

A Comparative Study of the Changing Pattern of Print and Electronic Resource Utilisation among Undergraduate, Postgraduate, and Doctoral Students in Colleges in Mumbai City

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ABSTRACT

Academic libraries provide print and electronic resources to support learning and research, but students at different academic levels may use these resources differently. This study compared library visits, purposes of use, format preference, perceived adequacy and database utilisation among 300 students from selected Mumbai colleges. The sample comprised 135 undergraduate, 136 postgraduate, and 29 PhD students. Responses were collected through a structured questionnaire and analysed using descriptive statistics, with inferences made using Chi-Square Tests, Kruskal-Wallis Tests, and the Wilcoxon Signed-rank Test. This Study mainly focused on library-visit frequency, research-related use, perceived adequacy of print resources and the number of databases used differed significantly across academic levels. Postgraduate students visited the library more frequently and rated print resources more favourably than undergraduate students. PhD students used a wider range of databases and reported the highest research-related use. Academic level was not significantly associated with overall preference for print, electronic or combined formats, and electronic-resource adequacy did not differ significantly across groups. The mean adequacy score for print resources (60.74) was higher than for electronic resources (54.67), although the effect was small. The findings support a balanced approach to collection development. College libraries should continue to provide core print materials while improving access to electronic scholarly resources and offering database guidance suited to undergraduate, postgraduate and PhD students.

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KEYWORDS: Academic Libraries, Database Utilisation, Electronic Resources, Library-Resource Utilization, Print Resources.

1. INTRODUCTION

College libraries support classroom learning, independent study, and research by providing access to different forms of information. For many years, printed books, journals, newspapers, dissertations, and reference materials formed

the main part of college library collections. These resources remain useful because they are familiar, easy to consult, and suitable for sustained reading. However, the way students search for and use information has changed as electronic resources have become more widely available.

Electronic books, e-journals, online databases, and digital repositories have widened the range of information available to library users. They allow users to search for documents quickly and access academic material in different formats. Online databases are particularly useful for students engaged in project work and research. At the same time, access to electronic resources does not automatically ensure their effective use. Awareness, search skills, availability of suitable material, and the nature of academic work can influence students' choices.

Print and electronic resources serve different academic needs. Printed books may be preferred for regular reading, classroom preparation, and detailed study. Electronic resources may be more convenient for locating recent literature, searching across subjects, and obtaining information without depending entirely on the physical collection. Therefore, the two formats should not always be viewed as substitutes. In many cases, they complement each other. A college library must understand this relationship while planning its collection and services.

Students at different academic levels may not use library resources in the same manner. Undergraduate students generally depend on prescribed books, textbooks and introductory reading material. Postgraduate students require a wider range of subject-specific information for assignments, seminars, and project work. PhD scholars have more specialised information needs and often require theses, scholarly journals, databases, and current research literature. These differences make academic level an important factor when examining library-resource utilisation.

Resource availability also differs from actual use. A library may possess a sizeable print or electronic collection. Still, some resources may remain underused because students are unaware of them or do not consider them suitable for their academic requirements. Students' opinions about a collection's adequacy provide useful information about whether available resources meet their needs. Their preferred format, frequency of library visits, purpose of use, and use of online databases can further explain their utilisation patterns.

Colleges in Mumbai serve students from varied academic streams and educational levels. Their libraries maintain traditional collections while also providing access to electronic information. Examining how undergraduate, postgraduate, and PhD scholars respond to these formats can help identify similarities and differences in their information-use behaviour. This evidence can help libraries maintain a suitable balance between print and electronic resources.

The present study compares the utilisation of print and electronic resources among undergraduate, postgraduate and PhD students in selected Mumbai colleges. It considers the frequency and purpose of library visits, preferred format, perceived adequacy of available resources, and use of online databases. The analysis focuses on student utilisation and does not assess collection-development procedures, library administration, or librarians' promotional activities. By examining these dimensions together, the study provides evidence to guide collection balance, resource promotion, and user education for students with different academic requirements.

2. REVIEW OF LITERATURE

Academic libraries increasingly operate as hybrid information environments in which printed collections coexist with e-books, e-journals, databases, and digital repositories. Electronic resources offer quick searching and remote access, while print remains useful for sustained reading, annotation, and close engagement with a text. Students' choices are therefore shaped not only by availability but also by academic purpose, ease of access, and reading preference.

Cumaoglu, Sacici, and Torun (2013) examined university students' reading habits and preferences for e-books and printed materials. Students used e-books, but print remained important for several academic reading activities. The authors showed that format preference was connected with reading habits and the intended use of the material, suggesting that collection decisions should account for variation within the student population.

