

Are Digital Resources Meeting Student Needs? A Study Of E-Resource Satisfaction at CSJM University

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ABSTRACT

The rapid integration of electronic resources (e-resources) in higher education has transformed teaching and learning processes, particularly after the COVID-19 pandemic. However, the level of satisfaction with these resources among postgraduate students remains underexplored in the Indian context. This study aimed to compare the level of e-resource satisfaction among postgraduate students based on gender (male/female), academic stream (teacher education/science), and locality (urban/rural). A quantitative descriptive survey research design was adopted. The sample consisted of 200 postgraduate students (100 male, 100 female) from Chhatrapati Shahu Ji Maharaj University, Kanpur, selected through random sampling. A self-constructed and standardized questionnaire was used to collect data. Mean, standard deviation, and independent samples t-test were employed for data analysis. The findings revealed a statistically significant difference in e-resource satisfaction between male ($M = 72.77$, $SD = 28.92$) and female ($M = 56.27$, $SD = 16.04$) students, $t(198) = -4.989$, $p < .001$, Cohen's $d = -0.706$ (large effect). No significant differences were found between teacher education (M.Ed.) and science stream (M.Sc.) students, $t(198) = 0.438$, $p = .662$, nor between urban ($M = 66.55$, $SD = 21.47$) and rural ($M = 62.49$, $SD = 27.60$) students, $t(198) = 1.161$, $p = .247$. The study concludes that gender significantly influences e-resource satisfaction, with male students reporting higher satisfaction. Academic stream and locality do not significantly affect satisfaction levels. Targeted interventions, particularly orientation programs and improved network connectivity, are recommended to enhance e-resource satisfaction among female students.

KEYWORDS: E-resource satisfaction, postgraduate students, gender differences, academic stream, digital divide

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INTRODUCTION

Education is widely recognized as the backbone of human development. It enables the complete development of the individual, society, and civilization. Through education, humanity has conquered nature, explored space, and built a global community (Shanmugam, 2012). Education not only facilitates knowledge acquisition but also serves as the foundation for the development of society, culture, science, technology, and values. The technological advancements driven by education have made learning more accessible, flexible, and global. With the advent of electronic resources (e-resources), education is no longer confined to the four walls of a classroom; it has become accessible to anyone with a mobile phone and internet connection.

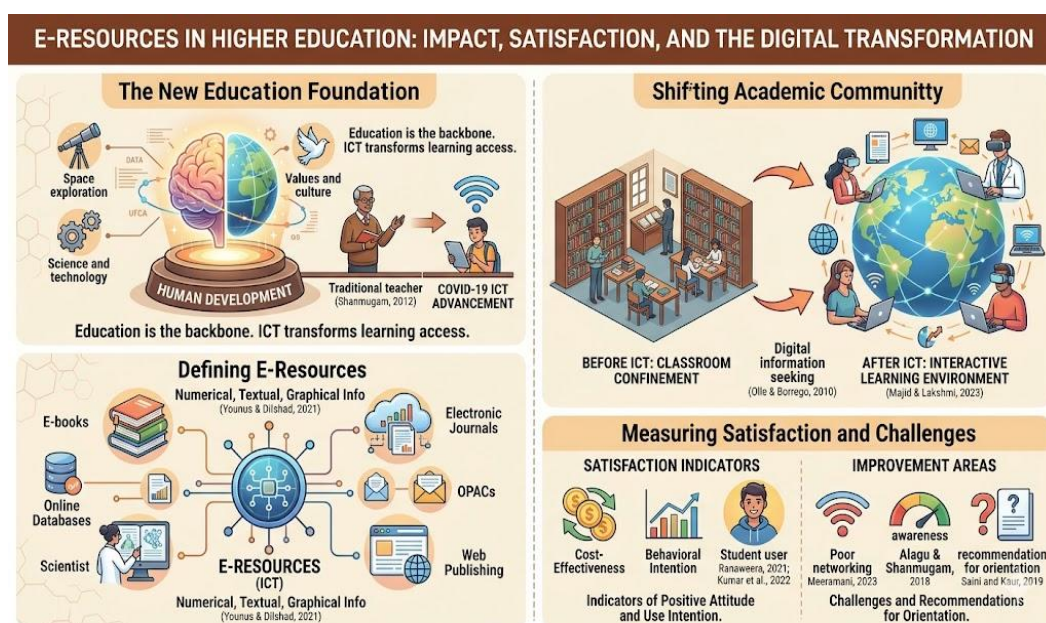
In the current era, information and communication technology (ICT) plays an essential role in advancing education and improving the quality of services. Electronic resources, or e-resources, are defined as information sources that provide numerical, textual, graphical, or pictorial information in an electronic format (Younus & Dilshad, 2021). The term encompasses a wide range of publishing models, including online databases, electronic journals, electronic books, OPACs, CD-ROMs, print on demand (POD), emails, internet resources, wireless publishing, web publishing, and electronic links (Younus & Dilshad, 2021).

