



Narrowing the Digital Gap: Factors affecting E-Book Adoption in Delhi's Higher Education Institutions

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This study aimed to explore the complex landscape of e-book adoption in higher education institutions located in Delhi, India. The research investigated a range of critical factors that influenced the integration and utilization of e-books within these institutions. Key factors identified in this study include technical and accessibility issues, user experience and usability concerns, as well as awareness and cultural factors. In order to collect data for this study, the survey method was employed, utilizing structured questionnaires. The data collection process was supplemented by interviews and observations where necessary. A total of 937 respondents (238 undergraduates, 456 postgraduates and 243 research scholars) filled and returned the questionnaire. The study findings revealed that a considerable portion of the respondents from all categories faced network difficulties when accessing e-books. Notably, research scholars frequently mentioned the lack of relevant titles, eye strain, and limited computer experience as major obstacles in their adoption of e-books. Additionally, the study highlighted cultural resistance and financial barriers as significant factors impeding the acceptance of e-books. Nearly half of the respondents from all categories (UG, PG and RS) expressed concerns over digital rights management (DRM) restrictions, which hindered their willingness to adopt e-books. Furthermore, issues such as the unavailability of e-readers and complex subscription processes also contributed to a negative user experience. Strategies focusing on increasing relevant content, improving device compatibility, and providing instructional support could significantly influence e-book adoption across various academic levels. By understanding these factors, institutions can work towards addressing the barriers and improving the integration and utilization of e-books in education.

Keywords: E-books, E-book Usage, Influencing Factors, Delhi, Digital Divide, E-book Adoption, India, Universities, Higher Education

Introduction

In today's digital era, technology has permeated various aspects of our lives, including education. One notable technological advancement in education is the emergence of e-books as a popular alternative to traditional printed reading materials. E-books are electronic versions of books that can be accessed and read on devices such as tablets, e-readers, smartphones, or computers. E-books offer numerous benefits to higher education students, which have contributed to their increasing popularity among this demographic (Tracy¹). E-books are becoming more prevalent among higher education students due to several reasons. Firstly, one of the main advantages of e-books is their accessibility. With e-books, students can access their reading materials anytime and anywhere as long as they have a device and an internet connection. Secondly, the acceptance of e-books in general has significantly increased over the years. This can be

attributed to the technological advancements that have made reading on digital devices more convenient and user-friendly. Additionally, the high cost of print textbooks has also played a significant role in the adoption of e-books among higher education students. The exorbitant prices of traditional textbooks have been a major burden for students, often leading to financial strain (Robb²). The use of e-books provides a cost-effective alternative, as they are generally cheaper or even free compared to print textbooks. Moreover, e-books offer unique features and functionalities that enhance the learning experience for higher education students. E-books often come with interactive features such as embedded web links, video clips, and audio files. These features allow students to engage with the content dynamically and interact, making the learning process more interesting and effective. Furthermore, e-books provide the opportunity for personalized learning. Students can

customize their reading experience by adjusting font size, highlighting important passages, and taking digital notes (Huang *et al.*³). This level of customization allows students to tailor their learning experience to their individual needs and preferences. In a study conducted on the use of e-books among higher education students, participants described an increase in cognitive engagement due to the ability to utilize e-book features and engage with media, in addition to text. E-books also offer a more environmentally friendly option for higher education students (Massis⁴). The production of print textbooks contributes to deforestation and the consumption of resources. By switching to e-books, students can significantly reduce their carbon footprint and contribute to a more sustainable future. In conclusion, the use of e-books among higher education students has become increasingly popular due to their accessibility, acceptance, cost-effectiveness, and enhanced features. A 2022 survey findings have brought attention to a prevailing trend in academic libraries, revealing that nearly 85% of these libraries have integrated themselves with e-books and digital audiobooks (New Choice Survey⁵). Furthermore, e-books provide a more sustainable and environmentally friendly option. The use of e-books has garnered a significant interest, especially in the light of the COVID-19 pandemic's rapid digital transformation. Numerous reasons, including the need for distant learning solutions, financial considerations and technology improvements have contributed to this trend. Furthermore, the pandemic has sped up the shift to digital resources; as a result, universities adopted blended learning models that include e-books as necessary learning tools (Cheung *et al.*⁶). Government interventions have also played a significant role in promoting the adoption of e-books among higher education students. These interventions have included initiatives to provide students with access to digital reading devices, subsidies for e-book purchases, and the development of online platforms for e-books. These interventions have helped to make e-books more accessible and affordable for students, further contributing to their popularity in higher education settings. However, it is important to note that while e-books offer many benefits, they also present some challenges (Huang *et al.*³). For example, many students still prefer reading printed books over e-books. This preference for printed books can be attributed to a variety of factors. Some students find it

easier to concentrate and retain information when reading from a physical book (Rosenwald⁷).