Roesnita and Zainab (2005) studied e-book use among undergraduates at the University of Malaya. Although the respondents were regular Internet users and generally viewed e-books positively, actual use remained limited. Respondents consulted e-books mainly for assignments, research projects, and reference work, whereas they preferred printed textbooks for repeated use. The study illustrates that technological familiarity alone does not ensure regular use of electronic library resources.

In India, Singh (2017) investigated the use of N-LIST resources among undergraduate students in four postgraduate colleges in Jalandhar District. Awareness and use of the programme were high, demonstrating the value of consortium-based access in college libraries. Because the study focused on undergraduates, it also left scope for comparison with postgraduate and research students.

Burhansab, Batcha and Ahmad (2020) examined awareness and utilisation of electronic resources in selected colleges affiliated with Solapur University. Library visits, time spent in the library, purposes of use, sources of awareness, and choice of access device varied across college categories. Limited awareness and training restricted the use of some web-based services, indicating that provision must be accompanied by user guidance.

Subaveerapandiyani and Sinha (2021) explored digital literacy and reading habits among students and research scholars at the Central University of Tamil Nadu. Although most participants were familiar with digital tools, printed books remained their preferred reading source. Their results show that digital competence can coexist with a preference for print, particularly when concentration and extended reading are required.

Amirtharaj, Raghavan and Arulappan (2023) compared print and e-book preferences among 607 university students. They valued electronic books for portability, while print was preferred for studying, taking notes, and exam preparation. Their findings suggest that the advantages of the two formats are task-specific and that neither format fully replaces the other.

Matthews and Johnson (2024) examined preferences for electronic and print books in an academic library. Many students preferred print for course-related reading because it supported concentration, physical engagement and

recall. Students valued electronic books for convenient access and quick consultation. The authors cautioned against assuming that familiarity with technology necessarily produces an electronic-only preference.

The literature review above confirms the continuing relevance of both formats. Much of the earlier work, however, concentrates on a single academic group, a particular electronic service or general awareness of e-resources. Fewer studies jointly examine visit behaviour, purpose of use, format preference, perceived adequacy and database utilisation across undergraduate, postgraduate and PhD students. This study addresses this gap in selected Mumbai colleges.

3. OBJECTIVES OF THE STUDY

1. To examine the frequency and purpose of library visits among undergraduate, postgraduate and PhD students.
2. To identify students' preferences for print, electronic and combined formats of library resources.
3. To assess and compare the perceived adequacy of print and electronic library resources.
4. To compare the utilisation of library resources across undergraduate, postgraduate and PhD levels.
5. To examine the use of online databases by students at different academic levels.

4. HYPOTHESES OF THE STUDY

The main hypotheses of the study are stated as:

H₀: There is no significant difference in the utilisation of library resources among undergraduate, postgraduate and PhD students.

H₁: There is a significant difference in the utilisation of library resources among undergraduate, postgraduate and PhD students.

To examine the main hypothesis systematically, six specific null hypotheses were formulated for statistical testing.

H₀₁ There is no significant difference in the frequency of library visits among UG, PG and PhD students.

H₀₂ There is no significant association between students' academic level and their preferred format of library resources.

H₀₃ There is no significant difference in the perceived adequacy of print resources among UG, PG and PhD students.

H₀₄ There is no significant difference in the perceived adequacy of electronic resources among UG, PG, and PhD students.

H₀₅ There is no significant difference in online database utilisation among UG, PG and PhD students.

H₀₆ There is no significant difference between students' adequacy ratings of print and electronic library resources.

5. RESEARCH METHODOLOGY

5.1 Research Design

The study used a quantitative, cross-sectional and comparative survey design. Descriptive analysis summarised students' visits, purposes of use, preferred formats, perceived resource adequacy and database use. Comparative analysis examined whether these aspects differed among undergraduate, postgraduate, and PhD students.

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The study covered students from selected colleges in Mumbai City and Mumbai Suburban areas. It was limited to college libraries and did not include public, school, special or university central libraries.

5.2 Population and Sample

The study population comprised undergraduate, postgraduate and PhD students who used the libraries of selected Mumbai colleges. A stratified sampling approach ensured representation from the three academic levels, with academic level as the stratification variable. The analysis included 300 complete responses.

Table 1. Distribution of respondents

Academic level	Number of respondents	Percentage
Undergraduate	135	45.00%
Postgraduate	136	45.33%
PhD.	29	9.67%
Total	300	100.00%

5.3 Data-Collection Instrument

Data were collected through a structured questionnaire for college-library users. The instrument covered academic level, frequency and purpose of library visits, preferred resource format, perceived adequacy of print and electronic resources, and use of online databases.

