of review of literature is fragmented into a few divisions where only relevant contents and terms are discussed. Observation is made where the researchers find that many studies highlight the importance of altmetrics studies or alternative metrics in libraries, scholarly communications, and their application in library administration and management. The analysis of kinds of literature fosters the researchers to detect the research gap that occurred in the previous studies of altmetrics. The literature review is considered an integral asset of any research study as it is an essential tool that helps identify research gaps and assists in sketching and analyzing research work. In addition, collecting earlier related studies is essential to designing the appropriate research methodology. One of the significances of a literature review is that it avoids the duplications of work that has already been carried out in the field of study and acts as an agent in exploring the different pros and cons of the research problem. It provides a platform for exploring undefined areas, which in return help create new ground for exploratory study. It is to be noted that asignificant number of publications in the form of journal articles, conference papers, pre-prints, reviews, and many more are available in the market area on the assets of altmetrics, and these pieces of literature keep on growing at a constant rate. The analysis of prior kinds of literature acts as a corridor for diagnosing the research vacuity in the earlier piece of work, preventing the redundant work that has already been done within this field from contemplating the different aspects of the comorbidity. It encourages the researchers to determine undiscovered fields of a research study in a sequence for an investigative reporter or research scientist to create unique fields for exploration. The literature has been conducted based on available literature in the form of macro and micro abstracts that cover different elements of the Library and Information Science faculties of central universities across Indian states.

The generation of fascinating explorations and investigations has grown due to the literature review process, which gets generated from various sources such as books, a thesis, conference papers, scientific journal articles, and many others. Some studies are concerned with the output of institutions concerning publications. In contrast, others are concerned with the impact of research in some specific discipline, and some researchers study the research output of the whole nation. To have easy access to the study, the

literature review is grouped into three major divisions, which have close relation with the subject related to a specific subject field and studies analyzing the nation's research output in a specific field. The summary 58Studies are presented in the enduring pages. The three divisions are based on

A. Studies related to institutions
B. Studies about a specific field of study
C. Studies analyzing the output of a country on a specific field of study

2.1.1 Studies related to institutions

Uysal et al. (2021) describe the top 100 most cited articles on Covid-19 by using bibliometric analysis, Altmetric Scores and dimension badges to guide the researchers in the COVID -19 pandemic. The analysis reveals that more citations received by articles indicate that more contribution is made in the field of science. Furthermore, the existence of methods outside academia to evaluate the effect of the article to quantify the valuation of an article arises more in an issue that affects the entire world, such as the COVID-19 pandemic.

In their article, **Hassan et al. (2020)** tend to understand the contribution of altmetrics databases across five different areas of study, understanding machine learning and natural language programming-based algorithms undertaking sentiment analysis as core concepts and identifying the best performing model. The study has employed guidelines for two human annotators with a similar task of related annotation of scientific literature. They used a sample of 6388 tweets for 300 papers indexed in the Web of Science database. This entire sample was measured by employing SentiStrenght and Sentiment/40 sentiment analysis model. It was demonstrated that SVM with uni-gram outperformed all other classifiers and baseline methods used.

Kim and Oh (2020) in their study has examined in the current study investigated whether social and individual motivation factors influence researchers' article-sharing intentions via institutional repository or ResearchGate, and how these factors differ between the two platforms. The result of the study reveals that institutional repository users'. According to the findings of this study, institutional repository users' article-

sharing intentions have been influenced by perceived community benefit, career benefit, and career risk. In contrast, subjective norms, perceived reciprocity, career benefit, career risk, and platform ease of use influenced ResearchGate users' intentions.

In the proposed investigation, **Joshi et al. (2019)** attempted to evaluate the Usability and applicability of ResearchGate for neurosurgical research that includes collaboration, as well as to compare the ResearchGate score with a few other classic bibliometrics levels. According to the study, 36% of the total population is present on ResearchGate, with 13.5% women and 86.5% men. Male and female proportions are similar, and more faculty members than residents are present on ResearchGate. In addition, it was found that a strong positive correlation was found between the h index and R.G. score.

Garcia, Leeuwen, and Rafols (2018) discuss the development of a methodology that applies altmetrics data to evaluate social scientist interaction as one of the paths for mapping the contents in societal perspectives and its implications. The study examines if there arises a necessity to assess the societal impact by adopting quantitative methodologies; social media data has served as a potential method to sketch the broader type of impact. Finally, the analysis proposed using altmetrics data for network analysis of researchers and stakeholders.

Bonnet and Brady (2017) have mentioned the instructional steps the University of Maine Library took to promote the discussions of alternative impact assessments beyond traditional boundaries. The author also discussed a series of altmetrics workshops aiming to seed conversations and find main ways to track the impact of researchers' diverse scholarly output.

Muscanell and Utz (2017), in their article, tried to examine the usage and utility of social networking sites with particular emphasis on ResearchGate as the prime source of altmetrics for the evaluation of research output. They tried to collect samples of primarily American and European academicians. The author evaluated sites' use, perception of their utility, and impact on career outcomes. The findings reveal that most academics who have an account in Researchgate do not extensively use social networking sites. The study also found that users did not receive any benefits from the

sites and neither is it closely associated with carrier satisfaction. The study also reveals that R.G. is related to productivity and stress.

Hoffmann et al. (2016) have experimented with a group of academicians where correlations are related to the R.G. score, the number of citations, downloads, and views with other metrics like bibliometrics, Scientometrics, and now altmetrics.

Kurniasih(2016) has discussed in his article the implementation of altmetrics in libraries by librarians so that it can provide high-impact factor journal articles. The author has found the method to reach its objectives is the evaluation method. The paper also discussed the role of librarians in disseminating, training, and administrative assessment of Altmetrics and the role of social media.

Sankar and Kavitha (2015) have highlighted the librarian's role in maintaining the library and keeping updated with the latest development in the field of study. The concept of metrics has not originated with the emergence of Altmetrics. The traditional metrics were developed for the collection development purpose and retention decisions. The study also expresses the initiative taken up by the librarians for the various housekeeping operations. The article describes librarians as natural leaders in using Altmetrics, different tools, sections, and evaluation methods in which the LIS professionals are dealing with Altmetrics.

Bornmann (2014), in his article, has explored the embryonic of altmetrics for assessing the societal impact as a standard method, such as peer review. Bibliometrics are usually used to measure research's scientific and societal impact. On the other side, there is no standard mechanism or accepted methodologies for measuring the societal impact of research. The articles also explain the definition and classification of Altmetrics in detail. Further, the articles also dealt with the merits and limitations of altmetrics for assessing its impact on society.

Sutton (2014) has explained that altmetrics are good sources for academic libraries for scholarly communication. The study tries to explain that in times of budget constraints and tightening, academic libraries need to think about how to establish some ways by which the value of the materials is restored, and the same is provided to the library. Impact factor and h-index are some traditional methods of measuring of quality of new

knowledge, which has added more meaning by adding social media as new alternative metrics. The study also explains the advantages and disadvantages of altmetrics over traditional metrics. The author has also suggested specific uses for which academic libraries may use altmetrics as an excellent source for scholarly communication.

Galligan and Correia (2013) highlight the relationship of altmetrics with other traditional metrics, its significance, usages, potential impacts, and some possible directions in evaluating scholarly communication. The study concludes that altmetrics has a significant role in the future and offers some potential to revolutionize value analysis and its impact on scholarly communications.

In their paper, **Zahedi, Costas, and Wouters (2013)** examined the presence and possibilities of altmetrics in place of bibliometrics. The analysis reveals that the significant source of altmetrics that gives most of the metrics is Mendeley, with an account of readership of 62.6%; on the other hand, other sources only provide marginal metrics comparatively. Furthermore, the spearman correlation has found a moderate relation between Mendeley readership counts and citation indicators. The study has also analyzed the presence and distribution of altmetrics across fields, document types, publication years, and the extent to which altmetrics correlate with citation indicators.

In their study**, Liu and Adie (2013)** discuss the limitations and obstacles faced when designing alternative metrics to the response of scholarly writing. The analysis reveals that the fundamental attention required is identifying the items to be measured and what should be accounted for. The study says that the alternative metrics should, by default, be counting all relevant items mentioned in a set of online resources and permitting all the online sources to drill out for more qualitative information for the consumers.

In their study,**Thelwall et al. (2013)** tried to fill the gap between specific altmetrics and citation rates for specific individual articles or journals. The study they initiated compares 11 altmetrics with the Web of Science citations for 76 to 208739 articles in PubMed, with at least one mention of altmetrics and up to 1891 journals per metric. This study has also introduced a simple sign test to overcome the bias caused by different citations and window usages. In all cases where sufficient evidence was available, statistically significant associations were discovered between higher metric scores and

higher citations for articles with positive altmetric scores. However, the study cannot draw any conclusion concerning articles having zero altmetrics sores or in terms of strengthening any correlation between altmetrics and citations of different metrics.

Kadriu (2013) presented a collaborative network inside a research social network structure in her article. The study analyses and presents four halfway measures for social network analysis for entities in the network. Furthermore, it has investigated some grouping of individuals based primarily on automatic clustering based on reciprocal relationships.

Konkiel and Scherer (2013) discuss the positive implications for institutional repositories by using altmetrics as an indicator of interest that can supplement traditional usage statistics. The study showcases several vital digital in-built metrics available through online repositories such as Digital Commons, Dspace, and E Prints. These online platforms provide metrics related to download counts at the collection level, searching terms, unique visitors, page views and social media and bookmarking metrics, and many more.

Piwowar (2013), in their paper, highlights and presents altmetrics as one of the innovative ways of measuring scholarly communication or the impact of a scholarly piece of work. Though there seem to be long-established citation-based metrics, we cannot grasp the wide variety of online references available for scholarly work. Still, alternative metrics have different approaches to offer some of the most iconic indicators of managing online references. The paper also discusses the transformation of scholarly communication by intersection with open access, digital repositories, and research in developing countries. It also highlights that the alternative metrics should be included in the mainstream metrics such as bibliometrics, Scientometrics, webometrics, and likewise.

Rodgers and Barrow(2013) mentioned the significant trends, opportunities, and challenges researchers and academic libraries face using altmetrics. It also discussed how research libraries could mould the prominent field. The study also tends to discuss the partnership between the University of Pittsburgh and Plum Analytics which shows the mapping out the role of the faculty in the campus arena.

Sud and Thelwall (2013) have evaluated altmetrics as a new tool for effectively evaluating scholarly communications on the social Web and social media. The study analyses the previous discussions and debates on citation analysis aspects. The articles highlight Altmetric evaluation strategies, including pragmatic analysis, interviews, content analysis, and some correlation tests for practical evaluation. Furthermore, the study has put forward a wide variety of methods necessary for Altmetric evaluations where respective strengths of influences on altmetrics creation and a majority of the evaluations should be arranged in a logical sequence.

Bar-Ilan *et al.* (2012), where the researcher found that 82 per cent of the documents have been at least bookmarked, and 28 per cent of the articles were booked marked in CiteULike.

2.1.2 Studies about a specific field of study

In their article, Kunze et al. (2022) tried to demonstrate the recent literature where a close association exists between social media attention and higher citation rates across different medical disciplines. The study mainly tried to understand and determine randomized trial relationships between psychometric properties, study biases, and the AAS (RCTs). Therefore, all RCTs published in the New England Journal of Medicine (NEJM), Journal of the American Medical Society (JAMA), and Lancet in 2016 were extracted, and the critical elements were recorded: AAS and Methodological Bias (JADAD Scale); and Study Bias (Cochrane Risk-of-Bias tool for RCTs).

In their paper, Shehata, Dakar and Salem (2022) mainly aim to examine the impact of Covid-19 vacation papers on social media analytics on the best 100 papers. The methodology adopted for the study was altmetrics analysis to measure the paper's Altmetric attention. The finding reveals a correlation between citations and Altmetric indicators, and Twitter and Mendeley are the high contributors in the social network of AAS for all the journals studied. It also reveals that altmetrics and covid-19 vaccination papers have gained maximum attention and citations on academic and social networks.

In their research study, **Ahmad et al. (2022)** have attempted to find the importance of the empirical significance of empirically demonstrating the success of the ResearchGate social media platform derived from Usability as a form of media for indexing scientific

paper publications that academic researchers necessitate these times. The result of the study depicts that the satisfaction level implies Usability, and determinant usability consists of learnability, memorability, efficiency, and errors are some parameters that have no implications. Nevertheless, Usability is significant, as evidenced by a powerful enough participation score of 63.7 per cent in the capacity ResearchGate indexing scientific report print edition.

Yan et al. (2022) aim to understand and explore question-and-answer participation and behavioural patterns on academic and social networking sites derived from diverse subjects such as educational, corporate, and government institutions in their study. The study's findings show that these three institutions have low levels of participation in ResearchGate's questions and answers services. Furthermore, the number of questions and answers proposed by institutional users follows a power-law distribution. Academic, corporate, and government institutions' participation in Q&A and behavioural patterns differ.

Bansal, Singh, and Muhuri (2021) explored and attempted to understand the nature and degree of correlation between altmetrics and citations in their paper. The study's findings show a positive but weak correlation between altmetric mentions and citation counts. Furthermore, correlations are relatively high in data from ResearchGate platforms compared to data derived from the other three social media platforms. Furthermore, the degree of correlation coefficients between altmetrics and citations varies significantly across disciplines.

In their report, **Yan et al. (2021)** chose ResearchGate as the site to collect samples. They collected 77,902 data from users from 61 U.S. research universities engaged in various levels of research activity as defined by the Carnegie Classification of Institutions of Higher Education. The study's findings show a difference in user participation and ResearchGate use characteristics by discipline. Again, the findings show that users from higher research activity level universities have a better presentation in R.G. metrics than their low-level counterparts, regardless of discipline. The findings of this study contribute to the ongoing effort to better understand the use of ASNSs among

researchers and to assist researchers in connecting and interacting with peers in their respective disciplines.

Similarly, **Roozbahani et al. (2021)** conducted a study in which they reviewed several previous studies to understand the gap for collaborators in social networks and attempted to fill the void. The study's main contribution is developing a new scientific collaborator recommendation system. The article describes an integrated model based on multilayer networks that allow the scientific collaborator's suggestions to be customized. In addition, the proposed model includes various types of collaboration features based on the researchers.

Kolahi et al. (2019), in their paper, discusses the altmetrics attention of knowledge structure of scientific articles published in the Endodontology field. The primary motivation was to discover hot topics, active researchers, and the journal involved in developing the endodontology perspective. The result revealed that only 192 articles had altmetrics scores>5. Furthermore, it was found that the Journal of Endodontics had the highest rank of altmetrics attention. The most popular altmetrics data is Twitter, followed by patents and Facebook.

In their study, **Bornmann and Haunschild (2018)** address some relevant questions, such as whether altmetrics have a suitable connection with the scientific quality of the paper. The study mainly tried to analyze the underlying factors for traditional metrics and altmetrics by considering principal component analysis and factor analysis. The analysis reveals that altmetrics operates with the other dimensions, and on the other hand, Mendeley counts are closely associated with citation counts, and Twitter has different relatively separate dimensions. Furthermore, the results reveal that citation-based metrics and readership counts are mainly related to quality rather than tweets, indicating a potential application of Mendeley reader counts.

Jeng et al. (2017) present a systematic data analysis based on data collected from ResearchGate in their study. The study was undertaken primarily to comprehend the growing popularity of academic and social networking sites and their usage among scholars and assess the effectiveness of ASNSs. The study's findings show that in some cases, the questioner's intention has a more significant impact than disciplinary factors.

Furthermore, responses to questions provide various resources across the three disciplines, such as contact information for experts, citations, links to Wikipedia, images, and so on.

Shrivastava and Mahajan(2017) discussed in their paper the concept of Altmetrics as a great source of metrics for the evaluation of research output. The primary purpose of their study is to analyze the faculty members and research scholars of the Department of Physics and Astrophysics, the University of Delhi, who is member of academic and social networking sites. The finding revealed that the academician's and researchers' publications to their respective profiles are relatively low. The study also helps to understand the validity of Researchgate as the novel source of Altmetrics for the research evaluation.

In their paper, Hassan et al. (2017) investigate 15 broad scientific disciplines about social media activities that were indexed in Scopus databases using Altmetric.com data. The study's result reveals a rapid increase in Altmetric.com data indexed in the Scopus database, which has increased from 10.19% to 20.46%. The study also found that the Blog count is considered the most critical factor in the discipline of Health Professionals and Nursing professionals.

Cho (2016) uses altmetrics as a method of evaluation to measure and compare the impact of Korean research on four significant subjects published in international journals. 383 Korean Research Articles published in medical science, engineering, social science, and arts and humanities were analyzed for the study. According to the study's findings, Twitter has the highest rate of social media communication in the medical sciences than any other related discipline, and Mendeley appears to have the highest frequency of research articles saved by reference management tools. Furthermore, the study concludes that there appears to be a positive correlation between the number of saved articles in Mendeley and the number of cited articles.

Sugimoto et al. (2016) have analyzed the existing pieces of literature which were published in the field of the use of social media and altmetrics. The study provides an extensive demography of state-of-the-art reviews in the scholarly use of altmetrics and social media. The study is divided into two divisions, as one deals with examining the

application of social media, its different functions in scholarly communications, and factors that affect the communication process. The second section reviews empirical studies based on altmetrics, methods of data collection and interpretation, and limitations in the perspective of methodologies. The study ends with a suitable evaluation shifting of a scholarly mode of communication system.

Barnes (2015) in her paper gives a glimpse of the use of altmetrics to evaluate the impact of research. The evidence speaks that altmetrics allows the users to measure the research impact in several days rather than a completion of years. However, as per the study, it is still a doubt and questionable factor in future citation analysis because of low correlations between article citations and altmetrics indicators. Nevertheless, despite shortcoming, it can be stated that altmetrics possess a good number of potential qualities which qualifies for measuring the more significant impact on society in term of research.

In their paper, Mohammadi et al. (2015) highlight context, as not many studies have detailed information about the reading of research articles and the dimension in which they were read. The study tends to explore the users by using data registered as readers of articles in Mendeley, where various disciplines such as medicine, engineering, social science, humanities, chemistry, and physics are within and outside academia. The analysis reveals that most readers of research articles in Mendeley are doctoral students, post-graduates, and Post-doctorate candidates. In addition to these findings, it was also revealed that a good number of medical professional also reads clinical medicine articles.

Barbic et al. (2015) emphasize analyzing the 50 most cited articles abstracted in emergency medicine journals (E.M.), wherein the comparison is made between traditional metrics and altmetrics. The result reveals that the E.M. articles that received the highest altmetrics score were 25.0. Resuscitation has received the highest mean articles Altmetric Score among the E.M. journals. The clinical areas in most of the E.M. articles were trauma and cardiac arrest. The result also demonstrated a mild correlation between citation counts and the Altmetric Score for the top papers in E.M.

Barbaro, Gentili, and Rebuffi (2014) in their paper highlight the growing trends of moving toward the Web by academicians and researchers, where new venture of spreading, discussing, sharing, and retrieval of information has merged. The process of online scholarly communications has led to finding a new way to measure the impact of scholarly content in the web process. So Altmetric or alternative metrics were invented to tackle the issues related to scientific research output evaluation. Although the study was about the challenges and opportunities for academicians and researchers, significant trends in the research of altmetrics are summarized in detail.

Thelwall and Wilson (2014) have examined the application of alternative metrics that correlate citation metrics with Mendeley readership counts across all medical fields. One of the essential aspects of this study is effectively evaluating medical research as it is expensive and is heavily funded by the funding organization. Based on evidence findings, it is to be noted that Mendeley readership counts have a strong correlation with citation counts in all fields of medical studies. However, it was also found that the correlation seems to have been slowly declining when students' readers are excluded from the list.

In theirarticles**, Haustein et al. (2013)** evaluated the usage and coverage of social media scenarios by examining a bunch of biometricians as a sample size in terms of the use of social media platforms and the usages of their paper on reference managers socially. The study surveyed the participants of ST12012, revealing that half of the respondents assert that social media tools have affected their professional lives. The analysis reveals that 68% of the participants have their accounts on LinkedIn, while the rest 5% of the respondents account to have their respective accounts on ResearchGate, Mendeley, and Academia.edu. The respondents have mixed opinions on using altmetrics as a powerful tool for research assessments.

Mohammadi et al. (2013) in their paper highlight the detailed information in the context of the readership of research articles and which articles are being used to read. The study explores the different types of users from different fields, such as Clinical Medicine, Engineering and Technology, Social Science, Physics, and Chemistry, where

data were gathered from members registered in Mendeley. The study reveals that most readers are Post- Graduate, PhD, and Postdocs candidates.

Zohreh, Costas, and Wouters (2013) in their articles analyzed the possibilities and presence of Altmetrics, where 20000 publications were collected using the web-based tool impact story from the Web of Science. The results indicate that Mendeley is the most significant source of Altmetrics that provides metrics, and a moderate correlation was found in terms of relation to citations.

Nidheesh (2009), in their paper, examines the knowledge and perceptions of the tribals among adults in Kerala state. The study was conducted based on specific parameters such as natural resources, food, and agriculture. It was found that the people who reside in rural areas have more knowledge about agriculture than those who live in urban areas. Moreover, the educated have more agricultural knowledge than the less educated ones.

2.1.3 Studies analyzing the output of a country on a specific field of study

Biranvand and Shanbedi (2022), in their study, have attempted to identify the effects of altmetrics indexes of ResearchGate as a social, academic network. The study's findings reveal a significant relationship between most Researchgate metrics and those studied in Scopus, Web of Science and Google scholar databases. However, it was also found that there is no significant relationship between the indexes of the followers with H-Indexes metrics.

In their study, Nath and Jana (2021) tend to investigate the Scopus database and explore some research publications on altmetrics over eight years on a global level. The article has studied the global patterns, research power, collaborative network and core study area. The analysis reveals that the publication pattern on altmetrics has increased dramatically and is still growing. The publications mainly emerged from countries such as the USA and the U.K., where the University of Wolverhampton has been the core organization performing such research activities. Furthermore, the study reveals that journal articles are the most preferred communication among researchers' peers.

Anaraki, Razmgir and Moradzadeh (2020), in their paper, want to highlight the image of the Iran University of Medical Sciences faculties' member's activities and the methodology adopted to communicate among the academic world via ResearchGate.

The analysis reveals that 91% of their shared documents are composed of journal articles, and the average R.G. score was 15.26, of which 94% comes from publications. Furthermore, the findings show a strong correlation between the Scopus and Google scholar indicators and R.G. variables.

Anafi and Dookhani(2019) have highlighted the organization's resource observation and knowledge sharing, which Altmetrics tools address. The study also describes the role the librarians to be played in this field in familiarizing themselves with the concept of Altmetrics and its tools. The study's primary purpose was to analyze the use of virtual media resources by users of the central library of Islamic Azad University, Tehran, Science and Research Branch.

Verma and Madhusudhan(2019*)* examined the altmetrics analysis of the published publication in India and China highly cited, which were published in "Digital Library" from 1989-2017. The study finds that the computer Science disciple has more readerships in china, whereas, in India, Social Science has a more significant number of readerships. It was also found that Indian articles received the highest altmetrics scores compared to those of Chinese origin. They also found that there is a low correlation between citations and altmetrics.

In their study, Sutton, Miles, and Konkiel (2018) surveyed the LIS scholars and faculty teaching in U.S. and Canadian graduate LIS programs which the American Library Association about the consciousness and awareness of the Usability of Altmetrics is accrediting. The result of the study depicts that some of the LIS faculties are aware of Altmetrics, but the report indicates excellent familiarity with the traditional metrics measurements.

Ali and Richardson (2017) have highlighted the analysis of the library and Information Scholars of Pakistani nationality by using researchgate as the source of altmetrics. The study found a positive correlation between publications, reads, and citations for scholars who had recorded at least one publication. The study also found that most publications had not been published in high-impact factor journals. Finally, it describes the potentiality of academic networking sites where collaboration, building connections, and exchanging information can be created.

Wong and Vital (2017) have mentioned that the Saint Mary's College of California Library plays a significant role in achieving the strategic goals of the college plan. "Raise the Academic Profile and Distinction" is considered one of the strategic goals of the College, which the library helps to achieve its objectives. Therefore, the study also aims to evaluate the effectiveness of PlumX as a tool to display the academic profile and distinction of Saint Mary College. The study found that The collection of metrics across five categories (citations, usage, social media, mentions, and captures) and the flexibility of displaying on screen or downloading for use in other analytic reports made possible through PlumX proved to be a start toward demonstrating the academic distinction of College's unique faculty.

In their articles, Valiente, Mendoza, and Jorge (2016) analyze the publications based on the scientific production of Altmetrics as one of the emerging tools for research assessment. One of the study's primary objectives was identifying the investigated tendencies that characterize the subject area. The samples used for study purposes are the documents (253 number) indexed in Scopus and Web of Science. The analysis reveals that most productive institutions, journals, authors, and countries are from North America and Europe. Regarding collaboration of the research network, it was found that a similar pattern of peer network among the authors and institutions exists. Some significant areas where scholarly communication is in the process include social media and networking, scholarly and scientific communication and publication, open access and public libraries, information analysis, metrics analysis, and many more. We discovered a core group of contributors who attempted to solidify the knowledge domain with emerging principles of high theoretical consistency.

Htoo and Na (2016) highlight the understanding of altmetrics in the social science field among its different disciplines. The study's main objective is to investigate the budding potential of altmetrics in the different disciplines of social sciences. Furthermore, the study suggests a steady growth in the achievement of altmetrics attention among the articles published in a different discipline.

Alperin (2013) has examined the application of altmetrics in developing countries across the globe, whereby the traditional method of evaluating scholarly content is seen

as beneficial only to the North American and Europe continents. The study believes that alternative metrics can more accurately measure scholarly communication's impact on society. Therefore, the alternative metrics can serve the scholars better and help develop a research culture to achieve national development goals.

Hammerfest (2013), in his articles, majorly studies the coverage of altmetrics and its impact, which are humanities-oriented articles and books published in 2012 by Swedish universities. The study covers a sample size of 310 journal articles, and 54 books were examined. The analysis reveals that Mendeley has the highest journal article coverage, followed by Twitter. At the same time, it seems that only a few publications are noticed in the form of blogs and posts on social media such as Facebook or Instagram. The study has also found that most problems faced during the application of bibliometrics in terms of humanities seem more relevant in altmetrics approaches. Finally, the study has concluded by remarking on the heterogeneity of methods. Continuing development has embarked that altmetrics can be considered a standardized tool for evaluating and assessing the quality of research in the humanities and social science sector.

Prathap& Gupta (2011),in their article, analyze the research productivity in the area of agricultural sciences by Indian Institutions where the parameters are based on various quantitative indicators. The study concludes that the ranking based on composite indicators yields much better results than other indicators because it considers quality and quantity factors.

Dulle et al. (2001) tend to underline the factors of Agriculture University Libraries responsible for meeting the information needs of agriculture researchers. It also intends to study how the researchers meet their scientific information needs. Finally, it also provides suggestions and recommendations for the professionals working in agriculture university libraries in Tanzania.

Jain and Gloria's (2001) articles discuss the status of Agricultural Libraries in India. The study was basically upon the professionals, users, collections, and many more. The study has also attempted a comparative analysis between State Agricultural University libraries and ICAR institute libraries while considering the factors affecting agriculture development.

2.2 Conclusion

From now on, it can be stated that many studies have been carried out by researchers and academicians worldwide. The global phenomenon of the terms "Altmetrics" and "ResearchGate" has been evaluated and analyzed from various angles and dimensions. According to the literature review, only a few large-scale studies have been conducted in India to analyze and evaluate using ResearchGate as the source and Altmetrics as an approach or methodology. The study area was primarily based on the discipline of Library and Information Science among faculties in India's central universities. Therefore, this study is an effort to understand the performance of the faculties regarding research and another area of academics.

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Chapter 3- Altmetrics: An Overview

CHAPTER - 3
ALTMETRIC: AN OVERVIEW

3.1 Introduction

The venture for publishing the scholarly article is considered an important segment for any researcher to portray their creativity and show their educational work to the academic community (Bonnet & Méndez, 2017). The mode of publishing has dramatically changed from traditional or printed form to digital content where the researcher tends to publish their creative ideas via an online medium such as the Webby blogging, tweeting, responding, linking, bookmarking, sharing, etc. The content researcher's intense in publishing often changes with time.

Often in today's scenario of research publications, the publisher/scholars tends not only to publish written reports or conference proceedings, but they also intend to publish data, source data, videos, and many more. The articles and data published have always received identification of their existence and standards. The desire also exists within the academic community to understand and measure the impact of scholarship. The measurement of the scholarly article helps the researcher to be promoted and support the tenure of their existence. Therefore, the citation is to be upheld as one of the essential measurements of impact (Sutton, 2014). Traditionally, scholarly journals are measured based on the number of citations to the article published, termed as Journal Impact Factor (JIF). Journal Impact Factor is generally the measurement of the average number of citations to an article published in a journal over two or five years. It is to be noted that "Citable items" usually include articles, reviews, proceedings, or notes rather than editorials or letters.

Traditionally individual academic achievement is based on a ratio of the number of articles published to the number of citations. This is termed the h-index. The h-index measures the impact or productivity of an individual author or group of authors. The base of the h-index is the number of citations received by the author's most cited papers. The h-index measure is available from a variety of sources.

3.2 Altmetrics

One of the critical observations made in the field of Altmetrics is its more advanced mechanism of measuring the impact of research documents in any discipline. It is to be noted that the prediction of filtering the scholarly method of communication and the new version of the improved tool can be connected to the discovery of the impact factor by Eugene Garfield more the 55 years ahead. The status of Altmetrics has come to a significant position as it justifies the accuracy compared to other traditional metrics.