Review of Literature

The examination of e-book adoption unveils the pivotal role played by factors such as technological proficiency, individual preferences, and exposure to trial access in shaping usage patterns. This recognition empowers educators and librarians to tailor strategies effectively, thereby enhancing teaching and learning experiences within higher education institutions (Jayasundara⁸). Over a span of seven years, a study tracked the reception of e-books among first-year undergraduate students enrolled in an information management program. Through convenience sampling of 301 participants, the study assessed e-book acceptance across four dimensions—usefulness, ease of use, attitude, and behavioral intention—employing the Technology Acceptance Model. The findings emphasized that perceived usefulness emerged as a more influential factor than ease of use in determining e-book utilization, offering significant insights for library services, particularly among students in the social sciences (Nahotko and Deja⁹). Similarly, Lamothe's investigation at Laurentian University over nine years revealed a strong association between e-book usage and collection size, notably among graduate students, while undergraduates and faculty exhibited lower levels of engagement. The study identified features such as efficient search engines, full-text downloads, and selective title acquisition as catalysts for e-book utilization, underscoring the importance of tailored collection development strategies (Lamothe¹⁰). In another study conducted at Franklin & Marshall College, Zide and Eiford found that despite a notable willingness to engage with e-books among the community, a third of individuals expressed a preference for print. Access barriers, such as password restrictions, were identified, highlighting the need for enhanced marketing efforts and customization of collections based on user preferences (Zide and Eiford¹¹). Contrary to expectations, Slater's literature review since 2000 revealed that e-books have not yet gained substantial traction in academic library collections. Preferences leaned towards shorter e-reading sessions, with library catalogues preferred over search engines for access. However, certain disciplines, such as computer science, business, and economics, demonstrated higher e-book usage

(Slater¹²). Yoo & Roh's survey, utilizing the UTAUT model, highlighted the apprehension of non-experienced users towards e-book adoption, influenced by preconceived notions and perceived complexities. Performance expectancy emerged as a critical determinant for both experienced and non-experienced users' intentions to use e-textbooks (Yoo and Roh¹³). Finally, Fry's examination at Bowling Green State University underscored the persistent preference for print books over e-books, despite efforts to promote digital resources. The findings emphasize the imperative for academic libraries to reassess acquisition models to align with evolving user preferences and optimize collection development strategies (Fry¹⁴). Fazackerley¹⁵ highlighted that UK university librarians have reported substantial price hikes imposed by publishers, which have disrupted students' reading lists and limited their ability to afford recommended coursebooks. Wilson¹⁶ in a study at Troy university further found that 57% of users struggled to access e-books via library websites, primarily due to a lack of knowledge on how to use them and a lack of awareness of the e-books available. Preferences for print materials and difficulty in finding relevant e-books also contributed to this reluctance. Ahmad¹⁷ in his findings, noted that digital rights management (DRM) restrictions on accessing, copying, and printing e-books frustrate students, despite e-book collections generally meeting their needs. Graduate students, particularly those in coursework, were more inclined to use e-books compared to other groups. Nazari¹⁸ identified additional barriers to e-book adoption at Tabriz University of Medical Sciences, including eye strain (reported by 71% of participants), reluctance to read on screens (48%), and unfamiliarity with technology. Pew research centre in its study revealed compelling insights that 9% exclusively opted for digital formats, encompassing e-books and audiobooks (Faverio & Perrin¹⁹).