5.4 Data Processing

The researchers checked responses for completeness and consistency before analysis. Categorical variables were assigned numerical codes. For multiple-response questions, each option was coded separately as selected (1) or not selected (0). The study calculated frequencies and percentages for individual resources. The study ranked adequacy percentages separately within the print and electronic categories because the categories contained different numbers of items.

6. SCOPE OF THE STUDY

The study focused on the utilisation and perceived adequacy of print and electronic library resources among undergraduate, postgraduate and PhD students. It examined academic-level differences in library visits, resource-format preferences and online database use.

7. ETHICAL CONSIDERATIONS

Responses were used only for academic purposes. The analysis excluded personal, professional, and institutional identifiers. Results were reported in aggregate form so that no individual respondent could be identified.

8. STATISTICAL ANALYSIS AND DISCUSSION

Microsoft Excel was used for coding and tabulation, and inferential tests were performed using SPSS-21. Frequencies and percentages summarised categorical variables. Multiple-response percentages were calculated within each academic group. The print adequacy score represented the percentage of nine print resources rated adequate; the electronic adequacy score represented the percentage of five electronic resources rated adequate. The database-use count ranged from 0 to 5.

Pearson's chi-square test examined associations between academic level and categorical outcomes. Monte Carlo exact significance was used where expected frequencies were sparse, and Cramer's V described the strength of association. Kruskal-Wallis tests compared ordered or bounded scores across the three independent academic groups. Pairwise Mann-Whitney tests with Bonferroni adjustment followed significant omnibus results. The Wilcoxon signed-rank test compared print and electronic adequacy scores reported by the same respondents. All tests were two-tailed with $\alpha = .05$.

Library Visit Frequency

Table 2. Frequency of library visits by academic level

Library Visit Frequency	Total count	Percentage (n=300)	Academic Level		
			UG % (n=135)	PG % (n=136)	PhD % (n=29)
Not using	5	1.7	1.5	2.2	0.0
Rarely	46	15.3	23.7	8.1	10.3
Once a month	32	10.7	11.9	8.1	17.2
Once a week	91	Frequency 30.3	26.7	33.1	34.5
Once every 2 days	57	19.0	15.6	23.5	13.8
Daily	69	23.0	20.7	25.0	24.1

Library visit "Once a week" was the most common response (30.3%), followed by daily (23.0%) and once every two days (19.0%). Visit frequency differed across academic levels.

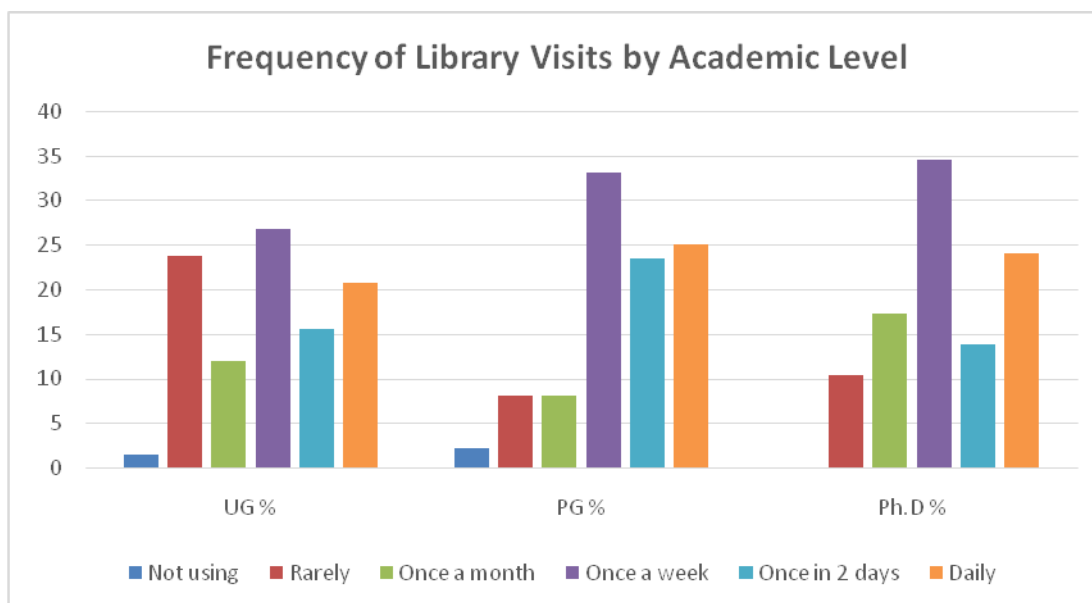


Figure 1. Frequency of Library Visits by Academic Level

A **Kruskal-Wallis test** was used to compare visit frequency across UG, PG, and PhD students. This test was appropriate because library-visit frequency was measured as an ordered categorical variable and three independent academic groups were being compared. $H(2) = 7.895$, $p = .019$, epsilon squared = .020. PG respondents visited more frequently than UG respondents (adjusted $p = .017$). The UG-Ph.D. and PG-Ph.D. comparisons were not significant. Although statistically significant, the effect was small.