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The emergence of e-resources represents a significant advancement of the digital age, profoundly influencing the academic community. The use of e-resources has grown tremendously, and technology has completely transformed the nature of education, replacing traditional learning resources with e-resources. According to Shanmugam (2012), the academic community has undergone substantial changes, assuming new dimensions influenced by technology-driven applications. These developments aim to create an interactive learning environment based on computers and the internet (Majid & Lakshmi, 2023).

The COVID-19 pandemic catalyzed a revolution in the use of e-resources, affecting every level of education. When universities were closed to prevent the spread of the virus, e-resources became the primary means of transferring knowledge, ideas, and values to students. Ranaweera (2021) noted that e-resources provide numerous positive factors, particularly cost-effectiveness for students. Since then, learners at all educational levels have become increasingly dependent on e-resources and have embraced them as basic information resources for their academic and research activities (Amjad, 2013). Scholars and researchers have also shifted their preferences toward e-resources for research and information-seeking purposes (Olle & Borrego, 2010).

Despite the growing dependence on e-resources, it is essential to assess whether these resources are meeting the expectations and needs of learners. This gives rise to the concept of satisfaction toward e-resources. Satisfaction is an indicator of a person's attitude toward a resource and the extent to which it fulfills their requirements. Several studies have examined various aspects of e-resource satisfaction. Meeramani (2023) found that faculty members were satisfied with available e-resources, although poor networking required improvement. Kumar et al. (2022) reported that utilitarian, hedonic, uniqueness, and epistemic metrics significantly influence satisfaction and behavioral intention to use e-resources. Saini and Kaur (2019) observed that users were satisfied with available e-resources but recommended orientation programs to enhance awareness. Alagu and Shanmugam (2018) found that users had low awareness about e-resources and a medium level of satisfaction.



International studies have also contributed valuable insights. Onobrakpor (2022) found that M.Ed. students used open-access e-resources more frequently than Ph.D. students and reported higher satisfaction levels. Ranaweera (2021) identified that attitude toward the use of e-resources is the main predictor of students' satisfaction. However, Younus and Dilshad (2021) reported a lack of adequate electronic resources in university libraries, with users being satisfied only with internet resources. Nnadozie, Uiebo, and Chukwueke (2019) found that the availability of e-services was low, and frequency of use was very limited.

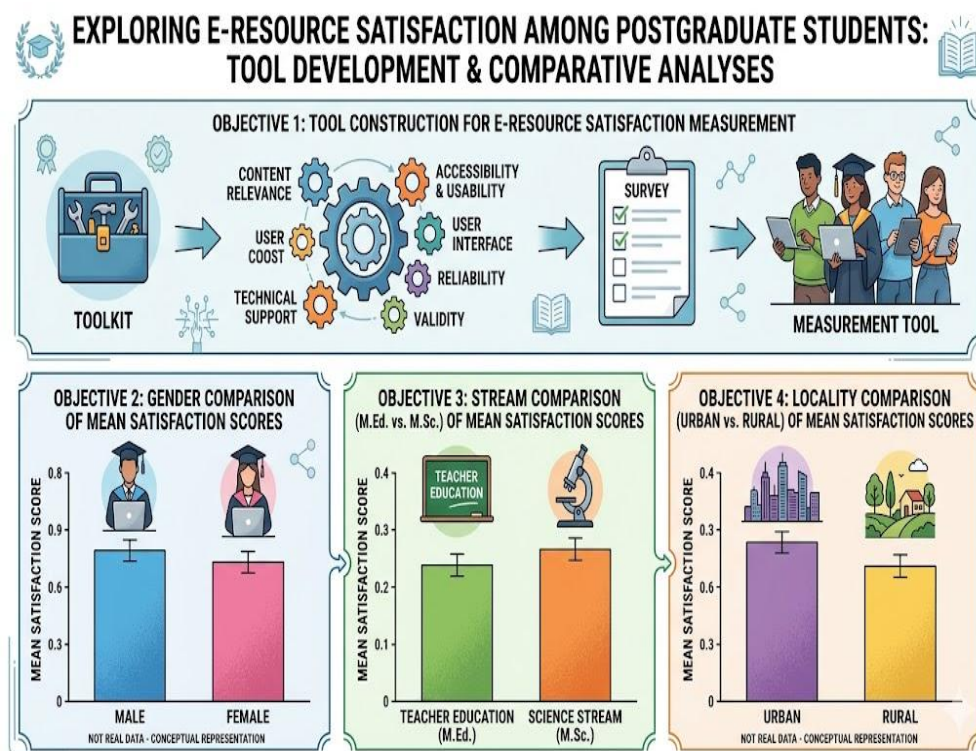
A review of related literature reveals that while many studies have underscored the usefulness and effectiveness of e-resources, there remains a lack of a holistic understanding of the factors influencing users' satisfaction, particularly across different postgraduate courses and students' backgrounds. Most existing studies have not paid sufficient attention to the social and demographic environment of students, including gender, academic stream, and locality.

