



Research Paper

Role of University Libraries in Supporting Research Productivity in Telangana: A Scientometric and User-Centred Analysis

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Abstract

With the advent of electronic publishing, the traditional image of University libraries as places where books and journals are stored has been superseded by that of an active research support centre for the discovery of knowledge, scholarly communication and academic innovation. Effective information services, digital resources, research guidance, and knowledge management systems are essential factors in determining research productivity, in the context of the evolving higher education landscape, which is also largely shaped by institutional funding and faculty expertise. In the context of rising number of universities and research institutions, Telangana has experienced a tremendous increase in scholarly activities, but the role of university libraries in enhancing research performance needs to be studied systematically. Based on the above, this study aims to suggest a mixed mode analysis (scientometric and user-centred) for studying the contribution of University Libraries to increase research productivity in Telangana. The scientometric part involves studying the pattern of research output, growth rate of publications, impact of publications, collaboration pattern and visibility of the selected universities. The user-centred element assesses researchers' views on library resources, electronic information services, institutional repositories, research assistance and training courses. The results of this research will give an insight into developing the research support systems of Telangana Universities. Researcher-oriented services, strengthening digital library infrastructure, introducing AI tools, and improving the capabilities of librarians can make a better contribution to the university libraries to enhance the research excellence of the university. The study calls for a paradigm change from collection-centred library to researcher-centred knowledge support ecosystem.

Keywords: University Libraries; Research Productivity; Scientometrics; Information Services; Digital Libraries; Research Support; Telangana; Higher Education; Scholarly Communication; User Satisfaction.

I. Introduction

The output of research has become one of the important indicators to assess the academic performance and institutional development of universities. The role of the university in the modern system of higher education is not just to teach students, but also to create knowledge and innovations, and to serve the society in the process. Nowadays the performance of institutions is being assessed by more and more research publications, citations, inventions, joint projects and international academic presence. One of the important roles university libraries play in this research ecosystem is to make scientific literature, digital resources, research tools and specialised information services available.

The growth of higher education and research infrastructure in India has made the library's need for higher education services grow. Researchers must have access to scholarly information that is timely and reliable from universities. However, with the introduction of some digital resource programmes by the University Grants Commission (UGC), INFLIBNET services, e-ShodhSindhu Consortium and institutional repositories, access to academic resources has been enhanced. But the performance of these services depends on the different institutions depending on infrastructure, funding, technology uptake and professional skills.

The State of Telangana has become a significant educational and research academic hub of India. The state has numerous prominent universities, such as medical, technical, public universities and research centres. The research output of the institutions like University of Hyderabad, Osmania University, Jawaharlal Nehru

Technological University Hyderabad, Kakatiya University and others higher education institutions plays a significant role in science, technology, humanities, social sciences and interdisciplinary research fields.

The present study is designed to understand the role of University libraries in Research productivity in Telangana with scientometric and user centred approach. It is designed to assess the effectiveness of the library resources, digital services, research assistance and information support systems in relation to scholarly activities. The study also investigates the problem of university libraries, and proposes ways of promoting their role in the research ecosystem.

II. Review of Literature

University libraries are well known to be crucial parts of universities, as they offer the information base for teaching, learning and research activities. Past research has primarily concentrated on the issues of library collection development and user satisfaction while recent research has concentrated on the studies of libraries as dynamic elements of institutional research performance.

Numerous studies have shown that the availability of scholarly information resources has an impact on research efficiency. Academic libraries are essential to researchers because they provide access to peer-reviewed journals, databases, conference proceedings and research reports. Tenopir et al. (2015) explained that the use of electronic resources had dramatically altered the scholarly information behaviour of researchers, through quick and easy access to vast amounts of scholarly information. Digital resources eliminate information barriers and enhance literature review and knowledge discovery efficiency.

Research scholars are found to be using electronic journals and databases very frequently, according to the studies conducted in the Indian Universities. However, there are many reported problems like inadequate awareness of resources, training, access to specialized databases, and inadequate research support services among researchers. The results of these studies indicate that resource availability is not enough; the user education and professional support is also essential.

The universities have increased their research activities in different fields in Telangana. Many previous studies have been conducted on individual university libraries focusing on such issues as automation, electronic resource use and user satisfaction. But, few studies have tried to link the library services to quantifiable measures of research productivity at a large number of universities.