A. Purpose of Library Visits

Table 3. Purpose of library visits by academic level

Purpose	Count	Total %	UG %	PG %	Ph.D %	Adjusted p
Study	249	83.00	84.4	83.1	75.9	1.000
Borrow books	125	41.67	34.1	50.0	37.9	.213
Project work	105	35.00	30.4	42.6	20.7	.200
Research work	101	33.67	20.7	40.4	62.1	<.001
Prepare lecture notes	85	28.33	30.4	29.4	13.8	1.000
Increase general knowledge	39	13.00	9.6	16.2	13.8	1.000
Read newspapers	34	11.33	7.4	15.4	10.3	.894
Use the Internet	25	8.33	6.7	11.0	3.4	1.000

Multiple responses were allowed; consequently, the percentages do not total 100%. Study was the most frequently reported purpose (83.0%), followed by borrowing books (41.7%), project work (35.0%), research work (33.7%) and preparing lecture notes (28.3%). Percentages for UG, PG and PhD students were calculated within the respective academic groups.

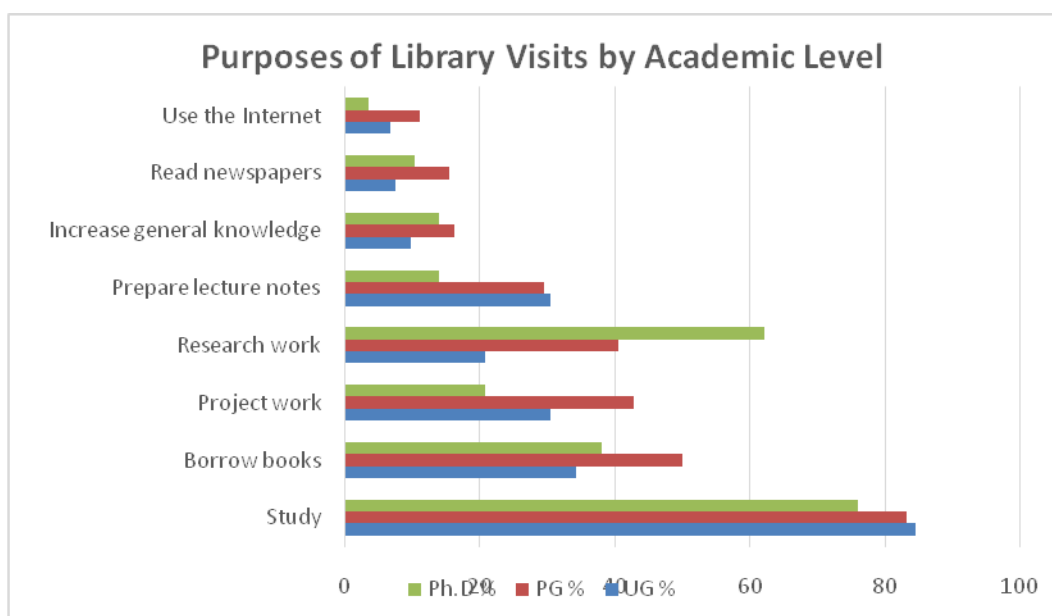


Figure 2. Purposes of Library Visits by Academic Level

A separate Pearson chi-square test examined the association between academic level and each purpose. Every option was coded as selected or not selected. Because eight purposes were tested, Bonferroni-adjusted p-values were used to control the family-wise error rate, and Cramer's V summarised the effect size. Only research work remained significant after adjustment, $\chi^2(2) = 23.370$, adjusted $p < .001$, Cramer's $V = .279$. Research use increased from 20.7% among UG students to 40.4% among PG students and 62.1% among PhD students.

B. Preferred Resource Format

Table 4. Preferred format of library resources

Preferred format	Total n (%)	UG %	PG %	Ph.D %
Print only	63 (21.0)	23.0	20.6	13.8
Electronic only	22 (7.3)	6.7	7.4	10.3
Both print and electronic	215 (71.7)	70.4	72.1	75.9

Most respondents preferred to use both print and electronic resources (71.7%). Print-only use was preferred by 21.0%, while 7.3% preferred electronic resources only.