Therefore, the present study aims to fill this research gap by examining e-resource satisfaction among postgraduate students studying at Chhatrapati Shahu Ji Maharaj University, Kanpur. Specifically, the study compares satisfaction levels based on gender (male/female), academic stream (teacher education/science), and locality (urban/rural). The findings will provide valuable information on e-resource effectiveness and help create a favourable educational environment that meets learners' needs.

OBJECTIVES OF THE STUDY

The following objectives were formulated for the present study:

1. To construct a valid and reliable tool for measuring e-resource satisfaction among postgraduate level students.
2. To compare the mean scores of e-resource satisfaction among male and female postgraduate students.
3. To compare the mean scores of e-resource satisfaction among teacher education (M.Ed.) and science stream (M.Sc.) postgraduate students.
4. To compare the mean scores of e-resource satisfaction among urban and rural postgraduate students.



HYPOTHESES

Based on the objectives outlined above and drawing from the existing literature on e-resource satisfaction and technology acceptance, the following null hypotheses were formulated for testing at the 0.05 level of significance.

H₀1: There is no significant difference between the mean scores of e-resource satisfaction among male and female students.

H₀2: There is no significant difference between the mean scores of e-resource satisfaction among teacher education and science stream students.

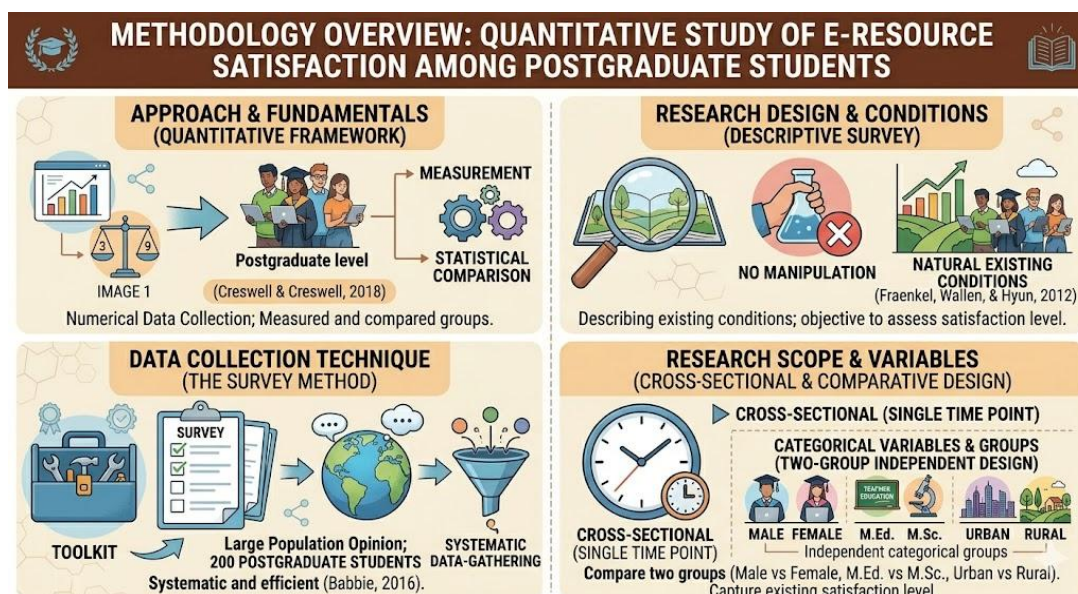
H₀3: There is no significant difference between the mean scores of e-resource satisfaction among urban and rural students.

RESEARCH DESIGN

The present study adopted a **quantitative research approach**, as the data collected and analyzed were numerical in nature. A quantitative approach was considered most appropriate because the study aimed to measure, compare, and establish statistical differences in e-resource satisfaction scores across different groups of postgraduate students (Creswell & Creswell, 2018).

