International Journal of
Humanities, Education, and Social Sciences

e-ISSN : 3026-0892
p-ISSN : 3026-1422

Index: Harvard, Boston, Sydney, Dimensions, Lens, Scilit, Semantic, Google, etc

https://doi.org/10.58578/IJHESS.v3i1.4953

A Comparative Study of E-Books and Printed Books on Academic Performance: Perception from the University Students

Nisha Saiju[1], Nisha Tamang[2], Pramit Tamang[3], Piyush Bastola[4], Preeti Bhattarai[5], Dasarath Neupane[6]

[1,2,3,4,5]Tribhuvan University, Kathmandu, Nepal

[6]Srinivas University, Mangalore, Karnataka State, India

neupane.dasarath@gmail.com

Article Info:

Submitted:	Revised:	Accepted:	Published:
Jan 13, 2025	Jan 26, 2025	Feb 7, 2025	Feb 12, 2025

Abstract

The rise of digital learning resources has led to ongoing debates about the effectiveness of e-books compared to printed books in academic performance. University students are increasingly using both formats, but their impact on learning outcomes remains a subject of interest. This study explores students' perceptions of e-books and printed books and their influence on academic performance. A quantitative research approach was employed to examine the comparative impact of e-books and printed books on academic performance. A structured questionnaire was distributed both online and offline to collect primary data from 210 university students across Shanker Dev Campus, Pulchowk Engineering Campus, Saraswoti Multiple Campus, and KIST College. Demographic analysis revealed that 96.7% of participants were undergraduates, with a balanced gender distribution (54.5% female, 45.5% male). Descriptive statistics indicated that printed books received higher mean ratings compared to e-books, particularly in perceived academic utility. Correlation analysis showed a moderate positive relationship between e-book usage and academic performance ($r = 0.406$, $p < 0.001$) and between printed book usage and academic performance ($r = 0.449$, $p < 0.001$), suggesting that

both formats contribute to learning outcomes, with printed books having a slightly stronger association. The study found that both e-books and printed books positively impact academic performance, with printed books demonstrating a marginally stronger correlation. While e-books offer convenience and accessibility, printed books remain preferred for deeper comprehension and retention. The findings highlight the need for a balanced approach in integrating digital and traditional learning materials to optimize academic success.

Keywords: Academic; E-Books; Printed Books; Perception; Students

INTRODUCTION

In the digital era, the way students access and consume academic resources has evolved significantly. The rise of technology has transformed education, introducing diverse teaching methods, easy access to online learning resources, and shifting student expectations. Learners have moved away from conventional classroom approaches, opting instead for tech-based alternatives like digital study materials accessible via laptops and smartphones (Singhal, Jambunathan, & Manrai, 2019). One of the most notable changes in recent years is the growing use of e-books, which provide an alternative to regular printed books.

E-books have been praised for their convenience and accessibility, providing students with the ability to carry multiple textbooks on a single device and access learning materials from anywhere. The majority of college and university students, around 80%, possess laptops, with a growing trend of students acquiring tablets, smartphones, and other portable gadgets (Berg, Hoffmann, & Dawson, 2010; Acharya et al., 2024). Research suggests that the interactive features of e-books, such as hyperlinks, multimedia content, and such functions, may enhance students' engagement and facilitate better understanding of the material (Smith, 2020). However, some studies suggest that digital books might cause distractions or make it harder for students to remember information compared to printed books. The format of e-books may also affect how students interact with the content, as some learners may find it more difficult to focus or engage deeply with digital texts.

Despite the rise of digital resources, printed books remain vital in academic education. In higher education, textbooks serve as key learning tools (Rai et al., 2024). In

certain courses, they form the core of classroom discussions, while in others, they function as supplementary materials, helping to connect various topics. Regardless of how instructors integrate textbooks into their teaching, both educators and students regard them as indispensable for effective learning (Courduff & J. Rockinson- Szapkiw, 2013; Parajuli, Mahat, & Lingden, 2022). Unlike digital formats, printed books offer a more focused, distraction-free reading experience. The students may retain information better when reading from physical books, as they can more easily highlight and annotate key sections.

In recent scenarios, the way students access and engage with academic content has drastically changed. With the increasing integration of digital tools, e-books are becoming more common, offering an alternative to traditional printed books. When the pandemic hit, school had to quickly switch to online learning, which showed that digital education could work better than expected. Previously deemed impractical, online and hybrid teaching methods in nursing and medical education dispelled such myths during the COVID-19 pandemic. The successful implementation of remote learning through technology highlighted the potential of innovative teaching and learning strategies for the future (Dawd, 2016). These experiences have demonstrated that with the right tools and strategies, technology can effectively bridge the gap in hands-on learning, especially for skill-based disciplines like nursing and medicine. Many student are now using e-books for their studies, but printed books are still used because they are believed that printed books helps students to focus and remember the information better (Mishra et al., 2021).There is still ongoing discussion over which type of book is better for studying.

In Nepal, e-books are slowly becoming more common but printed books are still the main choice for most students, especially in the places where internet access is not good (Parajuli et al., 2023). While e-books may offer flexibility and wider access to resources, the lack of stable internet and devices can hinder their effectiveness in these areas (Karki et al., 2024). In Latin America, educational content is traditionally provided through textbooks. Current research on underperforming elementary students in the United States reveals that access to textbooks significantly enhances their academic performance (Holden, 2016, pp. 100-127). While in Latin America, where digital tools are available, printed materials remain a strong foundation for academic success (Shrestha et al., 2024). It shows that in developing countries, disparities in income, infrastructure, and access to technology often exacerbate existing educational inequalities.