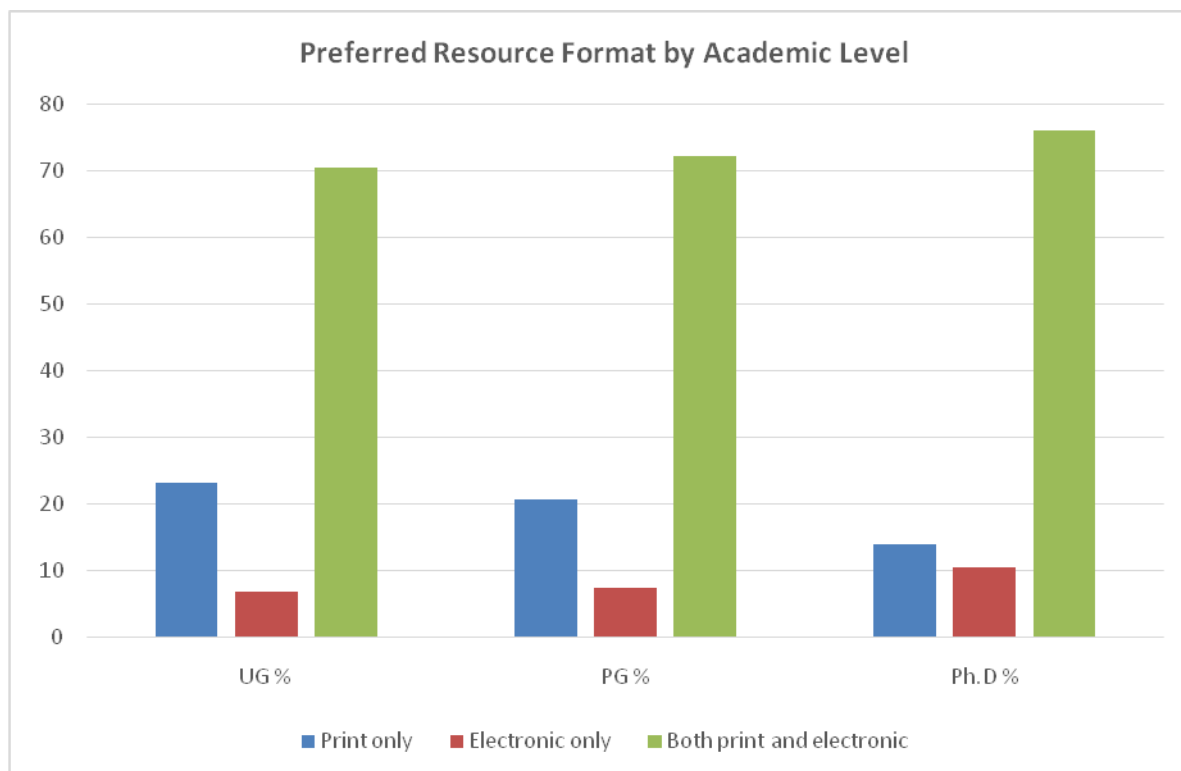


Figure 3. Preferred Resource Format by Academic Level

A **Pearson chi-square test of independence** was used to examine the association between academic level and preferred resource format. Both variables were categorical, and the analysis compared the distribution of three format preferences across three academic levels. The result was:

$$\chi^2(4) = 1.522, p = .823, \text{Cramer's } V = .050.$$

The chi-square value was low, and the p-value of .823 was considerably greater than .05. Therefore, the null hypothesis was not rejected. Cramer's V of .050 indicates a negligible association between academic level and format preference.

C. Adequacy of Print and Electronic Resources

Table 5. Adequacy and Rank of Print and Electronic Resources

Print resource	Adequate %	Rank	Electronic resource	Adequate %	Rank
Books	75.3	1	E-books	65.0	1
Newspapers	73.3	2	E-journals	58.3	2
Journals/Periodicals	65.7	3	Databases	58.0	3
Maps/Teaching aids	62.7	4	E-theses	50.0	4
Project reports	60.0	5	CDs/DVDs	42.0	5
Theses	59.7	6			
Bound volumes	53.7	7			
Dissertations	52.7	8			
Braille books	43.7	9			

Table 5 compares the percentage of respondents who considered each resource adequate and the rank of that resource within its category. Books received the highest print adequacy rating (75.3%), followed by newspapers (73.3%) and journals or periodicals (65.7%); Braille books received the lowest rating (43.7%). Among electronic resources, e-books ranked first (65.0%), followed by e-journals (58.3%) and databases (58.0%), while CDs or DVDs ranked last (42.0%).