Altmetrics includes a greater spectrum of metrics measurements such as citation, web-based references, article downloads, social media attention, and many more, which were previously excluded in a conventional method of scholarly communications. Altmetrics tend to measure the article-level utility where they opt for various granular points of measuring scholarly communications where only Journal Impact Factors were considered earlier. The concept of Altmetrics was possible due to technological advancements made in the communications process (Sutton, 2014). It is to be noted that sources of Altmetrics have tended to portray different scholarly outputs as they measure it from different sources. It provides a common platform for publishers and aggregators of scholarly communications, which includes research articles, conferences paper, pre-prints, book chapters, and many other documents related to research areas in different sequences where they provide altmetrics along with the contents (Thelwall,2021). Numerous publishers such as BioMed Central, PLoS, Frontiers, Nature Publishing Group, and Elsevier are gaining momentum for measuring the high impact of the quality and quantity of research articles.

In addition, it is to be noted that the concept of Altmetrics was the brainchild of Jason Priem, a graduate student who studied at the University of North Carolina at Chapel Hill. The general Altmetrics concepts have gained momentum with the publication of "Altmetrics: A Manifesto", uploaded on the website, i.e. Altmetrics.org, in September 2010. Altmetic.org has defined Altmetrics as "the creation and study of new metrics based on the social web for analyzing and informing scholarship" (Muscanell and Utz 2017). From the definition, it is clearly stated that three salient features were discussed as

a. It is clearly stated that Altmetrics cannot be separated from the Internet and social media, especially the social Web.

b. Altmetrics is driven by two different aspects the creation of new metrics and the new data availability related to social media.

c. It always tries to create some way for a scholarship.

The same domain for the alternative parameters can be an extension of the impulse to measure, track and analyze scholarly activity as they render the practices and instruments of the current age.

Figure 3.1: Altmetrics' mind map

(Source:https://staticaltmetric.s3.amazonaws.com/uploads/2016/12/Screen-Shot-2017-09-07-at-17.12.16.png)

3.2.1 History of Altmetrics

The birth rise of the World Wide Web in the early 1990s has given a new platform to carry forward scholarly communication among the scholarly community. This has pushed many reputed publishers across the globe from different disciplines to move to an

online environment where they use the Internet to conduct various research activities related to marketing their various products and services (Liu, 2013). The first-transformation round began with libraries where they demanded online versions of access to different scholarly titles, along with the invention of search engines such as Google, chrome, and others, wherein they included the potentiality of websites, blogs, and "Born to digital" was the new norm for publishers back then 1990s (Galligan and Dyas2013).

Another transformation in the mid-2000s was transmitting an online sphere to networking and social media uprising. The early 2000s began acknowledging social media users as they began to desire communications and connections. A distinct hub was built where they would gather and share information. A study has shown that there is a shift from Delicious and MySpace to Facebook and Twitter, where they look upon these platforms as the mainstream of communication among academicians and practicing librarians are looking to reboot their personal and professional networking sphere (Ali, 2021). IT professionals and experts began to study the necessity of Social networking sites. They found that they are craving new innovative ways to channel communication technology via the Web, where it can serve the necessity of researchers and scholars. The year 2008 marked a remarkable destination for the academic community as three new online networks for researchers, namely ResearchGate, Academia.edu, and Mendeley, just after four years of Facebook launched. Since the beginning of the World Wide Web (WWW) stage, a network such as the Social Science Research Network in 1994 has been in practice in building Unique Researcher identities to have truly scholarly communication. The invention of the social Web has transformed the shape of scholarly practices and bought the prodigy for the creation of new ideas to be shared among researchers and depends on the researchers how to make the best possible utility of the application (Barbic, Lam and Barbic, 2016).

The vital transformation in the mid-2000s for scholarly communication has moved towards online networks, where a new wave of metrics within the field of Bibliometrics has emerged. The researchers have begun to survey and understand the means of communication wherein new innovative practices and tools were being recognized, such as bookmarking for later reading or the invention of Article level metrics (ALMs) by

journals such as PLOS ONE in 2009. The prestige of online publications and repositories has changed the scenario in disseminating scholarly information, which is more active and prolonged than the earlier models of means of communication. The existing citation-based metrics faced some limitations in the mid-2000s, which needs some urgent identification call for action (Cho, 2017). The innovative practice and development of new metrics have revolutionized better means for tackling the Web. There are alternative metrics, pronounced as web-based Bibliometrics, Scientometrics 2.0, and Webometrics. A new concept such as Altmetrics came into the limelight as the term was most likely favoured by most of the members of the impact community, which is somewhat related to the content and timing of the Altmetrics manifesto rather than its endorsement of the terminology and its receive its recognition in early 2010. Since the recognition of Altmetrics is still in the birth stage, it comprises dozens of tools and metrics that have been churning and developing for almost a decade. The elements and spirits associated with Altmetrics make the viewers compelling and attractive, but it is hard to follow from researchers' perspectives.

3.2.2 Categories of Altmetrics

The concepts of Altmetrics are divided into four levels such as:

- **Level 1:** Individual contribution Level Metrics
- **Level 2:** Venue –Level Metrics
- **Level 3:** Author- Level Metrics
- **Level 4:** Institutional-level metrics

3.2.3 Changing Pace of Research and Value Measures in the Modern Research Scenario

The methods the researchers and statisticians adopted for assessing and fostering scholarly communication among the researchers have gained immense importance in measuring the weight of the research work in quality and quantity aspects. As a result, there seems to have been revolutionized interest and active research in and around these processes. The best example can be cited by scholars such as Dan Cohen, the founding Executive Director of the Digital Library of America, who has constantly tried to bridge the gap between traditional methods of scholarly communication and digital scholarly

workflows. It can also be said that the development of Altmetrics is an essential aspect in this domain, wherein academic scholars and publishing houses are using new forms of technology to measure the impact of research in society. The format may be different, such as scientific journal Articles, book chapters, edited books, conference papers, pre-prints, reports, and many others.

With the advancement of information and communication technology, the use of technology in metrics studies has increased the speed and scale of scholarly communications. The dissemination of information in digital formats has increased the quality, quantity and various types of research made available to the academic community and scholars. This communication's usability helps analyze the work, its availability, and its impact on the scholarly society. The traditional method of assessing the value of the scholarly work is based on journal-based metrics, citations and peer-review processes, which might account for from week to year to complete the evaluation. The methodology previously adopted for evaluation purposes was mismatched, wherein new practices and evaluation strategies can be recognized with established practices. A critical component of the timing issue is the post-publication peer review was raised as a solution from the research output.

A significant incident in the history of metrics studies is a person named Jason Priem from the school of Information and Library Science at the University of North Carolina, Chapel Hill, and others criticized journal-based metrics as the sole components of the evaluation. Many have urged that new metrics such as Altmetrics should be considered a complementary tool along with the traditional measurement such as citation, peer review, etc., emphasizing openness, access and broader engagement in scholarship. Another story added to the same focal point is that the group of researchers belonging to the American Society for Cell Biology (ASCB) had published a declaration where a new method for evaluating scientific research output was outlined. An urgent need to emphasize new practices for evaluation has been the main highlight of the San Francisco Declaration on Research Assessment (DORA), where the Journal Impact Factor (JIF) shall no longer be the determinate of measurement. Though JIF is the widely used metric for the evaluation of academic impact, it has raised an alternative solution to the

problems of traditional methodology where the educational institution needs to coordinate with new emergent forms of metrics such as Altmetrics. Altmetrics though it may offer a more profound, more contextually based understanding and measure different forms of research value and impact, there are many unanswered questions related to the complex nature of libraries, institutions, scholars and the public in general by the digital and analogue communities.

3.2.4 CATEGORIES OF ALTMETRICS TOOL

There is a variety of Altmetrics indicators that were extensively and occasionally layered into various levels. Further, the level of Altmetrics is distinguished based on catering to individual needs; meanwhile, the others are designed on the necessity of administrators and other academic needy. It is significant to be noted that the correlation between Altmetrics and ideal philosophies such as community and openness have similarities. Still, all the byproducts of Altmetrics are not equally accessible free of cost. Through Altmetrics focuses on start-up ideas, but it has begun to gain a monopoly over large companies and ends with its grant funding (Moradi and Dokhani,2020). The cost of the Bibliometrics tool has become equivalent to nowhere of an Altmetrics tool. However, the Altmetrics still find its way to bear the stand and footing within the academic community, i.e. academia.

For a better understanding of beginners, the tools of Altmetrics can be divided into two major types. They include Peer networks- The metrics generated based on the Information within their network area and Harvesters- The metrics broadly gathered from external sources and give a comparative analysis of different metrics. The explanations of the terms are discussed in detail in the following sequence:

a. Peer Networks

It is considered one of the rapidly emerging trends for researchers and one of the significantly popular tools for generating Altmetrics for researchers. As the term indicates, a peer network is an online space that provides an interface among users with similar interests, skills, and credentials to disseminate information among them. In the sphere of academia, there came to exist many online sites which came into existence due to the growth and development of the social media web in the mid-2000s. In the late and

mid-2000s, the network developer has come out with new concepts and ideas to meet the needs of academicians and researchers of the contemporary period.

Figure 3.2: Different sources of altmetrics

(Source: https://blog.scielo.org/en/wp-content/uploads/sites/2/2013/08/Figura-Midias-Sociais.png)

The peer network groups were further divided into several types, which were discussed in the following manners:

- **Social Science Research Network (SSRN):** It is considered one of the oldest peer networks for academic utility, founded in 1994, followed by the uprising of the World Wide Web. SSRN is a repository composed of metadata consisting of more than 563000 abstracts, a storehouse of paper collection in electronic format, and a collection of 25 specialized subject networks. The registered candidates can get access to free abstracts and articles which promote collaborative work among a peer group of researchers. The users can search for papers across the SSRN eLibrary by adopting a centralized "search" mechanism or by using any network from any web page of the SSRN domain. Applying Altmetrics in SSRN offers quite a good number of keys that filter four levels: the whole site, article, author, and

network. In addition, SSRN provides information such as the number of downloads, viewing of abstracts and ranking of downloads. It also helps the authors track total citations and downloads and breaks them up into metrics for each contributor, which in turn helps draw the author's statistics. One of the critical features of SSRN is that it updates the list of top authors, top cited papers, and top publishers in the SSRN database, which helps researchers and academicians, retrieve the latest information. SSRN possesses' several potential qualities, but it suffers from some drawbacks, such as strict database policies (Thelwall and Kousha 2015). Despite these drawbacks, it has tried to address some advantages, such as adding new networks and sub-networks, which help complement new coverage for developing interest among the users. Thus it remains a crucial indicator for online scholarly communications and provides a strong hold in subjects such as economics, sociology, philosophy, business, and law.

- **ResearchGate:** This platform has become more relevant in measuring scholarly communications among the same academic community. It is the best example of a free and potential academic social network. It laid its foundation in 2008 by two subject experts in Physics and a computer scientist. The motto behind the foundation stone of ResearchGate is to help the academic community in terms of connectivity and collaboration and to give access to scientific publications, i.e. reports, e-prints, articles, edited books, and others. Users must register and sign in to the free account to access or identify any publications. In addition, the user must have an affiliated mail account of the institution they are employed in. By accumulating the detail of users' accounts, ResearchGate creates a profile of users where they get access to researchers' backgrounds and contributions to their specialized areas and help in sketching statistics of networks. The ResearchGate accumulates total full-text downloads, publication views, full-text requests, and total dataset downloads. Activities such as question views and profile views are traded on the respective profiles of researchers in ResearchGate. Users of ResearchGate have a clear and focused opportunity to see subtle changes in their in-network influence and impact over time. It was found that the researchers, besides the sciences-related area of study, have found less of populations with

research which has caused a chaotic imbalance in acceptance of ResearchGate as the platform across the various discipline of study.

- **Mendeley:** It is free citation management software that combines peer networks with some content the organization produced. Mendeley set its footprints in 2008 with a bunch of investors, which Elsevier later acquired in 2013. Mendeley provides a user-friendly interface such as searching for content, uploading publications, accessing articles by institutions, research interests, disciplines, citations of articles, and many more on this platform. One of the benefits of this platform is the network's citation aspects, which provide users with an access point for storing, organizing, and citing articles of similar interest wherein they can create their personalized library. From the perspective of Altmetrics, it seems that Mendeley data can be used as a harvesting platform where lots of Altmetrics tools can be applied and abstracted freely.
- **Academia:** it is a set of established peer networks that came into existence in 2008 with the motive of aiming to "accelerate the world's research" by developing a similar network of researchers with similar interests and uploading the materials which tend o develop a strong and broad base of the researchers. As per the report, over 11 million users have created the profiles, and approximately 3.5 million contents are uploaded to the database. To access academia, one needs to register a free account on the respective websites, which leads to uploading the articles, tagging the citations of the researchers' profiles, and sending copies to the formatted database for searchable purposes. The registered profiles in academia provide metrics in the form of analytics generated based on activity related to profiles or content uploaded. Academia provides an alternative option for choosing the analytics manually, such as profile views, document views, and downloads. One of the significant features of academia, in particular, is to view the institutions-specific URLs where they can especially draw the list of researchers along with its affiliation with the departments and institutions. The database also provides several documents associated with the unit or department. This feature provides additional features for LIS professionals to choose and identify "core user" groups and mechanics in acceptance of academia at their parent institutions.

- **CiteULike:** the existence of CiteULikewas designed in 2004 as a social bookmarking site for academicians to save and organizes citations from similar interest. This social networking site has been profounded by Richard Cameron, who was hypertension due to the availability of similar tools and applications operated independently and owned by the owner. This software provides the platform to rely on users who bookmarked browsed databases and customize the personalized library from a wide range of saving references. The customized libraries are ready for display in either private or public, giving users additional features to share their personalized library with their colleagues. However, the technical issues, such as low user counts and version control,andthe use of data supplied by CiteULike have continuously decreased, rendering the tool's future uncertain from an altmetrics perspective.

b. Harvesters

Harvesters include software developers such as Impact story, PlumX, Altmetrics and many more. Impactstory, earlier known as Total-Impact, is considered the most high-profile altmetrics tool Jason Priem and Heather Piwowar developed at the time of the Alfred P. Sloan Foundation and National Science Foundation. To upgrade the searching mechanism to the next level for researchers, Impact story has collected and harvested open data from both traditional scholarly sources and social networks, where metrics are presented using the latest mechanism of considering scholarly profiles. These new mechanisms have developed immensely and make researchers comfortable accessing information via online supplements.

3.2.5 Steps to implement Altmetrics in the course of Library operation:

The study conducted by Villavicencio et al. (2015) evaluated some recommendations that Librarians and LIS professionals can apply in their respective library operations. The recommendations include providing information about the emerging trends in the research field, creating new tools, and involving oneself in training and some of the results of Altmetrics. The steps to be implemented for successful operations of the library by librarians include the following patterns:

a. **Training in alternative metrics:** The LIS professionals should try to incorporate training and servicing aspects of the alternative metrics. They need to implement different mechanisms for those services and tools where metrics are offered. The institution should create profiles for various services and try to know their functionalities better.

b. **Application of tools:** The librarians and researchers need to apply those tools and mechanisms in the respective CV and profiles of the researchers.

c. **Collaborative work:** the team members of the library should consult the other professional members of different universities for scientific community support, start collaboration projects, and begin implementing altmetrics in their respective libraries.

d. **Recommendations for Altmetrics implementation:** the experts need to acknowledge and advise the supporting scientific community to implement these metrics and discuss the merits and demerits of using the metrics in the libraries.

e. **Training and Servicing:** The LIS professionals need to undertake some training programs in the development of scientific competences and digital literacy competencies, such as providing training for reference management tools such as Mendeley, Zotero, social makers, and some sites of open access, and many more. The libraries must also incorporate subject guides such as LibGuidesto enhance library information-seeking services.

f. **Dissemination of Altmetrics knowledge in the Library:** Incorporate training for researchers in scientific competencies such as alternative metrics, i.e. Altmetrics and implement it in their libraries. Train the researchers in scientific competencies, such as alternative metrics, and put them to the test. Assist researchers in depositing a copy of all research results, including codes and data, in the appropriate repositories, ideally with these services.

g. **Building of collection development:** to have an appropriate selection of information resources and services, the LIS professionals need to implement Altmetrics in their collection.

h. **Incorporation of Altmetrics in different library aspects: many universities have** incorporated Altmetrics in different aspects of operation in libraries. An

example can be cited from the University of Indiana, where they invented the IUScholar Works Repository. This repository has incorporated Altmetrics in its operations.

i. **Altmetrics to User study perspectives:** The user's study should incorporate Altmetrics into their procedure while the studies are in process.

j. **Mobile technologies**: The Librarians need to enhance the learning sets by understanding the limitations and advantages of all the metrics applied to measure scholarly communications and allowing access to the services through mobile technology applications.

3.2.6 Application of Altmetrics to the Researchers

One of the essential applications of Altmetrics in the field of Research and Development is to provide a bridge between informal academic discourse and the standard output of research. With the growth of information and communication technology, more researchers/ scholars are moving their conversation from the dark social space to open area networks such as open-access journals, public blogs, and social networks, which have become accessible for assessment and evaluation. It is noteworthy that the usability of social media and analytics and its associated tenure and practices seems inconsistent among the different disciplines, from the researchers to the industry, learned lessons, and some best practices. Many professional organizations, such as the American society for cell biology (ASCB), the association of Learned and Professional Society Publishers (ALPSP), and the Association for Information Science and Technology (ASIS & T), are carrying out a deep investigation into the application of altmetrics in their respective fields.

After the post of Jason Priem, many institutions, colleges, and researchers took their part with Priem as they believe that they seek to be benefited from Altmetrics as it provides new ways for information dissemination, impact, and engagement. The post also mentioned that it should provide three sets of values. First, it includes benefits such as a more outstanding amount of their academic contribution, a more holistic approach to

their research's impact, anda platform for scholarly discussion forums among cross-disciplinary areas in more innovative ways.

It is noteworthy that some practices exist where the scientific reports and papers in different disciplines like physics, statistics, quantitative biology, and computer science were open access and have been in practice for twenty years before the term "Altmetrics" came into existence. Researcher from different disciplines has been engaged in navigating and investigating the more social aspects of research for disseminating the research reports or data. An example can be cited from ArXiv. Org, an e-print repository, has been disseminating academic work to society (Dutta, 2016). There are many similar models of disseminating information that has been continuously setting research impact on society and persons. It is to be mentioned that the vendors/Adopters are less concerned about the broader spectrum of the tools and practices of Altmetrics for evaluation and analysis, and they seem to have more inclination towards marketing aspects of themselves and their research products. Many academic, social networks such as Mendeley, Social Science Research Network (SSRN), and Informal and formal social network sites provide information about total reads, citations, and likewise.

3.2.7 ALTMETRICS IN LIBRARIES AND THE ROLE OF LIBRARIANS

The growing tools in digital formats have been supporting the term Altmetrics, providing ample opportunities for libraries and librarians to maintain the standard of research and scholarly production process. Mendeley and Zotero are some of the softwares which provide reference services, and publishers such as Wiley and Springer use Altmetrics concepts and approaches to their services. Moreover, some companies started to target publishers engaged in Altmetrics as clients, namely Kudos, an Altmetrics company launched in 2014.

In the case of a journal, the Altmetrics indicators evaluate the value of Open Access journals and practices. Modern libraries are investing in various developmental projects and seek significant inclination towards open access policies and procedures that are correlated in supporting various academic purposes, practices, and perspectives of Altmetrics. The same example can be cited for the University of Michigan's Deep Blue, where the application for Altmetrics was indeed implemented. Modern-day Libraries are

well-equipped to develop multimedia and multimodal artifacts that complement academic and research objectives. As per the recent study, it was evaluated that the libraries are in a stand where they can evaluate and develop modern infrastructure to complement various activities such as adequate scholarly communication resources, tools, and practices at the grass root level or institutional level. The evolution of ICT has made the librarians navigate and evaluate the quality of information, recommendations or develop the latest information management tool for systematic and sustainable information management as LIS professionals have turned themselves into social media researchers.

The panel of experts in a discussion has highlighted the role of libraries and librarians in the development and facilitation of Altmetrics and also to help them determine the most appropriate evaluation methodology of metrics which is supposed to apply to both institutions at prominent researchers at individuals. Some eminent scholars such as Lapinski, Piwowar, and Priem have pinpointed three basic principles for implementing Altmetrics. In addition, they are informing the researchers on the latest areas of study, complementing the experimentation with the emerging Altmetrics tools, and involving themselves in Altmetrics education and outreach.

3.2.8 Example of Implementation of Altmetrics in Libraries

To start the experimentation and engage the employment of Altmetrics in libraries, the University of Pittsburgh Library System (ULS) has begun by drawing a pilot project. The University of Pittsburgh Library system has begun a partnership with Plum Analytics to evaluate the impact of the research in the university in less traditional established venues such as Social media Platforms and institutional Repositories of the respective university library collection. The Authorities in the University Library system have begun to administer ways to evaluate Altmetrics to connect scholarly communication directly to meet emerging research needs.

The development team of Plum Analytics has unique ways of exploring the University library system. During the experimentation, the library team has developed new inventory practices such as collection, organization, and sharing of experimental research work in the libraries.

The study has concluded two ways libraries and LIS professionals can participate in the conversation of conducting more research in terms of Alternative metrics in standardizing value, quality, and impact of the research process and started exploring new avenues and developing ways to expose metrics (Dehdarirad and Didegah 2020). Many academic libraries are beginning to develop metadata systems, institutional repositories, and some calligraphy that capture conventional artifacts developed and shared as a cycle of scholarly communication. As the investigation continues, developing a new workflow chart and searching for a digital identifier wherein the librarians must teach and disseminate the knowledge about preservation techniques and reuse that research property. To implement in the proper sequence, the librarians/ LIS professionals need to have a well-versed knowledge of the applications and implementation of Altmetrics, which they need to explain to administrators and researchers.

3.2.9 The implication of Altmetrics in contemporary Higher Education Scenario

Altmetrics has already generated quite a good amount of popularity in the higher education arena, especially its immense contribution to the field of research in addition to Academic impact measurement and information filtering in more traditional forms. In the conventional method of evaluation of research work, Bibliometrics methods are followed where a fair amount of critics and proponents follow some parameters such as Journal Impact Factor. Still, in the case of Altmetrics, online evaluation methods are adopted where a serious debate and discussion have been continued due to the use of online interactive spaces that, in return, push ahead towards intellectual debates, discussion, and development for using the forum (Galligan and Dyas 2013). However, there is a growing consensus among detractors that Altmetrics pose a significant risk when capturing data, particularly in-depth scholarly engagement, then the other pattern of citations. But on the contrary, it is seen that Altmetrics possess a lot of attention among scholars who seek out and use information with the best possible collection of metrics which promotes and track engagements beyond all the limitations of a formal pattern of citations.

One of the significant setbacks of all Altmetrics harvesters is the inability to dissertate any errors that might arise even if any tool has finished automatically gathering

different types of Altmetrics and combining them into a single report. The most frequent question.

3.2.10 important works needed to make Altmetrics a precious asset in society

It is obvious to everyone that there is much-needed work to be done with Altmetrics and its various associated components as it seems to have sparked, which led to increasing momentum over the past couple of years. They identify meaningful metrics for a specific group of individuals that might comprise research and development labs, research, publishers and libraries. It is to be noted that a wide variety of data sources can be combined to give a glimpse of the overall dimension. If the pictures are customized for the right audience, there seems to be a broader scope for development, which is yet to happen on a wider scutum. An example can be cited as Research and Development Institution, which wants to know the overall impact they are customizing over the Web to assess itself from other competitors. The institution needs to properly select barometers that are relevant to their piece of work and also provide comprehensive analytics for both agencies. The second phase of making Altmetric data accessible for better interpretation is streamlining this process into an intuitive dashboard.

3.2.11 Usability of Altmetrics to the Researchers

The alternative space provided by Altmetrics to the researchers and institutions to bridge the gap between the formal and informal modes of scholarly communication. The invention of web 2.0 and social networks have put scholars and academicians to move from the "dark" social space to cloud computing-based open social spaces such as public vlogs, open access journals, and academic social networks, which open the door for tangible measurement and assessment. However, the application of social media and analytics and the methodological design of tenure and promotion practices are not found in tune across or even within the branch of study and Early adopters' techniques and experimental studies, from investigators to industry, achieve stories, lessons learned, and strategies worth investigating. Many professional organizations, such as the American Society for Cell Biology (ASCB), the Association for Information Science and Technology (ASIS&T), and the Association of Learned and Professional Society

Publishers (ALPSP) of them, are making a deep investigation into the use and application of Altmetrics.

Several research studies and survey reports that different discipline researchers, colleges and universities, or institutions of national importance have significantly benefited from usingaltmetrics tools and practices and paved a new way for redesigning/ reimaging dissemination, impact, and engagement of scholarly communication. One prominent philosopher put forward the three sets of values for the teachers that Altmetrics can provide. These include a more distinguished position of their academic performances, a new avenue of the impact of their research or usability of their scholarship and the capability of the faculty to participate in scholarly debates and discussions within or across the variety of subjects in new pathways. The basic idea and knowledge of research provide unprecedented potential power for researchers, institutions, and funders in determining the potential aspects of any project, its financial aspects, and the allotment of funds, along with the proper dissemination of various components of funds. Finally, the usability and productivity of the products and services will hold potential features among the general public compared to an institution, professional organizations, or any funding agencies. These implementations can be distinguished using Altmetrics techniques and are more accurately estimated.

History had spoken that before the coinage of the term "Altmetrics", researchers across different disciplines had engaged themselves in understanding and investigating the more social aspects of research, such as sharing value and the motivations of conducting and accumulating research data. Hard sciences have well-established policies for implementing open-sharing practices in some specific disciplines. A typical example is arXiv.org, a repository of e-print that accumulates scientific papers in disciplines such as physics, statistics, quantitative biology, and computer science. This repository has a history of more than twenty years in open-access publications and redistributing academic output. Several open-access repositories, including ArXiv.org, have formed the base for apprehension in sharing research findings on a grand scale and forming the platform for a discussion forum on topics such as the impacts of the research on society and many more.

Several studies have determined and viewed Altmetrics as an instrument that enables a more comprehensive understanding of the published literature and its impacts on various communities. Though many researchers believe that research should speak for itself, many also argue that the audience needs can be understood by combining the analytics from Google and Altmetrics.com for whom the research resonates. This analogy includes determining propagation techniques and economic opportunities for his task. The applicability of Altmetrics tools provides a more comprehensive view of the usability of research rather than some pronouns such as who, where what and how. It is noticed that the aim of Altmetrics tools and resources is primarily based on researcher-level metrics rather than the whole amount of group of institutions or universities. In institutional coordination, various metrics, including Scopus and the Book Citation Index, don't form an integral part of social media-based Altmetrics tools and practices. Despite its setback in social media, it can still be determined and provides the individual researcher with a set of lenses for holistically understanding the forefront of their impact.

3.2.12 Merits and Demerits of Altmetrics

Altmetrics- Merits

Though Altmetrics cannot be considered as the replacement for traditional metrics in discerning research, they are meant as complementary to traditional evaluation methods. One of the merits of Altmetrics is the speed function that traditional measures lack. Altmetrics provides a platform for users to have a quick view of the impact of research work. It also provides traditional information, such as how often people have cited and discussed an article on a different platform. In addition to the above function, it helps adequately disseminate information among the large masses. Modern-day users use social media such as Facebook, Twitter, etc., where they quickly access the article and arrange references of scholarly work as soon as they are published. Another advantage of altmetrics is that they have a wide variety of applications that helps to track researchers' scholarly outputs, including data sharing, software, and presentations.

Altmetrics- Demerits

Through altmetrics provides a valuable number of functions, there are certain limitations along with the advantages functions. First, altmetrics is complementary to

traditional metrics, not a replacement for an old version of measurement. Second, subversive means or gaming, i.e., the practice of unethically exploiting a system or set of data to produce results that fit a user's desired outcome, can compromise Altmetrics. This raises concern in an environment where the data are easily manipulated. Thirdly, there is a lack of correlation between Bibliometrics and Altmetrics data. For example, there seems to be no evidence that remarks on the correlation between Altmetric and citation indicators. Fourthly, it can be said that there posses a potential problem with the inclusion of social media data such as Facebook and twitter.Lastly,Altmetric.com presently do not contain all possible sources in which a scholarly work is mentioned and may omit or misidentify scientific research.

Table 3.1: Limitations of Altmetrics with description

Limitation	Description
No citation based	Altmetrics are to be considered complementary to traditional metrics, not a kind of replacement for traditional metrics
Gaming	Data can easily be manipulated to fit the desire of the users
Lack of correlation between altmetrics and bibliometrics data	There is a lack of significant documentation pieces of evidence that marks the correlation between Altmetrics and citation-based indicators
Social Media Inclusion	It seems from the survey that the public seems to be less interested in academic research output rather than some burning issues
Common definitions lacking	It is challenging to categorize activities like Twitter mentions, Facebook "likes," and expert recommendations on F1000 as having the same meaning.

3.3 Conclusion

The study now provides an overview of Altmetrics and its application in the library and information science field. It has emphasized the gradual development of metrics for measuring various pieces of scientific literature. It also analyses its various applications in different domains of library activities. The study also highlights various key Altmetrics functionalities. The benefits and drawbacks of Altmetrics have been thoroughly discussed. Although Altmetrics has emerged as an alternative tool for measuring research work, traditional metrics will always be the backbone of modern-day metrics. Because of the diversity of disciplines in the field of research, there is a high demand for LIS professionals to enable researchers to make visible the various ways to communicate scholarly publications beyond academics. Altmetrics has been a tremendous help to the academic community in advancing academic collaboration and making research more visible (Liu, 2013). It has changed the landscape for researchers by providing a more profound, contextually based understanding and measuring various forms of research value and impact. However, there are many unanswered questions related to the complex nature of libraries, institutions, scholars, and the public in general by the digital and analogue communities. It should also be noted that Altmetrics in the field of R&D is intended to bridge the gap between informal academic discourse and formal research output. This platform has given new meaning to research and development as the academic fraternity moves from dark space to more open space, making it more tangible from an R&D standpoint. Altmetrics has created a new diagram for Librarians and Information Managers to use to maintain the standard of Information Management and the educational production process.