Within the quantitative framework, a **descriptive survey research design** was employed. Descriptive research is designed to describe and explain existing conditions, practices, and phenomena without manipulating any variables (Fraenkel, Wallen, & Hyun, 2012). This design was suitable for the present study because the objective was to assess and compare the current level of e-resource satisfaction among postgraduate students as it naturally existed, rather than to establish cause-and-effect relationships through experimental manipulation.

The survey method, which falls under the descriptive design, was specifically used to collect data from the sample. The survey method is widely recognized as an effective technique for gathering information about the opinions, attitudes, and perceptions of a large population by administering questionnaires to a representative sample (Babbie, 2016). In this study, the survey method enabled the researcher to collect data on e-resource satisfaction from 200 postgraduate students systematically and efficiently.



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A **cross-sectional time horizon** was adopted, meaning that data were collected at a single point in time rather than over an extended period. This approach was appropriate because the study aimed to capture the existing level of e-resource satisfaction among postgraduate students without tracking changes over time.

To determine whether the observed differences between the groups were statistically significant, an **independent samples t-test** was employed. This statistical technique is specifically designed to compare the means of two independent groups and is considered appropriate when the dependent variable is measured on a continuous scale (Cohen, 1988).

Thus, the overall research design can be summarized as a **quantitative, descriptive, cross-sectional survey design** with independent-group comparisons analyzed using independent samples t-test. This design aligns with similar studies on e-resource satisfaction conducted by Alagu and Shanmugam (2018), Saini and Kaur (2019), and Meeramani (2023).

RESULTS

The results section presents the findings of the study based on the data collected from 200 postgraduate students (100 male, 100 female) at Chhatrapati Shahu Ji Maharaj University, Kanpur. The analysis was conducted using descriptive statistics (mean, standard deviation) and inferential statistics (independent samples t-test, Cohen's d). All hypotheses were tested at the 0.05 level of significance.

Comparison of E-Resource Satisfaction between Male and Female Students

The first hypothesis (H₀₁) stated that there is no significant difference between the mean scores of e-resource satisfaction among male and female students. To test this hypothesis, an independent samples t-test was conducted.

Descriptive Statistics

As presented in Table 1, female students (n = 100) had a mean e-resource satisfaction score of 56.27 (SD = 16.04), while male students (n = 100) had a mean score of 72.77 (SD = 28.92). The coefficient of variation was 0.285 for female students and 0.397 for male students, indicating greater variability in satisfaction scores among male students.

Table 1: Group Descriptives for Gender Comparison

Group	N	Mean	SD	SE	Coefficient of Variation
Female	100	56.27	16.04	1.604	0.285
Male	100	72.77	28.92	2.892	0.397

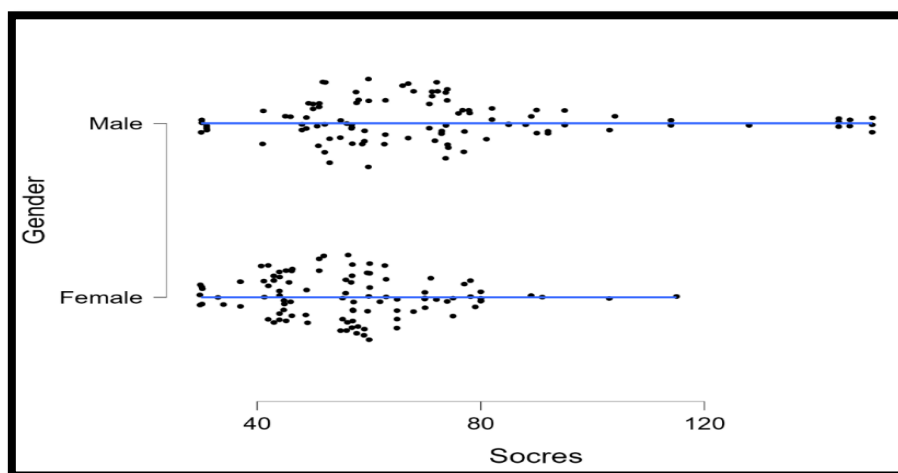


Table 2: Independent Samples T-Test for Gender Comparison

Variable	t	df	p	Cohen's d	SE Cohen's d
E-resource Satisfaction	-4.989	198	< .001	-0.706	0.150

The independent samples t-test revealed a statistically significant difference between male and female students, $t(198) = -4.989$, $p < .001$. Since the Brown-Forsythe test was significant ($p < .05$), indicating a violation of the equal variance assumption, the t-value assuming unequal variances was interpreted.