After adjustment for nine print-item tests, academic-level differences remained significant for dissertations, chi-square (2) = 18.710, adjusted $p < .001$, Cramer's $V = .250$, and theses, chi-square (2) = 10.769, adjusted $p = .041$, Cramer's $V = .189$. PG respondents gave the highest adequacy ratings to dissertations (65.4%) and theses (69.1%). None of the five electronic-resource distributions differed significantly by academic level after adjustment.

Table 6. Descriptive Statistics for Utilisation Indicators by Academic Level

UtilisationIndicator	Academic levels	N	Mean	SD	Median
Print adequacy score	UG	135	54.24	35.68	55.56
	PG	136	66.26	34.52	77.78
	Ph.D	29	65.13	30.82	66.67
Electronic adequacy score	UG	135	52.30	43.36	60.00
	PG	136	54.12	39.71	60.00
	Ph.D	29	68.28	35.26	80.00
Database use count	UG	135	1.15	0.78	1.00
	PG	136	1.14	0.66	1.00
	Ph.D	29	1.86	1.16	1.00

Table 6 presents the mean, standard deviation and median for print adequacy, electronic adequacy and database-use scores.

The mean print adequacy score was highest among PG students at 66.26, followed by PhD students at 65.13 and UG students at 54.24. The relatively large standard deviations indicate considerable variation among respondents within each academic group.

A **Kruskal-Wallis test** was used to compare print adequacy scores because the scores were bounded between 0 and 100 and were not assumed to follow a normal distribution.

The result was

$$H(2) = 8.284, p = .016, \epsilon^2 = .021.$$

The p-value shows a significant difference in print adequacy scores across academic levels. However, the epsilon squared of .021 indicates a small effect. Post-hoc testing showed that PG students reported significantly higher print adequacy than UG students, adjusted $p = .016$. The comparisons involving PhD students were not significant.

For electronic adequacy, the mean scores were 52.30 for UG, 54.12 for PG and 68.28 for PhD students. The Kruskal-Wallis result was:

$$H(2) = 2.561, p = .278, \epsilon^2 = .002.$$

Since $p = .278$ was greater than .05, the null hypothesis was not rejected. The effect size of .002 was negligible. Although the PhD mean was numerically higher, the difference was not statistically significant.

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A **Wilcoxon signed-rank test** compared each respondent's print and electronic adequacy scores. This test was appropriate because the same respondents provided both scores.

The result was

$$W = 13,929.5, p = .034, r = .123.$$

The mean print adequacy score was 60.74%, compared with 54.67% for electronic resources. The difference was statistically significant, but the effect size ($r = .123$) was small. Therefore, the finding should not be interpreted as a large practical difference between the two formats.

D. Online Database Utilisation

Table 7. Online databases used by academic level

Database	Total count	UG %	PG %	Ph.D %	Total %	Adjusted p
UGC-INFONET	188	68.9	53.7	75.9	62.7	.053
N-LIST	79	22.2	24.3	55.2	26.3	.005
DELNET	53	11.9	21.3	27.6	17.7	.209
INDEST-AICTE	37	10.4	11.8	24.1	12.3	.594
Other	7	1.5	2.9	3.4	2.3	1.000

Table 7 shows that UGC-INFONET was the most frequently used database, reported by 62.7% of respondents. It was followed by N-LIST at 26.3%, DELNET at 17.7% and INDEST-AICTE at 12.3%.