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https://staticaltmetric.s3.amazonaws.com/uploads/2016/12/Screen-Shot-2017-09-07-at-17.12.16.png

Chapter 4 - ResearchGate and its Impact on Academics

CHAPTER - 4

RESEARCHGATE AND ITS IMPACT ON ACADEMICS

4.1 Introduction

The publication of scientific literature on various websites is essential to research. In the case of some works of literature, the journal publishes its articles on the publisher's websites, which are freely accessible to all. On the other hand, the journal's editors may require authors to pay article processing fees. There are also other options for authors to self-publish their pre-prints in an institutional repository, on their websites, or a different academic platform such as ResearchGate, Google Scholar, or Academia.edu. It should be noted that the time required for uploading any documents and the extraordinary benefits of these academic, social networking sites are essential to understanding and distinguishing them from other ordinary websites. Users must understand the importance and significance of these networks to make rational decisions about their usability and visibility.

Few studies have looked into the benefits and usability of open-access publications, particularly academic articles. Articles published open-access tend to be cited more than those published closed-to-access because they appear more easily accessible. However, there is no evidence that articles on specific subjects or academic sites are mentioned more than those published in other disciplines. It is also clear that scholarly impact is measured using citations and usage metrics available through digital libraries or subject repositories. The number of views and downloads of articles correlates, increasing the research's scholarly impact. It also appears true for scientific literature published on academic and social websites, but it has not been tested in any studies.

Since the study focuses primarily on ResearchGate, other academic, social networks such as Google Scholar and Academia.edu are not discussed in depth. The foundation stone of ResearchGate was laid in 2008 with the primary goal of assisting researchers from various disciplines to communicate, collaborate, and share information among the academic fraternity. It was founded in Berlin by two physicians and a computer scientist. This scholarly, social website is free to join (as of August 2015), and

each member can create a profile page with a biographical description of themselves and their publication list. The publications registered in ResearchGate have their page displaying metadata. In some fields, it also provides a preview and a link to the full-text version of the article provided that the full text of the article is uploaded, or the publisher may ask the author to remove it due to copyright reasons. The full version display of article-level metrics on ResearchGate includes the times the work has been cited, downloaded, or viewed. It is a platform with various interfaces through which researchers can easily communicate with members and exchange information. It connects members affiliated with a specific institution or who have expressed an interest in specific academic subjects. One of the most notable features of ResearchGate is its support for social networks. It also includes information about their profile's activities and publications. It also provides an interface for its members to ask questions, and members can answer questions forwarded to them. Though only a tiny percentage of users use ResearchGate as a social site, the vast majority use it to disseminate scientific research literature.

Perhaps one ResearchGate's distinguishing features are that it vigorously shares the users' engagement in various social media platforms. It also frequently encourages members to log in to their profiles so that it can track the number of views on their profiles, how many people follow their accounts, and other engagement metrics. All of these activities can be managed through the ResearchGate account settings of members. Another feature that distinguishes ResearchGate is the high visibility of user profiles. These features have significantly increased ResearchGate's popularity, as a large volume of full-text portable document format (PDF) is readily available in many of the researchers' profiles. These features have significantly increased ResearchGate's popularity, as a large volume of full-text portable document format (PDF) is readily available in many of the researchers' profiles. As a result, it is the most searchable database for article searching. Unfortunately, all documents available in PDF format on ResearchGate are copyright protected and cannot be shared. As a result, many issues are raised, but these issues are addressed collaboratively by the publishers and individual account holders and successfully resolved.

In addition, ResearchGate generates a wide range of statistics about institutions and members. These statistics appear to broadly reflect other academic rankings, though they are skewed by factors such as vastly different international educational levels or website acceptance. For example, the RG Score "measures scientific reputation based on how all of your research is received by your peers," according to the sites (http://www.researchgate.net/publicprofile.RGScoreFAQ. Html). It is important to remember that score calculations in ResearchGate are not transparent and depend on the journal's impact factor, which poses a barrier to evaluating individual academicians. Nevertheless, a critical study is being conducted on the ResearchGate presence in 23 South African universities. Significant correlations were discovered between an average web of science citations per paper and the average ResearchGate downloads, views, impact points, and scores of the respective institutions, implying that the use of ResearchGate accurately reflects academic interest or impact at the organizational level (Onyancha, 2015).

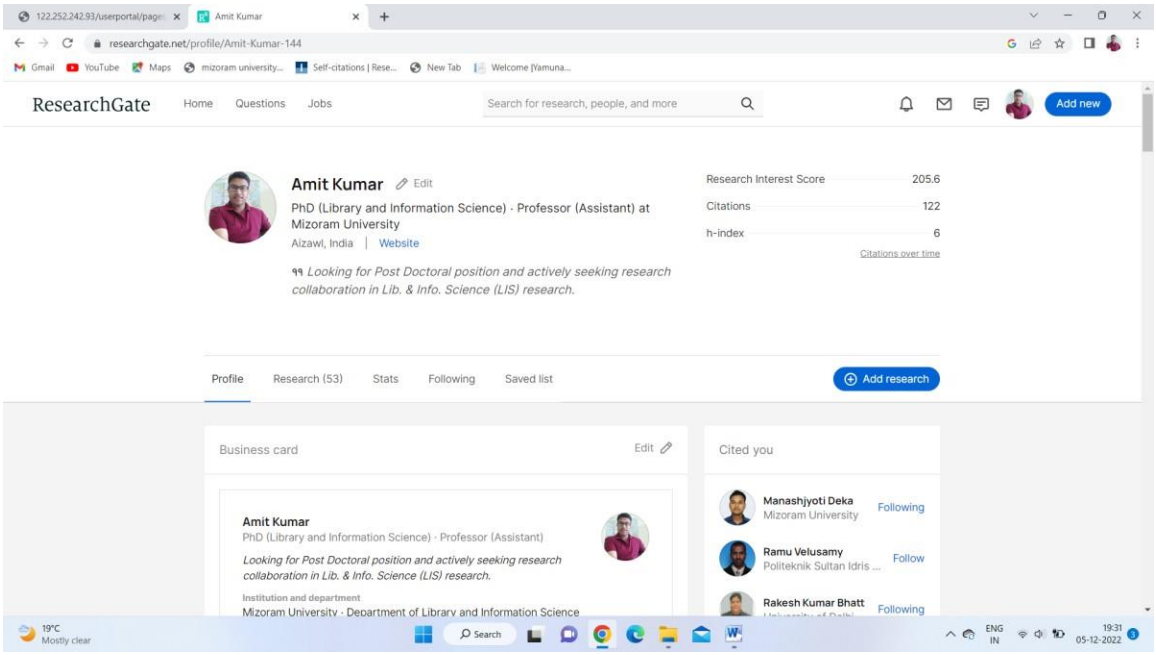
Academicians are increasingly requesting that they use ResearchGate as an academic site for disseminating information and increasing their visibility. As of July 2022, there are more than 20 million users, and this number is expected to grow as the service grows in popularity. An online survey conducted by a researcher in Indian universities revealed that 54% of the population uses ResearchGate and has a profile. On the other hand, 51% are on Academia, 39% on LinkedIn, and 35% on CiteULike. In addition, an online survey was conducted on a global scale.

4.2 Brief History of ResearchGate:

ResearchGate, one of the most popular sites among the academic community, was founded in 2008 by renowned virologist Dr Ijad Madisch, along with a partnership friend, Dr Soren Hofmayer, a physician, and Horst Fickenscher, a computer scientist, who started the company as a project by combining their output knowledge from various backgrounds. This academic platform began in Boston, Massachusetts, and was later relocated to Berlin, Germany. Benchmark, a venture capital firm, made one of the first benchers for investment in 2010. Benchmark partner Matt Cohler joined the board and was involved in the decision to relocate to Berlin. According to one New York Times

report, the ResearchGate websites began with simple features but were later designed and developed based on additional output provided by scientists and academicians. The report also revealed that the number of sites increased over time, rising from 25,000 to more than one million between 2009 and 2011.

Figure 4.1: The front page of a ResearchGate profile of an individual



(Source: https://www.researchgate.net/profile/Amit-Kumar-144)

Another momentous event in ResearchGate's gradual growth and development was the second round of funding, led and announced by Peter Thiel's Founders Fund in February 2012. Later, on June 4, 2013, it braided a series of investors worth $35 million, including Bill Gates and many other well-known business figures. With increased investment, the company grew gradually from 12 employees in 2011 to 120 in 2014. There are currently about 300 employees, including 100 salespeople.

Some of the competitors in the groups include Academia.edu, Google Scholar, and Mendeley. According to one of the reports, it was found that Academia.edu had more significant segments of registered users in 2016 and also high web traffic. Still, in the context of active users, ResearchGate is more involved than other platforms, such as Academia.edu. However, it is to be noted that ResearchGate restricts its user's accounts

to people at recognized institutions. The disparity in active usage may be explained by published researchers, as many Academia.edu accounts are lapsed or inactive. It is also to be mentioned that an academic survey tool was conducted in 2015-2016 among educated community respondents. Most of the respondents have active accounts with ResearchGate and Google Scholars. Still, as per the findings, it was revealed that almost twice the respondents use Google Scholars for retrieving information compared to other ResearchGate.

The core founder of ResearchGate has stated that the company's business approach depends on highly targeted advertising based on user activity analysis. It also announced that it would be spending on Science $1 trillion per year under the control of a "relatively small number of people".

Again in 2015, the company acquired some additional investments worth $52.6 million from a wide range of investors such as Goldman Sachs, Benchmark Capital, Wellcome Trust, and Bill Gates. Unfortunately, the announcement of the funding was not released until February 2017. As a result, the company has suffered several Million in losses since its inception. Still, the CEO has expressed profound optimism that would make us lose and grow as a better company.

In the history of ResearchGate, a 2009 Business Week article reports that ResearchGate will be one of the most "potentially powerful links" in promoting technology innovation in developing nations by connecting scientists from different countries with a peer mindset. According to the report, the websites have grown in popularity due to their user-friendly interface. In addition, according to the article report, ResearchGate is known for its involvement in various notable cross-country collaborations between academic communities, which result in substantive development.

According to a review of several studies, ResearchGate has a positive contribution to the academic fraternity, and many audiences accept the concept of ResearchGate. According to one study published in The International Information & Library Review, most respondents use social networking sites for academic purposes. The most popular social networking sites are Facebook and ResearchGate, which appear to be the most

popular at the University of Delhi. However, it is also reported that using social media applications is a pointless exercise.

The platform claims to be one of the most internationally used social networking sites. Still, according to a report, there is an uneven distribution of users, with Brazil having the most users compared to China having only a few accounts of researchers compared to the number of publications.

Again, under the awareness and applications of ResearchGate better, a survey conducted by nature in 2014 reported that 88% of the respondents were aware of ResearchGate and had also used it whenever necessary. On the other hand, less than 10% of the population said they would use it actively for academic purposes, while 40% prefer using Twitter for academic discussion. It was also reported that Researchgate is the most popular social networking site as per the survey conducted by nature. In contrast, the other hand Google Scholar is considered the second most visited site in the academic community. Again, it is also said that 29% of regular visitors had signed up in their profiles on ResearchGate in the past few years. It was also noticed that 35% of the surveyed participants were invited to the research accounts by mail.

As per one of the reports from Times Higher Education, it was reported in a global survey that 20,670 people have to use ResearchGate for academic and social networking sites. It was also noted that "ResearchGate" was one of the dominant networks compared to other educational and social networking and twice the popularity of other competitors. Around 61% of the registered participants had published at least one paper in their respective ResearchGate profiles. Another study also reports that "relatively few academics appear to post questions and answers" but applied as one of "Online CVs".

Several studies also found that one of the most significant factors for cancellations by several library systems is the widespread use and application of ResearchGate was considered one of the factors to reduce the value of open access systems of information resources. Tools for data analysis such as Unpaywall Journals, which libraries have used to calculate their options' actual costs and value before making such choices. Help scientists distinguish ResearchGate from open archives, such as academic libraries, which are considered more stable.

It is not only the popularity of ResearchGate that made significant contributions to its upliftment along the way, a few criticisms are associated with this academic, social networking platform. For example, it was found repeatedly that many criticized its decision on the removal of convicted sex offenders, wherein many of the users of ResearchGate had protested silently by deleting their accounts as they refused to publish any of the literature that is related to pornographers as well as a registered sex offender in Canada as the reporter from Ben Levin as a user. However, one of the significant aspects of "Researcher Ben" is that he is a frequent user of ResearchGate and has published more than 80 kinds of literature, wherein the vast majority of them hold interest in different areas with child pornography and paedophiles as research interest areas.

Another ground on which ResearchGate has been criticized for the email of unsolicited invitations to its users' coauthors. Generally, some of the emails are written and sent to the authors as if they have been written personally or were sent automatically unless the users opted out, which causes some of the researchers to boycott the services provided by ResearchGate. This feature of ResearchGate harms the academic community in carrying forward some scientific studies. After a series of complaints from the members, this practice was discontinued.

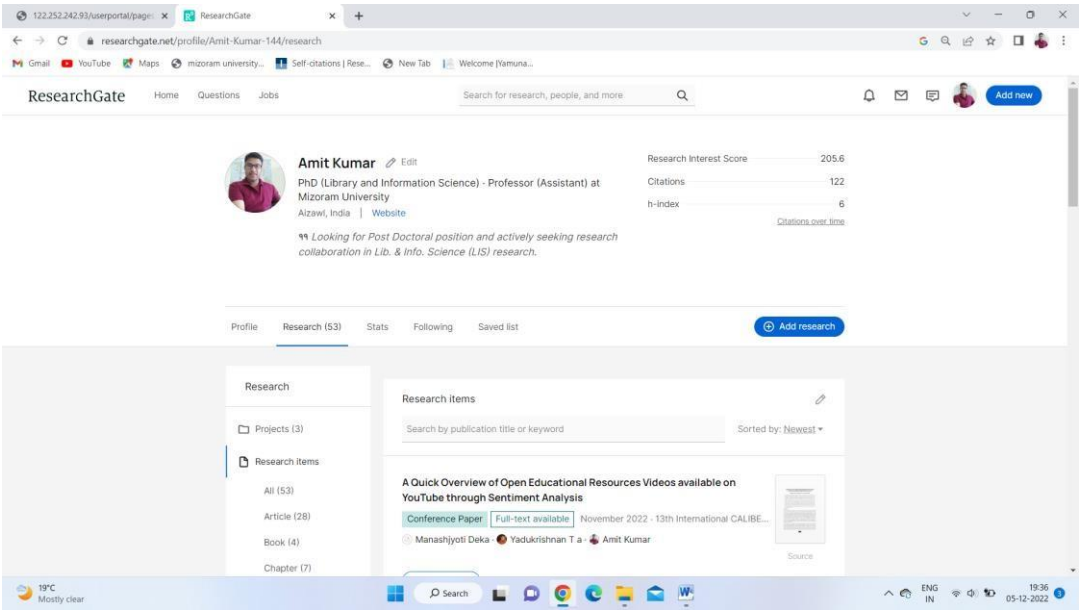
Another criticism that has been accounted for is the study published by the Association for Information Systems in 2014 has found that the ResearchGate has generated more than 297 invitations for 38 people over the past 16 months. In addition, over 430 publications were automatically added to the user profile. Furthermore, it was Reporters and scientists discovered that the RG score, calculated by ResearchGate using an internally developed algorithm, can reach high values under dubious conditions.

The metrics calculations of ResearchGate found in several studies indicate that no good works of literature have been published. The studies conclude that RG metrics are "intransparent and irreproducible", which suggests that it incorporated the Journal Impact Factor into the user's scores and indicated that it should "not be considered for academic evaluation". The findings were confirmed in a second "response" study, which also discovered that journal impact factors primarily determined the score. In addition, the RG score was negatively associated with network centrality, suggesting that users who are

the most active (and thus central to the network) in Online research do not typically have high RG scores. It was also found that there is a positively correlated with Quacquarelli Symonds University rankings at the institutional level.

It was also criticized for failing to provide safeguards regarding "the dark side of academic writing", including some phenomena such as fake publishers, publishers with "predatory" publication fees, and fake impact ratings. It has also been chastised for infringing on the rights of published works.

Figure 4.2: Interface of ResearchGate account of a researcher



(Source: https://www.researchgate.net/profile/Amit-Kumar-144/research)

It was also found from the study that in Sept. 2017, lawyers representing the International Association of Scientific, Technical, and Medical Publishers (STM) sent a letter to ResearchGate taking legal action for copyright infringement and demanding that they alter their handling of posted online articles to include pre-release licensing checks and "particularly, [for ResearchGate to] halt its extraction of content from hosted articles and the modification of any hosted content." It would also signal the end of ResearchGate's copy and pasting and downloading of published journal content of the article and the creation of internal blog post databases. Again, this is followed by an announcement that takedown requests need to be issued and addressed by the

ResearchGate team regarding the copyright infringement related to millions of articles in the databases.

Despite several shortcomings, the researchgate has agreed to upload articles with three major publishers, including Springer Nature, Cambridge University Press, and Thieme. As per the agreements, it was notified that the publishers would send notifications as their articles are uploaded, but they will not be able to upload by themselves.

4.3 Features of ResearchGate

Some of the relevant features of ResearchGate include the followings:

a. One of the most notable features of ResearchGate is that it indexes self-published information on user profiles and suggests connections to members with similar research interests.
b. The question and Answer feature are one of the significant aspects of ResearchGate. Whenever a member asks a question, it is distributed to others who have indicated on their user profile that they have specialist knowledge.
c. Social networking platforms also have specialized chat rooms where users can share information and knowledge and have productive conversations on relevant subjects.
d. Another essential feature of ResearchGate is its research-focused job board.
e. ResearchGate is one of the largest databases, with over 15 million users, most of whom are from Europe and North America. Though most users are from medicine and biology, it also has participants from other fields, such as biology.
f. For a decade, ResearchGate has published its metrics in the form of author-level metrics. Though the RG score has been available on ResearchGate for some time, the company announced its removal in July 2022 due to a policy change. However, ResearchGate does not charge fees for publishing content on their sites, and no peer review is required.

4.4 Importance of Analyzing Research Impact in Library and Information Science

Researchers and academic scholars who teach or are engaged in research and development aspects of Library and Information science are in a unique position in measuring research impacts. It should be noted that compared to other academic subjects, measuring research impact is frequently regarded as necessary for LIS scholars in terms of career advancement. In addition, contrary to many different disciplines, LIS scholars can propose research topics such as measuring research impact, and some of them can also develop subject expertise. Other branches of knowledge include research impact measurement as a complementary topic for graduate students as part of their curricula. Still, graduate students in LIS require instruction in the use of measures because they are likely to encounter them in professional settings practice.

In addition to the use and application of measuring research impact for career development by LIS researchers, practicing librarians should identify and recognize the functionality of measurement of research impact in their collection development policies and how such tools can assist them in identifying resources with the most significant impact in the disciplines and subject areas supported by the library. The curriculum of the study of Library and Information Science mainly gives exposure to identifying the mechanism of identifying various techniques and tools for measuring research impact while, in return, giving the practising librarians responsibility and ability to perform professional activities. This factor has led the teaching professionals of LIS programs to incorporate some portion of the measurement of research impacts upon the budding professionals.

The study has also tried to devote somebody of kinds of literature in examining the beliefs and usages of research impact tools such as altmetrics, which can lead to provide directions in providing some library support services for researchers and educators that might include services such as the use of author identifiers, maintenance, and creation of scholarly profiles. This effort has given the point to comprehend disciplinary differences in beliefs about and applications of research impact measurement. It has been noticed from the review of related literature that many studies across different disciplines have been carried out in more broad subjects such as physical sciences, social sciences and

humanities, art and atheistic, and some of them concern themselves more specifically on disciplines such as psychology, French language or sociology which makes cross-disciplinary comparison difficult. One of the studies carried forward by Sutton, miles, and Konkel in 2018 found that most faculties have awareness and familiarity with altmetrics, including measurement of research impact. The findings also show a relationship between years of teaching experience and an understanding of altmetrics. Though they are aware of altmetrics, they are more in touch with traditional metrics such as citation counts and usage statistics.

It can be said that the study provides an overview of altmetrics and its usability in the field of library and information science. It has highlighted the gradual development of metrics for measuring various scientific pieces of literature. It also tends to analyze its multiple applications in the various domains of library activities. Different key functionalities of altmetrics are also a highlight of the study. The merits and limitations of altmetrics have been pin pointy discussed. It can be marked that though altmetrics has emerged as an alternative tool for the measurement of research work, traditional metrics shall always remain the backbone of modern-day metrics.

4.5 Changing Pace of Research and Measures of Valuation among scientific community

The methods the researchers and statisticians adopted for assessing and fostering scholarly communication among the researchers have gained immense importance in measuring the weight of the research work in quality and quantity aspects. As a result, there seems to have been revolutionized interest and active research in and around these processes. The best example can be cited by scholars such as Dan Cohen, the founding Executive Director of the Digital Library of America, who has constantly tried to bridge the gap between traditional methods of scholarly communication and digital scholarly workflows. It can also be said that the development of Altmetrics is an essential aspect in this domain, wherein academic scholars and publishing houses are using new forms of technology to measure the impact of research in society. The format may be different, such as scientific journal Articles, book chapters, edited books, conference papers, pre-prints, reports, and many others.

With the advancement of information and communication technology, the use of technology in metrics studies has increased the speed and scale of scholarly communications. The dissemination of information in digital formats has improved the quality and quantity, and various types of research have been made available to the academic community and scholars in particular. This communication's usability helps analyze the work, its availability, and its impact on the scholarly society. The traditional method of assessing the value of the literary work is based on journal-based metrics, citations, and peer-review process, which might account for from week to year to complete the evaluation. The methodology previously adopted for evaluation purposes was mismatched, wherein new practices and evaluation strategies can be recognized with established procedures. A critical component of the issue of timing is the post-publication peer review was raised as a solution from the research output.

A significant incident in the history of metrics studies is a person named Jason Priem from the school of Information and Library Science at the University of North Carolina, Chapel Hill. Others have been criticized for using journal-based metrics as the sole components of the evaluation. Many have urged that new metrics such as Altmetrics should be considered a complementary tool along with the traditional measurement such as citation, and peer-reviewed, emphasizing openness, access, and broader engagement in scholarship. Another story added to the same focal point is the group of researchers belonging to the American Society for Cell Biology (ASCB) published a declaration where the new method for evaluating scientific research output has been outlined[18]. An urgent need for emphasis on contemporary practices for evaluation has been the main highlight of the San Francisco Declaration on Research Assessment (DORA), where the Journal Impact Factor (JIF) shall no longer be the determinate of measurement. Though JIF is the widely used metric for evaluating the academic impact, it has raised an alternative solution to the problems of traditional methodology where the educational institution needs to coordinate with a new emergent form of metrics such as Altmetrics. Altmetrics though it may offer a more profound, more contextually based understanding and measure different forms of research value and impact, there are lots of unanswered questions related to the complex nature of libraries, institutions, scholars, and the public in general by the digital and analogue communities.

4.6 Conclusion

It can be concluded that through the platform has suffered from various sorts of criticism at different point of times, but over the period of time it has able to sustain its survival in the contemporary world where there are many similar products and services. Looking into the bright perspective of the study, it can be said that the invention of this kind of platform has brought a new era of scholarly communication among the masses having similar interest of area of study. The sites have brought the global researchers to the single platform and make their research work visible to the large group of audience. The sites have been the greatest invention of all time since its inspection it has rendered valuable services to the academic fraternity.

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Chapter 5- Data Analysis and Interpretation

CHAPTER -5

DATA ANALYSIS AND INTERPRETATION

5.1 Introduction

In general, scientific research is considered one of the significant aspects of any academic activity. Therefore, the proper utility and dissemination of information to researchers and the academic community are of utmost importance. With time, there seems to be a lot of technological development that directly or indirectly affects the traditional (formal) and non-traditional (Informal) means of scholarly communication. One factor drastically changing communication mode is the shift from print to online publishing. In other words, Journal subscription modes in academic libraries are changing, leading to open access movement. In contemporary times, readers are not dependent on publishers for retrieving information related to research. As the rapid development of information and communication technology has taken place, there seem to have various repositories which provide access to different information and help the researchers as alternative tools for retrieving data. Furthermore, various web 2.0 tools such as blogs, wikis, and social and academic networks have dramatically changed informal publishing.

With the gradual development of academic and social networking sites such as academia, Google scholars and ResearchGate and at the same time, various reference managers such as Mendeley, CiteULike and Zotero are the significant sources of metrics that includes readership, the total number of tags, total number of tweets, total numbers of profiles views and many more have provided a ground for evaluation purpose of research work, individual researchers, an institutions or a country. The evaluation process of such metrics is known as "Altmetrics" or "alternative metrics".

The widely accepted definition of Altmetrics is"the study of scholarly impact measures based on activity in online tools and environments" (Priem et al., 2012).

This chapter focuses on data analysis, interpretation, and findings based on the research objectives established for analyzing and evaluating the research performance of LIS teaching faculties in India's central universities.

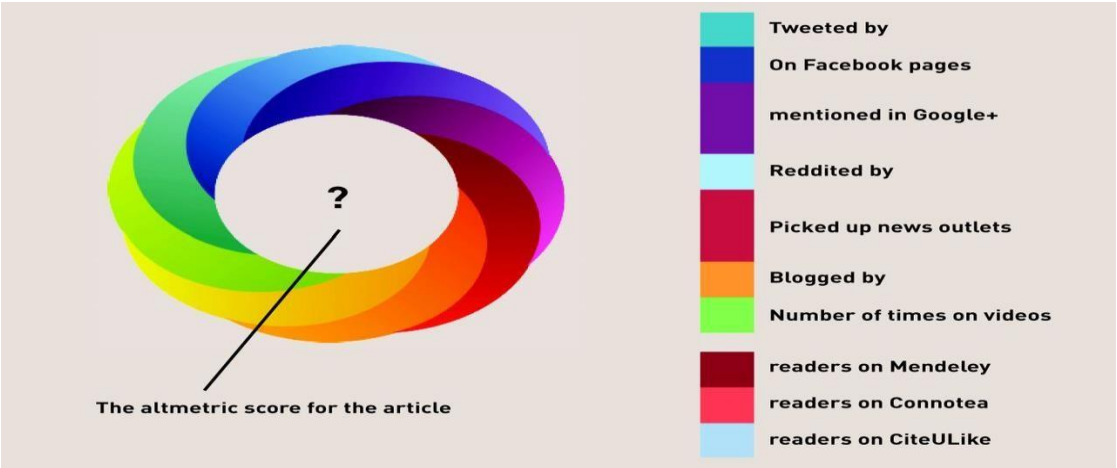


Fig 5.1: Process of AltmetricsData Collection(Source: https://www.wur.nl/upload/d5e0a79d-feb1-4001-89ac-c21f796a4f40_altmetrics.jpg)

A critical analysis of processed data provides the correct meaning for the study objectives and maintains a link with the various variables investigated in this study.

5.2 Data analysis and interpretation

Interpreting collected data is a significant aspect of any skilled researcher, which the researcher has to do with utmost care and follow some set methodology and guidelines for data analysis. Based on the study's objective, the process has been designed for collecting data. ResearchGate has been used as a primary source for data collection by following specific parameters restricted to the study. However, out of 19 central universities in India, Hemwati Nandan Bahuguna Garhwal University has been excluded from the study as no list of faculties was found on the university website. Again, it is to mention that only 66 of the total faculties have their accounts in ResearchGate. The collected data were analyzed, tabulated and interpreted to draw references under various subheadings. The analysis has been divided significantly into two parts. The first part is based on a general description of the universities and the various details related to the study's objectives—the second deals with the correlation of analysis of different ResearchGate metrics. Since the survey is concerned with the goals prepared during the 2019-2020 session, only the faculties present during the tenure were taken for a study especially.

5.2.1 Part 1: Analysis of data based on the General Information

This section of the analysis deals with the first three objectives proposed for the study. The data collected are from LIS teaching faculties having their account in the ResearchGate platform and respective university websites.

5.2.1.1. Number of faculties in the LIS teaching department

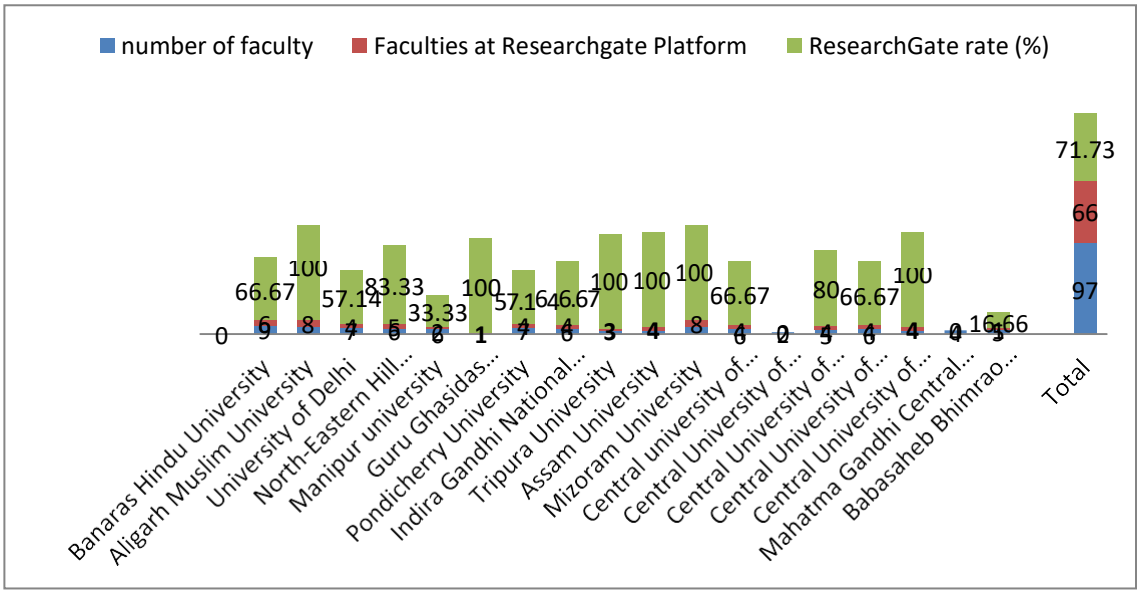
Table 5.1 and figure 5.2 show the number of teaching faculties in various central universities in India belonging to the Library and Information Science discipline. It is noticed that out of 97 faculties, only 66 of the working teaching professionals have profiles in the ResearchGate platform, accounting for 71.73%. Universities such as Aligarh Muslim University, Guru Ghasidas Vishwavidyalaya, Tripura University, Assam University, Mizoram University and the Central University of Gujarat have 100% faculties present in the ResearchGate platform. On the other hand, universities such as Mahatma Gandhi Central University, Bihar, have reported that none of the faculties has an account in ResearchGate. Banaras Hindu University, Indira Gandhi National University, Central University of Tamil Nadu and the Central University of Himachal Pradesh has the same percentage rate of 66.67%. On the other hand, universities such as the University of Delhi and Pondicherry University with 57.14%, North-Eastern Hill University with 83.33% and the Central University of Punjab with 80% and Babasaheb Bhimrao Ambedkar University with 16.66% respectively.