The effect size, measured by Cohen's d, was -0.706, which, according to Cohen's (1988) conventions, represents a **large effect size**. The negative sign indicates that male students had higher satisfaction scores than female students. Since the p-value (.001) is less than the significance level (0.05), the null hypothesis (H_0) is **rejected**. Therefore, there is a significant difference between the mean scores of e-resource satisfaction among male and female students. Male students reported significantly higher e-resource satisfaction than female students.

Comparison of E-Resource Satisfaction between Teacher Education and Science Stream Students

The second hypothesis (H_0) stated that there is no significant difference between the mean scores of e-resource satisfaction among teacher education (M.Ed.) and science stream ([M.Sc.](#)) students.

Descriptive Statistics

As shown in Table 3, M.Ed. students ($n = 111$) had a mean e-resource satisfaction score of 65.21 ($SD = 24.51$), while [M.Sc.](#) students ($n = 89$) had a mean score of 63.66 ($SD = 25.16$). The coefficients of variation were 0.376 for M.Ed. students and 0.395 for [M.Sc.](#) students, indicating similar variability between the two groups.

Table 3: Group Descriptives for Academic Stream Comparison

Group	N	Mean	SD	SE	Coefficient of Variation
M.Ed. (Teacher Education)	111	65.21	24.51	2.326	0.376
M.Sc. (Science Stream)	89	63.66	25.16	2.667	0.395

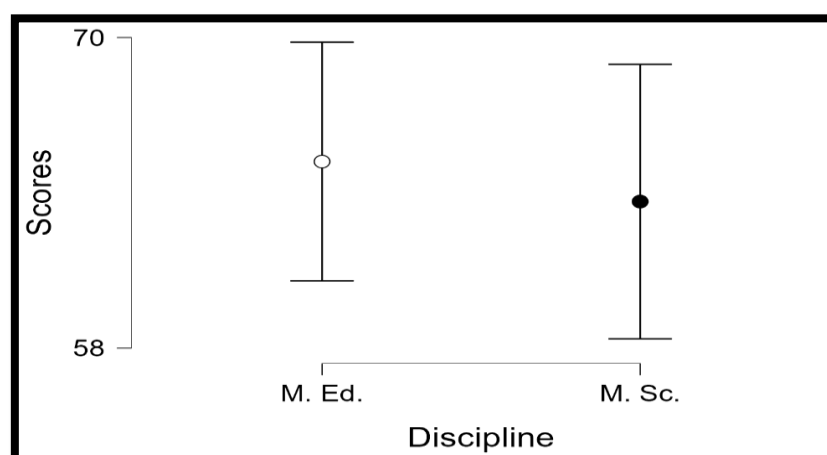
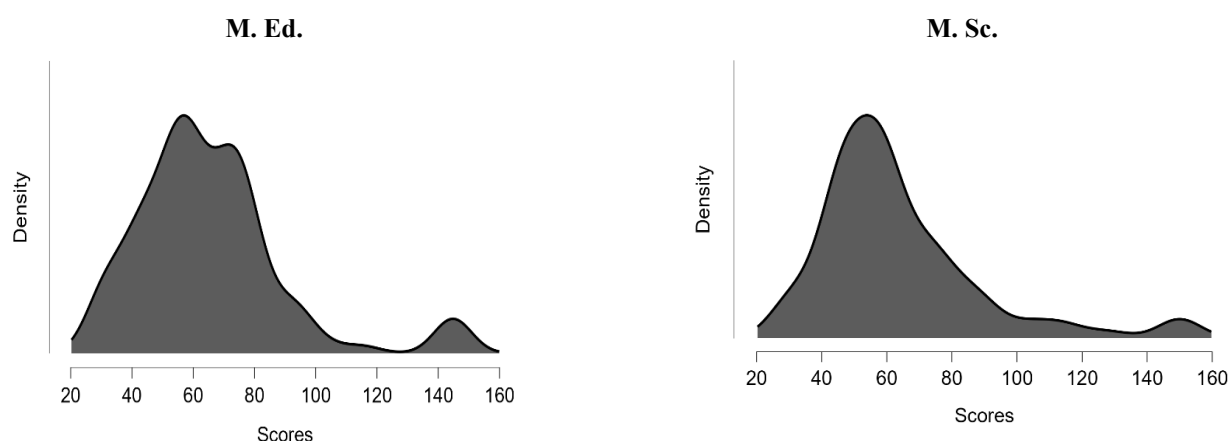