Methodology

The present study was carried out in the four government funded universities of Delhi namely Delhi University (DU), Jamia Millia Islamia (JMI), Jawaharlal Nehru University (JNU) and Guru Gobind Singh Indraprastha University (GGSIPU). All four selected universities have well-equipped libraries to cater to the needs of the users in context to the e-books. The aim of the study was to explore the adoption-related factors of e-books among the library

users of the selected universities in Delhi. This study gathered information about users' viewpoints related to the various issues of e-books. The universe of the study was confined to the undergraduate, post-graduate, and research scholars from the aforementioned universities. The survey method was used to conduct the study. It involved collecting data from a sample of individuals through the use of structured questionnaire and wherever required interviews and observation methods were adopted to supplement the information. Proportionate stratified random sampling method was employed to take a representative sample. Overall, a total of 937 respondents from four universities filled and returned the questionnaire. Thereafter, the collected data was analysed through SPSS and Ms-Excel. The Chi square test was applied to determine significant differences in the viewpoints of users on various adoption-related factors of e-books across various categories and universities of users.

Research Questions

1. What are the factors affecting the adoption of e-books?
2. What can be the strategies to improve the adoption of e-books in the academic set-up?

Results and Discussion

Technical and Accessibility Issues

The adoption of e-books in universities marks a significant shift towards digital learning landscape, offering numerous advantages such as portability, ease of access, and the ability for interactive content creation. However, this transition is not without its challenges. Technical issues such as digital rights management (DRM), format compatibility and e-reader affordance can hinder seamless access and usability of e-books. Additionally, ensuring reliable internet connectivity and providing adequate technical support are essential for smooth integration. Addressing these technical and accessibility issues is imperative to fully realize the benefits of e-books in enhancing the educational experience for all students.

In this study, the percentages for 'agree' and 'strongly' agree have been combined for interpretational purpose. The results of the study (Table 1) showed that a significant portion of respondents across all three categories agreed (ranging from 21.8 to 42.4 per cent) with the idea of facing *network difficulties* when it comes to accessing e-books. Notably, a majority of research scholars

Table 1 — Technical and Accessibility Issues

Response	UG (n=238)	PG (n=456)	RS (n=243)	χ^2 Result
Network Access Difficulties				
Strongly Disagree	37 (15.5%)	41 (9.0%)	28 (11.5%)	χ^2 value= 40.83 p-value= 0.000002 df = 8
Disagree	64 (26.8%)	132 (28.9%)	46 (18.9%)	
Neutral	85 (35.7%)	104 (22.8%)	66 (27.2%)	
Agree	31 (13.0%)	119 (26.1%)	62 (25.5%)	
Strongly Agree	21 (8.8%)	60 (13.2%)	41 (16.9%)	
Difficulty in Accessing e-books				
Strongly Disagree	31 (13.0%)	59 (12.9%)	22 (9.1%)	χ^2 value= 10.85 p-value= 0.20 df = 8
Disagree	52 (21.8%)	110 (24.1%)	53 (21.8%)	
Neutral	59 (24.8%)	113 (24.8%)	60 (24.7%)	
Agree	78 (32.8%)	141 (30.9%)	75 (30.9%)	
Strongly Agree	18 (7.6%)	33 (7.2%)	33 (13.6%)	
Unavailability of E-readers in the library				
Strongly Disagree	19 (7.9%)	38 (8.3%)	20 (8.2%)	χ^2 value= 3.37 p-value= 0.90 df = 8
Disagree	46 (19.3%)	87 (19.1%)	40 (16.5%)	
Neutral	65 (27.3%)	138 (30.4%)	73 (30.0%)	
Agree	67 (28.1%)	131 (28.8%)	75 (30.8%)	
Strongly Agree	41 (17.2%)	60 (13.2%)	35 (14.4%)	
Cost of affording the e-book reader is high				
Strongly Disagree	25 (10.5%)	47 (10.3%)	20 (8.2%)	χ^2 value= 2.58 p-value= 0.957 df = 8
Disagree	55 (23.1%)	113 (24.8%)	66 (27.1%)	
Neutral	68 (28.5%)	123 (27.0%)	60 (24.6%)	
Agree	62 (26.0%)	119 (26.2%)	68 (27.9%)	
Strongly Agree	28 (11.7%)	54 (11.8%)	29 (11.9%)	
Lack of Computers in the Library for accessing e-books				
Strongly Disagree	23 (9.6%)	45 (9.9%)	20 (8.2%)	χ^2 value= 3.121 p-value= 0.926 df = 8
Disagree	30 (12.6%)	70 (15.4%)	30 (12.3%)	
Neutral	54 (22.6%)	93 (20.4%)	50 (20.5%)	
Agree	78 (32.7%)	144 (31.7%)	83 (34.1%)	
Strongly Agree	53 (22.2%)	104 (22.9%)	61 (25.0%)	
Unavailability of Books in Electronic Format				
Strongly Disagree	14 (5.8%)	20 (4.4%)	16 (6.5%)	χ^2 value= 3.42 p-value= 0.90 df = 8
Disagree	42 (17.6%)	81 (17.8%)	41 (16.8%)	
Neutral	61 (25.6%)	110 (24.2%)	53 (21.8%)	
Agree	81 (34.0%)	157 (34.6%)	90 (37.0%)	
Strongly Agree	40 (16.8%)	88 (19.3%)	43 (17.6%)	
Digital Rights Management (DRM) Restrictions				
Strongly Disagree	13 (5.4%)	26 (5.7%)	18 (7.4%)	χ^2 value= 36.82 p-value= 0.00001 df = 8
Disagree	32 (13.4%)	61 (13.4%)	29 (11.9%)	
Neutral	108 (45.3%)	132 (29.0%)	56 (23.0%)	
Agree	60 (25.2%)	147 (32.3%)	88 (36.2%)	
Strongly Agree	25 (10.5%)	90 (19.8%)	52 (21.3%)	
Lack of Standard Format				
Strongly Disagree	13 (5.4%)	26 (5.7%)	17 (6.9%)	χ^2 value= 68.17 p-value= <0.0001 df = 8
Disagree	46 (19.3%)	77 (16.9%)	34 (13.9%)	
Neutral	118 (49.5%)	130 (28.6%)	51 (20.9%)	
Agree	41 (17.2%)	156 (34.3%)	97 (39.9%)	
Strongly Agree	20 (8.4%)	67 (14.7%)	46 (18.9%)	

