



IMPACT OF ELECTRONIC RESOURCES AND DIGITAL LIBRARY SERVICES ON RESEARCH AND ACADEMIC ACTIVITIES OF FACULTY MEMBERS AND RESEARCH SCHOLARS IN NITTTRs

Uma Rani Shukla¹; Dr. Shesh Mishra²

Research Scholar, Library and Information Science ,Banasthali Vidyapith, Banasthali , Rajasthan¹

Faculty, Library and Information Science ,Banasthali Vidyapith, Banasthali , Rajasthan²

umashuklaa30@gmail.com ; shesh2709@gmail.com

ABSTRACT

The evolution of digital library services and electronic resources has a profound impact on the ways in which students' study and researchers conduct their work in higher education. In this study, we look at how they affect the academic and research careers of National Institutes of Technical Teachers Training and Research (NITTTRs) academics and staff. A total of 150 participants were surveyed using a pre-designed questionnaire as part of the quantitative descriptive research strategy. Descriptive statistics, Pearson's correlation, multiple linear regression, and independent samples t-test are employed in the data analysis carried out with the Social Science Statistical Package (SPSS). It shows positive perceptions of electronic resources and digital library services, where the availability of electronic resources is the most significant predictor of the research and academic activities. The study finds that further enhancement in the research productivity and academic performance of the NITTTRs can be achieved by strengthening the digital library infrastructure, expanding the collections of electronic resources and improving the support to the users.

Keywords: *Electronic Resources, Digital Library Services, Academic Libraries, Research Productivity, Faculty Members, Research Scholars, NITTTRs, Academic Performance.*

1. INTRODUCTION

Information and Communication Technologies (ICT) have rapidly changed the face of the academic library, by offering increased access to electronic resources and digital library services. In contrast to traditional

libraries, digital libraries provide researchers and teachers immediate access to a wealth of intellectual resources, including electronic journals, books, databases, and institutional repositories (IRs). The reliance on digital information resources has greatly improved the efficiency of literature retrieval, academic collaboration between people and research productivity in higher education institutions.

The NITTTRs has a significant role to play in fostering the quality technical education, faculty development and research in India. In order to achieve these goals, the NITTTR libraries have subscribed to a range of e-resources and digital library services which allow the users to access the reliable information from the academic perspective, anytime and anywhere. But the impact of this digital service on the research and academic activities of faculty members and research scholars needs to be systematically studied. It is important to understand users' perception and usage of their digital library, to improve the efficiency of digital library infrastructure and its services.

In light of the above, the purpose of this research is to analyse how NITTTR's academic staff and researchers have benefited from digital library services and electronic resources. It assesses accessibility and availability of electronic resources, effectiveness of information retrieval, of user support services and of training programmes, and studies their impact on research productivity, the academic performance of students, the effectiveness of teaching, on publication activities and on overall satisfaction of users. The results of the study will be helpful for various academic libraries and policy makers to improve digital library services and research and academic excellence in the NITTTR system.

With the increasing use of digital library services, the information-seeking behaviour of academic users have also undergone change. Electronic resources have become a vital tool for faculty members and research scholars to access up to date literature, to review literature systematically, to prepare research proposals, to publish academic articles and to aid in the classroom instruction. Even in the case of these resources, the effective use can be limited due to the difference in the accessibility, digital literacy, knowledge about the resources and the institutional support. The present status of technical education libraries' use of digital library services and electronic resources can be better understood, as well as their strengths, weaknesses, and opportunities for service improvement, it is important to conduct an assessment of this usage.

2. LITERATURE REVIEW

These electronic facilities and library services have become integral parts of academic libraries that provide convenient access to scholarly information, databases, and e-journals to faculty members and researchers. The use of these facilities and services has greatly contributed to the process of learning and research by allowing instant access to credible information.

Although digital information resources are easily accessible, Singh, B. P., and Madhusudhan, M. (2022) suggested that research support services based on ICT could improve research productivity without compromising academic integrity. Researcher assistance through electronic databases and information services is emphasized by modern academic libraries (Padhan, D. K. and Naidu, G. H., 2022).

The use of electronic sources by university faculty members and research scholars has also been extensively studied at Indian universities. For instance, Sinha, P. et al. (2020) found that availability of electronic journals and databases plays an important role in enhancing research output and academic achievement. Similarly, Kaushal, M. L. and Singh, S. (2017) found that ICT-based library services increase the availability of information and enhance users' satisfaction levels; however, continuous training of users is required for optimum use of the available resources.

The recent researches have added more insight into the significance of digital technologies in higher education. It was noted by Amruta, A., and Naik Ramgir, V. (2021) that academic libraries have managed to promote open learning systems and digital learning platforms. Similarly, Pathak, P., and Pal, A. (2024) discovered that professors and students had favourable opinions on the use of electronic resources.