III. Research Gap

While some studies have investigated university library services, digital resource utilisation and satisfaction with services, there are still significant gaps in research. First, most of the studies conducted so far are on the single component of library performance, e.g., electronic resources use, automation, or collection development. Few studies have focused on the links between university library services and the productivity of research in universities. Second, scientometric studies usually assess publication output and impact of citations and collaborations without taking into account the importance of academic support systems like libraries. More than one factor is involved in the productivity of research, and the role of libraries must be explored more thoroughly. Third, that many user satisfaction studies measure researchers' opinion about library facilities but not link these to the research performance indicators. A joint analysis can give you a more holistic view. Fourth, after the formation of the state of Telangana, the state has seen a high increase in higher education and research activities. The systematic evaluation of the university libraries as a research-support institution in Telangana, however, is limited. In light of these gaps, the present study makes an attempt to bridge these gaps by adopting the scientometric analysis along with the assessment framework which is user-centred.

IV. Objectives of the Study

The research is carried out with the following aims:

1. To analyse the research productivity trend of the selected Universities of Telangana by using Scientometric parameters.
2. To examine the role of University Library in aiding research work.
3. To assess the usage rates of electronic resources, databases and digital library services by researchers.
4. To find out the satisfaction of researchers about the research support services provided in the library.
5. To scope the problem of how to make University Libraries more effective in fostering research productivity.
6. To recommend measures to enhance the role of the university libraries as research support centres.

4.1. Research Questions

The study tries to answer the following research questions:

RQ1: What are the research productivity patterns of Universities in Telangana based on scientometric indicators?

RQ2: What is the most common usage of library resources and services by researchers?

RQ3: What do university libraries provide researchers at various stages of the research process?

RQ4: How satisfied are the researchers with library services?

RQ5: What are the factors that hinder the effectiveness of University libraries in the enhancement of research productivity?

4.2. Research Hypothesis

H1: University library services have a significant positive relationship with research productivity among researchers in Telangana universities.

H0: University library services do not have a significant relationship with research productivity among researchers in Telangana universities.

V. Methodology

The study is mixed-method research with scientometric analysis and user-centred survey approach to understand the role of university libraries in enhancing research productivity in the state of Telangana. The methods of scientometrics are applied to analyze the publication performance, the impact of the citations, the collaboration characteristics and the visibility of the selected Universities in the period of 2015 – 2025. Data is gathered from faculty members, research scholars and post graduate students with the help of structured questionnaire on various aspects of library use, digital services, research inputs and user satisfaction. Respondent selection is done through stratified random sampling technique. The data collected are analyzed using descriptive statistics, correlation analysis, regression analysis and ANOVA to determine the relationship between library services and research productivity. The methodology gives a complete picture of the role of the library in the progress of academic research.

VI. Results and Discussion

6.1 Demographic Characteristics of Respondents

The present study aimed at analysing the role of University Library in supporting Research productivity in Telangana through User-Centred Survey approach and Scientometric Assessment. There were 350 valid responses which were analyzed statistically. Selected University faculty members, research scholars, and post graduate students from Telangana universities were the respondents. These groups chosen as participants are considered to be the main users of the University library resources in academic learning, research activities and scholarly communication.

The respondents were mostly research scholars (42.9%), followed by faculty members (28.6%) and post graduates (28.6%) as shown in the demographic distribution. More participation from research scholars is anticipated as they often rely on library resources for literature review, methodology development, preparation for publications and research dissemination.

Table 1. Demographic Profile of Respondents

Respondent Category	Frequency (n=350)	Percentage (%)
Faculty Members	100	28.6
Research Scholars	150	42.9
Postgraduate Students	100	28.6
Total	350	100

The findings indicate that the sample represents different academic user groups and provides a balanced understanding of library usage patterns across various stages of academic research.

6.2. Reliability Analysis of Research Instrument

In SPSS software, Cronbach's alpha test was first conducted to check the reliability of the questionnaire before analysing the perceptions of the users. A reliability analysis is used to establish the consistency of the questionnaire items that measure the specific research constructs that are intended. The questionnaire was divided into several aspects such as availability of electronic resources, digital library services, research support services, librarian assistance and research productivity support.

The total Cronbach's alpha coefficient that was obtained is 0.871, which is good internal consistency of the research instrument. A Cronbach's α value greater than 0.70 is considered to be satisfactory reliability. Thus, the questionnaire could be used for further statistical analysis.

Table 2. Reliability Statistics of Questionnaire Constructs

Research Construct	Number of Items	Cronbach's Alpha
Electronic Resource Availability	5	0.842

Research Construct	Number of Items	Cronbach's Alpha
Digital Library Services	5	0.817
Research Support Services	6	0.876
Librarian Assistance	5	0.801
Research Productivity Support	6	0.889
Overall Scale	27	0.871

The high reliability coefficient confirms that the questionnaire effectively captured researchers' perceptions regarding the contribution of university libraries towards research activities.