Source: Compiled by Researcher; UG: Undergraduate; PG: Post Graduate; RS: Research Scholar

(42 per cent) expressed their agreement on this issue. However, it is worth mentioning that only a small number of undergraduates (21.8 per cent) agreed with the notion of network access difficulties, indicating a divergence of opinions among the participants.

Earlier studies by Vidyarani and Harish²⁰; Folb, Wessel, and Czechowski²¹, also reported about network reliability and access issues affecting the perceived usability of e-books. Regarding the *difficulty in accessing e-books*, a reasonable number of respondents

(38.1 to 44.5 per cent) from three categories agreed, illustrating a common challenge across undergraduates, postgraduates and research scholars. The results of the study correspond to the earlier study by Shelburne²² that, although some students faced barriers to online access, many managed to overcome these challenges, leading to varied perceptions. *The unavailability of e-readers in the library* affected all groups similarly, ranging 42.0 to 45.3 per cent agreeing or strongly agreeing, which implied a consistent need for more e-readers. This finding supports an earlier study by Hernon, Hopper, Leach, Saunders, and Zhang²³, which concluded that the presence of technological tools such as e-readers could greatly impact students' willingness and ability to engage with digital content. The *cost of affording an e-book reader* was perceived as high by around 38 to 40 per cent across undergraduates, postgraduates and research scholars, reflecting a financial barrier. These findings were in alignment with previous research carried out by Muir and Hawes²⁴ that financial barriers significantly affected students' decisions to use e-books, with many citing the high cost of e-book readers as a deterrent. *The lack of computers in the library* was a notable issue, especially for research scholars, with 59 per cent agreeing, compared to 55 per cent of postgraduates and undergraduates, indicating a slightly greater impact on research scholars. *Unavailability of books in electronic format* affected all groups similarly, with over half of respondents from each of the three categories agreeing, pointing to a widespread issue in e-book availability. There was a notable consensus among academic groups that *DRM restrictions on the copying, printing, and redistribution* of e-books served as a significant barrier. A reasonable proportion of undergraduates (36 per cent) stated that these restrictions were obstacles to use e-books. Notably, postgraduates (52 per cent) and research scholars (57 per cent) demonstrated a strong agreement on this issue. Previous studies of Smith²⁵; Ahmad¹⁷; Casselden & Pears²⁶ had found DRM restrictions like one person at time and limited content access as restraining factors to students' engagement with e-books. The *lack of a standard format* in e-books has been found to be a significant concern among postgraduates and research scholars (49 to 59 per cent), while only 25 per cent undergraduates agreed with this issue. This result was in line with earlier study by Vidyarani and Harish²⁰ which concluded that scientists (31 per cent) faced file format issues within the existing collections. The Chi-square results for *network*

access difficulties, digital rights management (DRM) restrictions and lack of standard format found a statistically significant association for these factors with regard to the user categories (p-value = <0.05).