Although a lot of research has been done on the use of digital libraries and electronic resources in educational institutions, very little has been done on how these resources and digital libraries affect the academic work and research of the faculty and researchers at NITTTRs. Consequently, this event is what this study is trying to investigate.

3. RESEARCH METHODOLOGY

The research technique used to investigate how digital library services and electronic resources have impacted the scholarly work of NITTTRs' faculty and students is detailed below. It details the research strategy, sampling plan, data gathering tool, study variables, validity and reliability, data gathering process, and analysis techniques which were employed to review the acquired data.

3.1 Research Design

A quantitative and descriptive research approach was used to examine the impacts of digital library services and electronic resources on the academic and research activities of NITTTRs faculty members and research scientists. The reason why a descriptive research methodology was chosen is that such a methodology helps in collecting and analyzing data about users' perception, use, and satisfaction with digital library services. This study used the method of cross-sectional survey to collect the information from the respondents who were from various academic streams.

3.2 Population and Sampling

Participants in this study include academics and researchers at several NITTTRs in India who make use of electronic information resources and digital library services for purposes like as course creation, scholarly writing, publishing, and professional development. In order to increase the sample's representativeness, 150 individuals were chosen for the study using the stratified random selection technique. The sample used in the research included 90 faculty members (60%) and 60 research scholars (40%), which have been selected from various academic departments of the selected NITTTRs.

3.3 Data Collection Instrument

After reviewing the literature on electronic information sources and digital libraries, a pre-made questionnaire was utilised to collect the main facts. The questionnaire had two parts: Part A asked for basic demographic information such job title, education level, employer, years of experience, field of study, and digital library usage, while Part B asked respondents to rate their opinions on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The tool was designed to assess the availability and accessibility of electronic sources of information, the efficiency of information search, user support and overall satisfaction with digital library services, and its impact on research productivity, teaching effectiveness, and collaboration among others.

3.4 Variables of the Study

The influence of the utilisation of e-resources and digital library facilities on academic performance was investigated utilising the following variables:

- **Independent Variables:** Independent variables used in this study included access to electronic resources, availability of digital library facilities, information search efficiency, user services, and

training and awareness programs. This was done in order to measure the impact of these variables on the research and academic activities of faculty members and researchers.

- **Dependent Variables:** The dependent variables of the research involved research productivity, academic performance, teaching efficiency, publishing activities, and total user satisfaction. These variables were employed to assess the effects of e-resources and digital library on the academic and research achievements of faculty members and research scholars.

3.5 Reliability and Validity of the Instrument

Through an expert assessment, professionals in the fields of education research and library and information science evaluated the content validity of the questionnaire, which allowed for an evaluation of its reliability and validity. After conducting a pilot test to establish the tool's reliability and measuring the internal consistency with Cronbach's Alpha, the 28-item questionnaire was found to have a value of 0.891. Because the coefficient surpassed the recommended level of 0.70, the tool was deemed reliable.

3.6 Data Collection Procedure

After securing permission from the institution, the questionnaire was circulated electronically through Google Forms and institutional email correspondence. Participation was on a voluntary basis, and the participants were made aware of the aims of the study before they filled out the questionnaire. Participants' privacy and identities were protected at every stage of the study. Incomplete questionnaires were excluded from the analysis. A total of 150 comprehensive answers were obtained.

3.7 Data Analysis Techniques

The collected data was subsequently analysed using SPSS. This descriptive study made use of a number of statistical tools, such as %, means (M), and standard deviations (SD). The reliability of the survey items was tested using Cronbach's Alpha, and the correlations between the study's variables were assessed using Pearson's correlation. Using multiple linear regression analysis, we looked at how digital libraries and other electronic resources affected academic research and other academic activities. To compare the two groups' viewpoints, we utilised an independent samples t-test.

The multiple regression equation that follows illustrates the link between the dependent and independent variables:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

For all inferential statistical studies, a 5% significance level ($p < 0.05$) was used.

4. RESULTS AND DISCUSSION

Analysis was done using the SPSS on the collected data of 150 faculties and researchers to determine the effect of electronic resources and digital library facilities on research and academic practices at NITTTRs. Statistical tools for both descriptive and inferential analysis, including percentage and frequency plots, Pearson's correlation, multiple linear regression, and the independent samples t-test, have helped to shed light on the study's variables.

The characteristics of the participants of this research have been described using the demographic profile that is depicted in Table 1, which includes their gender, type of respondents, years of experience in teaching and research, and frequency of usage of digital libraries. Demographic characteristics mentioned above serve as the means of presenting the sample chosen to carry out the research. The data from Table 1 about demographics are shown graphically in Figure 1.

