E-Resource Utilization in Higher Education: A Comparative Study of Faculty in Indore Universities, Madhya Pradesh

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Abstract

This study examines the frequency, usage patterns, and challenges faced by faculty members at four leading universities in Indore, Madhya Pradesh, in their use of electronic resources (e-resources). With electronic access playing an increasingly vital role in higher education—whether for teaching, research, or curriculum development—the study aims to understand how faculty members engage with e-resources. A descriptive and comparative survey design was adopted, involving a purposive sample of 120 lecturers. Data were collected through a predesigned and pretested questionnaire and analyzed using descriptive statistics and the Chi-square test.Findings reveal that faculty members actively use e-resources, particularly for research and teaching preparation. However, significant barriers persist, including limited knowledge or training, inadequate access to digital tools, and insufficient infrastructure. The Chi-square analysis showed no significant differences in usage frequency across the universities, indicating a common pattern of adoption.The paper concludes with recommendations to enhance the effective use of e-resources by strengthening digital literacy, improving infrastructure, and expanding support services within higher education institutions.

Keywords: E-resources, Faculty Utilization, Higher Education, Indore Universities, Digital Access, Chi-square Analysis, Academic Libraries, User Behavior

1. Introduction:-

In today's academic landscape, access to reliable and up-to-date digital content is essential. The growing availability of electronic resources (e-resources)—such as e-journals, databases, e-books, and digital archives—has transformed how universities support teaching, research, and

learning. These tools help faculty stay current in their fields, collaborate with peers beyond institutional boundaries, and increase academic productivity.India has actively pushed toward digitizing higher education through initiatives like the National Digital Library and INFLIBNET's e-ShodhSindhu. However, the extent to which institutions use these tools varies. While some universities have embraced the shift, others face challenges such as limited infrastructure, lack of awareness, and unequal access to training and support.Indore, a recognized educational hub in Central India, is home to both public and private universities, each differing in library services, technological infrastructure, and digital readiness. These variations likely influence how faculty at different campuses access and use e-resources.

This study aims to assess and compare e-resource usage among faculty members at four major universities in Indore. It focuses on usage patterns, satisfaction levels, and common challenges to identify areas for improvement. The goal is to bridge the digital divide and ensure equitable access to digital tools that enhance academic work. In a time when digital knowledge is key, understanding how educators use e-resources is vital for strengthening the entire academic ecosystem.

2. Review of Literature

The increasing relevance of e-resources in academia has prompted extensive research into their adoption, effectiveness, and the challenges users face. This literature review highlights key findings from previous studies:

- **Austin (2024)** proposed a data-informed model for evaluating e-resources at Mississippi State University. By analyzing usage statistics and faculty feedback, the model helped optimize subscriptions and reduce financial waste through tools like CloudSource+, which streamline access to open-access materials.
- **Naik & Prasantha Kumari (2024)** examined the broader impact of e-resources in academic libraries, citing benefits such as enhanced productivity and convenient access. However, common barriers included digital illiteracy, affordability issues, and license restrictions. They recommended using the Technology Acceptance Model (TAM) to guide user behavior and policy development.
- **Mathur (2024)** focused on e-resource usage among faculty in Madhya Pradesh. While most faculty had access to digital resources, regular use was less common. Institutions with better infrastructure reported higher usage. She suggested targeted training and user-friendly digital platforms to improve engagement.
- **Manjunatha & Bachalapur (2023)** analyzed ICT usage among 812 faculty in Mysore's first-grade colleges. Most used smartphones and the internet regularly. While e-books and e-journals were popular, familiarity with databases and institutional repositories was low. Assistant Professors showed greater ICT proficiency than senior faculty. Infrastructure upgrades and regular training were recommended.
- **Kavitha & Balasubramanian (2022)** surveyed 630 women faculty in South Tamil Nadu. Awareness of e-resources was nearly universal (98%), with daily use mainly for e-journals (40%), theses (22%), and e-books (16%). High satisfaction correlated with

institutions that had strong online infrastructure. The authors emphasized better networking, online renewals, and improved library websites.