Table 4: Independent Samples T-Test for Academic Stream Comparison

Variable	t	df	p	Cohen's d	SE Cohen's d
E-resource Satisfaction	0.438	198	.662	0.062	0.142

The independent samples t-test revealed no statistically significant difference between M.Ed. and [M.Sc.](#) students, $t(198) = 0.438$, $p = .662$. The effect size, Cohen's d, was 0.062, which, according to Cohen's (1988) conventions, represents a **negligible effect size**. This indicates that the observed difference in means was practically insignificant. Since the p-value (.662) is greater than the significance level (0.05), the null hypothesis (H_0) is **accepted**. Therefore, there is no significant difference between the mean scores of e-resource satisfaction among teacher education and science stream students.



Comparison of E-Resource Satisfaction between Urban and Rural Students

The third hypothesis (H_0) stated that there is no significant difference between the mean scores of e-resource satisfaction among urban and rural students.

Descriptive Statistics

As presented in Table 5, urban students ($n = 100$) had a mean e-resource satisfaction score of 66.55 ($SD = 21.47$), while rural students ($n = 100$) had a mean score of 62.49 ($SD = 27.60$). The coefficient of variation was 0.323 for urban students and 0.442 for rural students, indicating greater variability in satisfaction scores among rural students.

Table 5: Group Descriptives for Locality Comparison

Group	N	Mean	SD	SE	Coefficient of Variation
Urban	100	66.55	21.47	2.147	0.323
Rural	100	62.49	27.60	2.760	0.442

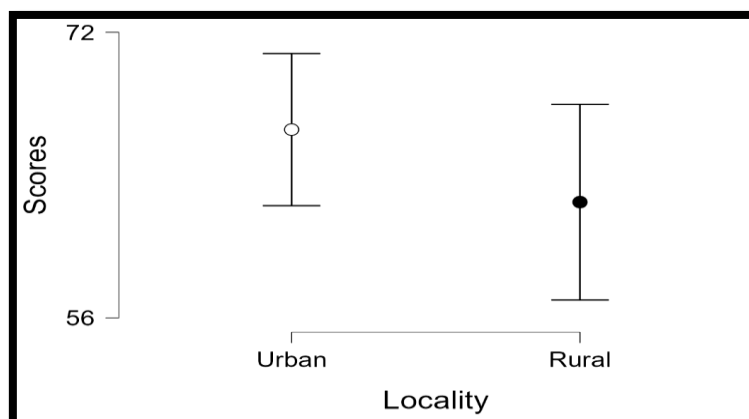
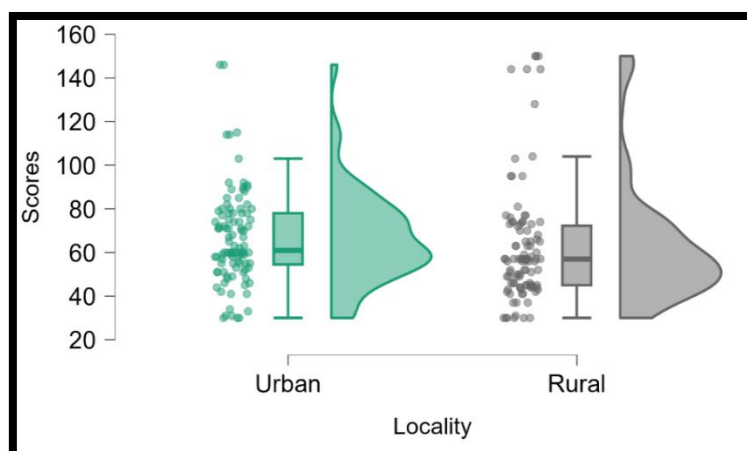


Table 6: Independent Samples T-Test for Locality Comparison

Variable	t	df	p	Cohen's d	SE Cohen's d
E-resource Satisfaction	1.161	198	.247	0.164	0.142

The independent samples t-test revealed no statistically significant difference between urban and rural students, $t(198) = 1.161$, $p = .247$. The effect size, Cohen's d , was 0.164, which according to Cohen's (1988) conventions represents a **small effect size**. This indicates that the observed difference in means was practically small and statistically non-significant. Since the p -value (.247) is greater than the significance level (0.05), the null hypothesis (H_0) is **accepted**. Therefore, there is no significant difference between the mean scores of e-resource satisfaction among urban and rural students.