Table 1: Characteristics of the Respondent Population

Variable	Category	Frequency	%
Gender	M	88	58.7
	F	62	41.3
Respondent Category	Faculty Members	90	60.0
	Research Scholars	60	40.0
Teaching/Research Experience	Below 5 Years	42	28.0
	5–10 Years	54	36.0
	Above 10 Years	54	36.0
Frequency of Digital Library Usage	Daily	71	47.3
	Weekly	49	32.7

	Monthly	21	14.0
	Occasionally	9	6.0

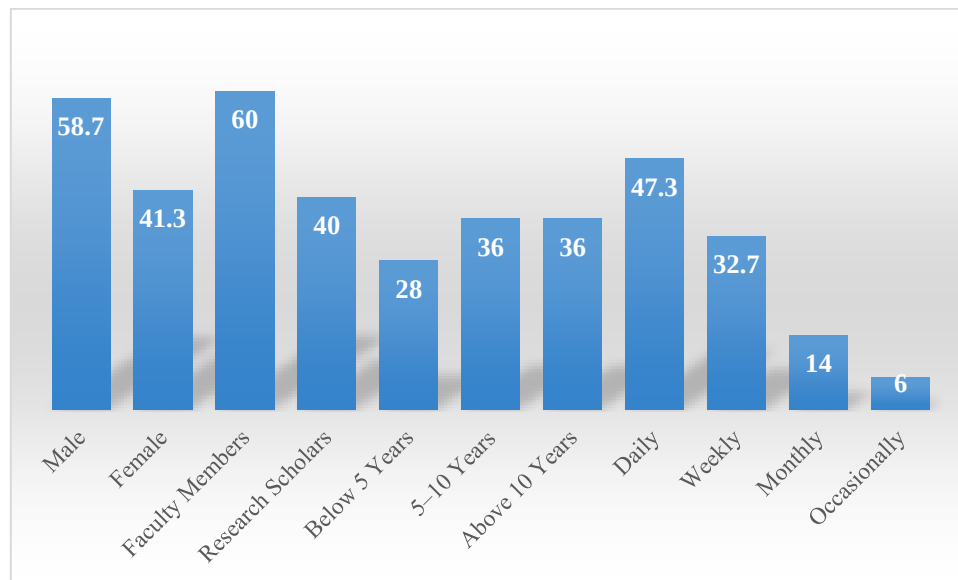


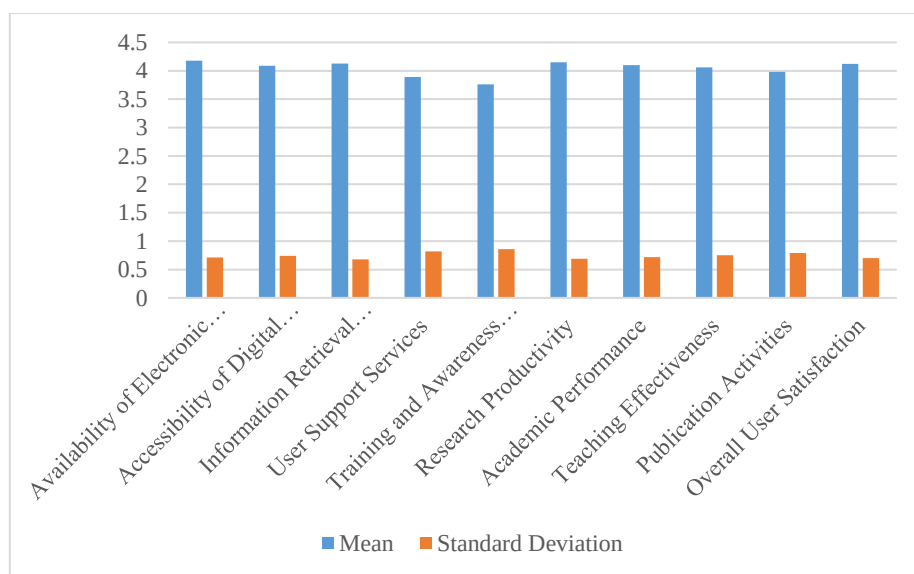
Figure 1: Graphical Representation of Characteristics of the Respondent Population

According to Table 1 and Figure 1, in the total of 150 respondents, 58.7% were males, and 41.3% females. Among them, 60.0% were from faculties, and 40.0% from research scholars. The majority of respondents had been working as teachers or researchers for over five years, according to their professional experience. Moreover, nearly half of the respondents (47.3%) were using digital libraries services on a daily basis.

In order to analyze how the respondents view the various characteristics of electronic resources and digital library services, The descriptive analysis of the study's primary variables using SD and M is presented in Table 2. Figure 2 shows the mean score for each of the variables provided in Table 2 in relation to the respondents' perception of electronic resources and digital library services.