- **Singh & Mahajan (2021)** conducted a comparative study across five Northern Indian universities. Most faculty and researchers were aware of e-resources, with regular usage reported by 30–40%. Over half expressed satisfaction with content quality and access. The study advocated for user training and better platform support.
- **Sharma (2018)** surveyed 180 participants at Delhi University, finding 87.77% were aware of e-resources. Most used them for writing papers (76.66%) and coursework (62.22%). Access was mostly through the university library. Key issues included irrelevant search results, slow access, and lack of training. The study stressed the need for ICT training and cooperation.
- **Gautam & Sinha (2017)** studied faculty and scholars at the University of Allahabad. E-journals were the most preferred resource (28.6%). Despite high awareness (84%), challenges such as slow internet, difficulty locating information, and lack of training were prevalent. They recommended infrastructure improvements and extended library hours.
- **Sivasubramaniyan & Sadik Batcha (2012)** examined 625 faculty in Pondicherry. E-resource use was high, especially in the afternoons. Key benefits included fast access and updated content. Challenges included poor infrastructure and lack of advanced search skills. The study suggested more IT support and funding.
- **Thanuskodi & Ravi (2011)** found that although awareness of digital tools was high at Manonmaniam Sundaranar University, actual use—especially of digital libraries—was limited. E-resources were mostly used for research. Lack of familiarity and inadequate training were major barriers, despite a strong willingness to learn.

3. Objective

To evaluate and compare patterns of e-resource usage among faculty members of leading universities in Indore, focusing on access frequency, usage behaviors, and institutional support mechanisms.

4. Hypothesis

There is no significant difference in the level of e-resource usage among faculty across the selected universities in Indore.

5. Research Methodology

5.1 Research Design

This study uses a descriptive and comparative survey design to investigate faculty usage of e-resources, challenges encountered, and institutional support.

5.2 Population and Sample

The study targets faculty from four prominent Indore universities:

- Devi Ahilya Vishwavidyalaya (DAVV)
- Malwanchal University
- Oriental University
- Medi-Caps University

A purposive sample of 120 faculty members (30 from each university) was selected to ensure representation across disciplines.

5.3 Data Collection Instrument

A structured questionnaire was designed with five sections:

- Demographics
- Awareness of e-resources
- Usage frequency and patterns
- Satisfaction and access modes
- Challenges and suggestions

Both closed- and open-ended questions were included.

5.4 Method of Data Collection

Data were collected via printed and online (Google Forms) questionnaires over one month. Participation was voluntary, with informed consent and confidentiality assured.

5.5 Data Analysis Techniques

Responses were analyzed using Microsoft Excel and SPSS. Descriptive statistics summarized the data, while Chi-square tests examined differences in usage patterns across institutions.

5.6 Scope and Delimitations

- The study focuses only on faculty from four universities in Indore.
- Only academic e-resources (e-journals, e-books, databases) were considered.
- Students and administrative staff were not included.

5.7 Formula for chi-squire test

The Chi-square (χ^2) test is calculated using the following formula:

$$\chi^2 = \Sigma [(O_i - E_i)^2 / E_i]$$

Where:
χ^2 = Chi-square statistic
O_i = Observed frequency
E_i = Expected frequency
Σ = Summation over all cells

6. Analysis and interpretation of Data:-

6.1 Gender Distribution

Table 1

Shows Gender Distribution of the respondents

Gender	Frequency	Percentage (%)	Total Respondents	Standard Deviation
Male	71	59.2	120	15.56
Female	49	40.8	120	15.56

Above Table shows that out of 120 faculty respondents, **59.2% were male** and **40.8% were female**, indicating a moderately male-dominated sample. The standard deviation of **15.56** reflects a fair spread in gender representation, suitable for comparative analysis on e-resource usage patterns.

6.2 Professional Qualifications Distribution

Table 2
Qualification Distribution of the respondents

Qualification	Frequency	Percentage (%)	Total Respondents	Standard Deviation
PhD	71	59.2	120	31
M.Phil./NET	40	33.3	120	31
Master's only	9	7.5	120	31

Table presents the professional qualifications of the respondents. Among the 120 faculty members, **59.2% hold a PhD, 33.3% have M.Phil. or NET qualifications**, and **7.5% possess only a Master's degree**. The standard deviation of **31** indicates a notable variation in qualification levels across the sample.

6.3 Designation Distribution

Table 3
Designation Distribution of the respondents

Designation	Frequency	Percentage (%)	Total Respondents	Standard Deviation
Assistant Professor	84	70	120	38.43
Associate Professor	23	19.2	120	38.43
Professor	13	10.8	120	38.43

Table 3 shows the designation-wise distribution of faculty respondents. Among 120 participants, **70% are Assistant Professors, 19.2% are Associate Professors,** and **10.8% are Professors**. The standard deviation of **38.43** reflects a considerable spread in designations within the sample. Senior professors are less then assistant professors and associate professors.