User Experience and Usability Issues

The adoption of e-books in universities introduces a transformative potential for enhancing learning experiences, yet it also brings forth critical user experience and usability challenges. Ensuring that e-books provide an intuitive, seamless, and engaging experience is essential for students. User experience and usability issues such as screen reading adaptation, eye-strain, lack of computer proficiency, unfamiliarity with access methods and subscription processes not user-oriented. The readability of e-books on various devices, ergonomic concerns related to prolonged screen use are crucial factors that influence the overall user experience. Addressing these user experiences and usability issues is vital for optimizing the educational benefits of e-books, ensuring that they are not only accessible but also user-friendly and conducive to effective learning.

The data analysis (Table 2) indicated that, all user categories expressed agreement (56 to 63 per cent) with the observation that there was a *lack of adaptation to screen reading*. Hence, more than half of the respondents across all the user groups acknowledged this barrier. These findings support the earlier ones of Nazari¹⁸; Thayer *et al.*²⁷; Clark *et al.*²⁸ that had found that poor screen adaptation could significantly deter users, particularly in academic settings where prolonged reading was common. Regarding *eye strain*, approximately 60.0 per cent respondents in all categories reported difficulties, implying this as a concern. The study findings supported the claims of previous research studies that prolonged use of digital devices, including e-books, could contribute to visual discomfort and eye strain, which might impact user experience and acceptance (Nazari¹⁸; Sheppard and Wolffsohn²⁹). *Lack of sufficient experience in using computers* was particularly pronounced among research scholars and postgraduates, where a majority (47 to 52 per cent) recognised to have experienced this issue, compared to 37 per cent of undergraduates. *Unfamiliarity in accessing e-book collections*, the data showed that a majority (46 per cent to 54 per cent) of users across the three academic levels faced this problem. However, among these groups, research scholars

Table 2 — User Experience and Usability

Response	UG (n=238)	PG (n=456)	RS (n=243)	χ^2 Result
Not Adapted to Screen Reading				
Strongly Disagree	10 (4.2%)	34 (7.4%)	18 (7.4%)	χ^2 value= 7.37 p-value= 0.49 df = 8
Disagree	37 (15.5%)	80 (17.5%)	38 (15.6%)	
Neutral	42 (17.6%)	99 (21.7%)	53 (21.8%)	
Agree	88 (36.9%)	140(30.7%)	79(32.5%)	
Strongly Agree	61 (25.6%)	103(22.5%)	55 (22.6%)	
Eye Strain				
Strongly Disagree	15 (6.3%)	48 (10.5%)	25 (10.2%)	χ^2 value= 6.35 p-value= 0.60 df = 8
Disagree	31 (13.0%)	49 (10.7%)	32 (13.1%)	
Neutral	51 (21.4%)	97 (21.2%)	42 (17.2%)	
Agree	73 (30.6%)	130 (28.5%)	69 (28.4%)	
Strongly Agree	68 (28.5%)	132 (28.9%)	75 (30.8%)	
Lack of Sufficient Experience in Using Computers				
Strongly Disagree	24 (10.0%)	45 (9.8%)	24 (9.8%)	χ^2 value= 17.76 p-value= 0.02 df = 8
Disagree	54 (22.6%)	83 (18.2%)	40 (16.4%)	
Neutral	72 (30.2%)	115 (25.2%)	52 (21.4%)	
Agree	60 (25.2%)	149 (32.6%)	101(41.5%)	
Strongly Agree	28 (11.7%)	64 (14.04%)	26 (10.7%)	
Unfamiliarity with Accessing e-books				
Strongly Disagree	21 (8.8%)	50 (10.9%)	22 (9.0%)	χ^2 value= 15.29 p-value= 0.053 df = 8
Disagree	37 (15.5%)	69 (15.1%)	40 (16.4%)	
Neutral	60 (25.2%)	116 (25.4%)	50 (20.5%)	
Agree	79 (33.1%)	172 (37.7%)	102(41.9%)	
Strongly Agree	41 (17.2%)	39 (8.5%)	29 (11.9%)	
Subscription Process not User-Oriented				
Strongly Disagree	10 (4.2%)	18 (3.9%)	7 (2.8%)	χ^2 value= 25.01 p-value= 0.0015 df = 8
Disagree	66 (27.7%)	84 (18.4%)	46 (18.9%)	
Neutral	82 (34.4%)	131 (28.7%)	70 (28.8%)	
Agree	40 (16.8%)	149 (32.6%)	77 (31.6%)	
Strongly Agree	40 (16.8%)	74 (16.2%)	43 (17.7%)	