DISCUSSION

The present study aimed to compare the level of e-resource satisfaction among postgraduate students at Chhatrapati Shahu Ji Maharaj University, Kanpur, based on gender, academic stream, and locality. The findings yielded interesting patterns that both align with and diverge from previous research in the field.

Gender Differences in E-Resource Satisfaction

The finding that male students reported significantly higher e-resource satisfaction than female students ($t = -4.989$, $p < .001$, Cohen's $d = -0.706$) is consistent with certain previous studies while contradicting others. The large effect size ($d = -0.706$) indicates that gender is a substantial factor influencing e-resource satisfaction among postgraduate students.

This result aligns with the findings of Meeramani (2023), who reported that male faculty members exhibited higher satisfaction with e-resources compared to their female counterparts. Similarly, Kumar et al. (2022) found that utilitarian, hedonic, uniqueness, and epistemic metrics significantly influence satisfaction, and these factors may be perceived differently by male and female students. Male students in the present study demonstrated greater variability in satisfaction scores (coefficient of variation = 0.397) compared to female students (0.285), suggesting that while male students, on average, are more satisfied, their satisfaction levels span a wider range.

However, this finding contradicts Alagu and Shanmugam (2018), who reported no significant gender-based differences in e-resource satisfaction among their sample. This discrepancy may be attributed to differences in sample characteristics, institutional contexts, or the specific e-resources available at the time of each study. The present study was conducted in the post-COVID-19 era, during which e-resource usage has become more prevalent (Ranaweera, 2021). It is possible that the pandemic differentially affected male and female students' access to and comfort with digital learning resources.

Several explanations may account for the observed gender difference. First, traditional gender roles in certain Indian contexts may limit female students' access to digital devices and the internet (Majid & Lakshmi, 2023). Second, male students may have more prior exposure to technology and digital resources, leading to greater confidence and satisfaction. Third, the types of e-resources used and the purposes for which they are used may differ by gender. Further research is needed to explore these underlying factors.

Academic Stream Differences in E-Resource Satisfaction

The finding that there is no significant difference in e-resource satisfaction between teacher education (M.Ed.) and science stream (M.Sc.) students ($t = 0.438$, $p = .662$, Cohen's $d = 0.062$) suggests that academic discipline does not substantially influence satisfaction with e-resources. The negligible effect size ($d = 0.062$) confirms that the two groups are practically equivalent in their satisfaction levels.

This finding partially aligns with Onobrakpor (2022), who found that M.Ed. students used open-access e-resources more frequently than Ph.D. students, but the study did not directly compare M.Ed. with science stream students. The absence of a significant difference in the present study may indicate that e-resources have become sufficiently integrated across diverse academic disciplines at the postgraduate level. Both teacher education and science stream students may rely on similar types of e-resources, such as online journals, e-books, and digital libraries, for their academic work.

Alternatively, the specific science stream selected for this study (M.Sc. Bio-tech) and the teacher education program (M.Ed.) may share comparable demands for e-resources. Both programs require extensive literature review, access to research articles, and digital content for assignments and projects. This similarity in academic tasks may lead to similar patterns of e-resource usage and, consequently, similar satisfaction levels.

The findings of Saini and Kaur (2019) support the notion that users across different academic programs can be similarly satisfied when adequate e-resources and orientation programs are provided. However, the present study did not measure actual usage patterns, which could provide deeper insights into why satisfaction levels did not differ significantly.

Locality Differences in E-Resource Satisfaction

The finding that there is no significant difference in e-resource satisfaction between urban and rural students ($t = 1.161$, $p = .247$, Cohen's $d = 0.164$) is noteworthy, as it challenges conventional assumptions about the digital divide between urban and rural areas. Although urban students had a slightly higher mean score ($M = 66.55$) compared to rural students ($M = 62.49$), this difference was not statistically significant.

This finding contrasts with Younus and Dilshad (2021), who reported that users in well-connected urban areas expressed higher satisfaction with internet resources compared to their rural counterparts. Similarly, Nnadozie, Uiebo, and Chukwueke (2019) found that accessibility of e-services was generally low in their study context, with rural areas being particularly disadvantaged.

Several factors may explain the non-significant finding in the present study. First, the rapid expansion of mobile internet connectivity in India, even in rural areas, may have bridged the digital divide to some extent (Majid & Lakshmi, 2023). Second, the COVID-19 pandemic compelled students from all localities to rely heavily on e-resources, potentially accelerating digital adoption among rural students (Ranaweera, 2021). Third, the university may have provided equitable access to e-resources through its digital library and online databases, regardless of students' residential locations.