Table 5.1: Number of LIS teaching faculties in Central Universities

S. N.	Name of the Central University	No. of Faculty	Faculties at ResearchGate	ResearchGate rate (%)
1.	Banaras Hindu University	9	6	66.67
2.	Aligarh Muslim University	8	8	100
3.	University of Delhi	7	4	57.14
4.	North-Eastern Hill University	6	5	83.33
5.	Manipur university	6	2	33.33

6.	Guru GhasidasVishwavidyalaya	1	1	100
7.	Pondicherry University	7	4	57.14
8.	Indira Gandhi National Open University	6	4	66.67
9.	Tripura University	3	3	100
10.	Assam University	4	4	100
11.	Mizoram University	8	8	100
12.	Central university of Tamil Nadu	6	4	66.67
13.	Central University of Haryana	2	0	0
14.	Central University of Punjab	5	4	80
15.	Central University of Himachal Pradesh	6	4	66.67
16.	Central University of Gujarat	4	4	100
17.	Mahatma Gandhi Central University	4	0	0
18.	BabasahebBhimraoAmbedkar University	5	1	16.66
	Total	**97**	**66**	**71.73**

Figure 5.2: Number of teaching faculties in the LIS discipline



5.2.1.2 Gender based on Academic Position:

Regarding gender distribution among the LIS teaching faculties, it is noticed from figure 5.3 and table 5.2 that most of the faculties belong to the male community, with 49 (74.24%). While on the other hand, female faculties account for 25.75% of the total population. The total population of the research study accounted for 66.

Figure 5.3: Academic status based on gender

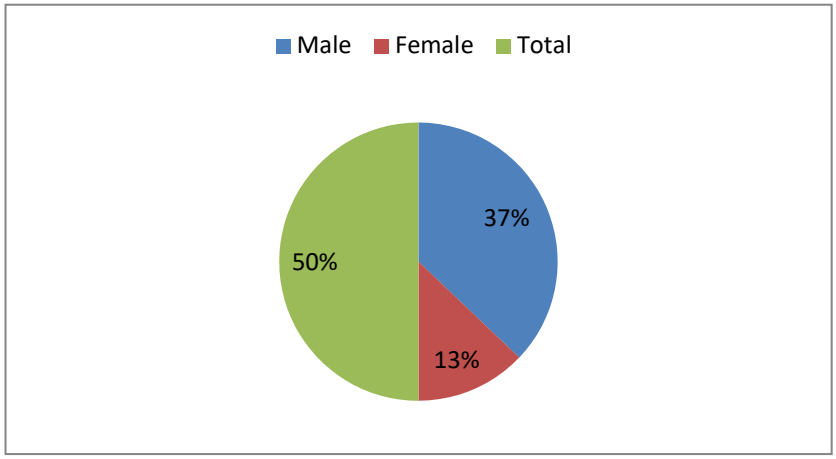


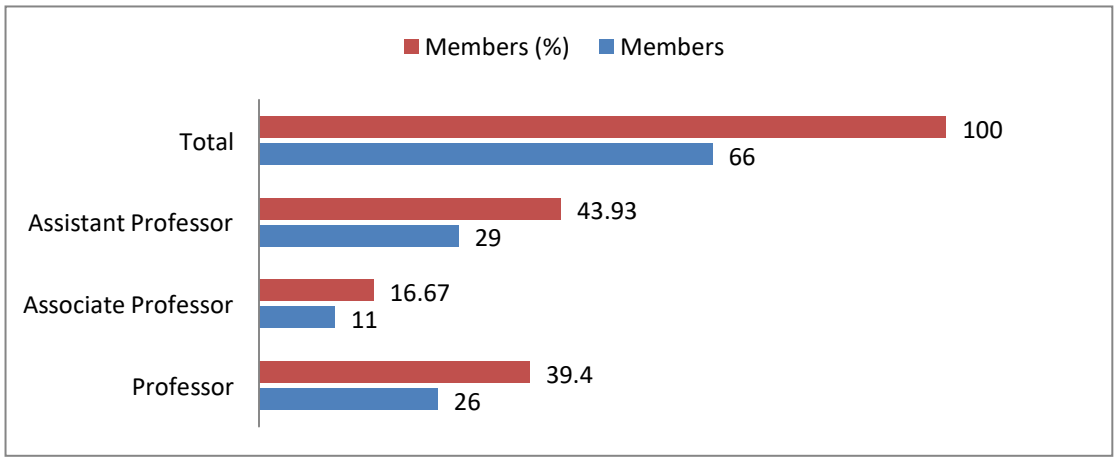
Table 5.2: Frequency distribution by gender

Sl. No	Gender	Frequency	Frequency (%)
1.	Male	49	74.24
2.	Female	17	25.75
	Total	**66**	**100.00**

5.2.1.3 Job Title (Academic Position)

In academic teaching professionals, various positions are held by different teaching fraternities based on years of experience in teaching and research.

Figure 5.4: Frequency distribution by Job title



Based on the data analysis, it is noticed from table 5.3 and figure 5.4 that the majority of the teaching fraternity belongs to the category of Assistant Professor at 43.93%, which Professors follow with 39.40%. On the other hand, in the type of Associate Professor, 11 of the total position belong to positions bearing a percentage of 16.67%.

Table 5.3: Frequency distribution by Job title

S. No.	Job Titles	Frequency	Frequency (%)
1.	Professor	26	39.40
2.	Associate Professor	11	16.67

3.	Assistant Professor	29	43.93
	Total	**66**	**100.00**

5.2.1.4 Geographical Affiliation

India has a diverse range of geographical affiliations in the vast land, mountain, and valley category. There are 28 states and 8 Union Territory in the Indian subcontinent. Although all Indian states have central universities, not all have a library and information science department. According to the study, only 18 universities in various forms have a well-established library science department for education and research. Table 5.4 shows two central universities in New Delhi and three established LIS department universities in Uttar Pradesh. The frequency distribution in terms of geographic affiliation of Delhi and Uttar Pradesh is 11.76% and 16.66%, respectively. Each of the other states has one central university, and the frequency of geographic distribution is 5.88% each.

Table 5.4: Frequency Distribution by Geographic Affiliation

S. No.	State/ Region	Frequency	Frequency (%)
1.	Assam	1	5.88
2.	Chhattisgarh	1	5.88
3.	Gujarat	1	5.88
4.	Haryana	1	5.88
5.	Himachal Pradesh	1	5.88
6.	Manipur	1	5.88
7.	Meghalaya	1	5.88
8.	Mizoram	1	5.88

9.	New Delhi	2	11.76
10.	Puducherry	1	5.88
11.	Punjab	1	5.88
12.	Tamil Nadu	1	5.88
13.	Tripura	1	5.88
14.	Uttar Pradesh	3	16.66
	TOTAL	**18**	**100.00**

5.2.2 Part 2: Analysis of data based on various ResearchGate metrics

This study sectionis primarily based on data collection and analysis about LIS Teaching Faculties from various universities across India. The data collected are from LIS teaching faculties having their account in the ResearchGate platform and respective university websites.

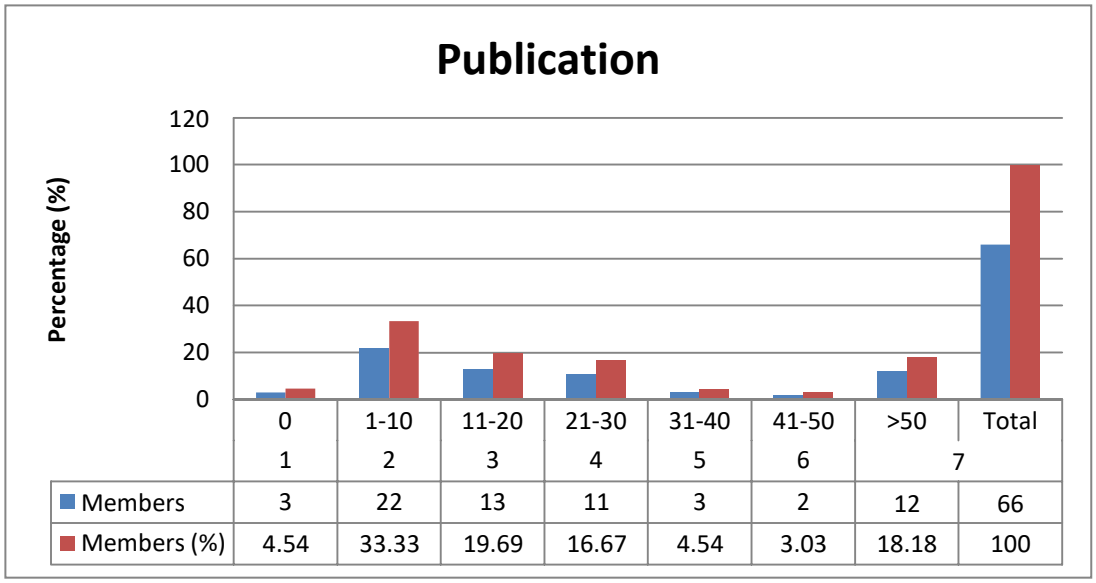
5.2.2.1 Frequency Distribution of Faculty Publications

Table 5.5 and figure 5.5 show the distribution of LIS faculty publications in different central universities across India. A total of 97 faculties presently work in various prominent universities' libraries and information science departments. Out of 97 faculties, only 66 have accounts in the ResearchGate platform. As per the analysis of data, it is seen that the highest number of publications is in the category of 1-10. The distribution frequency in terms of publications is seen as 33.33%, with 22 faculties. Three faculties have no publications to their accounts, with 4.54%. There are 12 (18.18%) faculties that have publications greater than 50. The median distribution of publications is 55.33, and the median is 83. The minimum and maximum frequency of publication distributions are 0 and 100, respectively.

Table 5.5: Frequency Distribution of Publications

SN	Pub.	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	3	4.54	2.51	3	2.3	0	4.54
2	1-10	22	33.33	27.65	33.33	4.73	22	8.01
3	11-20	13	19.69	16.34	19.69	4.73	13	4.73
4	21-30	11	16.67	9.22	13.835	4.009	0	16.67
5	31-40	3	4.54	2.51	3.77	1.08	0	4.54
6	41-50	2	3.03	1.67	2.515	0.72	0	3.03
7	>50	12	18.18	10.06	15.09	4.36	0	18.18
	Total	**66**	**100**	**55.33**	**83**	**24.04**	**0**	**100**

Figure 5.5: Distribution of Publications



5.2.2.2 Frequency Distribution of Full-Text Publications

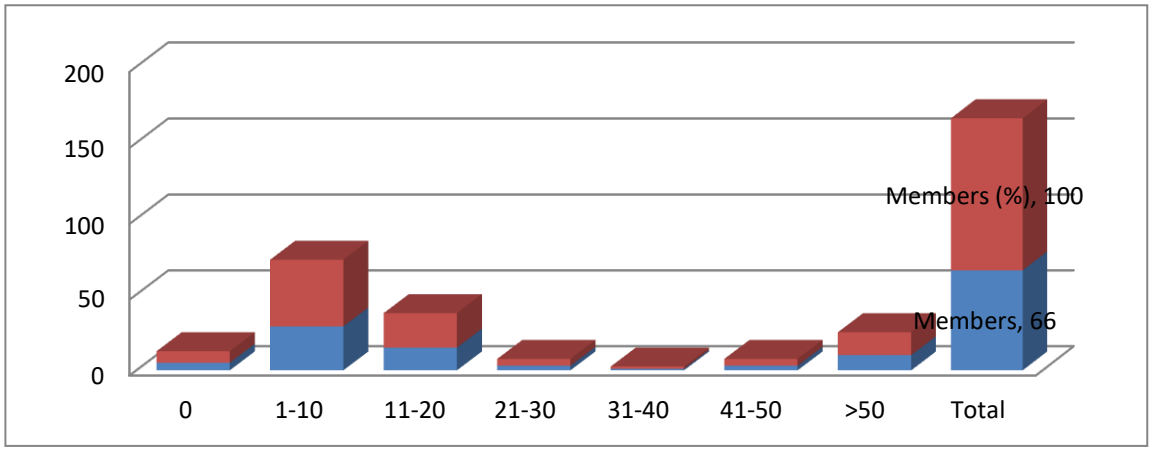
Table 5.6 and figure 5.6 displays the distribution of Full-Text Publications among the LIS teaching faculties in the Department of Library and Information Science.

Table 5.6: Frequency Distribution of Full-Text

S.N	Full-Text	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	5	7.57	4.19	5	3.84	0	7.57
2	1-10	29	43.93	36.46	43.93	10.55	29	43.93
3	11-20	15	22.72	18.86	22.72	5.45	15	22.72
4	21-30	3	4.54	2.51	3.77	2.3	0	4.54
5	31-40	1	1.51	0.83	1.255	0.76	0	1.51
6	41-50	3	4.54	2.51	3.77	2.30	0	4.54
7	>50	10	15.15	8.38	12.575	7.7	0	15.15
	Total	**66**	**100**	**55.33**	**83**	**50.84**	**0**	**100**

Most of them have full-text publications in the range of 1-10, with a frequency distribution of 43.93%. Around 7.57% of the faculties have no addition of full-text journals to their accounts. It was also noticed that 15.15% of the faculties have full-text publications greater than 50. As per the analysis of data, it is seen that the full-text addition in the range of 11-20 is 22.72%, whereas, on the other hand, 4.54% of the faculties have their full-text addition in their respective ResearchGate platform. The mean of the full-text publications is 55.33, and the median is 83. Therefore, the standard deviation of the full-text journal in ResearchGate accounts is 50.84.

Figure 5.6: Frequency Distribution of Full-Text



5.2.2.3 Number of Citations by LIS faculties

Citations play a very significant role in evaluations of the academic performance of any individual researchers and a particular academic community. In contemporary times, quotations are calculated based on data extracted from ResearchGate databases. Although RG mentions the development of a prototype on its webpage, there is no ability to interface with external sources of citation data. RG derives its h-index from the data it does have based on Hirsch's work (2005). There are two possible results: including and excluding self-citations.

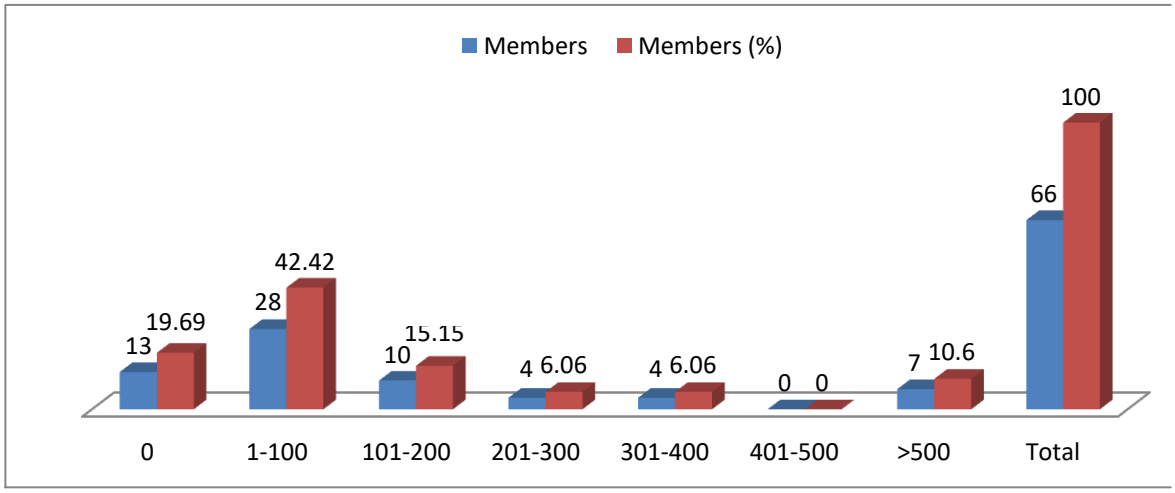
Table 5.7: Frequency Distribution of Citations

S.N	Citations	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	13	19.69	10.89	13	10.01	0	19.69
2	1-100	28	42.42	23.47	35.21	21.56	28	42.42
3	101-200	10	15.15	8.38	12.57	7.70	10	15.15
4	201-300	4	6.06	3.35	5.03	3.08	4	6.06
5	301-400	4	6.06	3.35	5.03	3.08	4	6.06

6	401-500	0	0	0	0	0	0	0
7	>500	7	10.6	5.86	8.8	5.39	7	10.6
	Total	**66**	**100**	55.33	83	50.84	66	100

Table 5.7 and figure 5.7 showcases the distribution of citations received by the faculties across different central universities, specifically to the Department of Library and Information Science teaching staff. As per the data analysis, it is noticed that most faculties, around 42.42% of the total population, have received citations in the range of 1-100. A sum of seven faculties (10.6%) has received citations in the range of greater than 500. 6.06% of the faculties have received citations in 201-300 and 301-400. There seem to have no faculties who have received citations in the range of 401-500. In addition to the list, it is also worth mentioning that 15.15% of the faculties have received citations in the range of 101-200. After analysing the data, it has been found that the mean citation is 55.33, and the overall median is 83.

Figure5.7: Frequency Distribution of Citations



5.2.2.4 Number of H-Index

In general, the h-index is a methodology or, rather, a simple way of measuring the impact of individual research work and the academic community. Its primary applications review the number of highly influential publications a researcher has published. As a result, researchers receive more citations; the higher will be the H-Index,

regardless of any work published in journals.

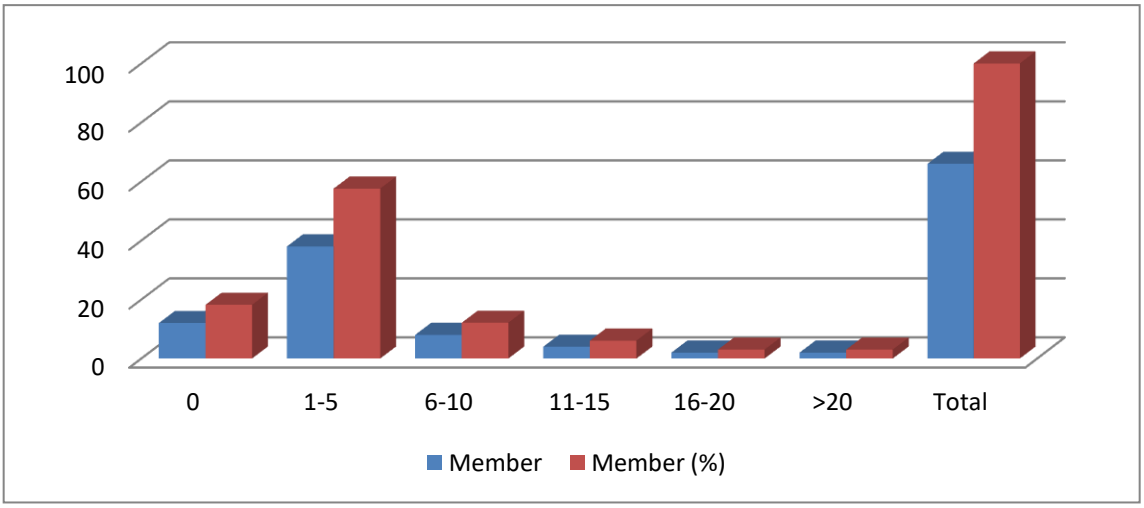
Table 5.8: Frequency Distribution of H-Index

S.N	H-Index	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	12	18.18	10.06	12	9.24	0	18.18
2	1-5	38	57.57	47.78	57.57	13.83	38	57.57
3	6-10	8	12.12	10.06	12.12	2.91	8	12.12
4	11-15	4	6.06	5.03	6.06	1.45	4	6.06
5	16-20	2	3.03	1.67	2.51	1.54	2	3.03
6	>20	2	3.03	1.67	2.51	1.54	2	3.03
	Total	**66**	**100.00**	**55.33**	**83**	**50.84**	**66**	**100**

Table 5.8 and figure 5.8 shows the distribution of the H-Index received by the faculties in the central universities of LIS teaching faculty. It is seen from the table that 57.57% of the faculty has received H-Index in the range of 1-5. Around 12 (18.18%) faculties have not received any of the H-Index in their ResearchGate account. In the 6-10, 12.12% of the faculties received their H-Index, and 6.06% received H-Index distribution in the 11-15. Only a few per cent of faculties, roughly 3.03% of the total population, have received H-Index greater than 20.

On the other hand, 3.03% of the faculties have their H-Index in the category of 16-20. It is also to be noted that the mean derived from the analysis is 55.33, and the median is 83. The standard deviation derived from the study is 50.84. The minimum and maximum standardization received from the calculation is 66 and 100, respectively.

Figure 5.8: Frequency Distribution of H-Index



5.2.2.5 No. of followers

Like any other social networking sites such as Twitter and Facebook, ResearchGate also provides the platforms for metrics regardless of "followers" and "followings".

Followers: The number of RG participants will be notified of the member's published articles and ability to contribute.

Followings: The multitude of other RG representatives for whom the member will receive updates on RG publications and contributions.

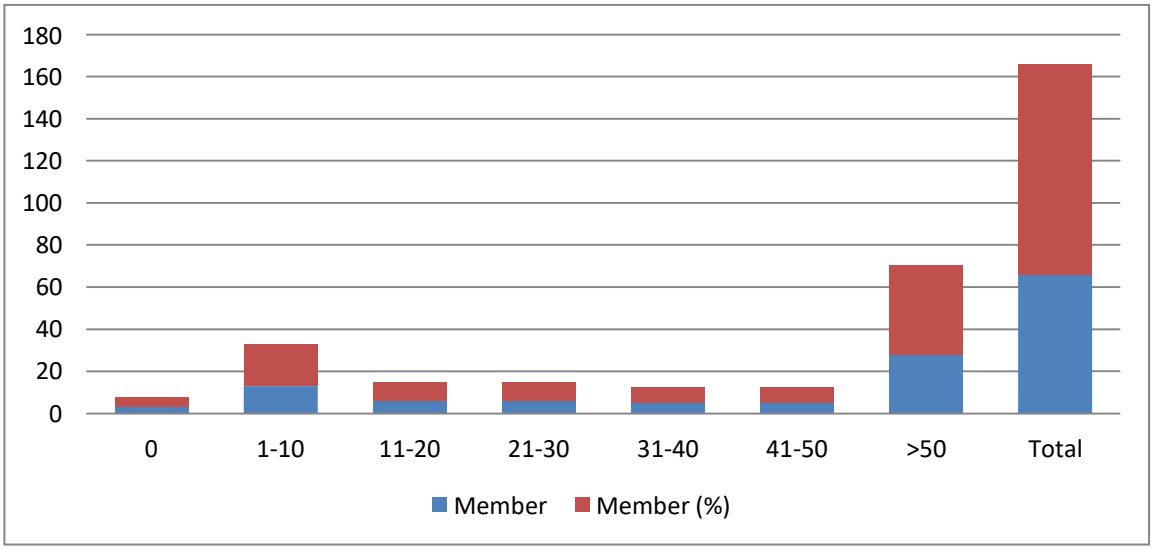
Table 5.9: Frequency Distribution of followers

S.N	No. of followers	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	3	4.54	2.51	3	2.30	0	4.54
2	1-10	13	19.69	16.34	19.69	4.73	13	19.69
3	11-20	6	9.09	7.54	9.09	2.18	6	9.09
4	21-30	6	9.09	5.03	7.545	4.62	0	9.09
5	31-40	5	7.57	4.19	6.285	3.84	0	7.57

6	41-50	5	7.57	4.19	6.285	3.84	0	7.57
7	>50	28	42.42	23.47	35.21	21.56	0	42.42
	Total	**66**	**100.00**	55.33	83	50.84	0	100

Table 5.9 and figure 5.9 shows the distribution of the number of followers among the faculties across the different LIS teaching faculties in Central Universities in India. It is seen that the majority of the faculties have followers greater than 50. The number has come up to 28 of the total faculty, with 42.42%. 4.54% of the faculties have not received followers in their RG profiles. In the range of 1-10, the total number of followers received by the faculties is 19.69% (13). On the other hand, in the category of 11-20 and 21-30, the total number of followers received in this category is 9.09% (6), and 7.57% of the total population has received followers in the range of 31-40 and 41-50. Further data analysis shows that the mean derived from the interpretation is 55, and the standard deviation they received is 50.84.

Figure 5.9: Frequency Distribution of Followers



5.2.2.6 Frequency Distribution of Followings

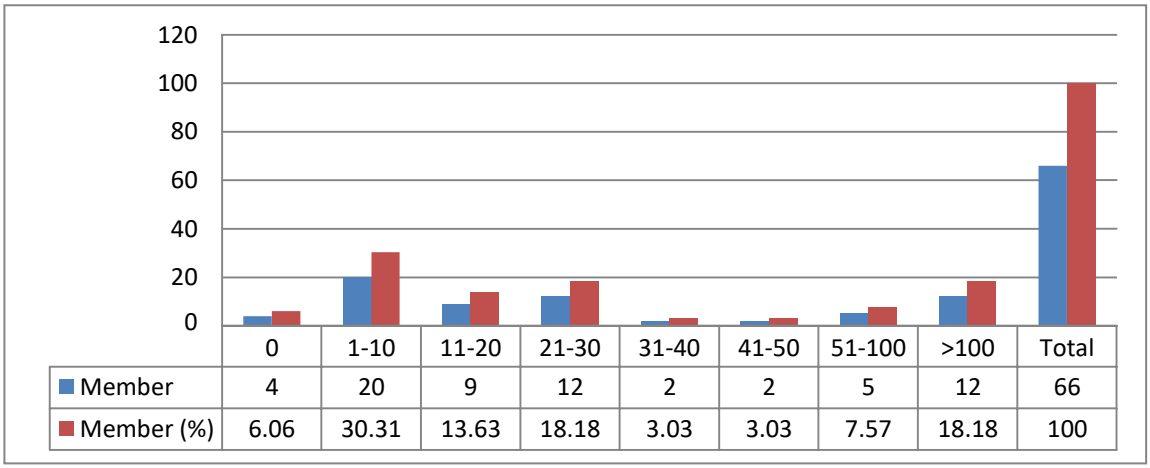
As per table 5.10 and figure 5.10, the vast majority of the LIS teaching faculties have excellent followers in their ResearchGate profiles across the different central universities of India.

Table 5.10: Frequency Distribution of following

S.N	No. of followings	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	4	6.06	3.35	4	3.08	0	6.06
2	1-10	20	30.31	25.15	30.31	7.29	20	30.31
3	11-20	9	13.63	11.31	13.63	3.27	9	13.63
4	21-30	12	18.18	10.06	15.09	9.24	0	18.18
5	31-40	2	3.03	1.67	2.515	1.54	0	3.03
6	41-50	2	3.03	1.67	2.515	1.54	0	3.03
7	51-100	5	7.57	4.19	6.285	3.84	0	7.57
8	>100	12	18.18	10.06	15.09	9.24	0	18.18
	Total	**66**	**100.00**	**55.33**	**83**	**50.84**	**0**	**100**

The highest number of following is seen in the 1-10 with 30.31%. Around 12 of the faculty members have followings greater than 100, with 18.18%. In the categories 31-40 and 41-50, only 3.03% of the faculties follow this range. 13.63% of the faculties have their cults in the 11-20, and 7.57% followings in the 51-100. It is also mentioned that 18.18% of the faculties have their cults in the 21-30. In addition to the above mention detail, it is also necessary to be added that the mean derived after calculations is 55.33, and the standard deviation is 50.84.

Figure 5.10: Number of followings



	0	1-10	11-20	21-30	31-40	41-50	51-100	>100	Total
Member	4	20	9	12	2	2	5	12	66
Member (%)	6.06	30.31	13.63	18.18	3.03	3.03	7.57	18.18	100

5.2.2.7 Research Interest among LIS faculties

In the scientific community, the Research Interest Score is one of the easy that helps researchers and readers track the impact of any scientific research on the academic community. The research interest score is generally a combination of reads by the research community, some recommendations received on the RG platform, and, at the same time, the citation received that include the self-citations. In brief, it can be described as an overview summary of the researcher based on the experiences and goals of the research.