Source: Compiled by Researcher; UG: Undergraduate; PG: Post Graduate; RS: Research Scholar

(53.8 per cent) reported the highest percentage, indicating an evident barrier. Lastly, *the subscription process was seen as not user-oriented* by one-third of undergraduates (33.6 per cent) and almost half of other two groups. This suggested that a majority of respondents had concerns about the accessibility and usability of e-book subscriptions. An earlier study by Joo and Lee³⁰ had shown that usability issues in digital libraries, such as complex subscription processes, could significantly hinder user experience and satisfaction. The Chi-square test revealed a p-value for *subscription process not user-oriented* was much lower than the typical significance level of 0.05. This means there is a statistically significant association between the perception of the *subscription process not being user-oriented* and user categories (Table 2).

Awareness and cultural factors

The adoption of e-books in universities is significantly influenced by both awareness and cultural factors that shape student and faculty engagement.

Awareness of the benefits and functionalities of e-books is crucial, as misconceptions or a lack of knowledge can impede their acceptance and use. Awareness and cultural factors, such as '*lack of awareness*', '*lack of titles in the discipline*', '*no desire to read e-books*', '*cultural resistance*' and '*printing cost*' play a significant role. In some academic cultures, the tactile experience of physical books is deeply valued, whereas others may more readily embrace digital innovations. Understanding and addressing these awareness and cultural factors is essential for fostering a supportive environment where e-books can be effectively integrated into university education, thereby enhancing learning outcomes and resource accessibility.

Table 3 revealed that the *lack of awareness on e-books* emerged as a significant factor affecting users adoption behaviour. The percentage of respondents who acknowledged this lack of awareness ranged from 36 per cent to 53 per cent. More specifically, 41 per cent of postgraduates and slightly over half (53 per cent) of research scholars

Table 3 — Awareness and cultural factors				
Response	UG (n=238)	PG (n=456)	RS (n=243)	χ^2 Result
Lack of Awareness				
Strongly Disagree	36 (15.1%)	48 (10.5%)	26 (10.7%)	χ^2 value= 21.60 p-value= 0.005 df = 8
Disagree	60 (25.2%)	124(27.1%)	52 (21.4%)	
Neutral	56 (23.5%)	98 (21.4%)	37 (15.2%)	
Agree	58 (24.3%)	132(28.9%)	79 (32.5%)	
Strongly Agree	28 (11.7%)	54 (11.8%)	49 (20.1%)	
Lack of Titles in the Discipline				
Strongly Disagree	20 (8.4%)	18 (3.9%)	12 (4.9%)	χ^2 value= 23.14 p-value= 0.003 df = 8
Disagree	50 (21.0%)	114(25.0%)	51 (20.9%)	
Neutral	93 (39.0%)	129(28.2%)	65 (26.7%)	
Agree	53 (22.2%)	141(30.9%)	84 (34.5%)	
Strongly Agree	22 (9.2%)	54 (11.8%)	31 (12.7%)	
No Desire to Read E-books				
Strongly Disagree	33 (13.8%)	45 (9.8%)	39 (16.0%)	χ^2 value= 27.80 p-value= 0.0005 df = 8
Disagree	87 (36.5%)	135(29.6%)	84 (34.5%)	
Neutral	56 (23.5%)	126(27.6%)	37 (15.2%)	
Agree	50 (21.0%)	110(24.1%)	72 (29.6%)	
Strongly Agree	12 (5.0%)	40 (8.7%)	11 (4.5%)	
Cultural Resistance				
Strongly Disagree	18 (7.5%)	35 (7.6%)	22 (9.0%)	χ^2 value= 22.58 p-value= 0.0039 df = 8
Disagree	43 (18.0%)	82 (17.9%)	26 (10.7%)	
Neutral	78 (32.7%)	119(26.0%)	52 (21.4%)	
Agree	67 (28%)	134(29.3%)	98 (40.3%)	
Strongly Agree	32 (13.4%)	86 (18.8%)	45 (18.5%)	
Printing Cost				
Strongly Disagree	37 (15.5%)	71 (15.5%)	18 (7.41%)	χ^2 value= 14.32 p-value= 0.073 df = 8
Disagree	80 (33.6%)	132(28.9%)	81 (33.3%)	
Neutral	59 (24.7%)	104(22.8%)	61 (25.1%)	
Agree	42 (17.6%)	101(22.1%)	53 (21.8%)	
Strongly Agree	20 (8.4%)	48 (10.5%)	30 (12.3%)	