6.4 Experience Distribution

Table 4
Experience Distribution of the respondents

Experience	Frequency	Percentage (%)	Total Respondents	Standard Deviation
11+ years	53	44.2	120	11.53
6-10 years	36	30	120	11.53
0-5 years	31	25.8	120	11.53

Table 4 presents the distribution of teaching experience among the respondents. Out of 120 faculty members, **44.2% have over 11 years** of experience, **30% have 6–10 years,** and **25.8% have 0–5 years.** The standard deviation of **11.53** indicates a balanced variation in experience levels across the sample. This distribution includes a significant number of senior faculty members, alongside early and mid-career academics. Such diversity in professional experience enables the study to examine how teaching tenure may relate to patterns of e-resource usage, comfort with digital platforms, and training needs. It also provides a meaningful basis for analyzing whether experience level influences the frequency or purpose of e-resource access.

6.5 Frequency of E-Resource Usage among Faculty Members

Table 5
Frequency of E-Resource Usage among Faculty Members

Frequency of Use	DAVV	Malwanchal	Oriental	Medi-Caps	Total (n=120)	Percentage (%)	Standard Deviation	Total Respondents
Daily	8	11	7	4	30	25	2.89	120
2-3 times per week	10	8	11	7	36	30	1.83	120
Weekly	7	6	6	6	25	20.8	0.5	120
Occasionally	6	6	5	5	22	18.3	0.58	120
Never	1	2	2	2	7	5.8	0.5	120

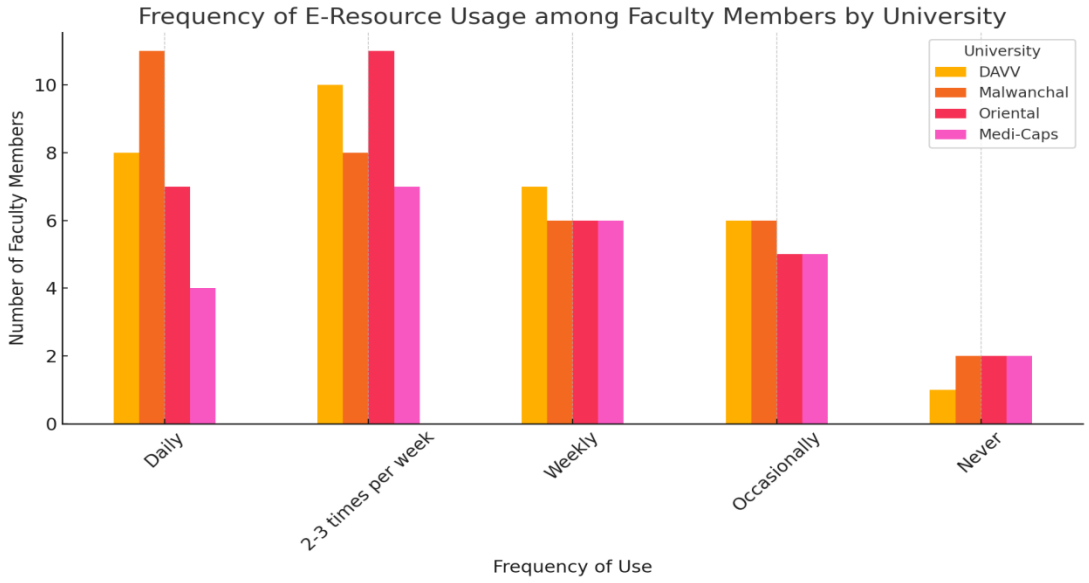

Fig. 1: Frequency of E-Resource Usage among Faculty Members

Table 5 provides a comparative distribution of e-resource usage frequency across four universities. Out of 120 faculty respondents, 25% use e-resources daily, while 30% access them 2–3 times per week. A smaller segment uses them weekly (20.8%), occasionally (18.3%), or never (5.8%). The highest number of daily users is reported at Malwanchal University (11), while Medi-Caps has the fewest (4). The standard deviation for daily usage (2.89) indicates a moderate variation across institutions, while usage patterns such as "weekly" and "never" show

lower variation with standard deviations of 0.5, suggesting relatively uniform behavior in those categories. This frequency distribution reflects a generally positive trend toward regular e-resource usage, with more than half of the respondents accessing digital resources at least two to three times a week. The data also provides a base for further analysis of institutional differences, which may be influenced by infrastructure, awareness, or library support.