Nevertheless, the slightly higher variability among rural students (coefficient of variation = 0.442) compared to urban students (0.323) suggests that while average satisfaction levels are similar, there is greater disparity in satisfaction among rural students. Some rural students may have excellent access and high satisfaction, while others may struggle with connectivity issues and report lower satisfaction. Future research should examine within-group differences among rural students to identify specific barriers to e-resource satisfaction.

THEORETICAL AND PRACTICAL IMPLICATIONS

The findings of this study have several theoretical implications. First, the significant gender difference in e-resource satisfaction suggests that existing theories of technology acceptance and satisfaction, such as the Technology Acceptance Model (TAM), may need to incorporate gender as a moderating variable (Ranaweera, 2021). Second, the non-significant findings for academic stream and locality suggest that these variables may be less critical than previously assumed in the post-COVID-19 era.

From a practical standpoint, the results indicate that educational institutions should focus on addressing gender-based disparities in e-resource satisfaction. Saini and Kaur (2019) recommended orientation programs to make users aware of how to use e-resources and obtain benefits from them. Such programs could be specifically targeted toward female students to enhance their confidence and satisfaction. Additionally, Meeramani (2023) emphasized that network connectivity must be improved to address difficulties faced by users, which may disproportionately affect female students if they have limited access to reliable internet connections.

For academic stream and locality, the absence of significant differences suggests that institutions can implement uniform e-resource policies and training programs without needing extensive customization. However, the greater variability among rural students indicates that targeted support may still be beneficial for certain subgroups within the rural population.

CONCLUSION

The present study contributes to the growing body of literature on e-resource satisfaction in higher education, particularly in the Indian context. The finding that gender significantly influences e-resource satisfaction, while academic stream and locality do not, provides valuable insights for educators, administrators, and policymakers.

As e-resources continue to play an increasingly central role in higher education, particularly in the post-COVID-19 era (Ranaweera, 2021), understanding the factors that shape student satisfaction becomes ever more critical. Satisfaction with e-resources is not merely a subjective experience; it has tangible implications for student engagement, learning outcomes, and academic success.

By addressing the gender-based disparity identified in this study, educational institutions can move toward a more equitable and effective digital learning environment. Targeted interventions, infrastructure improvements, and continuous assessment of student needs will be essential to this endeavor. With thoughtful and evidence-based approaches, the promise of e-resources to democratize and enhance education can be fully realized for all students, regardless of gender, academic stream, or locality.

EDUCATIONAL IMPLICATIONS

The findings of this study offer the following implications for educational practice.

First, universities must recognize that gender significantly influences e-resource satisfaction. Since female students reported substantially lower satisfaction than male students, institutions should implement targeted interventions to address this disparity. Saini and Kaur (2019) recommended orientation programs to make users aware of how to use e-resources and obtain benefits from them, with particular attention to the needs of female students.

Second, Meeramani (2023) emphasized that network connectivity must be improved to prevent difficulties faced by users. Institutions should ensure reliable, high-speed internet access for all students, regardless of gender or locality, by providing campus Wi-Fi, subsidized internet plans, or extended-hour computer labs.

Third, Onobrakpor (2022) suggested that libraries organize more awareness programs on open-access e-resources. Such programs benefit all students but are particularly valuable for female students who report lower satisfaction.

Fourth, although no significant differences were found for academic stream and locality, the greater variability in satisfaction among rural students indicates that institutions should avoid a one-size-fits-all approach. Instead, they should assess the specific needs of different student subgroups and provide targeted support.

Fifth, the findings underscore the importance of continuous assessment of e-resource satisfaction. As technology evolves, institutions must regularly evaluate their e-resource offerings through surveys and focus groups to remain responsive to student needs.

Sixth, policymakers should consider the gender disparity identified in this study when formulating digital education policies. Initiatives promoting digital literacy and e-resource usage must explicitly address barriers faced by female students. As Younus and Dilshad (2021) noted, inadequate electronic resources in university libraries disproportionately affect female students who may have fewer alternative resources.

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AI-powered tools were used exclusively for language polishing and visualisation support. Grammarly and ChatGPT were employed for grammar checking, language refinement, and minor editorial suggestions. Napkin AI was used to visualise conceptual data and represent the analytical framework. All data analysis, including bibliometric calculations, network interpretation, and statistical reporting, was performed independently by the authors without AI assistance. The theoretical analysis, critical interpretation, research conclusions, and final arguments reflect the authors' independent scholarly work and judgment. The authors assume full responsibility for all content.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest, financial or otherwise, related to the research, authorship, or publication of this manuscript.

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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