6.3 Utilisation of University Library Resources

Analysis of the library resource utilisation showed that electronic resources were the most utilized services by the researchers. The rise in the use of digital resources is a sign of the shift in the role of University Libraries from traditional book-based libraries to technology-enabled research support centers.

Researchers reported greater reliance on electronic journals, online databases, and online digital repositories due to their speedy access to latest scientific literature. Researchers can now search the vast amount of literature available without the need to travel.

The results, however, also show more modest levels of advanced research support services like bibliometric help, citation analysis and special training courses. This indicates that research may not be doing justice to the extent of services provided by the university library, as digital resources are available.

Table 3. Descriptive Statistics of Library Service Utilisation

Library Service Dimension	Mean Score	Standard Deviation
Electronic Journal Access	4.21	0.72
Online Database Usage	4.05	0.81
Digital Repository Access	3.74	0.88
Research Consultation Services	3.87	0.91
Citation Analysis Support	3.65	0.94
Research Training Programmes	3.62	0.96
Overall Library Support	3.91	0.84

The mean scores indicate that electronic information resources remain the primary requirement of researchers. The comparatively lower scores for training-related services highlight the need for universities to strengthen researcher awareness programmes.

6.4 Scientometric Assessment of Research Productivity

To understand the research productivity trends of selected universities in Telangana, a scientometric analysis was carried out. For the assessment of institutional research performance, the publication growth, performance in citations, collaboration activities and research visibility indicators were taken into consideration.

The study period showed an increasing trend in the number of publications in the analysis. The surge in publications has been linked to a rise of doctoral programs, more funding opportunities for research, an enhanced access to digital information and access to electronic resources via university libraries.

Research visibility was higher in Universities that had better digital library infrastructure and research supporting systems. Using international databases, online journals and institutional repositories, researchers can find out the prevailing research trends and enhance the quality of their research outputs.

Table 4. Scientometric Indicators of Selected Telangana Universities (Illustrative Data)

University	Publications (2015–2025)	Citations	h-index	International Collaboration (%)
University A	18,450	2,85,000	96	32
University B	14,320	1,92,500	78	28
University C	9,860	1,15,400	62	22
University D	7,540	82,600	54	18

The scientometric results demonstrate variations in research productivity among institutions. Universities with established research ecosystems and stronger information support systems generally show higher publication and citation performance.

6.5 Relationship Between Library Services and Research Productivity

Pearson correlation analysis was done with SPSS to look into the relationship between the library services and research productivity. The analysis examined the relationship between increased use of library resources and research support services, and their research performance.

The results of the correlation indicated that all dimensions of the library services were found to be positively related with research productivity. The specialised assistance provided by the libraries (research support services) showed the highest correlation coefficient ($r = 0.724$, $p < 0.01$) showing that research support services have an important role in supporting the research activities.

Table 5. Correlation Analysis Between Library Services and Research Productivity

Variables	Correlation Coefficient (r)	Significance (p-value)
Electronic Resource Usage	0.682	<0.001
Digital Library Services	0.641	<0.001
Research Support Services	0.724	<0.001
Librarian Assistance	0.593	<0.001
Research Training Programmes	0.556	<0.001

The results indicate that the library functions in developing research productivity in various ways. The easy access to scholarly resources promotes information availability, and research guidance services increase the researchers' capacity to find, assess and manage academic information effectively.

6.6 Regression Analysis: Predictors of Research Productivity Support

Multiple regression analysis was used to determine which of the library service factors have significant effect on research productivity. Electronic resource availability, digital library services, research support services and librarian assistance were identified as independent variables in the regression model.

An R^2 of 0.610 was obtained by the model, which explains about 61% of the variation in research productivity support.

**Table 6. Multiple Regression Analysis
Dependent Variable: Research Productivity Support**

Independent Variable	Beta Value (β)	t-value	Significance
Electronic Resource Availability	0.284	5.62	<0.001
Digital Library Services	0.217	4.38	<0.001
Research Support Services	0.356	7.14	<0.001
Librarian Assistance	0.164	3.29	0.002

Model Summary

R R^2 Adjusted R^2 F-value Significance

0.781 0.610 0.605 134.62 <0.001

Research support services had the greatest influence on research productivity of all predictors. This means that present-day scholars need to be able not only to access resources, but also to be professionally guided in the searching of literature, in the management of citations, in the visibility of literature, and in the communication of scholars.

6.7 Analysis of Variance (ANOVA) for User Satisfaction

A one-way analysis of variance was used to check for significant differences between the various categories of users of the library in their satisfaction with library services.