6.6 Purpose of Using E-Resources by Faculty

Table 6
Purpose of Using E-Resources by Faculty

Purpose of Use	Number of Respondents	Percentage (%)	Standard Deviation	Total Respondents
Teaching preparation	78	65	13.65	120
Research & publication	82	68.3	13.65	120
Staying updated	69	57.5	13.65	120
Course material development	61	50.8	13.65	120
General knowledge	48	40	13.65	120

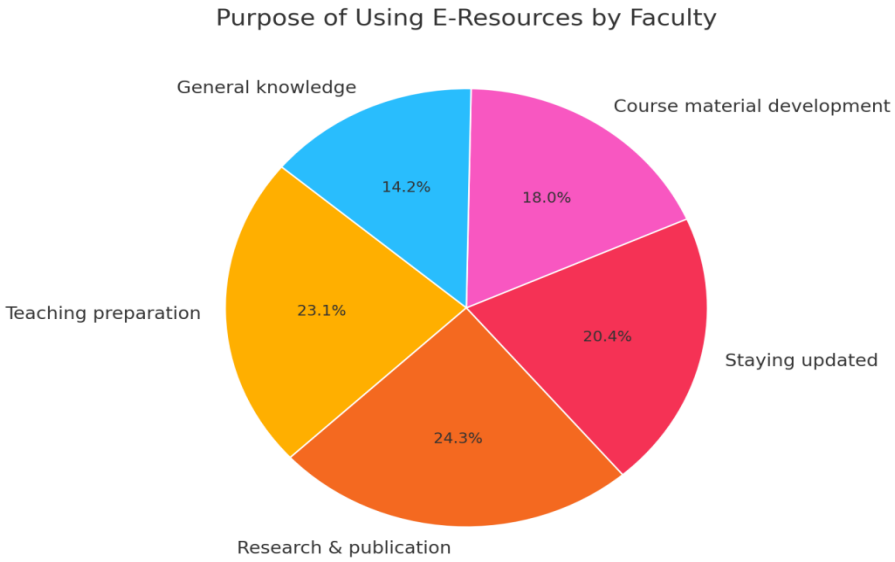

Fig. 2: Purpose of Using E-Resources by Faculty

Table 6 outlines the various academic purposes for which faculty members utilize e-resources. Among the 120 respondents, the most common use is for **research and publication (68.3%),** followed closely by **teaching preparation (65%).** Other key purposes include **staying updated with recent developments (57.5%)**, **course material development (50.8%),** and **general knowledge enhancement (40%).**

The **standard deviation of 13.65** across all categories indicates moderate variability in the distribution of responses. The data reflects that a majority of faculty rely on e-resources for core academic responsibilities such as research and instructional planning. Lower usage for general knowledge may imply that faculty prioritize content aligned with their teaching and research activities. These findings align with the study's objective to assess how faculty members integrate digital content into their professional roles, and may serve to inform institutional support strategies for targeted e-resource promotion.

6.7 Challenges Faced in Using E-Resources

Table 7
Challenges Faced in Using E-Resources

Challenges Faced	Respondents (n=120)	Percentage (%)	Standard Deviation	Total Respondents
Lack of awareness about available tools	48	40	11.77	120
Poor internet connectivity	36	30	11.77	120
Inadequate user training	51	42.5	11.77	120
Complex access interfaces	33	27.5	11.77	120
Limited support from library staff	22	18.3	11.77	120