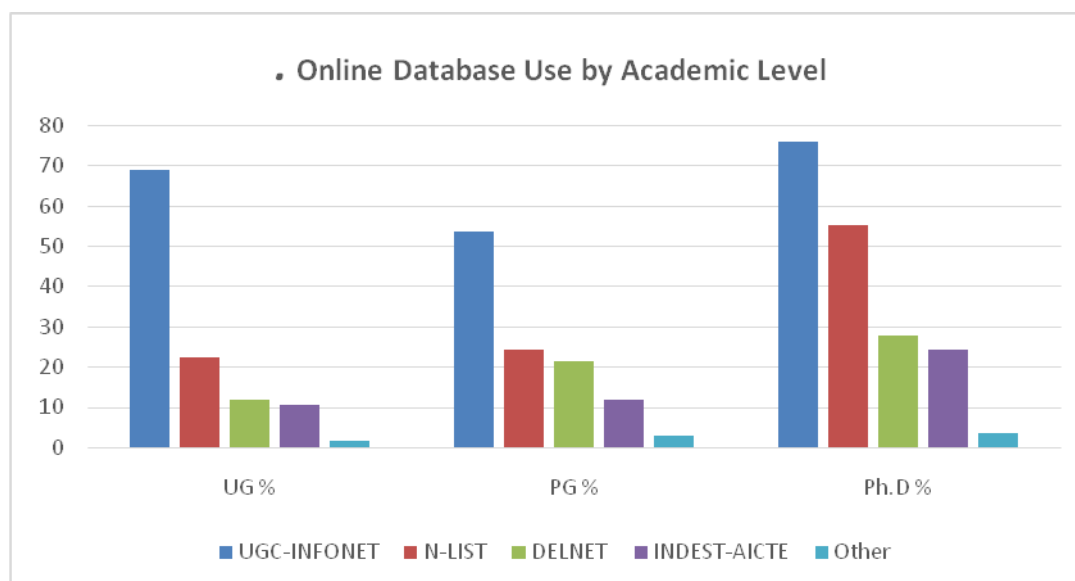


Figure 4. Online Database Use by Academic Level

For each database, a **chi-square test** was used to examine the association between academic level and database use. Five item-level tests were performed, and the p-values were adjusted using the Bonferroni method.

After adjustment, only N-LIST use was significantly associated with academic level:

$$\chi^2(2) = 13.909, \text{ adjusted } p = .005, \text{ Cramer's } V = .215.$$

N-LIST was used by 22.2% of UG, 24.3% of PG and 55.2% of PhD respondents. Cramer's V of .215 indicates a small-to-moderate association. The adjusted p-value for UGC-INFONET was .053, which was close to but still above the .05 significance level. It should therefore be reported as statistically non-significant.

The total number of databases used by each respondent was also compared using a **Kruskal-Wallis Test**:

$$H(2) = 20.018, p < .001, \epsilon^2 = .061.$$

The result indicates a significant academic-level difference in the breadth of database use. The effect size of .061 was larger than the effects observed for visit frequency and adequacy, although it remained modest.

9. SPECIFIC HYPOTHESIS TEST SUMMARY

Table 8. Summary of Inferential Tests

Null hypothesis	Test Statistics	df	p	Effect size	Decision
There is no significant difference in the frequency of library visits among UG, PG and PhD students.	Kruskal-Wallis H = 7.895	2	.019	.020	Reject
There is no significant association between students' academic level and their preferred format of library resources.	Chi-square = 1.522	4	.823	.050	Fail to reject
There is no significant difference in the perceived adequacy of print resources among UG, PG and PhD students.	Kruskal-Wallis H = 8.284	2	.016	.021	Reject
There is no significant difference in the perceived adequacy of electronic resources among UG, PG and PhD students.	Kruskal-Wallis H = 2.561	2	.278	.002	Fail to reject
There is no significant difference in online database utilisation among UG, PG and PhD students.	Kruskal-Wallis H = 20.018	2	<.001	.061	Reject
There is no significant difference between students' adequacy ratings of print and electronic library resources.	Wilcoxon W = 13,929.5	-	.034	.123	Reject

Note. Effect size is reported as epsilon squared (ϵ^2) for Kruskal-Wallis tests, Cramer's V for chi-square tests and r for the Wilcoxon signed-rank test.

10. DISCUSSION

The results portray print and electronic resources as complementary rather than competing formats. More than seven in ten respondents preferred using both. This agrees with Amirtharaj, Raghavan and Arulappan (2023), who found that electronic resources were valued for convenience while print remained useful for studying and note-taking. It also corresponds with Matthews and Johnson (2024), whose participants associated print with concentration and recall.

Academic level affected the intensity and purpose of use more clearly than it affected format preference. Research-related use rose steadily from UG to PhD level, and PhD respondents used a wider range of databases. This pattern aligns with the growing demand for current and specialised literature at advanced stages of study. The significant

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difference in N-LIST use further suggests that research requirements influence the range of electronic services consulted.

Print adequacy differed across academic levels, with PG students reporting higher scores than UG students. By contrast, electronic adequacy did not differ significantly. The mean print score was higher than the electronic score, but the Wilcoxon effect size was small ($r = .123$). The statistically significant findings for visit frequency ($\epsilon^2 = .020$), print adequacy ($\epsilon^2 = .021$) and database count ($\epsilon^2 = .061$) were also small or modest. These results should therefore inform targeted service improvements rather than be interpreted as large divisions among the academic groups.

The findings also support earlier observations that access by itself does not ensure sustained use. Roesnita and Zainab (2005) and Burhansab, Batcha and Ahmad (2020) emphasised the influence of awareness, academic purpose and user guidance. For the colleges represented here, improving discovery and search support may be as important as increasing subscribed electronic resources.