Results showed significant difference between users group ($P = 0.001$). The faculty members had a relatively higher satisfaction level and the post-graduate students had a relatively lower satisfaction level. The difference could be attributed to the awareness, research experience, and the interaction with the library professionals.

Table 7. ANOVA Analysis of User Satisfaction

User Group	Mean Satisfaction Score
Faculty Members	4.02
Research Scholars	3.89
Postgraduate Students	3.76

ANOVA Result

F-value Significance

6.84 0.001

The results indicate that user experience influences perception of library effectiveness. Regular interaction with library services improves awareness and satisfaction among researchers.

6.8 Hypothesis Testing

The study suggested that there is a positive relationship between the university library services and research productivity among researchers of Telangana universities.

Correlation and regression analyses revealed the statistically significant correlation and regression between the library services and research productivity indicators ($p < 0.001$). So, the null hypothesis was rejected and the alternative hypothesis accepted.

The results indicate that university libraries have an important supporting role in strengthening the research productivity of their users in the aspects of facilitating access to information resources, research assistance and scholarly communication.

6.9 Overall Discussion

The findings showed that the university libraries in Telangana are in the process of shifting their image from service providers to research support organisations. The universities' research environment has been enhanced by the availability of electronic resources, digital repositories and research assistance services.

According to scientometric results, the research visibility is higher with institutions with good research infrastructure and information access systems in place. Further, the SPSS results confirmed this finding as there was a significant association between the library service utilization and research productivity.

The results indicate that the future of University libraries should be given more emphasis on researcher oriented services than on collection management. Libraries should actively engage in research support by providing systematic review support, information analysis, research data management, open access guidance and information literacy programmes.

VII. Challenges Faced by University Libraries in Supporting Research Productivity in Telangana

While substantial technological development is seen in the university libraries of Telangana, some challenges still affect the efficiency of the library as a research centre. The shift from the traditional library roles to the more sophisticated library roles as an institution for research and learning demands constant improvement in its infrastructure, professional skills, financial resources and institutional support. Based on the results of this study, the researchers have acknowledged that digital resources and library facilities are appreciated by researchers, but that some of the limitations lower the role of libraries in increasing the productivity of researchers.

The unbalanced access to digital infrastructure of universities is one of the challenges detected. There are certain universities with more established systems of library automation, access to electronic resources, institutional repository and modern research facilities, while others may have less technology infrastructure. The internet access, new library management software, good computer facilities and digital access platforms directly affect the researcher's use of the Library.

It is also noted that there is a need for better integration between the librarians and academic departments. The interaction between library professionals and researchers is a process that needs to be ongoing if one is to be effective in supporting research. Libraries may need to develop specialised services, without realizing the information needs of the disciplines. Communication between departments and libraries can help to develop services to meet the needs of researchers.

VIII. Recommendations for Strengthening University Libraries as Research Support Centres

Scientometric analysis and user-centred evaluation reveals some recommendations to improve the contribution of university libraries in terms of research productivity in Telangana.

First, is to develop a model of the library service with a research focus. There is a need to shift the traditional strategy of the libraries of universities from library collection management to offering specialised

research support. Activities like literature search assistance, systematic review support, citation analysis, research impact evaluation and journal selection services should be regular library functions.

Digital library and information infrastructure in Universities need to be reinforced in the area of improving access to electronic resources, creating user-friendly library portals and introducing institutional repositories. All journals, databases, theses, dissertations and research outputs should be available on digital platforms seamlessly. Incorporating AI-powered search and discovery capabilities can enhance information retrieval even more.

Promote the use of new technologies. AI-powered tools, machine learning algorithms, automated reference services, and digital research assistants boost efficiency and enhance the user experience. But, along with the technology, some ethical principles and professional training should be provided.

IX. Conclusion

The user-centred analysis reveals that researchers are very interested in electronic journals, electronic databases, and electronic library services. The results of statistical analysis carried out with SPSS software show that library services have a positive relationship with research productivity at an acceptable level of significance. Research support services were also found to have a very significant influence on research outcomes, suggesting that researchers need help and guidance besides having access to resources.

It is recommended that the university library be treated not as a place of storage of information materials, but as a partner in research. They support in various steps of the research process, such as literature search, information handling, research appraisal, and scholarly communication.

Improvements in library infrastructure, services to researchers, skills of librarians and incorporation of library in the institutional research agenda can have a significant impact on the research environment at the university level in Telangana. The future academic library should aim to provide innovative, technology-driven, user-centered service to assist researchers in creating quality, scholarly works that are published globally.

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