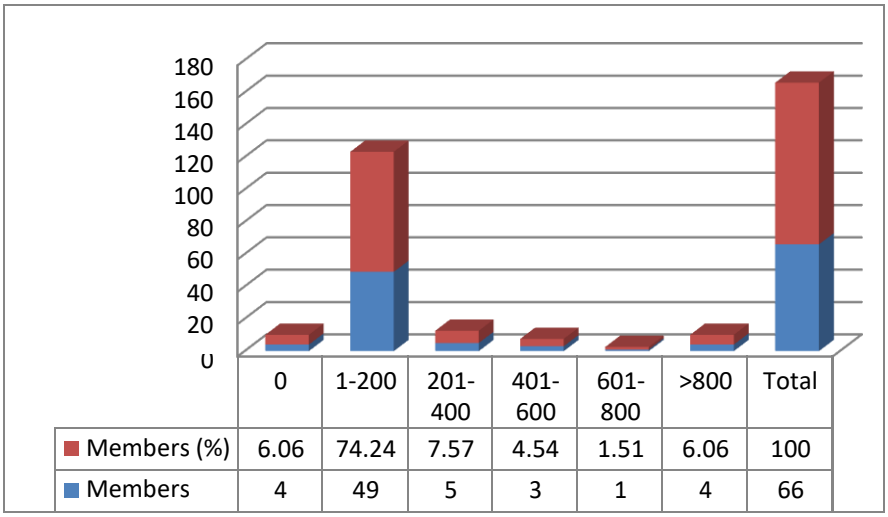
Table 5.11: Frequency Distribution of Research Interest

S.N	Research Interest	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	4	6.06	3.35	4	3.08	0	6.06
2	1-200	49	74.24	61.62	30.31	17.84	20	74.24
3	201-400	5	7.57	6.28	13.63	1.81	9	7.57
4	401-600	3	4.54	10.06	15.09	9.24	0	18.18
5	601-800	1	1.51	1.67	2.515	1.54	0	3.03

6	>800	4	6.06	1.67	2.515	1.54	0	3.03
	Total	**66**	**100.00**	4.19	6.285	3.84	0	7.57

According to table 5.11 and figure 5.11, it is a distribution of Research Interests that is displayed among the faculties across the different parts of India. It is seen that most faculties have received only a very low Research Interest Score as compared to other similar studies. In addition, it is also noticed that 74.24% of the faculties have their Research Interest in the range of 1-10, which seems to have low rankings as it displays the summary of research work and other scientific investigations. 6.06% of the faculties have no Research Interest score added to their accounts. It is also mentioned that 6.06% of the faculties have their Research Interest greater than 800. In the range of 201-400, a percentage of 7.57% of the faculties have their research interest score, and on the other hand, it is noticed that 4.54% of the faculties have their Research Interest distribution in the range of 401-600. It is also to be added that 1.51% of the faculties have their frequency distribution in 601- 800. As per the data analysis, it is to be mentioned that the mean is 4.19, and the median is 6.285. The standard deviation of Research Interest among the faculties across the county is 3.84, and the minimum and maximum obtained from the calculations are 0 and 7.57, respectively.

Figure 5.11: Frequency Distribution of Research Interest



5.2.2.8 Publications of Articles among LIS faculties

Journal Articles or scientific literature is one of the most important of research or any form of scientific work. It plays a crucial role in analysing and evaluating one's performance in analyzing an individual or community of researchers and academicians. ResearchGate is one platform where users can access and post any literature produced in any field of study and the findings for the betterment of society.

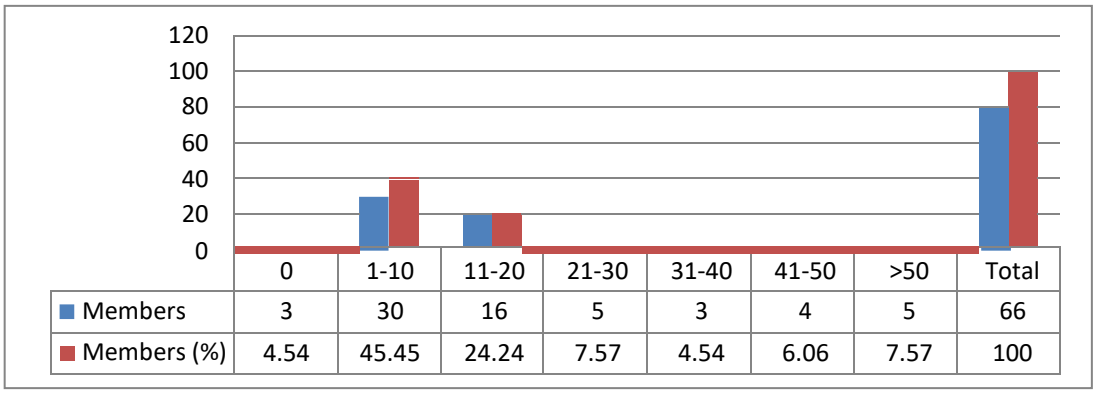
Table 5.12: Frequency Distribution of Articles

S.N	Articles	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	3	4.54	2.51	3	2.30	0	4.54
2	1-10	30	45.45	37.72	45.45	10.92	16	45.45
3	11-20	16	24.24	20.12	24.24	5.82	5	24.24
4	21-30	5	7.57	4.19	6.285	3.84	0	7.57
5	31-40	3	4.54	2.51	3.77	2.30	0	4.54
6	41-50	4	6.06	3.35	5.03	3.08	0	6.06
7	>50	5	7.57	4.19	6.285	3.84	0	7.57
	Total	**66**	**100**	55.33	83	50.84	0	100

Table 5.12 and figure 5.12 of the survey found that most faculties have at least one publication of articles in their account. The analysis reveals that 4.54% of the faculties have no addition of research articles to their accounts. 45.45% of the total faculties have their articles added in the 1-10. A total of five of the faculties have articles publications in the field more significant than 50. In the broad range of 11-20 and 21-30, the faculties' members have their articles publications, namely 24.24% and 7.57%, respectively. 4.54% of the faculties have pieces in the range of 31-40, and despotically in the category of 41-50, 6.06% have their articles publications. The data analysis reports that 55.33 is

the mean, and the median is 83. The finding also reveals that the standard deviations of articles published by the faculties are 50.84. The maximum and minimum articles distributions are 100 and 0, respectively.

Figure 5.12: Frequency Distribution of Articles



5.2.2.9 Distribution of Conference Paper

The papers presented at the conference play a vital role in the academic development of the researcher and the entire academic community.

Table 5.13: Frequency Distribution of Conference Paper

S.N	Conference Paper	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	23	34.84	2.51	3	2.30	0	4.54
2	1	9	13.63	11.31	45.45	3.27	9	13.63
3	2	5	7.57	6.28	6.28	1.81	5	7.57
4	3	2	3.03	4.19	6.285	3.84	0	7.57
5	>3	27	40.9	2.51	3.77	2.30	0	4.54
	Total	**66**	**100.00**	3.35	5.03	3.08	0	6.06

As per table 5.13 and figure 5.13 of the analysis, it is shown that most faculties have their conference published in any meetings or seminars. But at the same time, it is also

noticed that the vast majority of the total population has no conference paper added to their ResearchGate accounts. The people of 34.84% have no conference papers/ proceedings in their accounts. The highest frequency distribution of conference papers is in category 3, with 40.9% of the total population. 13.63% of the entire population have only a single conference paper in their RG profiles, and 7.57% of the faculties have their conference paper published in the category of 2. Only two of the faculties had published three conference papers in their account. In addition, it is also mentioned that the mean of the conference paper is 3.35, and the median is calculated as 5.03. At the same time, it is also to be added that the standard deviation of the conference category is 3.08. This category's maximum and minimum frequency distribution is 0 and 6.06, respectively.

Figure 5.13: Frequency Distribution of Conference Paper

5.2.2.10 Number of Chapters

Chapters published in the edited book are also essential for academicians and the whole academic community. Table 5.14 and figure 5.14 displays the number of chapters posted by LIS teaching faculties in the various central universities across India.

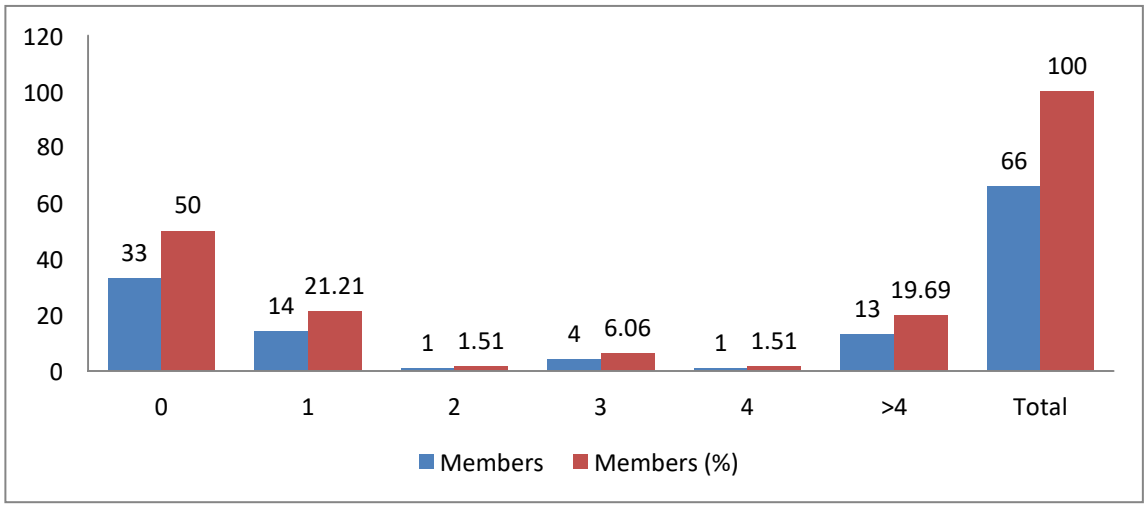
Table 5.14: Frequency Distribution of Chapters

S.N	Chapters	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	33	50	27.66	33	25.42	0	50
2	1	14	21.21	12.07	14	10.24	1	21.21

3	2	1	1.51	1.50	1.51	0.50	1	2
4	3	4	6.06	4.35	4	1.56	3	6.06
5	4	1	1.51	2.17	1.51	1.60	1	4
6	>4	13	19.69	10.89	16.34	10.01	0	19.69
	Total	**66**	**100.00**	55.33	83	50.84	0	100

As per the study's findings, it is seen that the vast majority of them have no publications in terms of chapters. A sum of 33 faculties (50%) has no chapter additions in the ResearchGate accounts. Around 21.21% of them have single book chapters published in conferences. Only one of them has published more than two chapters. 19.69% of the faculties have published more than four book chapters in the form of edited books. It also needs to be added that the mean distribution of chapters is 55.33, and the median is 83. The standard deviation of chapters is 50.84. The minimum and maximum ranges of chapters are 0 and 100, respectively.

Figure 5.14: Frequency Distribution of Chapters



5.2.2.11 Distribution of Pre-prints

Like any other form of publication, Pre-prints also have a vital role in community research and development. As shown in Table 5.15 and figure 5.15 that the distribution

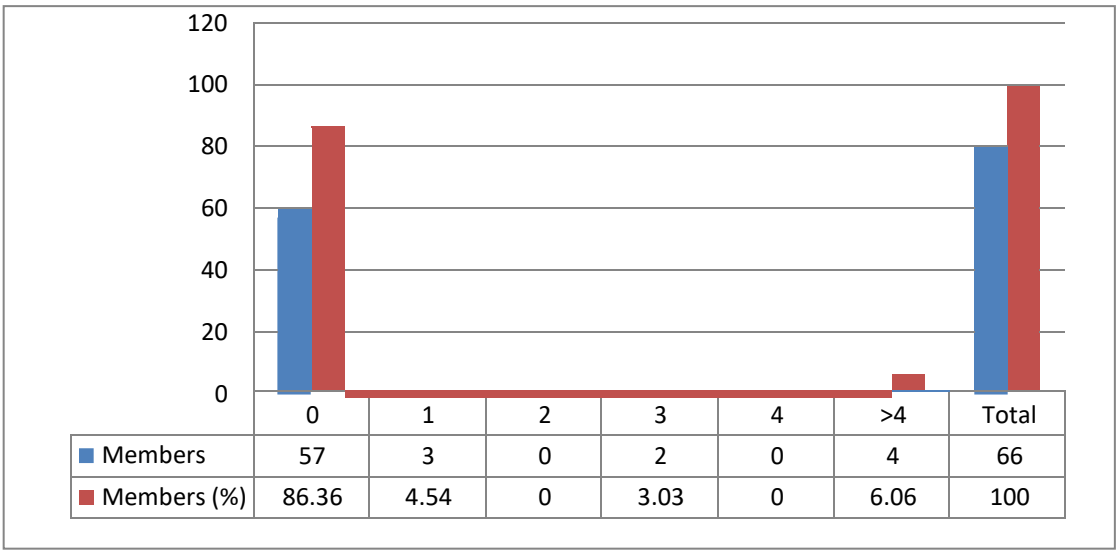
of Pre-prints among the LIS teaching faculties across different central universities in India.

Table 5.15: Frequency Distribution of Pre-prints

S.N	Pre-Prints	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	57	86.36	47.78	57	43.9	0	86.36
2	1	3	4.54	2.84	3	1.77	1	4.54
3	2	0	0	0.66	0	1.15	0	2
4	3	2	3.03	2.67	3	0.58	2	3.03
5	4	0	0	1.33	0	2.30	0	4
6	>4	4	6.06	3.35	5.03	3.08	0	6.06
	Total	**66**	**100.00**	55.33	83	50.84	0	100

It is seen that the majority of the population has no publications in this type of format. It is mentioned that 86.36% of the faculties have no pre-print publications to their accounts, giving some 57 faculties. Only 6.06% of the population has their pre-print publications in the reports of ResearchGate. It is also mentioned that 4.54% of the faculties have pre-print publications in the range of one. Two of the faculty members have their pre-prints publications in the field of two. There seem to have no publications in the range of four. After the analysis, the result derived for the mean is 55.33, and the median is 83. In addition, it is also mentioned that the standard deviation of pre-prints among the faculties is 50.84. The minimum and maximum scores of distribution of pre-prints are 0 and 100, respectively.

Figure 5.15: Frequency Distribution of Pre-prints



5.2.2.12 Frequency of data

Data are vital in the growth and development of any form of research. Moreover, these research and development aspects bring progress and prosperity to the human community.

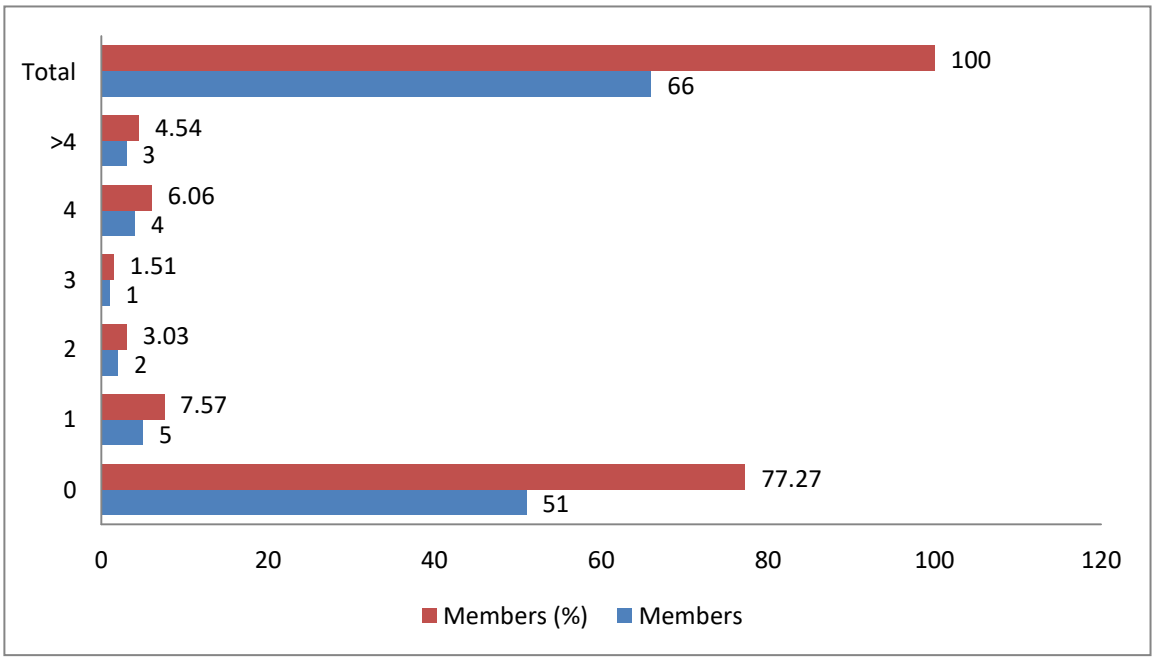
Table 5.16: Frequency Distribution of Data

S.N	Data	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	51	77.27	42.75	51	39.28	0	77.27
2	1	5	7.57	4.52	5	3.31	1	7.57
3	2	2	3.03	2.34	2	0.59	2	3.03
4	3	1	1.51	1.83	1.51	1.03	1	3
5	4	4	6.06	4.68	4	1.18	4	6.06
6	>4	3	4.54	2.51	3.77	2.30	0	4.54
	Total	**66**	**100.00**	**55.33**	**83**	**50.84**	**0**	**100**

According to table 5.16 and figure 5.16, it is noticed that the majority of the faculties have either less or few data that are published in the ResearchGate platform. The number accounted for 51 faculties (77.27%) with no data in their ResearchGate accounts. On the other hand, 4.54% of the faculties have data published in the category of more than 4. 7.57% of the faculties have one data published.

On the other hand, it was also noticed that two faculties (3.03%) have their data published in the range of 2. 6.06% of the faculties have their data published in the category of four. As per the analysis of the study, it was seen that the mean derived for data is 55.33, and the median is 83. In addition, it is also mentioned that the standard deviation received for data is 50.84. The maximum and minimum deviation of information is 100 and 0, respectively.

Figure5.16: Frequency Distribution of Data



5.2.2.13 Frequency Distribution of Questions

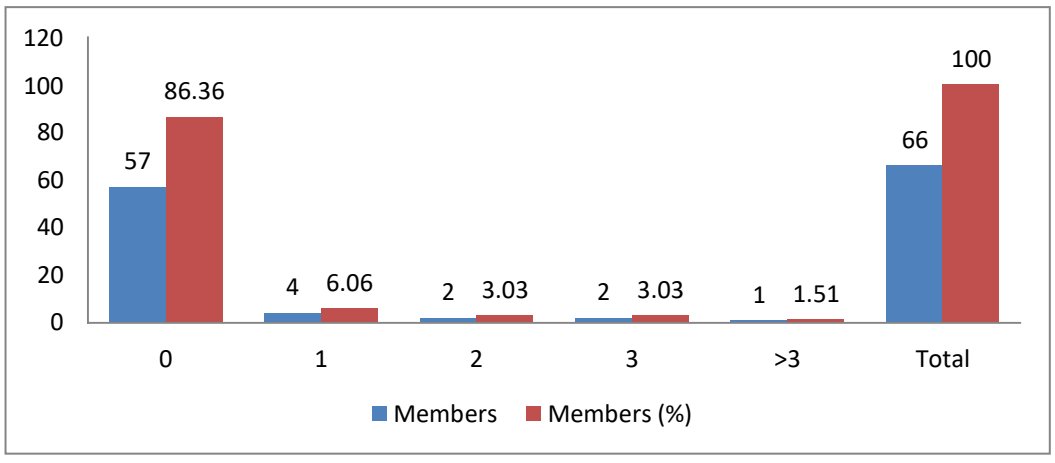
ResearchGate has developed numerous new features in this platform over time. For example, questions and answers features are new brand launch features to enhance the proper dissemination and access of information to the clientele. In addition, users can clear doubts and confusion regarding any information through these features.

Table 5.17: Frequency Distribution of Questions

S.N	Questions	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	57	86.36	47.78	57	43.91	0	86.36
2	1	4	6.06	3.68	4	2.54	1	6.06
3	2	2	3.03	2.34	2	0.59	2	3.03
4	3	2	3.03	2.67	3	0.58	2	3.03
5	>3	1	1.51	0.83	1.25	0.76	0	1.51
	Total	**66**	**100.00**	55.33	83	50.84	0	100

As per the analysis in Table 5.17 and figure 5.17 of the study, it is noticed that 86.36% of the faculties have no questions in their RG accounts. It is also to mention that only one of the faculties has more than three questions in the RG accounts. It is also to be said that two faculties (3.03%) of the total population havethree questions in their respective RG profiles. 6.06% of the faculties have their questions in the range of one. The mean derived from the analysis is 55.33, and the median derived from the research is 83. The standard deviation of question segments is 50.84. The minimum and maximum scores of data are 0 and 100, respectively.

Figure 5.17: Frequency Distribution of Questions



5.2.2.14 Frequency Distribution of Answers

In addition to the ResearchGate question features, the answers feature is one of the other characteristics.

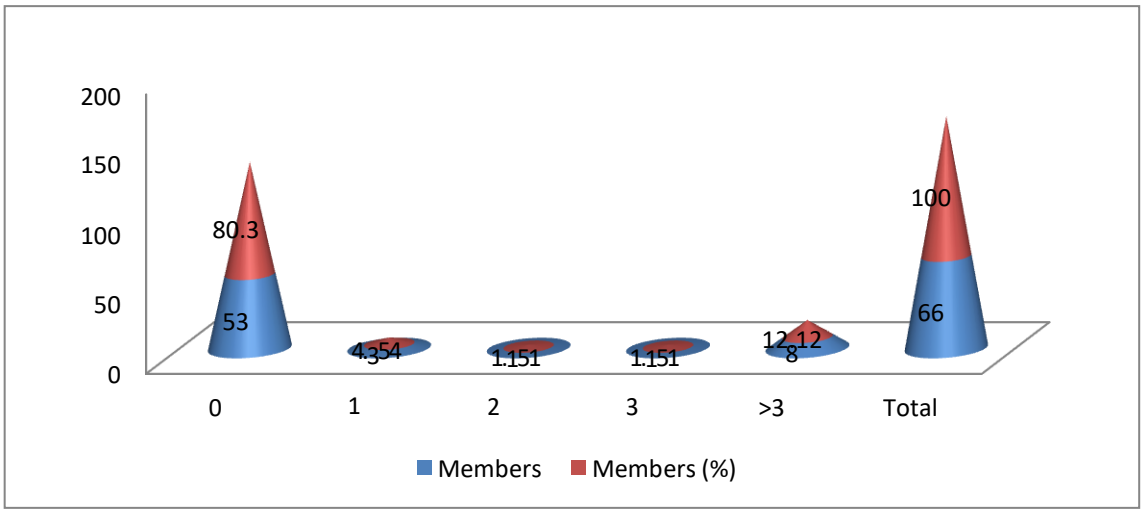
Table 5.18: Frequency Distribution of Answers

S.N	Answers	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	53	80.3	44.43	53	40.82	0	0
2	1	3	4.54	2.84	3	1.77	1	1
3	2	1	1.51	1.50	1.51	0.50	1	1
4	3	1	1.51	1.83	1.51	1.03	1	1
5	>3	8	12.12	6.70	10.06	6.16	0	0
	Total	**66**	**100.00**	55.33	83	50.84	0	0

According to table 5.18 and figure 5.18 of the analysis, most faculties in LIS teaching departments have no answers in the ResearchGate platform. It is also mentioned that 80.3% of the faculties have no answers in their profiles. While on the other hand, it is noticed that 12.12% of the faculties have more than three answers to their questions. 4.54% of the faculties have answers in the range of one. Again, 1.51% of the faculties have their accounts in the range of two and three regarding answers.

The mean, calculated for answers among the faculties, accounts for 55.33, and the median is 83 in number. It is also worth mentioning that the minimum and maximum scores regarding answers are 0 and 0, respectively. Therefore, the standard deviation derived from the calculations is accounted as 83.

Figure 5.18: Frequency Distribution of Answers



5.2.2.15 Distribution of Reads among LIS faculty

A read is recorded when someone:

- Reads the full text or summary of any publication on RG; and
- Downloads a file hosted on RG, including direct downloads from Google Scholar and other browsers or specific search engines.

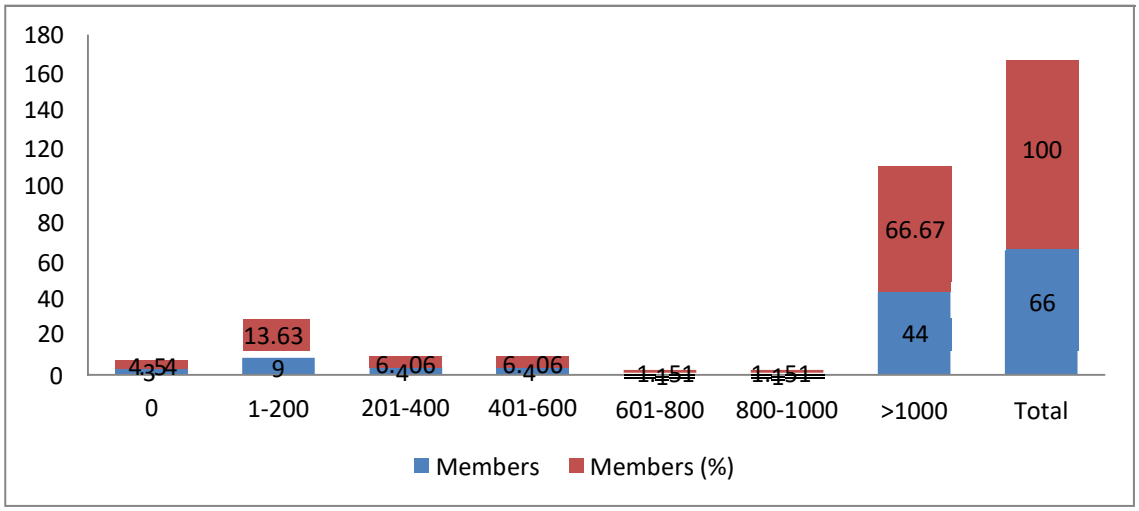
Table 5.19: Frequency Distribution of Reads

S.N	Reads	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	3	4.54	2.51	3	2.30	0	4.54
2	1-200	9	13.63	7.54	11.31	6.93	0	13.63
3	201-400	4	6.06	3.35	5.03	3.08	0	6.06
4	401-600	4	6.06	3.35	5.03	3.08	0	6.06
5	601-800	1	1.51	0.83	1.25	0.76	0	1.51
6	800-1000	1	1.51	0.83	1.25	0.76	0	1.51

7	>1000	44	66.67	36.89	55.33	33.89	0	66.67
	Total	**66**	**100.00**	55.33	83	50.84	0	100

As per the analysis of the study in table 5.19 and figure 5.19, it is seen that 4.54% of the faculties have no reads in their accounts. One interesting point to be noted is that most LIS teaching faculties have their maximum number of reads in their ResearchGate profiles. It is to be noted that 66.67% of the faculties have their reads in the range of greater than 1000. 13.63% of the faculties have their reads in the 1-200. In the range of 201-400 and 401-600, it is mentioned that 6.06% of the faculties have their reads. While on the other hand, it is also mentioned that 1.51% of the faculties have their reads in the 601-800 and 800-1000. The mean obtained in terms of reads is 55.33, and the median accounts for 83. The maximum and minimum score of reads is 0 and 100, respectively.

Figure 5.19: Frequency Distribution of Reads



5.2.2.16 Distribution of Impact Point

RG still was going to publish its score for "impact points" at the time of data collection and analysis. As previously stated, "impact points" appear based on Thomson Reuters' Web of Knowledge database. It was based on the "Journal Impact Factor," defined on the RG website as "a quantitative measure of the frequency on average with which articles in a journal have been cited in a given period." Thomson Reuter was not explicitly named. However, it is also to mention that Impact points have also been

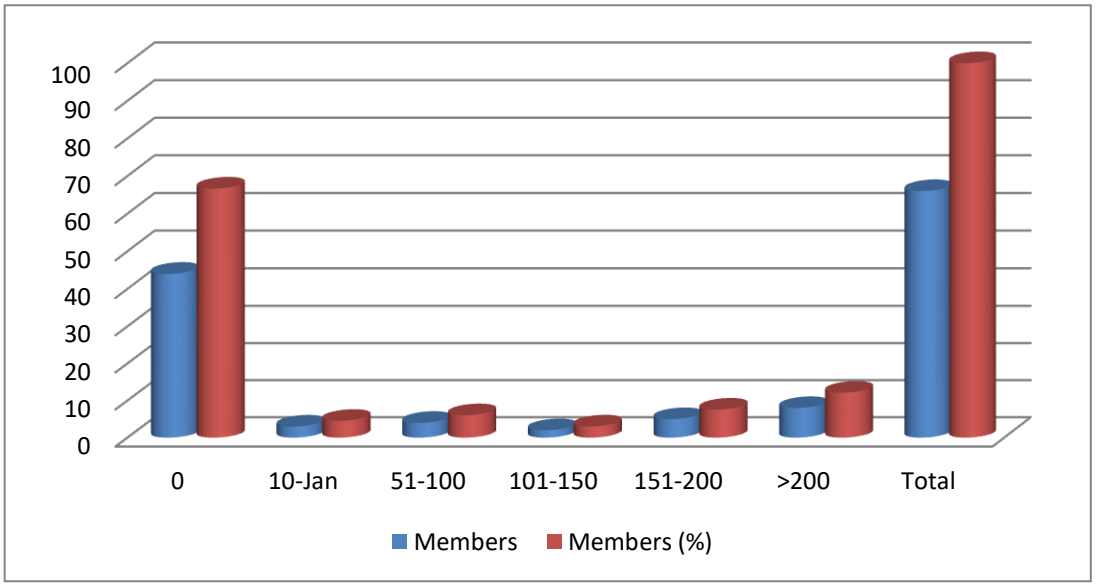
removed from ResearchGate platforms as of 2022 due to some serious debates and discussions. The present data were collected primarily before the diminishing of this feature.

Table 5.20: Frequency Distribution of Impact Point

S.N	Impact Points	Members	Members (%)	Mean	Median	SD	Min	Max
1	0	44	66.67	36.89	44	33.89	0	66.67
2	1-50	3	4.54	3.77	4.54	1.08	3	4.54
3	51-100	4	6.06	3.35	5.03	3.08	0	6.06
4	101-150	2	3.03	1.67	2.51	1.54	0	3.03
5	151-200	5	7.57	4.19	6.28	3.84	0	7.57
6	>200	8	12.12	6.70	10.06	6.16	0	12.12
	Total	**66**	**100.00**	55.33	83	50.84	0	100

As seen in table 5.20 and figure 5.20 of the analysis, it is seen that most of the faculties in LIS teaching departments seem to have fewer impact points in their ResearchGate profiles. It is also seen that 66.67% of the faculties have no impact point in their ResearchGate accounts. On the other hand, 12.12% of the faculties have impact points greater than 200. The present reports also say that 4.54% of the faculties have impact points in the 1-50. 7.57% have their faculties in the range of 151-200. It is also to be added that 6.06% of the total population has Impact points in the range of 51-100, and 3.03% of the faculties have impact points in the range of 101-150. The result also reveals that the mean and median of Impact Points are 55.33 and 83, respectively. It is also to mention that the faculties' minimum and maximum number scores are 0 and 100, respectively. The standard deviation derived from the calculation is 50.84.