11. FINDINGS OF THE STUDY

- The study included 300 respondents: 135 undergraduate students (45.0%), 136 postgraduate students (45.3%) and 29 PhD students (9.7%).
- Visiting the library once a week was the most common pattern (30.3%), followed by daily visits (23.0%) and visits once every two days (19.0%).
- Library-visit frequency differed significantly across academic levels, $H(2) = 7.895$, $p = .019$, $\epsilon^2 = .020$, although the effect was small.
- PG students visited the library significantly more frequently than UG students (adjusted $p = .017$). Differences involving PhD students were not significant.
- Study was the leading purpose of library visits (83.0%), followed by borrowing books (41.7%), project work (35.0%) and research work (33.7%).
- Research-related use increased with academic level: 20.7% among UG, 40.4% among PG and 62.1% among PhD students. The association was significant, $\chi^2(2) = 23.370$, adjusted $p < .001$, Cramer's $V = .279$.
- Most respondents (71.7%) preferred both print and electronic resources. Print-only resources were preferred by 21.0%, while 7.3% preferred electronic resources only.
- Preferred resource format was not associated with academic level, $\chi^2(4) = 1.522$, $p = .823$, Cramer's $V = .050$.
- Among print resources, books received the highest adequacy rating (75.3%), followed by newspapers (73.3%) and journals or periodicals (65.7%). Braille books received the lowest rating (43.7%).
- Among electronic resources, e-books ranked first in adequacy (65.0%), followed by e-journals (58.3%) and databases (58.0%). CDs or DVDs ranked last (42.0%).
- Perceived adequacy differed across academic levels for dissertations, $\chi^2(2) = 18.710$, adjusted $p < .001$, Cramer's $V = .250$, and theses, $\chi^2(2) = 10.769$, adjusted $p = .041$, Cramer's $V = .189$.
- The overall print adequacy score differed across academic levels, $H(2) = 8.284$, $p = .016$, $\epsilon^2 = .021$. PG students reported higher print adequacy than UG students, but the effect was small.
- Electronic adequacy scores did not differ significantly across UG, PG and PhD students, $H(2) = 2.561$, $p = .278$, $\epsilon^2 = .002$.

- The mean print adequacy score was 60.74, compared with 54.67 for electronic resources. The difference was significant but small, $W = 13,929.5$, $p = .034$, $r = .123$.
- UGC-INFONET was the most frequently used database (62.7%), followed by N-LIST (26.3%), DELNET (17.7%) and INDEST-AICTE (12.3%).
- N-LIST use differed across academic levels, $\chi^2(2) = 13.909$, adjusted $p = .005$, Cramer's $V = .215$, and was highest among PhD students (55.2%).
- The number of databases used differed across academic levels, $H(2) = 20.018$, $p < .001$, $\varepsilon^2 = .061$.
- PhD respondents used more database types than UG and PG respondents; both pairwise comparisons had adjusted $p < .001$. UG and PG students did not differ significantly.
- Academic level significantly influenced library-visit frequency, print-resource adequacy and online database utilisation.
- Academic level did not significantly influence students' preferred resource format or perceived adequacy of electronic resources.
- The main null hypothesis was partially rejected. Academic level was related to selected dimensions of utilisation, especially visit frequency, research-oriented use, print adequacy, and breadth of database use, but not to overall format preference or electronic-resource adequacy.

12. LIMITATIONS

The study was limited to 300 students from selected Mumbai colleges and may not represent all college-library users in the region. The PhD group was smaller than the UG and PG groups, which reduced the precision of comparisons involving PhD respondents. The results were based on self-reported use and perceived adequacy rather than independently verified holdings or transaction records. Because the study was cross-sectional, the observed associations should not be interpreted as causal relationships.

13. RECOMMENDATIONS

College libraries should maintain a balanced collection in which core textbooks and frequently used print materials are supported by current e-books, e-journals, databases and e-theses. Orientation for UG and PG students should include database discovery, keyword searching and access procedures, while PhD students may benefit from advanced searching and research-literature support. Libraries should periodically assess adequacy and use by academic level, promote underused electronic resources, and use the findings to set acquisition and training priorities.

CONCLUSION

Students in the selected Mumbai colleges relied on both print and electronic library resources. Academic level was associated with visit frequency, research-related use, perceived adequacy of print resources, and breadth of database use, but not with overall format preference or electronic-resource adequacy. PG students reported more frequent visits and higher print adequacy, whereas PhD students used a wider range of databases. The main null hypothesis was therefore partially rejected, and the alternative hypothesis received partial support. The evidence favours

balanced collections combined with academic-level-specific guidance for discovering and using electronic scholarly resources.

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