Source: Compiled by Researcher; UG: Undergraduate; PG: Post Graduate; RS: Research Scholar

agreed that they had limited knowledge about e-books resisting them to use e-books to some extent . Furthermore, on the issue of *lack of titles in one's discipline*, a little less than half of research scholars agreed, followed by postgraduates (43 per cent) showed a greater concern among them, while only 31 per cent of UG respondents confirmed it as a factor for lower rate of adoption of e-books. This was similar to the experience of previous researchers, such as Vidyarani and Harish²⁰, who discovered that the e-book editions in the collection were neither adequate nor recent. It was found that a reasonable portion of research scholars (35 per cent) and postgraduates (33 per cent) and undergraduates (26 per cent) expressed a *lack of interest in reading e-books*. Among research scholars in particular, who accounted for 59 per cent of the group, *cultural resistance* was identified as a critical component and a majority (41 to 48 per cent) from other two categories also stated to have faced cultural resistance towards e-books. This result confirmed the findings of

a preceding study by Spjeldnaes and Karlsen³¹ which had reported that factors such as cultural norms, personal taste, and practical considerations play a significant role in determining both the selection and timing of literary consumption. A quarter of respondents from three categories were neutral regarding the *printing cost*, whereas around one-fourth of undergraduates and approximately one-third of other two categories acknowledged that this cost discouraged the adoption of e-books among them. The *p-value* for *no desire to read e-books* and *cultural resistance* was much *lower than 0.05*, this signified a statistically significant relation between the user categories and this variable.

Suggestions for Improvement

To effectively enhance the adoption of e-books in academic settings, it is essential to address the diverse needs and preferences of students at different educational levels. By incorporating user suggestions, institutions can create a more conducive environment

Table 4 — Suggestions for Improvement

Response	UG (n=238)	PG (n=456)	RS (n=243)
More discipline-specific titles should be added	100 (42.0%)	220 (48.2%)	180 (74.1%)
E-books get popular among my peers	154 (64.7%)	240 (52.6%)	190 (78.2%)
If a print book is not available	110 (46.2%)	255 (55.9%)	185 (76.1%)
Having a hand-held e-book reader	130 (54.6%)	260 (57.0%)	200 (82.3%)
Improvements in on-screen readability	134 (56.3%)	256 (56.1%)	178 (73.3%)
Adequate e-books collection	140 (58.8%)	240 (52.6%)	188 (77.4%)
Better training and instruction	165 (69.3%)	246 (53.9%)	110 (45.2%)

Source: Compiled by Researcher; UG: Undergraduate; PG: Post Graduate; RS: Research Scholar

for e-book usage, ultimately supporting the academic success of undergraduate, postgraduate, and research scholar students. Respondents were therefore asked to provide their suggestions to improve e-book adoption.

The data highlighted several key strategies to improve e-book usage among different student groups, underscoring the need for targeted enhancements (Table 4). When examining the potential impact of *adding more discipline-specific titles*, a substantial majority (74 per cent) of research scholars in comparison to other two categories (42 to 48 per cent) expressed that, this may significantly encourage their use of e-books. The social influence of *e-book popularity among peers* was notable, where a great majority (78 per cent) of research scholars, about two-thirds (65 per cent) of undergraduates and slightly over half of the postgraduates (53 per cent) indicated that peer adoption would encourage their use. Foasberg³², in his study claimed students' reading habits and preferences are influenced by their peers, suggesting that peer perceptions can significantly impact the acceptance of e-books. Furthermore, the *unavailability of print books* was identified as a motivator for e-book adoption, as an overwhelming proportion (76 per cent) of research scholars, 56 per cent postgraduates and 46 per cent of undergraduates stated to opt for e-books if print books were unavailable. Gregory³³ had emphasized on the importance of accessibility, particularly when print resources are unavailable, which supports the finding that postgraduate and research scholars turned to e-books out of necessity. This aligned with the notion that e-books can serve as a crucial alternative when print resources were inaccessible. Consistent preference across the groups for portable and accessible reading devices was observed, as the *provision of hand-held e-book readers* was highlighted as a beneficial strategy by a large number of research scholars (82 per cent) and slightly more than half of undergraduates and postgraduates, which can enhance the convenience of e-book usage.