Figure 5.20: Frequency Distribution of Impact Point

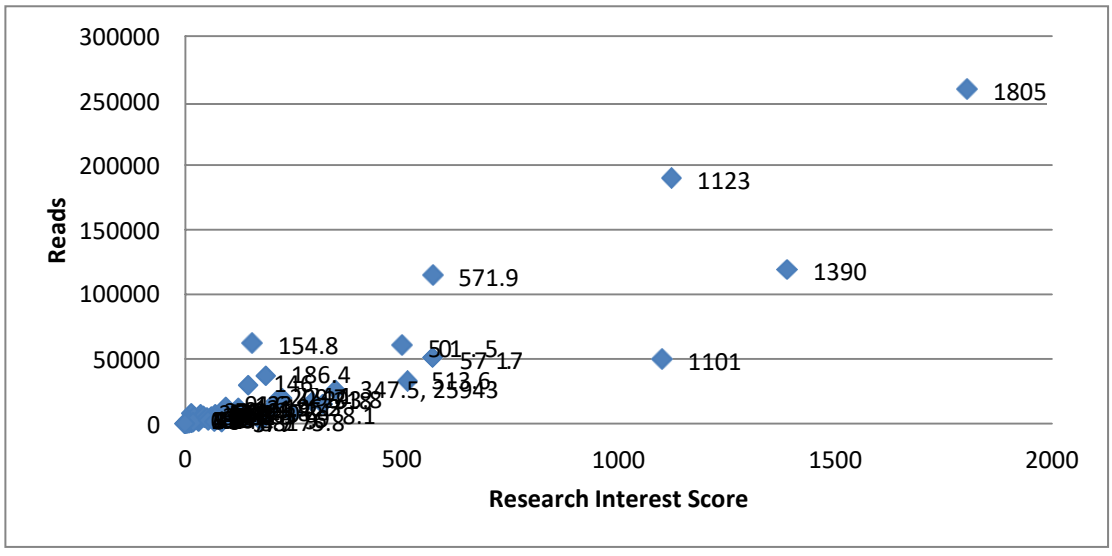


5.3 Correlation between Research Interest and Other Research Metrics

5.3.1 Correlation between Research Interest Score and Reads

The figure 5.21 shows the correlation between Research Interest Score and Reads. The correlation coefficient (*r*) was calculated between Research Interest Score and Reads was found to be 0.907343285. The value of *r* suggests a positive and significant correlation between Research Interest and citations. Furthermore, it represents a perfectly positive correlation.

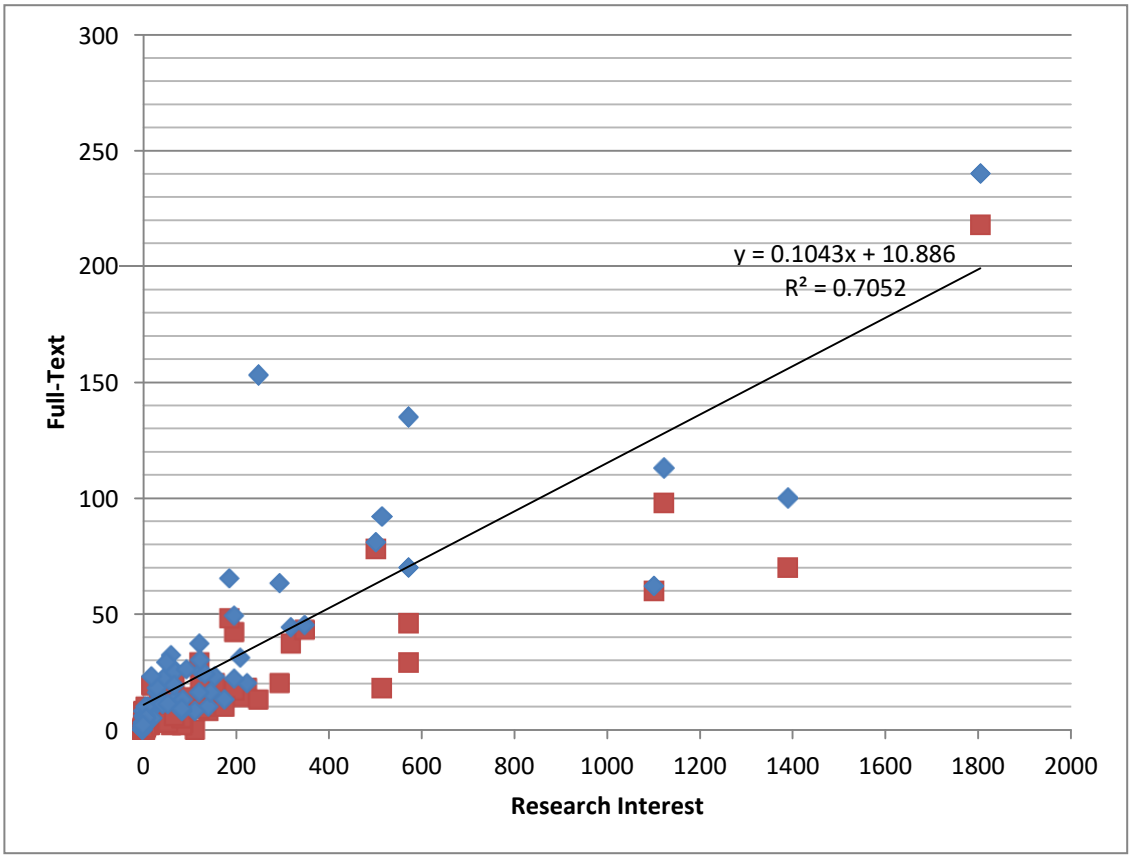
Figure 5.21: Correlation between Research Interest Score and Reads



5.3.2 Correlation between Research Interest and Full-Text

The figure 5.22 shows the correlation between Research Interest Score and Full-Text. The calculation of the Research Interest Score and Full-Text was made using the correlation coefficient (*r*), which was found to be 0.891. Therefore, apositive correlation was found between the two variables and adding full-text means more increase in the score.

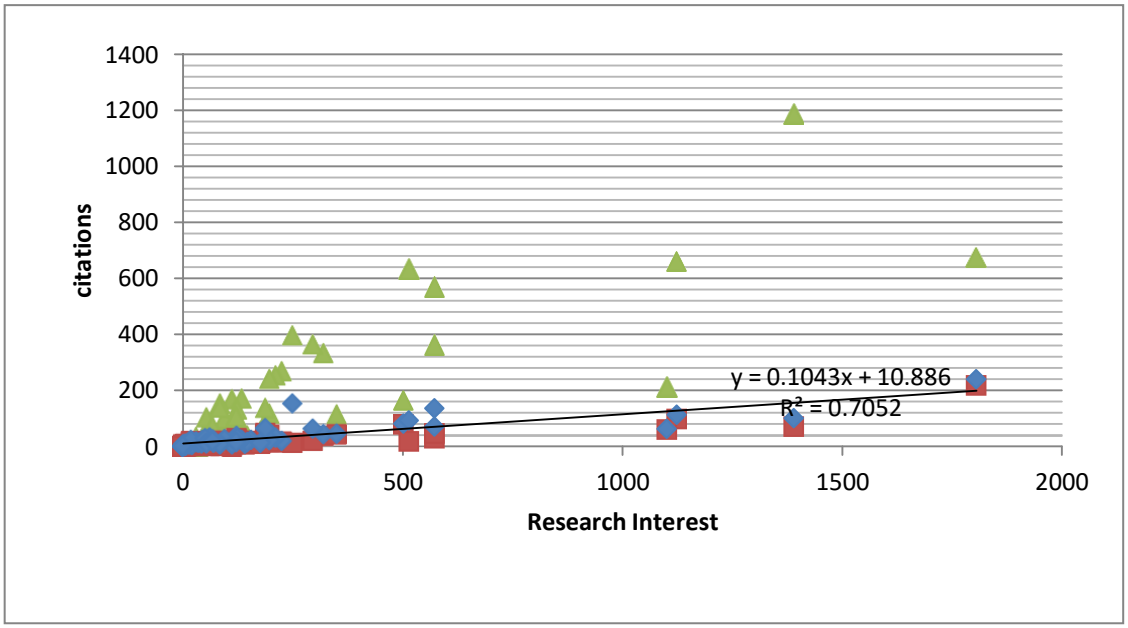
Figure 5.22: Correlation between Research Interest Score and Full-Text



5.3.3 Correlation between Research Interest and Citations

The figure 5.23 shows the correlation between Research Interest Score and citations. The correlation coefficient (*r*) formula indicates a 0.84 point in the correlation between Research Interest and citations. The value of *r* suggests a positive and significant correlation between Research Interest and citations. It represents a strongly positive correlation.

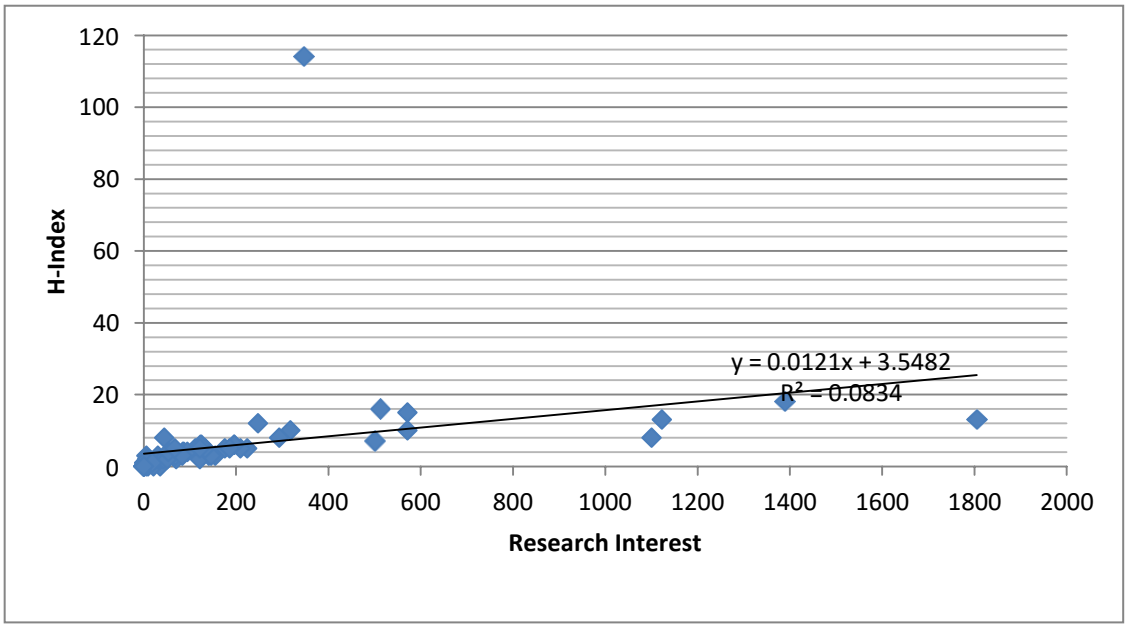
Figure 5.23: Correlation between Research Interest Score and Citations



5.3.4 Correlation between Research Interest and H-Index

The figure 5.24 shows the correlation between Research Interest Score and H-Index. The correlation coefficient (*r*) formula indicates a 0.288 point in the correlation between Research Interest and Reads. The value of *r* suggests a weakly positive correlation between Research Interest and citations.

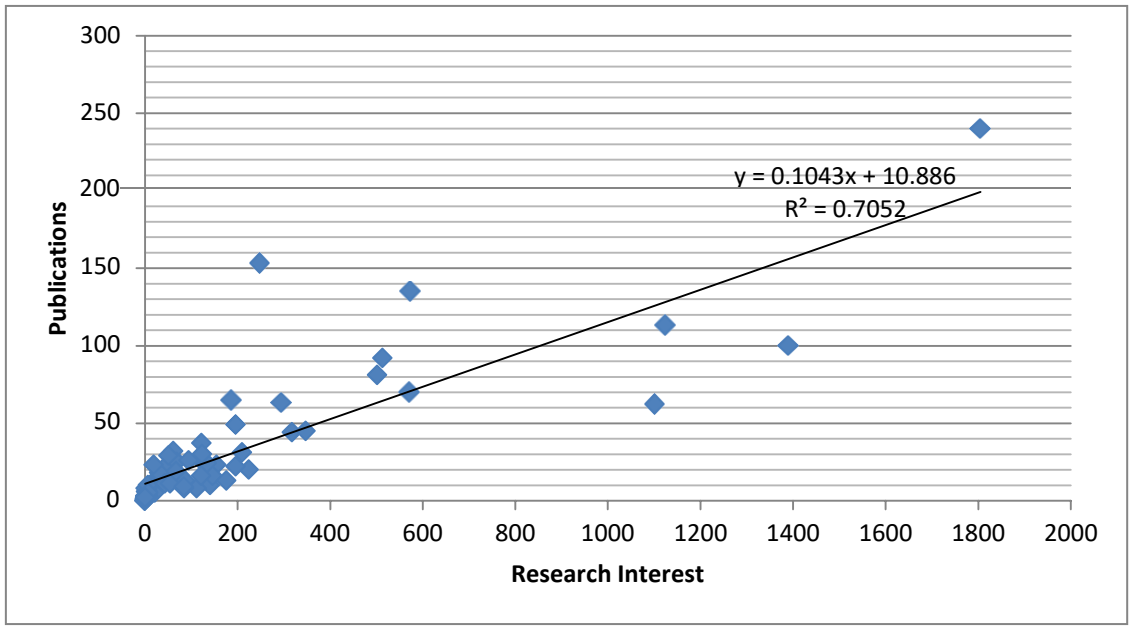
Figure 5.24: Correlation between Research Interest Score and H-Index



5.3.5 Correlation between Research Interest and Publications (Articles, books, chapters, conference paper, pre-prints)

The figure 5.25 shows the correlation between Research Interest Score and Publications. Publications are divided into several items: articles, books, chapters, conference papers, and pre-prints. The correlation between Research Interest and Publications is calculated between these variables, and a positive correlation was found between them. The value of *r is* 0.839.The positive correlation marks that more publications in ResearchGate led to more research interest in the RG profiles of the faculties.

Figure 5.25: Correlation between Research Interest Score and Publications



5.4 Hypotheses Testing

The study has proposed two hypotheses, which are tested using the Statistical method Pearson Correlation coefficient and percentage. The hypotheses were tested using SPSS version (20.0). The hypotheses of the study were:

Hypothesis 1:

H^0- The majorities of the faculty members under study are well aware and have their ResearchGate profile.

H^1- Most faculty members under study areunaware and don't have their ResearchGate profile.

Hypothesis 2:

H^0- The majority of the Assistant professors among the faculty members have their ResearchGate profile.

H^1- Most of the Assistant professors are not among the faculty members with their ResearchGate profile.

Testing of Hypotheses

H^0- The majorities of the faculty members under study are well aware and have their ResearchGate profile.

H^1- Most faculty members under study areunaware and don't have their ResearchGate profile.

Table 5.21: Total Number of LIS faculties across Indian Central Universities

S. No	**Name of the university**	**No. of Faculty Members**	**Faculty Members with RG** Profiles	**Percentage** (%)	**r**
1	BHU	9	6		
2	AMU	8	8		
3	DU	7	4		
4	NEHU	6	5		
5	MU	6	2		

6	GGV	1	1		
7	PU	7	4		
8	IGNOU	6	4		
9	TU	3	3		
10	AUS	4	4	68.41%	0.764384858
11	MZU	8	8		
12	CUTN	6	4		
13	CUH	2	0		
14	CUP	5	4		
15	CUHP	6	4		
16	CUG	4	4		
17	MGCU	4	0		
18	BBAU	5	1		
	Total	97	66		

Table 5.21 represents the total number of LIS faculties engaged in various central universities across India. The table depicts the total of LIS faculties present in the ResearchGate platform, along with the names of the universities. To know the awareness and number of faculties having ResearchGate profiles, the Pearson Correlation between the total of faculty and the total number of faculties present in ResearchGate is calculated.

Table 5.21 shows the Pearson correlation Coefficient between the total faculty and the total number of faculties present in ResearchGate is 0.764. This denotes a high correlation between the total number of faculties and the total number of LIS faculties in ResearchGate. However, the percentage aspect of the table also depicts that it has more than half of the total population in ResearchGate. Hence the null hypothesis (H^0) is accepted.

Hypothesis 2:

H^0- The majority of the Assistant professors among the faculty members have their ResearchGate profile.

H^1- Most of the Assistant professors are not among the faculty members with their ResearchGate profile.

Table 5.22: Total Number of Assistant professors in ResearchGate

S.N	Univ.	No. of Asst. Professors	No. of Assistant Professors at ResearchGate	*R*	Percentage (%)
1	BHU	4	3	0.710555	64.44%
2	AMU	2	2		
3	DU	0	0		
4	NEHU	3	2		
5	MU	4	1		
6	GGV	0	0		
7	PU	2	1		

8	IGNOU	2	2	
9	TU	2	2	
10	AUS	2	2	
11	MZU	4	4	
12	CUTN	4	3	
13	CUH	1	0	
14	CUP	4	3	
15	CUHP	4	2	
16	CUG	3	3	
17	MGCU	3	0	
18	BBAU	1	1	
	Total	45	29	

Table 5.22 represents the total number of Assistant Professors in ResearchGate in various central universities across India. The table depicts the total of Assistant Professors present in the ResearchGate platform along with their names of the universities. To know if the majority of the Assistant professors among the faculty members have their ResearchGate profile, the Correlation coefficient between the total of Assistant Professors and the total number of Assistant Professors present in ResearchGate is calculated.

In table 19, the result of correlation coefficient (*r*) between the total of Assistant Professors in the LIS fraternity and the total number of Assistant Professors present in ResearchGate is found to be 0.71, and this denotes that there is a high correlation between the total of Assistant Professors and the total number of Assistant Professor present in ResearchGate. However, the percentage aspect of the table also depicts that it has more than half of the total population in ResearchGate. Hence the null hypothesis (H^0) is accepted.

Note: The correlation coefficient that was calculated for testing the hypothesis was based on the following scale:

Table 5.23: Scale for Correlation Coefficient Value

Sl. No.	Scale of Correlation Coefficient	Value (*r*)
1.	$0< r\leq 0.19$	Very Low Correlation
2.	$0.2< r\leq 0.39$	Low Correlation
3.	$0.4< r\leq 0.59$	Moderate Correlation
4.	$0.6< r\leq 0.79$	High Correlation
5.	$0.8< r\leq 1.0$	Very High Correlation

5.5 Research Findings - General

The analysis of the data collected through survey and observation has revealed several findings on the Altmetrics analysis of RG profiles of LIS teaching faculties which are as follows:

a) It was found from the analysis that most of the faculties belong to the male community, with 49 (74.24%). While on the other hand, female faculties account for 25.75% of the total population. The total population of the research study accounted for 66.

b) The analysis shows that several teaching faculties in various central universities in India belong to the Library and Information Science discipline. It is noticed that out of 97 faculties, only 66 of the working teaching professionals have profiles in

the ResearchGate platform, accounting for 71.73%. On the other hand, universities such as Aligarh Muslim University, Guru GhasidasVishwavidyalaya, Tripura University, Assam University, Mizoram University and the Central University of Gujarat have 100% faculties present in the ResearchGate platform. Universities such as the University of Delhi and Pondicherry University with 57.14%, North-Eastern Hill University with 83.33%, the Central University of Punjab with 80%, and Babasaheb Bhimrao Ambedkar University with 16.66% respectively.

c) It also reveals that most of the teaching fraternity belongs to the category of Assistant Professor at 43.93%, which Professors follow with 39.40%. On the other hand, in the type of Associate Professor, 11 of the total position belong to positions bearing a percentage of 16.67%.

d) The analysis also reveals those two central universities in New Delhi and three established LIS department universities in Uttar Pradesh. The frequency distribution in terms of geographic affiliation of Delhi and Uttar Pradesh is 11.76% and 16.66%, respectively. Each of the other states has one central university, and the frequency of geographic distribution is 5.88% each.

e) It was also found that 97 faculties presently work in prominent universities' libraries and information science departments. Out of 97 faculties, only 66 have accounts in the ResearchGate platform. As per the analysis of data, it is seen that the highest number of publications is in the category of 1-10. There are 12 (18.18%) faculties that have publications greater than 50. The median distribution of publications is 55.33, and the median is 83. The minimum and maximum frequency of publication distributions are 0 and 100, respectively.

f) As per the analysis, most of them have full-text publications in the range of 1-10, with a frequency distribution of 43.93%. On the other hand, around 7.57% of the faculties do not add full-text journals to their accounts. It was also noticed that 15.15% of the faculties have full-text publications greater than 50. As per the analysis of data, it is seen that the full-text addition in the range of 11-20 is 22.72%, whereas, on the other hand, 4.54% of the faculties have their full-text addition in their respective ResearchGate platform.

g) As per the data analysis, it is noticed that most faculties, around 42.42% of the total population, have received citations in the range of 1-100. A sum of seven faculties (10.6%) has received citations in the range of greater than 500. 6.06% of the faculties have received citations in 201-300 and 301-400.

h) It is seen from the findings that 57.57% of the faculty has received H-Index in the range of 1-5. On the other hand, around 12 (18.18%) faculties have not received any of the H-Index in their ResearchGate account. In the 6-10, 12.12% of the faculties received their H-Index, and 6.06% received H-Index distribution in the 11-15.

i) It is seen that the majority of the faculties have followers greater than 50. The number has come up to 28 of the total faculty, with 42.42%. 4.54% of the faculties have not received followers in their RG profiles. In the range of 1-10, the total number of followers received by the faculties is 19.69% (13). On the other hand, in the category of 11-20 and 21-30, the total number of followers received in this category is 9.09% (6), and 7.57% of the total population has received followers in the range of 31-40 and 41-50.

j) The highest number of following is seen in the 1-10 with 30.31%. Around 12 of the faculty members have followings greater than 100, with 18.18%. In the categories 31-40 and 41-50, only 3.03% of the faculties follow this range. 13.63% of the faculties have their cults in the 11-20, and 7.57% followings in the 51-100. It is also mentioned that 18.18% of the faculties have their cults in the 21-30.

k) It is also noticed that 74.24% of the faculties have their Research Interest in the range of 1-10, which seems to have low rankings as it displays the summary of research work and other scientific investigations. 6.06% of the faculties have no Research Interest score added to their accounts. It is also mentioned that 6.06% of the faculties have their Research Interest greater than 800. In the range of 201-400, a percentage of 7.57% of the faculties have their research interest score, and on the other hand, it is noticed that 4.54% of the faculties have their Research Interest distribution in the range of 401-600.

l) The analysis reveals that 4.54% of the faculties have no addition of research articles to their accounts. On the other hand, 45.45% of the total faculties have

their articles added in the 1-10. A total of five of the faculties have articles publications in the field more significant than 50. In the broad range of 11-20 and 21-30, the faculties' members have their articles publications, namely 24.24% and 7.57%, respectively. 4.54% of the faculties have pieces in the range of 31-40, and despotically in the category of 41-50, 6.06% have their articles publications.

m) The people of 34.84% have no conference papers/ proceedings in their accounts. The highest frequency distribution of conference papers is in category 3, with 40.9% of the total population. 13.63% of the entire population has only a single conference paper in their RG profiles, and 7.57% of the faculties have their conference paper published in the category of 2. Only two of the faculties had published three conference papers in their account.

n) A sum of 33 faculties (50%) has no chapter additions in the ResearchGate accounts. Around 21.21% of them have single book chapters published in conferences. Only one of them has published more than two chapters. On the other hand, 19.69% of the faculties have published more than four book chapters in the form of edited books.

o) It is seen that the majority of the population has no publications in this type of format. It is mentioned that 86.36% of the faculties have no pre-print publications to their accounts, giving some 57 faculties. Only 6.06% of the population has their pre-print publications in the reports of ResearchGate. It is also mentioned that 4.54% of the faculties have pre-print publications in the range of one. Two of the faculty members have their pre-prints publications in the field of two.

p) The number accounted for 51 faculties (77.27%) with no data in their ResearchGate accounts. On the other hand, 4.54% of the faculties have data published in the category of more than 4. 7.57% of the faculties have one data published. On the other hand, it was also noticed that two faculties (3.03%) have their data published in the range of 2. 6.06% of the faculties have their data published in the category of four.

q) It is also to mention that only one of the faculties has more than three questions in the RG accounts. It is also to be said that two faculties (3.03%) of the total

population have three questions in their respective RG profiles. 6.06% of the faculties have their questions in the range of one.

r) It is also mentioned that 80.3% of the faculties have no answers in their profiles. While on the other hand, it is noticed that 12.12% of the faculties have more than three answers to their questions. 4.54% of the faculties have answers in the range of one. Again, 1.51% of the faculties have their accounts in the range of two and three regarding answers.

s) It is seen that 4.54% of the faculties have no reads in their accounts. One interesting point to be noted is that most LIS teaching faculties have their maximum number of reads in their ResearchGate profiles. It is to be noted that 66.67% of the faculties have their reads in the range of greater than 1000. 13.63% of the faculties have their reads in the 1-200.

t) It is seen that most of the faculties in LIS teaching departments seem to have fewer impact points in their ResearchGate profiles. It is also seen that 66.67% of the faculties have no impact point in their ResearchGate accounts. On the other hand, 12.12% of the faculties have impact points greater than 200. The present reports also say that 4.54% of the faculties have impact points in the 1-50. 7.57% have their faculties in the range of 151-200.

This chapter primarily addresses the study's data analysis components. A detailed analysis of the data collected from various sources was displayed and analyzed in accordance with the study's objectives. The data analysis and interpretation have revealed some remarkable findings that will be extremely useful to future researchers and policymakers. The following chapter discusses the area of study's recommendations and concluding remarks.

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Chapter 6- Findings, Conclusion and Suggestions

CHAPTER -6

FINDINGS, CONCLUSION AND SUGGESTIONS

6.1 Introduction

The usability and accessibility of scholarly research impact are becoming increasingly important in academia and the public sector. Journal publishers use them to determine publication influence, while academic institutions use them to assess research productivity and impact. Librarians and information scientists use them to determine the value of collections to users. Scholars and researchers commonly use metrics to assess the impact of their research, as well as for promotion and tenure. As a result, measuring research impacts is becoming more widely recognized in libraries and other institutions associated with higher education.

If we move back a few years, traditional measurements include Journal Impact Factor (JIF) and journal-level usage. It also considers variables such as citation counts, article-level impact, and the author's h-index.

It is important to remember that the core functions of online scientific communication via social media include collaboration, searching for relevant literature, achieving original records, stimulating one's work, building a peer network, organizing and extracting information, and organizing peer reviews. Engineering and science have always encouraged online scientific and professional communication. It has provided a forum for various role models from various specializations to connect and communicate with new academicians and scientists. Online scientific communication allows individuals from various disciplines to stay connected while located in different geographical areas in a specific virtual environment. Social media enables asynchronous and synchronous communication for the designated design team to complete projects.

With many advantages, a wide range of social web tools provides various functions and utilities by conducting programmes or workshops for faculty members to understand the importance of various emerging social media web and article-level Altmetrics,

practicing librarians or LIS professionals can strategically choose how to impart scholarly work in a way designed to maximize impact within the social network landscape.

The study has mainly tried to analyze the Library and Information Science Teaching faculties in various central Universities across India. The objectives laid down for the study include the followings;

i. To analyze the publication of faculty members uploaded at ResearchGate;
ii. To study the diverse contributions made by the faculty member in the development of the ResearchGate profile in full-text format;
iii. To investigate how many times the research works of a researcher have been cited or read by other researchers;
iv. To study the impact points received by the faculty in publications of scholarly work; and
v. To analyze the number of followers a researcher had and the number of researchers the researcher is following.

Regarding the basis of the study, the following hypotheses have been laid down:

Hypothesis 1:

H^0- The Majorities of the faculty members under study are well aware and have their ResearchGate profile.

H^1- Most faculty members under study are unaware and don't have their ResearchGate profile.

Hypothesis 2:

H^0- The majority of the Assistant professors among the faculty members have their ResearchGate profile.

H^1- Most Assistant professors are not among the faculty members with their ResearchGate profile.

The study was mainly limited to the LIS teaching faculties in the Library and Information Science department among the various central universities across India. The faculties recruited post-2021were excluded from the study as the objectives were prepared based on this time frame. The primary data were collected from the

ResearchGate platform and tabulated and processed in MS Excel based on different criteria. The study examines the metrics provided by ResearchGate and includes a systematic observation of the metrics as per ResearchGate, such as publications, reads, citations, networking that includes followers and the following information, h-index, total research Interest, etc.

6.2 Research Objectives

This section primarily presents the discussion based on the objectives:

6.2.1 To analyze the publication of faculty members uploaded at Researchgate.

One of the study's objectives was to analyze the faculties' publications in the LIS teaching department across the central universities in India. It was found that the distribution of LIS faculty publications in different central universities across India. A total of 97 faculties presently work in various prominent universities' libraries and information science departments. Out of 97 faculties, only 66 have accounts in the ResearchGate platform. As per the analysis of data, it is seen that the highest number of publications is in the category of 1-10. The distribution frequency in terms of publications is seen as 33.33%, with 22 faculties. Three faculties have no publications to their accounts, with 4.54%. There are 12 (18.18%) faculties that have publications greater than 50. The median distribution of publications is 55.33, and the median is 83. The minimum and maximum frequency of publication distribution is 0 and 100, respectively.

6.2.2 To study the diverse contributions made by the faculty member in the development of the ResearchGate profile in full-text format.