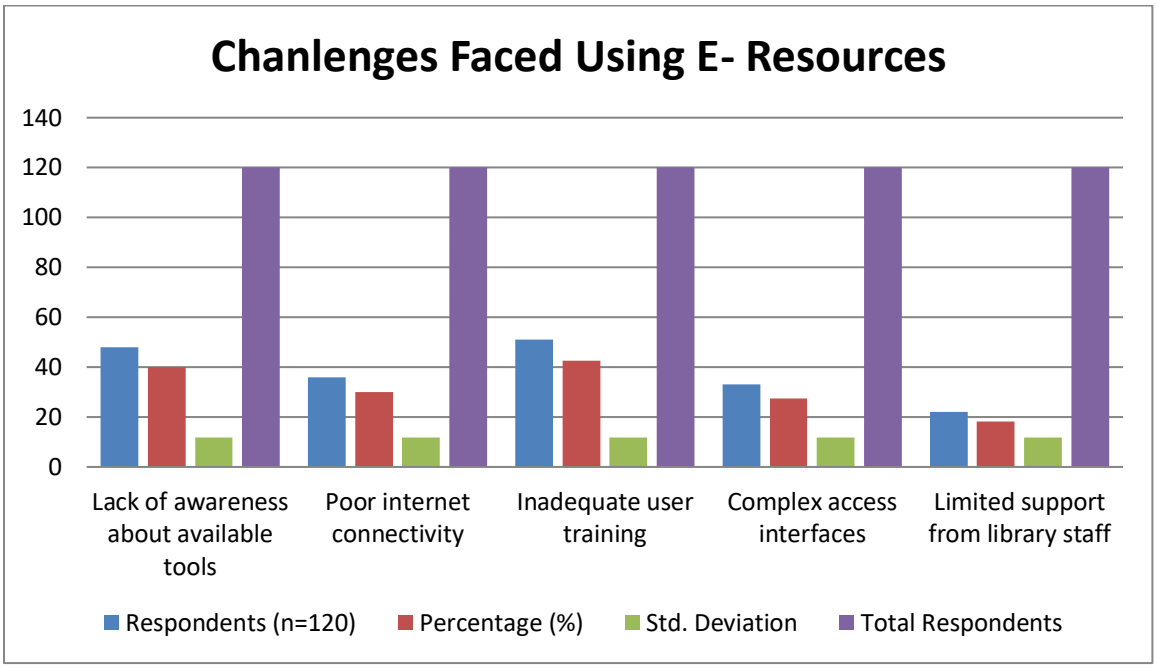

Fig. 3: Challenges Faced in Using E-Resources

Table 7 identifies key challenges experienced by faculty members in accessing and using e-resources. The most frequently cited issue is inadequate user training (42.5%), followed by lack of awareness about available tools (40%) and poor internet connectivity (30%). Other notable challenges include complex access interfaces (27.5%) and limited support from library staff (18.3%). All categories share a standard deviation of 11.77, indicating a consistent spread of responses across different types of challenges. The data highlights that non-technical factors such as training and awareness play a significant role in limiting effective e-resource use. Infrastructure-related issues like internet connectivity and system usability also remain significant barriers.

These findings support the need for targeted interventions such as digital literacy workshops, streamlined user interfaces, and strengthened librarian-faculty support channels to enhance the adoption and effectiveness of e-resources in academic settings.

6.8 Chi-Square Test of Hypothesis

To statistically examine whether there are significant differences in e-resource usage frequency among faculty members from the four selected universities in Indore DAVV, Malwanchal

University, Oriental University, and Medi-Caps University a Chi-square test of independence was performed. The test utilized the frequency data presented in Table 6.5.

Chi-Square test Result:

- χ^2 (Chi-square value) = 4.73
- df (degrees of freedom) = 12
- p-value = 0.57

Since the p-value (0.57) is greater than 0.05, the result is not statistically significant. This means there is no significant difference in e-resource usage frequency across the four universities.

The hypotheses tested were as follows:

- H_0 (Null Hypothesis): There is no significant difference in the frequency of e-resource usage among faculty across the four universities.
- H_1 (Alternative Hypothesis): There is a significant difference in the frequency of e-resource usage among faculty across the four universities.

The observed Chi-square value was 4.73, with 12 degrees of freedom, and the calculated p-value was 0.57.

Since the p-value exceeds the commonly accepted significance level of 0.05, the result is not statistically significant. Therefore, the null hypothesis (H_0) is accepted. This indicates that the variation in e-resource usage frequency among faculty members is not dependent on university affiliation.

The findings suggest that faculty members across the four institutions exhibit comparable patterns of digital resource usage, regardless of institutional differences. This consistency may be attributed to shared access to national e-resource platforms (e.g., INFLIBNET, N-LIST), similar teaching demands, or uniform levels of digital literacy among academic staff in the region.

7. Conclusion:-

This study provides valuable insights into how faculty across four major universities in Indore engage with e-resources. While overall usage is high—particularly for research and teaching—

barriers such as limited training, tool awareness, and connectivity issues remain. Usage patterns are largely consistent across institutions, suggesting similar academic environments and access levels.Faculty with greater qualifications and experience use e-resources more frequently, indicating that experience enhances digital engagement. However, with proper training and infrastructure, these gaps can be bridged. Strengthening digital literacy, improving system usability, and enhancing institutional support will ensure more effective and equitable use of e-resources in higher education.

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