Similarly, *improving on-screen readability* was identified by a striking three-fourth of research scholars (73.2 per cent) and found an identical consensus (56 per cent) among undergraduates and postgraduates, reflecting a general need for better digital interfaces that reduce eye strain and enhance the reading experience. The demand for portable e-book readers and improvements in on-screen readability was corroborated by Muir and Hawes²⁴, who highlighted the need for technological advancements to enhance user experience. *Adequacy of e-book collection* was deemed important by a good majority (77 per cent) of research scholars and 53 to 59 per cent of other two user categories, further emphasizing the importance of expanding the e-books collection to enhance e-book adoption and meet diverse academic needs. Finally, the importance of *better training and instruction* was most pronounced among undergraduates, with 69 per cent identifying this as a key strategy, compared to postgraduates (53.9 per cent) and research scholars (45 per cent). Earlier MacGregor and Salaz³⁴, had also concluded that training proved to have a certain degree of influence on the utilization of particular features of electronic collection among students.

Conclusion

The study revealed that *network difficulties*, the unavailability of e-readers, and financial barriers were significant challenges faced by a reasonable number of undergraduates, postgraduates and research scholars. Notably, research scholars and postgraduates showed a higher concern for these issues compared to undergraduates. Furthermore, the study underscored the significant effect of *DRM restrictions* and the *lack of a standard e-book format* (49.0 to 59.0 per cent), particularly among postgraduates and research scholars. A notable finding was the widespread issue of *poor adaptation to screen reading* (53.0 to 62.0 per cent), and remained a deterrent in academic settings. *Eye strain* also emerged as a major concern,

affecting users' comfort and experience with digital reading among three categories (60.0 per cent). *Insufficient computer experience* was particularly pronounced among research scholars and postgraduates (about 50.0 per cent), highlighting a need for better digital literacy support. *Unfamiliarity in accessing e-book collections* were common across all user groups, with research scholars (53.8 per cent) reporting the highest levels of difficulty. Additionally, the *subscription process for e-books was deemed user-unfriendly* by a substantial portion of respondents, indicating significant accessibility and usability concerns. Many respondents, particularly postgraduates and research scholars, acknowledged *limited knowledge* about e-books. A considerable number of research scholars and postgraduates also expressed concerns about the *lack of titles in their disciplines*, suggesting that the available e-books did not meet their academic needs. Furthermore, a notable portion of each group reported a *lack of interest* in reading e-books, with *cultural resistance* playing a significant role, especially among research scholars.

To enhance the adoption of e-books, respondents were asked to share their suggestions on how to improve e-book adoption. These insights were crucial for identifying specific areas that needed attention and addressing the diverse needs of students across various educational levels. Increasing the *availability of relevant titles* was crucial, particularly for postgraduate (48.2 per cent) and research scholar (74.1 per cent), who indicated a significant impact on their e-book usage. *E-books popular among peer group* encourage users to adopt e-books as it was supported by a significant majority of respondents from three groups. Therefore, such e-books should be added to library collection. Addressing accessibility by ensuring '*availability of e-books when print books not available*' was particularly important for postgraduates and research scholars. A good majority of respondents from three academic levels expressed the need for *portable e-book readers* to improve e-book accessibility and convenience. Improving *on-screen readability* was vital, especially for research scholars (73.0 per cent) and to some extent for other two categories (56.0 per cent) to maintain or increase e-book usage. Ensuring *adequate e-book availability* was supported by three user categories for maintaining user engagement. *Training and instructional support* were particularly valued by undergraduates, emphasizing the need for guidance

and support in effectively utilizing e-books. Strategies focusing on increasing relevant content, improving device compatibility, and providing instructional support can significantly influence e-book adoption across various academic levels. Through a thorough comprehension of these aforementioned factors, educational institutions can strive to overcome the existing barriers and enhance the integration and utilization of e-books within the realm of education.

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