The study's second objective is to analyze the contribution made by LIS faculties in the growth and development of RG in the form of the full text. Most of them have full-text publications in the range of 1-10, with a frequency distribution of 43.93%. On the other hand, around 7.57% of the faculties do not add full-text journals to their accounts. It was also noticed that 15.15% of the faculties have full-text publications greater than 50. As per the analysis of data, it is seen that the full-text addition in the range of 11-20 is 22.72%, whereas, on the other hand, 4.54% of the faculties have their full-text addition in their respective ResearchGate platform. The mean of the full-text publications is 55.33,

and the median is 83. Therefore, the standard deviation of the full-text journal in ResearchGate accounts is 50.84.

6.2.3 To investigate how many times the research works of a researcher have been cited or read by other researchers.

The study's third objective is to analyze Many Times the Research Works of a Researcher Have Been Cited or Read by Other Researchers. Table 6 showcases the distribution of citations received by the faculties across different central universities, specifically to the Department of Library and Information Science teaching staff. As per the data analysis, it is noticed that most faculties, around 42.42% of the total population, have received citations in the range of 1-100. A sum of seven faculties (10.6%) has received citations in the range of greater than 500. 6.06% of the faculties have received citations in 201-300 and 301-400. There seem to have no faculties who have received citations in the range of 401-500. In addition to the list, it is also worth mentioning that 15.15% of the faculties have received citations in the range of 101-200. After analyzing the data, it has been found that the mean citation is 55.33, and the overall median is 83.

While on the other hand, the analysis of the study depicts that 4.54% of the faculties have no reads in their accounts. One interesting point to be noted is that most LIS teaching faculties have their maximum number of reads in their ResearchGate profiles. It is to be noted that 66.67% of the faculties have their reads in the range of greater than 1000. 13.63% of the faculties have their reads in the 1-200. In the range of 201-400 and 401-600, it is mentioned that 6.06% of the faculties have their reads. While on the other hand, it is also mentioned that 1.51% of the faculties have their reads in the 601-800 and 800-1000. The mean obtained in terms of reads is 55.33, and the median accounts for 83. The maximum and minimum score of reads is 0 and 100, respectively.

6.2.4 To study the impact points received by the faculty in publications of scholarly work.

One of the study objectives is to examine Impact Points Received by the Faculty in Publications of Scholarly Work. It is seen that most of the faculties in LIS teaching departments seem to have fewer impact points in their ResearchGate profiles. It is also

seen that 66.67% of the faculties have no impact point in their ResearchGate accounts. On the other hand, 12.12% of the faculties have impact points greater than 200. The present reports also say that 4.54% of the faculties have impact points in the 1-50. 7.57% have their faculties in the range of 151-200. It is also to be added that 6.06% of the total population has Impact points in the range of 51-100, and 3.03% of the faculties have impact points in the range of 101-150. The result also reveals that the mean and median of Impact Points are 55.33 and 83, respectively. It is also to mention that the faculties' minimum and maximum number scores are 0 and 100, respectively. The standard deviation derived from the calculation is 50.84.

6.2.5 To analyze the number of followers a researcher had and the number of the following research received.

Another prime objective of the study is to analyze the Number of Followers a Researcher Had and the number of the following research received. The highest number of following is seen in the 1-10 with 30.31%. Around 12 of the faculty members have followings greater than 100, with 18.18%. In the categories 31-40 and 41-50, only 3.03% of the faculties follow this range. 13.63% of the faculties have their cults in the 11-20, and 7.57% followings in the 51-100. It is also mentioned that 18.18% of the faculties have their cults in the 21-30. In addition to the above mention detail, it is also necessary to be added that the mean derived after calculations is 55.33, and the standard deviation is 50.84.

The finding also reveals the distribution of the number of followers among the faculties across the different LIS teaching faculties in Central Universities in India. It is seen that the majority of the faculties have followers greater than 50. The number has come up to 28 of the total faculty, with 42.42%. 4.54% of the faculties have not received followers in their RG profiles. In the range of 1-10, the total number of followers received by the faculties is 19.69% (13). On the other hand, in the category of 11-20 and 21-30, the total number of followers received in this category is 9.09% (6), and 7.57% of the total population has received followers in the range of 31-40 and 41-50. Further data analysis shows that the mean derived from the interpretation is 55, and the standard deviation they received is 50.84.

6.3 Research Hypotheses

Hypothesis 1:

H^0- Most faculty members under study are well aware and have their ResearchGate profile.

H^1- Most faculty members under study are unaware and don't have their ResearchGate profile.

At the beginning of the study, it was found that the total number of LIS faculties engaged in various central universities across India that are present in the ResearchGate platform, along with their names of the universities. To know the awareness and number of faculties having ResearchGate profiles, the Pearson Correlation between the total of faculty and the total number of faculties present in ResearchGate is calculated. The Pearson correlation between the total faculty and the total number of faculties present in ResearchGate is 0.764. This denotes a high correlation between the total number of faculties and the total number of LIS faculties in ResearchGate. The percentage aspect of the table also depicts that it has more than half of the total population in ResearchGate. Hence the null hypothesis (H^0) is accepted.

Hypothesis 2:

H^0- The majority of the Assistant professors among the faculty members have their ResearchGate profile.

H^1- Most Assistant professors are not among the faculty members with their ResearchGate profile.

Scholarly communication is considered an essential asset for properly disseminating and circulating information. It has been observed that the total number of Assistant Professors present in ResearchGate in various central universities across India ismaximum. To know if the majority of the Assistant professors among the faculty members have their ResearchGate profile, the Pearson Correlation between the total of Assistant Professors and the total number of Assistant Professors present in ResearchGate is calculated. The Pearson correlation between the total of Assistant Professors in the LIS fraternity and the total number of Assistant Professors present in ResearchGate is found

to be 0.71, which denotes a high correlation between the total of Assistant Professors and the total number of Assistant Professor present in ResearchGate. The percentage aspect of the table also depicts that it has more than half of the total population in ResearchGate. Hence the null hypothesis (H^0) is accepted.

6.4 Observation and Experiences

The researcher has gone through several observation and experiences during the course of the study. It has been observed that the majority of the faculties are unaware about the various academic social networking sites and also the essence of the presence of such metrics. More and more number of workshops, campaign, conferences, and training programmes need to be organized by holding institution either individually or collectively. The institutions should also organize some brain-storming sessions that shall provide the faculty new atmosphere to think and nourish their talent and ability in academic sphere is concern. On the other hand, the faculties especially the LIS teaching fraternity as the study is primarily concern with the subject also with the change of time need to enhance their skill and ability with the changing technology. The researcher has observed that lack of interest among the faculties specially the aged teaching staff is one of the prime reasons for the less number of faculties in such academic social networking sites. The academicians need to understand some of brightest advantages features this modern technology possess and should build a belief system among themselves so that the upcoming generation can better enhance the technology and combine both the teaching, technology and researcher together to provide new era of teaching and learning. The new generation should build these skills and make a better world tomorrow.

6.5 Final Outcome

The prime aim of the study was to analyze the Library and Information Science Teaching faculties in the various central universities across India. The method to analyze the study was basically "Altmetrics" or alternative metrics approach to understand the scholarly communication and work distributed among the academic fraternity. The main motto also accurately depicts activities in and around the discipline. One of the core outcomes of the study is to understand the underlying factors that help an individual grow as a researcher in academic, social networking sites such as ResearchGate, Google Scholar and Academia.edu. The key takeaway of the study was to understand the position

of LIS faculties concerning research and other related activities performed in the ResearchGate platform, as it is the prime area undertaken for the study.

Since the study mainly focused on the ResearchGate activity of LIS faculties, it has helped the researchers understand the several metrics associated with ResearchGate. The several metrics of ResearchGate includes publication in different formats such as journal articles, book, conference paper, pre-prints, data, chapters and many more; reads, citations, followers and followings, Research Interest, H-Index, Impact Points and many others have resulted in fulfilling the objectives laid down for the study. This study has also resulted in understanding the correlation of metrics associated with the ResearchGate. The study has also portrayed a clear picture infront of people to understand the status and position of faculties.

The study's finding has resulted in more awareness being required to understand the importance and significance of ResearchGate in present academia. Therefore, the study's outcome has resulted in more awareness programmes such as campaigns, workshops, seminars and conferences required and can serve as a backbone in achieving success and progress about information for Altmetrics. In addition, it is also to mention that much attention in their publications and give some priority to the use of academic, social networking like ResearchGate as it is an essential medium for the evaluation of the researcher in their respective field of specialization.

6.6 Suggestions

Based on the analysis, observation, and experience related to the study, the followings are a few of the suggestions that are necessary to improve knowledge and Awareness of ResearchGate and Altmetrics as the contemporary method of evaluation among the academic fraternity:

6.6.1 Suggestions for Professionals

(i) The professionals need to use more Academic Social Network Sites such as ResearchGate to make their research work more transparent;

(ii) The professionals need to understand the importance and significance of the ResearchGate platform;

(iii) The professionals must make their research more visible to the audience, as the ResearchGate provides these opportunities; and

(iv) The professionals also need to spread awareness and its significance among peers and the community about the various Academic Social Network sites that shall enable them to remain connected and share with academicians across the globe.

6.6.2 Suggestions for LIS Research Scholars and Academicians

(i) The students at the Postgraduates and undergraduate levels need to understand the importance and latest development of ResearchGate;

(ii) The students should conduct some discussions about various Academic Social Networking sites on some doubts and confusion and enhance both the theoretical and practical aspects of ResearchGate and likewise;

(iii) The students and Research Scholars should participate more in seminars and workshops and must maintain a good professional relationship with the subject-expert across the globe; and

(iv) The Research Scholars and students should build knowledge and significance about the social networking sites and various metrics associated with these ASNS so that near future, they are well versed and adequate about the usability and applicability of these sites.

6.6.3 Suggestions for Forum Administrator/ Moderator

(i) The social networking site administrator should responsibly perform activities related to promoting various social networking sites in the educational environment;

(ii) The administrator should promote the importance or significance of these social networking sites so that more and more professionals, both technical and non-technical, come and use these platforms;

(iii) More and more workshops, seminars, conferences, and awareness campaigns need to be organized from the administration's perspective so that much interaction and debates enhance the learning among the academic community;

(iv) The administrators need to promote the usability of ASNS among the faculties as the university's or institution's visibility is brought to the limelight by this forum as more and more activities are moving to an online environment; and

(v) The administrator should ask the Department of Library and Information Science to motivate other students from different subjects about Academic Social Networking Sites so they will be aware and promote usability among their peers.

6.7 Scope for future research

Altmetrics analysis is an emerging area of research in Library and Information Science as we deal with new technology. Few studies have been carried forward by researcher, particularly in the discipline of Information Science as a core area of study. There is no doubt that several studies have been done adopting Bibliometrics and scientometrics approaches. In aspects of further research, the researcher has undertaken the areas such as the *South-Asia region* in analyzing the LIS teaching staff from the perspective of Altmetrics. This method can also be applied in analyzing the other sources of Altmetrics source such as *Google Scholar, CiteULike, Mendeley, Academia.edu* and many others that provide a good and reliable form of metrics. The researchers can also analyze by adopting approaches to other disciplines such as *medicine, humanities, technology, applied and basic sciences, earth sciences* and many more.

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APPENDIX – A

LIS FACULTIES IN CENTRAL UNIVERSITIES

S.No.	Name of the Central University	Establishment Year	Establishment Year (Dept.)	No. of Faculty
1.	Banaras Hindu University	1915	1941	9
2.	Aligarh Muslim University	1920	1950	8
3.	University of Delhi	1922	1946	7
4.	North-Eastern Hill University	1973	1985	6
5.	Manipur university	1980	-	6
6.	Guru Ghasidas Vishwavidyalaya	1983	1985	1
7.	Pondicherry University	1985	2007	7
8.	Indira Gandhi National Open University	1985	1989	6
9.	Tripura University	1987	2016	3
10.	Assam University	1994	2009	4
11.	Mizoram University	2001	2002	8
12.	Central university of Tamil Nadu	2009	2017	6
13.	Central University of Haryana	2009	2014	2
14.	Central University of Punjab	2009	-	5
15.	Central University of Himachal Pradesh	2009	-	6
16.	Central University of Gujarat	2009	-	4
17.	Mahatma Gandhi Central	2014	2019	4

	University			
18.	Babasaheb Bhimrao Ambedkar University	1996	1997	5
	Total			**97**

APPENDIX – B

LIS FACULTIES IN CENTRAL UNIVERSIIES OF INDIA

S. No.	Name	Designation	Gender	University Name
1.	H.N Prasad	Professor	Male	Banaras Hindu University
2.	Bhaskar Mukherjee	Professor	Male	Banaras Hindu University
3.	Ajay Pratap Singh	Professor	Male	Banaras Hindu University
4.	Aditya Tripathi	Professor	Male	Banaras Hindu University
5.	Rajani Mishra	Associate Professor	Female	Banaras Hindu University
6.	Kunwar Singh	Assistant Professor	Male	Banaras Hindu University
7.	Shriram Pandey	Assistant Professor	Male	Banaras Hindu University
8.	Ashwini Singh	Assistant Professor	Male	Banaras Hindu University
9.	Gireesh Kumat T.K.	Assistant Professor	Male	Banaras Hindu University
10.	Nishat Fatima	Professor	Female	Aligarh Muslim University
11.	Naushad Ali P.M.	Professor	Male	Aligarh Muslim University
12.	Sudharma Haridasan	Professor	Female	Aligarh Muslim University
13.	M. Masoom Raza	Professor	Male	Aligarh Muslim University
14.	Mehtab Alam Ansari	Professor	Male	Aligarh Muslim University
15.	Mohammad Nazim	Associate Professor	Male	Aligarh Muslim University
16.	Muzamil Mushtaq	Assistant Professor	Male	Aligarh Muslim University
17.	Keshwar Jahan	Assistant Professor	Female	Aligarh Muslim University
18.	Shailendra Kumar	Professor	Male	University of Delhi
19.	Rakesh Kumar Bhatt	Professor	Male	University of Delhi
20.	Paramjeet Kaur Walia	Professor	Female	University of Delhi
21.	K.P. Singh	Professor	Male	University of Delhi
22.	Margam Madhusudhan	Professor	Male	University of Delhi

23.	Meera	Professor	Female	University of Delhi
24.	Manish Kumar	Associate Professor	Male	University of Delhi
25.	Moses M Naga	Professor	Male	North-Eastern Hill University
26.	Bikika Laloo Tariang	Professor	Female	North-Eastern Hill University
27.	Paokholun Hangsing	Professor	Male	North-Eastern Hill University
28.	Jacqueline J. Thabah	Assistant Professor	Female	North-Eastern Hill University
29.	S. Ravi Kumar	Assistant Professor	Male	North-Eastern Hill University
30.	Jialimon Khongtim	Assistant Professor	Female	North-Eastern Hill University
31.	Thoidingjam Purnima Devi	Professor	Female	Manipur University
32.	Ch Ibohal Singh	Professor	Male	Manipur University
33.	Bobby Phuritsabam	Assistant Professor	Male	Manipur University
34.	Keisham Sangeeta Devi	Assistant Professor	Female	Manipur University
35.	Dalip Singh	Assistant Professor	Male	Manipur University
36.	Kh. Surachand Singh	Assistant Professor	Male	Manipur University
37.	Brajesh Tiwari	Associate Professor	Male	Guru Ghasidas Vishwavidyalaya
38.	Chennupati Kodanda Ramaiah	Professor	Male	Pondicherry University
39.	Sevukan R	Professor	Male	Pondicherry University
40.	Rekha Rani Varghese	Associate Professor	Female	Pondicherry University

41.	Mangkhollen Singson	Associate Professor	Male	Pondicherry University
42.	R. Jeyshankar	Associate Professor	Male	Pondicherry University
43.	Leeladharan M.	Assistant Professor	Male	Pondicherry University
44.	Kohila G.T.	Assistant Professor	Female	Pondicherry University
45.	Uma Kanjilal	Professor	Female	Indira Gandhi National Open University
46.	Jaideep Sharma	Professor	Male	Indira Gandhi National Open University
47.	Archana Shukla	Professor	Female	Indira Gandhi National Open University
48.	Zuchamo Yathan	Professor	Male	Indira Gandhi National Open University
49.	Ashok Kumar	Assistant Professor		Indira Gandhi National Open University
50.	Pawan Kumar Saini	Assistant Professor	Male	Indira Gandhi National Open University
51.	Rabindra Kumar Mahapatra	Professor	Male	Tripura University
52.	Mithu Anjali Gayan	Assistant Professor	Female	Tripura University
53.	Augustine Zimik	Assistant Professor	Male	Tripura University
54.	Monaj Kumar Sinha	Professor	Male	Assam University
55.	Mukut Sarmah	Associate Professor	Male	Assam University
56.	Nabin Chandra Dey	Assistant Professor	Male	Assam University
57.	Rajesh Rangappa Aldarthi	Assistant Professor	Male	Assam University
58.	Pravakar Rath	Professor	Male	Mizoram University
59.	R.K. Ngurtinkhuma	Professor	Male	Mizoram University
60.	Shyam Narayan Singh	Professor	Male	Mizoram University

61.	Manoj Kumar Verma	Associate Professor	Male	Mizoram University
62.	Lalngaizuali	Assistant Professor	Female	Mizoram University
63.	Amit Kumar	Assistant Professor	Male	Mizoram University
64.	F.Chanchinmawia	Assistant Professor	Male	Mizoram University
65.	Manendra Kumar Singh	Assistant Professor	Male	Mizoram University
66.	Akhandanand Shukla	Associate Professor	Male	Central University of Tamil Nadu
67.	S. Ravi	Professor	Male	Central University of Tamil Nadu
68.	K.G. Sudhier	Assistant Professor	Male	Central University of Tamil Nadu
69.	Anila Sulochana	Assistant Professor	Female	Central University of Tamil Nadu
70.	Taddi Murali	Assistant Professor	Male	Central University of Tamil Nadu
71.	V.K. Dhanyasree	Assistant Professor	Female	Central University of Tamil Nadu
72.	Dinesh Kumar Gupta	Professor	Male	Central University of Haryana
73.	Amit Kumar	Assistant Professor	Male	Central University of Haryana
74.	Sandeep Kaur	Associate Professor	Female	Central University of Punjab
75.	Sukhdev Singh	Assistant Professor	Male	Central University of Punjab
76.	Florence Guite	Assistant Professor	Female	Central University of Punjab
77.	Rishabh Shrivastava	Assistant Professor	Male	Central University of

				Punjab
78.	Somesh Rai	Assistant Professor	Male	Central University of Punjab
79.	Dimpee Patel	Associate Professor	Female	Central University of Himachal Pradesh
80.	Shivarama Rao K	Associate Professor	Male	Central University of Himachal Pradesh
81.	Pawan Kumar Saini	Assistant Professor	Male	Central University of Himachal Pradesh
82.	Muruli N	Assistant Professor	Male	Central University of Himachal Pradesh
83.	Nimmala Karunakar	Assistant Professor	Male	Central University of Himachal Pradesh
84.	Sudam Charan Sahu	Assistant Professor	Male	Central University of Himachal Pradesh
85.	Ranjeet Kumar Choudhury	Professor	Male	Mahatma Gandhi Central University
86.	Bhaw Nath Pandey	Assistant Professor	Male	Mahatma Gandhi Central University
87.	Madhu Patel	Assistant Professor	Female	Mahatma Gandhi Central University
88.	Sapna	Assistant Professor	Female	Mahatma Gandhi Central University
89.	Bhakti Gala	Assistant Professor	Female	Central University of Gujarat
90.	Minaxi Parmar	Assistant Professor	Female	Central University of Gujarat
91.	Rashmi Kumbar	Assistant Professor	Female	Central University of Gujarat

92.	Jayaendrakumar N. Amin	Professor	Male	Central University of Gujarat
93.	K.L. Mahawar	Professor	Male	Babasaheb Bhimrao Ambedkar University
94.	Shilpi Verma	Professor	Female	Babasaheb Bhimrao Ambedkar University
95.	M.P. Singh	Professor	Male	Babasaheb Bhimrao Ambedkar University
96.	Dr. Sharad Kumar Sonker	Associate Professor	Male	Babasaheb Bhimrao Ambedkar University
97.	Dr. Vinit Kumar	Assistant Professor	Male	Babasaheb Bhimrao Ambedkar University

APPENDIX – C

LIS FACULTIES AVAILABLE ON RESEARCHGATE

Name	Publication	Articles	Chapters	Conference Paper	Data	Pre-Prints	Full-Text	Citations	Reads	H-Index	Research Interest Score	No. Of Followers	No. Of Followings	Questions	Answer	University
Jayaendra kumar N. Amin	3	2	1	0	0	0	3	0	184	0	1.2	2	1	0	0	Central Univ. of Gujarat
Rashmi Kumbar	8	4	1	3	0	0	2	2	458	1	15.4	30	19	0	0	Central Univ. of Gujarat
Minaxi Parmar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Central Univ. of Gujarat
Bhakti Gala	27	13	3	6	0	0	10	29	3296	3	63.5	54	59	0	0	Central Univ. of Gujarat
Sudam Charan Sahu	9	5	0	2	1	0	4	4	7829	1	14.8	45	43	2	35	Central Univ. of Himachal Pradesh
Muruli N	2	1	0	1	0	0	1	0	86	0	1.3	56	23	0	0	Central Univ. of Himachal Pradesh
Shivarama Rao K	0	0	0	0	0	0	0	0	8	0	0	14	10	0	0	Central Univ. of Himachal Pradesh
Dimpee Patel	32	9	20	1	0	0	2	84	5275	4	61.2	69	64	0	0	Central Univ. of Himachal Pradesh
Somesh Rai	10	6	1	0	0	1	8	33	4951	3	140.9	47	110	1	1	Central Univ. of Punjab

Rishabh Shrivastava	8	8	0	0	0	0	0	167	3366	5	111.9	63	109	1	12	Central Univ. of Punjab
Florence Guite	6	6	0	0	0	0	3	1	291	1	2.6	3	1	0	0	Central Univ. of Punjab
Sukhdev Singh	8	4	0	0	4	0	8	1	26	1	1.9	2	0	0	0	Central Univ. of Punjab
V.K. Dhanyasree	7	3	1	2	1	0	2	0	211	0	9.4	4	1	0	0	Central Univ. of Tamil Nadu
Sudhier K G	44	33	0	4	3	0	37	331	15108	10	318	113	126	0	0	Central Univ. of Tamil Nadu
Anila Sulochana	0	0	0	0	0	0	0	0	0	0	0	2	20	0	0	Central Univ. of Tamil Nadu
Akhandan and Shukla	81	41	11	17	4	8	78	163	60780	7	501.5	168	170	0	4	Central Univ. of Tamil Nadu
Manendra Kumar Singh	1	1	0	0	0	0	1	0	113	0	1.6	4	4	0	0	Mizoram University
F. Chanchinmawia	13	8	0	3	0	1	12	17	6982	2	70.4	34	22	0	0	Mizoram University
Amit Kumar	49	27	6	11	0	0	42	116	10373	6	196.2	90	196	0	5	Mizoram University
Lalngaizuali	13	4	4	5	0	0	11	0	7105	0	35.7	26	1	0	0	Mizoram University
Manoj Kumar Verma	240	147	24	54	0	8	218	674	258561	13	1805	279	263	0	0	Mizoram University

Shyam Narayan Singh	20	15	0	5	0	0	18	267	19344	5	224.1	34	21	0	0	Mizoram University
R.K. Ngurtinkhuma	37	18	3	12	0	3	29	25	6503	2	121.8	87	66	0	0	Mizoram University
Pravakar Rath	23	7	0	11	0	0	20	24	62208	3	154.8	51	59	0	0	Mizoram University
Rajesh Rangappa Aldarthi	1	1	0	0	0	0	0	0	0	0	0	3	15	0	0	Assam University
Mukut Sarmah	22	9	1	4	7	0	14	8	4320	8	44.7	27	3	0	0	Assam University
Nabin Chandra Dey	5	4	0	1	0	0	3	2	297	1	4.6	23	8	0	0	Assam University
Monaj Kumar Sinha	135	63	13	40	10	0	29	362	115001	10	571.9	267	297	2	12	Assam University
Augustine Zimik	2	2	0	0	0	0	2	0	134	0	6.1	7	23	0	0	Tripura University
Mithu Anjali Gayan	25	15	6	4	0	0	20	29	4722	3	69	34	53	0	0	Tripura University
Rabindra Kumar Mahapatra	5	3	0	2	0	0	3	0	5400	0	21.4	2	7	0	0	Tripura University
Zuchamo Yathan	6	6	0	0	0	0	0	0	151	3	6	0	4	0	0	Indira Gandhi National Open University

Archana Shukla	13	13	0	0	0	0	3	58	4360	4	87	3	1	0	0	Indira Gandhi National Open University
Jaideep Sharma	8	7	0	0	0	0	2	153	916	4	84.7	11	1	0	0	Indira Gandhi National Open University
Uma Kanjilal	16	11	0	4	0	0	11	40	29693	3	146	0	1	0	0	Indira Gandhi National Open University
Leeladharan M.	10	10	0	0	0	0	4	10	662	2	11.5	28	3	0	0	Pondicherry University
Mangkhollen Singson	25	20	0	5	o	0	17	95	6769	6	125	76	0	3	13	Pondicherry University
Sevukan R	24	21	0	1	0	0	10	170	4270	5	133.6	45	4	0	0	Pondicherry University
Chennupati Kodanda Ramaiah	113	84	1	1	4	6	98	660	189913	13	1123	210	226	15	179	Pondicherry University
Brajesh Tiwari	10	4	0	6	0	0	10	3	358	1	6.9	1	1	0	0	Guru Ghasidas Vishwavidyalaya
Dalip Singh	3	1	0	2	0	0	1	2	2617	1	7.6	31	19	0	0	Manipur University
Ch Ibohal Singh	16	14	1	1	0	0	6	14	1418	2	31.8	12	27	0	0	Manipur University

Jialimon Khongtim	3	3	0	0	0	0	0	1	159	1	1.8	7	26	0	0	North-Eastern Hill University
S. Ravikumar	31	23	3	5	0	0	14	252	17080	5	209.7	58	56	0	1	North-Eastern Hill University
Paokholun Hangsing	18	15	0	1	2	0	7	34	2949	3	30.8	65	12	0	0	North-Eastern Hill University
Bikika Laloo Tariang	5	3	0	2	0	0	2	7	340	2	7.2	12	18	0	0	North-Eastern Hill University
Moses M Naga	11	2	2	6	0	0	10	6	5788	2	43	63	34	0	0	North-Eastern Hill University
Manish Kumar	23	16	0	7	0	0	19	7	811	1	19.3	0	14	0	0	Univ. of Delhi
Margam Madhusudhan	100	69	19	4	4	3	70	1186	119067	18	1390	805	908	1	3	Univ. of Delhi
K.P. Singh	153	109	1	32	0	0	13	394	7500	12	248.1	29	0	0	0	Univ. of Delhi
Rakesh Kumar Bhatt	30	22	3	5	0	0	22	131	12155	6	123.4	20	14	0	0	Univ. of Delhi
Keshwar Jahan	2	1	0	0	0	0	1	0	4	0	0.1	2	1	0	0	Aligarh Muslim University

Muzamil Mushtaq	29	28	0	0	1	0	19	24	4673	2	50.9	82	112	0	0	Aligarh Muslim University
Mohammad Nazim	70	38	18	11	2	0	46	569	50935	15	571.7	162	48	1	2	Aligarh Muslim University
Mehtab Alam Ansari	11	10	1	0	0	0	3	103	2376	4	54	54	22	0	0	Aligarh Muslim University
M. Masoom Raza	26	18	1	4	1	0	14	99	12690	4	94.6	41	3	0	0	Aligarh Muslim University
Sudharma Haridasan	9	8	0	1	0	0	5	138	2202	3	83.9	75	35	0	1	Aligarh Muslim University
Naushad Ali P.M.	63	31	14	16	0	0	20	362	16660	8	293.8	150	22	0	0	Aligarh Muslim University
Nishat Fatima	22	13	1	6	1	0	17	240	10059	6	196.3	91	14	0	0	Aligarh Muslim University
Gireesh Kumat T.K.	13	13	0	0	0	0	10	54	1875	5	175.8	31	29	O	O	Banaras Hindu University
Shriram Pandey	19	18	1	0	0	0	6	72	1499	5	67.8	13	1	0	0	Banaras Hindu University
Kunwar Singh	62	48	11	1	0	1	60	211	50030	8	1101	283	621	3	38	Banaras Hindu University
Rajani Mishra	16	15	1	0	0	0	9	106	9265	5	121.4	53	23	0	0	Banaras Hindu University

Aditya Tripathi	65	28	13	10	0	11	48	137	36862	5	186.4	41	11	0	0	Banaras Hindu University
Bhaskar Mukherjee	92	44	24	18	0	0	18	632	32931	16	513.6	178	21	0	0	Banaras Hindu University
Vinit Kumar	45	27	7	10	1	0	43	114	25943	114	347.5	195	259	0	0	Babasaheb Bhimrao Ambedkar University

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List of Publications

Journal Articles

1. Lalduhzuali, Amit Kumar, **Dibanjyoti Buragohain** & Manashjyoti Deka. **"Assessing and Fostering Media Literacy Education among Under Graduate Students: The Competence in Information Retrieval and Usability"** *Journal of Print and Media Technology Research.* Vol. 11 No. 03 **(**2022): pp. 205-217. ISSN: 2414-6250. DOI - 10.14622/JPMTR-2202 Peer-Reviewed Journal. **Scopus/WoS Indexed/ UGC Care List**
2. **Dibanjyoti Buragohain,** Manashjyoti Deka and Amit Kumar. **"Documentation and Preservation of Endangered Manuscripts through Digital Archiving in North-Eastern States of India."** *Library Philosophy and Practice (e-journal).* 6662 (2022). 1-23. ISSN: 1522-0222, Peer-Reviewed Journal, **Scopus Indexed (Published).**
3. Amit Kumar, **Dibanjyoti Buragohain** and Vinod Kumar Singh. **"Problems and Prospects of Implementing MOOCs (Massive Open Online Courses) in North-East India in LIS Perspective",** *DESIDOC Journal of Library and Information Technology (DJLIT).* Vol. 42 No. 01 (2022): 11-17. ISSN 0974-0643. **DOI: 10.14429/djlit.42.1.17084**, Peer Reviewed Journal, **Scopus/WoS Indexed/UGC Care List (Published).**
4. **Dibanjyoti Buragohain** and Amit Kumar**. "An Analytical Study of Managing Institutional Repositories in Selected University Libraries of Assam",** *Library Philosophy and Practice (e-journal).* 6169. (2021): 1-24. ISSN 1522-0222. *Peer-Reviewed Journal*, **Scopus Indexed (Published).**

5. Amit Kumar, Lalduhzuali, Manashjyoti Deka & **Dibanjyoti Buragohain. "Media Literacy and its Significance for the Past One Decade: A Study of Literature Published by SpringerLink Database through Bibliometric Lens."** *Library Philosophy and Practice (e-journal),* 5981, (Aug., 2021): pp. 1-24. ISSN: 1522-0222. Peer-Reviewed Journal. **Scopus Indexed (Published).**

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8. Dibanjyoti Buragohain, Borna Nath and **Amit Kumar. "The Correlation Investigation of ResearchGate Behavior among the Universities Faculties of School of Physical Sciences in Tezpur University and Mizoram University: An Altmetric Approach"** In Metrics, Indicators, Mapping and Data Visualizations in Webometrics, Informatrics and Scientometrics. Parveen Babbar and others (eds.) Publisher: B. K. Books International, Delhi. 2022. Pg. 451-457. ISBN: 978-81-932517-7-5

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Conference/Seminar Paper (s) Presented)

1. Presented a paper **"Applicability of Altmetrics as an Alternative Tool for the Academicians of Contemporary Times: An Overview"** in CALIBER 2022 jointly organized by INFLIBNET and Central Library, Banaras Hindu University **(Poster Paper).**

2. Presented a paper **"Altmetrics-Based Correlation Analysis of ResearchGate Activity Among the Top NIRF**-Ranked North East Indian Universities in Schools of Physical Sciences" in ICAL 2022 jointly organized by Asian Library Association and Aligarh Muslim University.