Table 2: Characteristics of the Research Variables

Variable	M	SD
Availability of Electronic Resources	4.18	0.71
Accessibility of Digital Library Services	4.09	0.74
Information Retrieval Efficiency	4.13	0.68
User Support Services	3.89	0.82
Training and Awareness Programmes	3.76	0.86
Research Productivity	4.15	0.69
Academic Performance	4.10	0.72
Teaching Effectiveness	4.06	0.75
Publication Activities	3.98	0.79
Overall User Satisfaction	4.12	0.70

**Figure 2:** Graphical Representation of Characteristics of the Research Variables

According to the results in Table 2 and Figure 2, the perceptions of respondents were largely favorable towards digital libraries and electronic information resources. Availability of Electronic Resources attained the highest average score of $M = 4.18$, followed by Research Productivity ($M = 4.15$) and Information Retrieval Efficiency ($M = 4.13$). On the other hand, Training and Awareness Programmes ($M = 3.76$) and User Support Services ($M = 3.89$) had comparatively lower scores. This implies that these aspects need improvement in order to harness maximum use of digital libraries.

Table 3 illustrates the findings of the Pearson's correlation test between the variables of electronic resources and research/academic activity. This was done to investigate the links between the research variables.

Table 3: Analyzing Pearson's Correlation

Variables	1	2	3	4	5	6
1. Availability of Electronic Resources	1					
2. Accessibility of Digital Library Services	0.684**	1				
3. Information Retrieval Efficiency	0.642**	0.703**	1			
4. User Support Services	0.511**	0.576**	0.604**	1		
5. Training and Awareness Programmes	0.463**	0.521**	0.549**	0.618**	1	
6. Research and Academic Activities	0.746**	0.718**	0.701**	0.645**	0.598**	1

Note: $p < 0.01$

As shown in Table 3 below, all independent variables showed positive correlation and statistical significance with research and academic activities ($p < 0.01$). The most correlated was the Availability of Electronic Resources with Research and Academic Activities with $r = 0.746$, followed by Accessibility of Digital Library Services with $r = 0.718$ and Information Retrieval Efficiency with $r = 0.701$. It is clear that User Support Services and Training and Awareness Programs have significant positive correlation.

Table 4 displays the findings of a multiple linear regression analysis that was conducted to ascertain the effect of electronic resources and digital library services on scholarly work and projects.

Table 4: Forecasting Academic and Research-Related Activities via Multiple Linear Regression

Predictor Variable	Standardized Beta (β)	t-value	Sig. (p-value)
Availability of Electronic Resources	0.341	5.287	0.000**
Accessibility of Digital Library Services	0.286	4.642	0.000**
Information Retrieval Efficiency	0.224	3.918	0.001**
User Support Services	0.167	2.876	0.005**
Training and Awareness Programmes	0.121	2.164	0.032*

Note: Dependent Variable: Research and Academic Activities. $p < 0.05$; $p < 0.01$.

Based on the results shown in Table 4, the regression analysis clarified 67.9% of the variation in Research and Academic Activities, and it was significant ($R = 0.824$, $R^2 = 0.679$, Adjusted $R^2 = 0.668$, $F = 60.947$, $p < 0.001$). From among the predictors, Availability of Electronic Resources ($\beta = 0.341$) was the strongest predictor variable followed by Accessibility of Digital Library Services ($\beta = 0.286$) and Information Retrieval Efficiency ($\beta = 0.224$). The other two factors, namely User Support Services and Training & Awareness Programmes were also significant but to a lesser degree.

Research scholars' and faculty members' perspectives on electronic resources and digital library services were compared using an independent samples t-test, the results of which are presented in Table 5.

Table 5: Comparison of Research Scholars and Faculty Members Using an Independent Samples t-Test

Respondent Category	N	M	SD	t-value	Sig. (p-value)
Faculty Members	90	4.14	0.53		
Research Scholars	60	4.01	0.58	1.487	0.139

As per Table 5, it is evident that the average overall perception score among the faculty members (Mean = 4.14) was marginally higher compared to research scholars (Mean = 4.01). Still, the two were not significantly related ($t=1.487$, $p = 0.139$). It follows that the academics' views on the usefulness of digital resources were consistent with those of the research researchers.

5. CONCLUSION

This research looked at how NITTTRs' teachers and research scholars used digital library services and electronic resources for their coursework and research. The results showed that availability and access of electronic resources, research information retrieval, users' support service, and training programme positively affect research productivity and academic performance. Of these, the unquestionable factor that most strongly predicted research and academic activities was the availability of electronic resources. The investigation also found that the research scholars and faculty members were statistically indistinguishable. In general, the results have shown the need for improving the digital library services and electronic resource collections for research, teaching and research work to promote academic excellence in NITTTRs.

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