3. Presented a paper **"The Correlation Investigation of ResearchGate Behavior among the Universities Faculties of School of Physical Sciences in Tezpur University and Mizoram University: An Altmetric Approach"**. In **16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting 2022** organized jointly by COLLNET, Society for Library Professionals and Special Libraries Association, Asia Community and Co-hosted by Office of Academic Resources (OAR), Chulalongkorn University, Bangkok, Thailand

4. Presentied a paper **"Delineating Knowledge Domains in Scientific Domains in Scientific Literature using Machine Learning (ML)"** in online "**10th Annual Global Tech Mining Conference**" with the Beijing Institute of Technology, China and organized by The VP Institute. Held on Nov 11 -13, 2020. http://www.gtmconference.org/

PARTICULARS OF THE CANDIDATE

NAME OF CANDIDATE	:	Dibanjyoti Buragohain
DEGREE	:	Ph.D.
DEPARTMENT	:	Library and Information Science
TITLE OF THESIS	:	An Altmetric Analysis of ResearchGate Profiles of LIS Teaching Faculty in Central Universities In India
DATE OF ADMISSION	:	24.07.2019

APPROVAL OF RESEARCH PROPOSAL

1.	DRC	:	13.03.2020
2.	BOS	:	18.05.2020
2.	SCHOOL BOARD	:	29.05.2020
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REGISTRATION NO. & DATE		:	MZU/Ph.D./1318 of 24.07.2019
EXTENSION (IF ANY)		:	N/A

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ABSTRACT

AN ALTMETRIC ANALYSIS OF RESEARCHGATE PROFILES OF LIS TEACHING FACULTY IN CENTRAL UNIVERSITIES IN INDIA

AN ABSTRACT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

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DECEMBER, 2022

1. Introduction

Scientific research is a significant aspect of academic activity, and its proper distribution, dissemination and utilization of resources are of utmost importance for the academic and research fraternity. Rapid changes have taken place in recent decades for scholarly communication. It has also affected many traditional and non-traditional methods of scholarly communication. The change that has affected the traditional method of scholarly communication includes the shift of access to online materials, online publishing, online subscription, and the open access movement. Repositories and open-access publications have dramatically changed people's perception of accessing scholarly materials. The social web has provided another means for the better visibility and impact of scholarly communication among intellectuals. It is found from the evidence that the majority of researchers are using social networking for locating, retrieving, sharing, and communicating their works and materials among the academic community for review and recommendations. Web 2.0 has added new insight to the new road of scholarly communication. Web 2.0 tools like blogs, wikis and social and academic communities have brought alternative scholarly access. Social networking sites have redesigned scholarly communication regarding sharing, disseminating and promoting research activities.

With the emergence of Web 2.0, the methodology of processing Information has changed, starting from the production of the Information to its dissemination, promotion and sharing of Information. Schmidt (2009) defined an SNS as one which allows members to create a "sophisticated personal profile" and contains Information such as members' interests, activities, etc. in a digital space that other users can only access after registering and becoming a member of that particular site. The SNS (social networking sites) are rich in grey literature. Some frequently used SNS includes Academia.edu, ResearchGate, Zotero, CiteULike, BibSonomy, etc., by researcher and the academic community for sharing, bookmarking, retrieving, collaborating, connecting and other purposes. It is found in several studies that most researchers and academicians are aware of SNS and its productivity on several occasions. Academicians and researchers are using social networking to expand creative ideas and interaction among

peers.Academia.edu and ResearchGate are two prominent SNS for the academicians that emphasize communication between researchers in terms of informal messages and sharing of research work among peers through the web. On the other hand, the online reference manager stresses acting as a reference manager tool and creating its digital library.

It is known from the fact that social networking sites and online reference managers are the most significant sources of metrics in terms of readership, aggregate tags, the total number of tweets, aggregate view of personal profiles, etc., which can be the most reliable sources to evaluate the researcher, research works, an organization and nation as a whole. These metrics are generally termed Altmetrics. The term "Altmetrics" it is dynamic. “Altmetrics" is an umbrella term for measuring the impact of research in social media through measuring online activity. A widely accepted definition of Altmetrics is" the study of scholarly impact measures based on activity in online tools and environments" (Priem and Heather, 2013).

2. Altmetrics: A Concept

The research evaluation is considered one of the essential components in research studies to measure the impact of research and its output. Scholars and experts have discovered various evaluation metrics and undertaken various studies on metrics. In the evaluation process, citation plays a vital role in judging the quality of the research work. The research studies have led to the creation of new metrics where the combination of modern and traditional metrics is found. Altmetrics is one of many new metrics which were being discovered. Altmetrics is a metric measuring the research impact by considering social networking sites, blogs, news, patents and many others. It set a new platform where the researchers can promote their research work using various social networking tools as Altmetrics measures the online impact of various research works and offer the Altmetrics score for the specific research publications.

Altmetrics is creating and studying new metrics based on the Social Web for analyzing and informing scholarship. According to Galligan, F. & Dyas-Correia, S (2013), Altmetrics defined as" Altmetrics are new measurements for the impact of scholarly content, based on how far and wide it travels through the social web (like

Twitter), social bookmarking (e.g. CiteULike) and collaboration tools (such as Mendeley).

The importance of Altmetrics in the world of scholarly communication is the insertion of Altmetrics badges which expresses the impact of research. In addition, the increasing demands of Altmetrics have led scientists and researchers to develop a keen interest in studying the correlation between citation and Altmetric scores.

3. Altmetrics Tools and Software

Altmetrics has different tools and softwares to measure the quality impact of the research activity. The following are some of the tools and software used in the evaluation process:

a) ORCID: ORCID provides a persistent digital identifier that distinguishes us from every other researcher and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between us and our professional activities, ensuring that our work is recognized.

b) Altmetric.com and Altmetric Explorer: Altmetric tracks what people say about papers online on behalf of publishers, authors, libraries and institutions. The Altmetric Explorer lets the researcher monitor, search and measure conversations about our publications and those of our competitors.

c) Academia.edu: It provides a platform to search for people, develop research interests and know the status of universities.

d) ResearchGate: ResearchGate helps the academic community to share publications, access millions of articles, promote their article, remain connected and have collaborative work with the peer group of their respective fields. It also helps the researcher to know their views, downloads and citation of the research work.

e) LinkedIn is considered the world's largest professional network, having members of 250 million across 200 countries. It served as a platform where professionals of different fields could increase their productivity and be successful in their fields. It also helps to get access to people, the latest job information, and other updated news which helps the researchers and scientists to promote creativity and remain informed.

f) Publish or Perish (Including H-Index):Publish or Perish is a software program that retrieves and analyses academic citations. It uses Google Scholar and Microsoft Academic Search to obtain the raw citations, then analyses these and presents the metrics.

g) CiteULike: It is a free service for managing and discovering scholarly references.

h) Naymz: It measures and manages our social reputation.

i) Figshare: It helps to Store, share and discover research. It also serves as a gateway to manage our research in the cloud and provides the key to controlling the Information to whom to share or make it available for the public to cite in their research field.

j) Peer Evaluation: Peer evaluation is about giving Open Access to our primary data, working papers, articles, and media and having them all reviewed and discussed by our peers.

k) Research Scorecard: It is all about facilitating scientific collaborations. This database and data mining tools provide a unique way to assess biomedical scientific and technical expertise, helping researchers find and evaluate potential colleagues and staff.

4. ResearchGate

ResearchGate is a social media platform where scientists and academicians can simultaneously disseminate their work and boost their scientific reputation. It is found that ResearchGate has more than 12 million users with a novel motto to help the scientist connect with their peers, share their knowledge and expertise and build their status in their respective fields of research study. This is accomplished by "following" other scientists who can follow us back, uploading and sharing manuscripts, presentations, and project-related materials, and asking and answering research-related questions. The researcher's reputation can be measured quantitatively by one's publications, likes, dislikes, comments, views, downloads, cites, answers, and followers, which all together form a number and it is displayed publicly on the respective RG profile, which is common term as the "RG Score".

5. Altmetrics and Librarianship

Librarianship is a noble profession which has attracted wholesome people to serve the community by providing education (Information). This noble profession carries a lot of responsibilities to make society knowledgeable and, at the same time to provide relevant Information at the minimum time and effort. But with the advancement of ICT, the evaluation methods have changed, leading to the creation of new metrics. Among many of the metrics discovered, Altmetrics is accepted as one of the prominent sources for evaluating research output. Therefore, modern librarianship has accepted "Altmetrics" as the prime source to run the librarians. Altmetrics facilitated the librarians to track the sentiment, reads, downloads, and previews, which helps them to upgrade and remain informed about the needs and requirements of the users. It also helps in building the collection development of the library. It also has helped the academic community, particularly scholars, to accept the change and help them to explore new areas of research. It also acts as a tool for promotional and marketing strategy. Therefore, Altmetrics and librarianship are to be considered complementary to each other in this rapidly changing world of Information.

6. Significance of the Study

Bibliometrics decades earlier is considered the essential source of metrics to evaluate the status and position of any research output or work. However, several studies revealed that Bibliometrics cannot be considered a prominent evaluation source. The researcher and academicians firmly believe in the need for reliable metrics where accurate evaluation can be implemented for better research output. After several studies and research, Altmetrics can be considered one of the sources of metrics in recent decades. Altmetrics seek to meet the drawbacks of all other metrics. Very few studies have been conducted on Altmetrics. The current generation most extensively uses Social Networking sites and online managers to access, locate, share, disseminate, promote and for other purposes. They are considered the most significant source of metrics to evaluate the status of the research work. Academia.edu and ResearchGate are some major social networking sites widely used by academicians and researchers for locating, accessing, retrieving, sharing, connecting, collaborating etc. The library and Information

as a discipline have continuously contributed immensely to the growth and betterment of academics and research. Department of Library and Information Science in different universities are rigorously working to develop new concepts and theories. The study has attempts to evaluate the faculties of the Department of Library and Information Science in different universities with particular reference to the Indian context. The study has considered ResearchGate as a source of Altmetrics for evaluating research. The study has helped in understanding the validity of ResearchGate as a significant source of Altmetrics for the research evaluation. The study is an attempt to evaluate ResearchGate Scores (RGScores) in depth and their relation with other ResearchGate metrics.

7. Scope of the Study

There are several metrics which occupies a significant role in the evaluation of any research output put forward by researcher and academicians. Altmetrics can be considered a critical source of metrics for the research evaluation. Academia.edu, ResearchGate, Zotero, CiteULike, BibSonomy, etc., are social networking sites that academicians prominently use for tagging, bookmarking, connecting, expanding their ideas and for other purposes. Finally, an online reference Manager like Mendeley is a popular reference manager and can be considered the source of the most critical metric.

ResearchGate and Academia.edu are some of the popular social networking sites used by the academic community for communicating with each other in terms of informal messages, locating, disseminating, sharing etc. The study mainly focuses on the ResearchGate as a source of Altmetrics for the evaluation of research output of the faculties of the Department of Library and Information Science of different Central Universities with particular reference to the Indian context. It is a member of academic social networking sites. Moreover, the study seeks to explore Research Interest Score, which is believed to be the unique feature of ResearchGate. Although there is a total of 49 central universities functional in India, the central universities having Department of Library and Information Science, along with the total number of faculty members, are given, a list of which were covered under the study, as follows:

Table 1: Total number of LIS faculties in Central Universities

S. No.	Name of the Central University	Establishment Year	Establishment Year (Dept.)	No. of Faculty
1.	Banaras HinduUniversity	1915	1941	9
2.	Aligarh MuslimUniversity	1920	1950	8
3.	University of Delhi	1922	1946	7
4.	North-Eastern HillUniversity	1973	1985	6
5.	Manipur university	1980	-	6
6.	Guru Ghasidas Vishwavidyalaya	1983	1985	1
7.	Pondicherry University	1985	2007	7
8.	Indira Gandhi National Open University	1985	1989	6
9.	Tripura University	1987	2016	3
10.	Assam University	1994	2009	4
11.	Mizoram University	2001	2002	8
12.	Central university ofTamil Nadu	2009	2017	6
13.	Central University ofHaryana	2009	2014	2
14.	Central University ofPunjab	2009	-	5
15.	Central University of Himachal Pradesh	2009	-	6
16.	Central University of Gujarat	2009	-	4
17.	Mahatma Gandhi Central University	2014	2019	4
18.	Babasaheb Bhimrao Ambedkar University	1996	1997	5
	Total			**97**

(Source: https://en.wikipedia.org/wiki/Central_university_(India))

8. Statement of the Problem

The experts are adopting several metrics to evaluate the research output.

Bibliometrics, scientometrics etc., are some of the measuring metrics tools extensively adopted across the globe for their productivity in research evaluations in the past years. The advancement in the evaluation of research output has led to the creation of alternative metrics, which is named "Altmetrics", to overcome the drawbacks found in traditional metrics. This metrics tool, i.e. Altmetrics, has found this metrics tool to be most trustworthy in evaluating research productivity. However, only very little research is being carried out in the area of Altmetrics especially using ResearchGate as a source of Altmetrics. The research in this area shall help in understanding the validity of ResearchGate as the source of Altmetrics for the evaluation of research, especially in a developing country like India. So far as the study of the area is concerned, no studies have attempted to evaluate the ResearchGate indicators such as Research Interest Score in depth with particular emphasis on evaluating the faculty of various central universities of the Department of Library and Information Science. The above reason cited has encouraged the researcher to take the initiative in resolving the issues concerning the study.

9. Objectives of the Study

The present study is to be carried out with the following objectives:

i. To analyze the publication of faculty members uploaded at ResearchGate;
ii. To study the diverse contributions made by the faculty member in the developmentof the ResearchGate profile in full-text format;
iii. To investigate how many times the research works of a researcher have been citedor read by other researchers;
iv. To study the impact points received by the faculty in publications of scholarlywork; and
v. To analyze the number of followers a researcher had and the number of researchers the researcher is following.

10. Research Methodology

The methodology can be considered one of the essential elements for the systematic evaluation of any research study. It helps researchers to have a deep understanding of the area of study. The present study is exploratory, and the prime objective of the present study is to apply the Altmetrics application to faculty profiles and find out the nature of relationship and metrics correlations. The

researcher in the present study named "An Altmetric Analysis of ResearchGate Profiles of LIS Teaching Professionals in India" has undertaken the following methodologies for the smoothrunning of the research work.

11. Method of Data Collection and Analysis

The observation method has been used for the study. The data was collected manually by visiting the ResearchGate profile pages of all the LIS teaching professionals of central universities in India. The researcher has begun collecting data from 1st August 2020 to July 2022 where time to time upgrading of data was made trimonthly. The last data up gradation was made on 31st July, 2022. The parameters for the study were publications, reads, profile views, citations, impact points, Research Interest, followers and the following from the members' profile pages. In addition, correlations have been being calculated amongst the metrics provided by ResearchGate to explore the nature of relationships amongst various ResearchGate metrics. For the analysis and interpretation part, the MS- Excel and SPSS 20.0 has been used. In addition, various internet sources have been used for getting additional Information. And to maintain uniformity in citation and reference, the latest version of the APA (7th Ed.) manual has been used.

12. Hypotheses

The hypotheses for the present study are as follows:

H^1- The majorities of the faculty members under study are well aware and have theirResearchGate profile

H^2- Most of the Assistant professors among the faculty members have their ResearchGate profile.

13. Chapterisation

The research study has been divided into the following chapters:

Chapter 1: This chapter deals with the introductory part of the whole of research study. The chapter is further classified into area such as significance of the study, research gap, and objectives of the study, Hypotheses, research methodology and method of data collection and analyze of data.

Chapter 2: This chapter deals with the numerous sorts of literatures that are published in various forms that have relations with the subject of study. There are 58

pieces of literatures in the chapter.

Chapter 3: This chapter basically deals with introduction of Altmetrics and its different variables associated with the metrics.

Chapter 4: This chapter is more likely discuss about the ResearchGate and its various functionalities associated with this platform. Various applicability of this platform has also been highlighted.

Chapter 5: This chapter deals with data Analysis and Interpretation of the study. The findings were based on the several objectives that have been laid down during the course of research study. The findings are been discussed elaborately and minutely reacted to the study.

Chapter 6: This chapter is the final outlook of the proposed area of study. Along with the concluding notes, it has also provided some of constructive suggestions that shall be highly beneficial for the academic fraternity. In addition, it has also provided a note of future scope of study.

14. Research Objectives

This section primarily presents the discussion based on the objectives:

a. To analyze the publication of faculty members uploaded at ResearchGate.

One of the study's objectives was to analyze the faculties' publications in the LIS teaching department across the central universities in India. It was found that the distribution of LIS faculty publications in different central universities across India. A total of 97 faculties presently work in various prominent universities' libraries and information science departments. Out of 97 faculties, only 66 have accounts in the ResearchGate platform. As per the analysis of data, it is seen that the highest number of publications is in the category of 1-10. The distribution frequency in terms of publications is seen as 33.33%, with 22 faculties. Three faculties have no publications to their accounts, with 4.54%. There are 12 (18.18%) faculties that have publications greaterthan 50. The median distribution of publications is 55.33, and the median is 83. The minimum and maximum frequency of publication distribution is 0 and 100, respectively.

b. To study the diverse contributions made by the faculty member in the development of the ResearchGate profile in full-text format.

The study's second objective is to analyze the contribution made by LIS faculties inthe growth and development of RG in the form of the full text. Most of them have full- text publications in the range of 1-10, with a frequency distribution of 43.93%. On the other hand, around 7.57% of the faculties do not add full-text journals to their accounts. Itwas also noticed that 15.15% of the faculties have full-text publications greater than 50. As per the analysis of data, it is seen that the full-text addition in the range of 11-20 is 22.72%, whereas, on the other hand, 4.54% of the faculties have their full-text addition intheir respective ResearchGate platform. The mean of the full-text publications is 55.33, and the median is 83. Therefore, the standard deviation of the full-text journal in ResearchGate accounts is 50.84.

c. To investigate how many times the research works of a researcher have been citedor read by other researchers.

The study's third objective is to analyze Many Times the Research Works of a Researcher Have Been Cited or Read by Other Researchers. Table 6 showcases the distribution of citations received by the faculties across different central universities, specifically to the Department of Library and Information Science teaching staff. As per the data analysis, it is noticed that most faculties, around 42.42% of the total population, have received citations in the range of 1-100. A sum of seven faculties (10.6%) has received citations in the range of greater than 500. 6.06% of the faculties have received citations in 201-300 and 301-400. There seem to have no faculties who have received citations in the range of 401-500. In addition to the list, it is also worth mentioning that 15.15% of the faculties have received citations in the range of 101-200. After analyzing the data, it has been found that the mean citation is 55.33, and the overall median is 83.

While on the other hand, the analysis of the study depicts that 4.54% of the faculties haveno reads in their accounts. One interesting point to be noted is that most LIS teaching faculties have their maximum number of reads in their ResearchGate profiles. It is to be noted that 66.67% of the faculties have their reads in the range of greater than 1000. 13.63% of the faculties have their reads in the 1-200. In the range of 201-400 and 401- 600, it is mentioned that 6.06% of the faculties have their reads. While on the other hand, it is also mentioned that 1.51% of the faculties have their reads in the 601-800 and 800- 1000. The mean obtained in terms of reads is 55.33, and the median accounts for 83. The maximum and minimum score of reads is 0 and

100, respectively.

d. To study the impact points received by the faculty in publications of scholarly work.

One of the study objectives is to examine Impact Points Received by the faculty in publications of scholarly work. It is seen that most of the faculties in LIS teaching departments seem to have fewer impact points in their ResearchGate profiles. It is also seen that 66.67% of the faculties have no impact point in their ResearchGate accounts. On the other hand, 12.12% of the faculties have impact points greater than 200. The present reports also say that 4.54% of the faculties have impact points in the 1-50. 7.57% have their faculties in the range of 151-200. It is also to be added that 6.06% of the total population has Impact points in the range of 51-100, and 3.03% of the faculties have impact points in the range of 101-150. The result also reveals that the mean and median of Impact Points are 55.33 and 83, respectively. It is also to mention that the faculties' minimum and maximum number scores are 0 and 100, respectively. The standard deviation derived from the calculation is 50.84.

e. To analyze the number of followers a researcher had and the number of the following research received.

Another prime objective of the study is to analyze the Number of Followers a Researcher Had and the number of the following research received. The highest number of following is seen in the 1-10 with 30.31%. Around 12 of the faculty members have followings greater than 100, with 18.18%. In the categories 31-40 and 41-50, only 3.03% of the faculties follow this range. 13.63% of the faculties have their cults in the 11-20, and 7.57% followings in the 51-100. It is also mentioned that 18.18% of the faculties have their cults in the 21-30. In addition to the above mention detail, it is also necessary to be added that the mean derived after calculations is 55.33, and the standard deviation is50.84.

The finding also reveals the distribution of the number of followers among the faculties across the different LIS teaching faculties in Central Universities in India. It is seen that the majority of the faculties have followers greater than 50. The number has come up to 28 of the total faculty, with 42.42%. 4.54% of the faculties have not received followers in their RG profiles. In the range of 1-10, the total number of

followersreceived by the faculties is 19.69% (13). On the other hand, in the category of 11-20 and 21-30, the total number of followers received in this category is 9.09% (6), and 7.57% of the total population has received followers in the range of 31-40 and 41-50. Further data analysis shows that the mean derived from the interpretation is 55, and the standard deviation they received is 50.84.

15. Research Hypotheses

Hypothesis 1:

At the beginning of the study, it was found that the total number of LIS faculties engaged in various central universities across India that are present in the ResearchGate platform, along with their names of the universities. To know the awareness and number of faculties having ResearchGate profiles, the Pearson Correlation between the total of faculty and the total number of faculties present in ResearchGate is calculated. The Pearson correlation between the total faculty and the total number of faculties present in ResearchGate is 0.764. This denotes a high correlation between the total number of faculties and the total number of LIS faculties in ResearchGate. The percentage aspect of the table also depicts that it has more than half of the total population in ResearchGate. Hence the null hypothesis (H^0) is accepted.

Hypothesis 2:

Scholarly communication is considered an essential asset for properly disseminating and circulating information. It has been observed that the total number of Assistant Professors present in ResearchGate in various central universities across India is maximum. To know if the majority of the Assistant professors among the faculty members have their ResearchGate profile, the Pearson Correlation between the total of Assistant Professors and the total number of Assistant Professors present in ResearchGateis calculated. The Pearson correlation between the total of Assistant Professors in the LIS fraternity and the total number of Assistant Professors present in ResearchGate is found to be 0.71, which denotes a high correlation between the total of Assistant Professors and the total number of Assistant Professor present in ResearchGate. The percentage aspect of the table also depicts that it has more than half of the total population in ResearchGate. Hence the null hypothesis (H^0) is accepted.

16. Observation and Experiences

The researcher has gone through several observation and experiences during the course of the study. It has been observed that the majority of the faculties are unaware about the various academic social networking sites and also the essence of the presence of such metrics. More and more number of workshops, campaign, conferences, and training programmes need to be organized by holding institution either individually or collectively. The institutions should also organize some brain-storming sessions that shallprovide the faculty new atmosphere to think and nourish their talent and ability inacademic sphere is concern. On the other hand, the faculties especially the LIS teaching fraternity as the study is primarily concern with the subject also with the change of time need to enhance their skill and ability with the changing technology. The researcher has observed that lack of interest among the faculties specially the aged teaching staff is one of the prime reasons for the less number of faculties in such academic social networking sites. The academicians need to understand some of brightest advantages features this modern technology possess and should build a belief system among themselves so that the upcoming generation can better enhance the technology and combine both the teaching, technology and researcher together to provide new era of teaching and learning. The new generation should build these skills and make a better world tomorrow.

17. Final Outcome

The prime aim of the study was to analyze the Library and Information Science Teaching faculties in the various central universities across India. The method to analyze the study was basically "Altmetrics" or alternative metrics approach to understand the scholarly communication and work distributed among the academic fraternity. The main motto also accurately depicts activities in and around the discipline. One of the core outcomes of the study is to understand the underlying factors that help an individual grow as a researcher in academic, social networking sites such as ResearchGate, GoogleScholar and Academia.edu. The key takeaway of the study was to understand the position of LIS faculties concerning research and other related activities performed in the ResearchGate platform, as it is the prime area undertaken for the study.

Since the study mainly focused on the ResearchGate activity of LIS faculties, it

has helped the researchers understand the several metrics associated with ResearchGate. The several metrics of ResearchGate includes publication in different formats such as journal articles, book, conference paper, pre-prints, data, chapters and many more; reads, citations, followers and followings, Research Interest, H-Index, Impact Points and many others have resulted in fulfilling the objectives laid down for the study. This study has also resulted in understanding the correlation of metrics associated with the ResearchGate. The study has also portrayed a clear picture in front of people to understand the status and position of faculties.

The study's finding has resulted in more awareness being required to understand the importance and significance of ResearchGate in present academia. Therefore, the study's outcome has resulted in more awareness programmes such as campaigns, workshops, seminars and conferences required and can serve as a backbone in achieving success and progress about information for Altmetrics. In addition, it is also to mention that much attention in their publications and give some priority to the use of academic, social networking like ResearchGate as it is an essential medium for the evaluation of the researcher in their respective field of specialization.

18. Suggestions

Based on the analysis, observation, and experience related to the study, the followings are a few of the suggestions that are necessary to improve knowledge and Awareness of ResearchGate and Altmetrics as the contemporary method of evaluation among the academic fraternity:

a. Suggestions for Professionals

(i) The professionals need to use more Academic Social Network Sites such as ResearchGate to make their research work more transparent;

(ii) The professionals need to understand the importance and significance of the ResearchGate platform;

(iii) The professionals must make their research more visible to the audience, as the ResearchGate provides these opportunities; and

(iv) The professionals also need to spread awareness and its significance among peers and the community about the various Academic Social Network sites that shall enable them to remain connected and share with academicians across the

globe.

b. Suggestions for LIS Research Scholars and Academicians

(i) The students at the Postgraduates and undergraduate levels need to understand the importance and latest development of ResearchGate;

(ii) The students should conduct some discussions about various Academic Social Networking sites on some doubts and confusion and enhance both the theoretical and practical aspects of ResearchGate and likewise;

(iii) The students and Research Scholars should participate more in seminars and workshops and must maintain a good professional relationship with the subject- expert across the globe; and

(iv) The Research Scholars and students should build knowledge and significance about the social networking sites and various metrics associated with these ASNS so that near future, they are well versed and adequate about the usability and applicability of these sites.

c. Suggestions for Forum Administrator/ Moderator

(i) The social networking site administrator should responsibly perform activities related to promoting various social networking sites in the educational environment;

(ii) The administrator should promote the importance or significance of these social networking sites so that more and more professionals, both technical and non- technical, come and use these platforms;

(iii) More and more workshops, seminars, conferences, and awareness campaigns need to be organized from the administration's perspective so that much interaction and debates enhance the learning among the academic community;

(iv) The administrators need to promote the usability of ASNS among the faculties as the university's or institution's visibility is brought to the limelight by this forum as more and more activities are moving to an online environment; and

(v) The administrator should ask the Department of Library and Information Science to motivate other students from different subjects about Academic Social Networking Sites so they will be aware and promote usability among their peers.

19. Scope for Future Research

Altmetrics analysis is an emerging area of research in Library and Information Science as we deal with new technology. Few studies have been carried forward by researcher, particularly in the discipline of Information Science as a core area of study. There is no doubt that several studies have been done adopting Bibliometrics and scientometrics approaches. In aspects of further research, the researcher has undertaken the areas such as the *South-Asia region* in analyzing the LIS teaching staff from the perspective of Altmetrics. This method can also be applied in analyzing the other sources of Altmetrics source such as *Google Scholar, CiteULike, Mendeley, Academia.edu* and many others that provide a good and reliable form of metrics. The researchers can also analyze by adopting approaches to other disciplines such as *medicine, humanities, technology, applied and basic sciences, earth sciences* and many more.