As education in Nepal continues to change, it is important to know how students feel about different learning materials. By comparing e-books and printed books, this paper aims to address the following research questions:

1. What is the general perception of students regarding e-books and printed books?
2. Is there any relationship between e-books and printed books on academic performance?
3. What are the impacts of e-books and printed books on academic performance?
4. Is there any difference between e-books and printed books?

Objectives

1. To access the perception of students on e-books, printed books and academic performance
2. To examine the relationship between e-books printed book on academic performance
3. To analyze the impact of e-book printed book on academic performance
4. To analyze user preferences between e-books and printed books

Conceptual Framework

Figure 1: Conceptual Framework

Literature Review

Park and Lee (2021) conducted a study comparing the effects of extensive reading on tablets, extensive reading with printed books, and traditional textbook-based instruction on the reading comprehension and grammatical knowledge of young elementary EFL students. The results showed that the tablet reading group experienced a notable improvement in literal reading comprehension compared to the print and textbook groups. However, after 11 weeks, only the group using printed books demonstrated a significant gain in grammatical knowledge, while no meaningful changes were observed in the grammatical skills of students in the tablet or textbook groups.

In the literature, "Reading Engagement: A Comparison between E-Books and Traditional Printed Books in an elementary classroom" factors affecting studying engagement was examined. The study by Jones & Brown (2011) shows the format of the reading material whether the digital or print did not significantly affect children's comprehension, enjoyment or engagement. The study clearly revealed that children's reading engagement was influenced more by their connection to the story's characters and settings than by having the freedom to choose their reading materials. The study also highlighted that providing students with a variety of reading options, and allowing them to choose their reading material was a more powerful factor in encouraging engagement and enhancing comprehensions.

Given the widespread use of e-books and tablets among students and the integration of these devices into classrooms, Shrestha et al. (2025) conducted a study to assess the impact of iPad-based reading on reading speed and comprehension. The findings indicate that e-books do not hinder students' reading speed or comprehension in academic settings; instead, they can serve as effective tools for learning. This positive outcome suggests that incorporating tablets and e-books into both school and higher education environments can be advantageous for students (Sackstein, Spark, & Jenkins, 2015). As digital content continues to expand and people spend more time engaging with electronic media, the digital landscape is increasingly shaping reading habits. A number of scholars argue that the arrival of digital media, together with the fragmentary nature of hypertext, is threatening sustained reading (Healy, 1990).

Haely observes that the younger generation, raised in a digital environment, struggles with deep reading and maintaining prolonged focus on reading tasks. This study aims to explore shifts in reading behavior over the past decade through self-reported assessments of individuals' overall reading experiences.

The study on "The effect of interactive e-books on students' achievement at Najran University in the computer education course" emphasizes the many benefits of e-books over traditional printed books. E-books incorporate audio, images, and video, along with interactive multimedia links that can be accessed on a PC using specialized tools for reading e-books. They offer various navigation options, such as maps and tables of contents with clickable links, and allow users to search for specific words or phrases. These features depend on robust navigation systems that connect different sections of the book and

enable easy movement through menus, graphics, and hyperlinks. The study also reveals that e-books facilitate easy storage and organization of addresses, making them more accessible for reading, thereby enhancing students' ability to acquire information. Furthermore, e-books allow students to access content anytime, anywhere, without limitations, enabling them to download the material to their mobile phones and study whenever they have the opportunity (Mohammed, Shimaa Ahmed, & Rahmann, 2015).

Only a limited number of studies have explored the impact of e-textbooks on university students' cognitive, affective, and psychomotor learning. Moreover, many of these studies have overlooked the medium used to access the e-textbook, such as mobile readers, tablets, or computers (Woody et al., 2010). The research by Rockinson-Szapki, Courduff, Carter, & Bennet (2013) investigates the connection between the format of textbooks and the academic performance and perceived learning outcomes of 538 university students. The findings show no significant difference in cognitive learning or grades between the two groups, suggesting that electronic textbooks are just as effective as traditional printed textbooks for learning. However, the study also reveals that students who opted for e-textbooks in their education courses reported significantly higher levels of affective and psychomotor learning compared to those using traditional printed textbooks.

A study by Macedo-Rouet, Epstein, & Fayard (2003) involved 47 undergraduate students and found that e-book readers had slightly lower comprehension scores than those reading printed books. The decrease in comprehension was mainly observed in questions related to supplementary documents, which were not directly visible on the screen but had to be accessed through a menu. The researchers noted that e-book readers spent time navigating pages using mouse clicks and scroll bars, which affected their reading process (Macedo-Rouet, Epstein, & Fayard, 2003). In a more recent UK study, Dungworth & Grimshaw (2004) examined 9-10-year-old students' use of e-books and compared it to their use of printed books. They found no significant difference in reading comprehension scores between the two groups. Similarly, a study by Kang, Wang, & Lin (2009) showed comparable reading accuracies for both e-books and printed books, with e-book users exhibiting slightly lower reading efficiency. However, there was no significant "book effect" influencing overall reading performance.

Research Gaps

Most research on e-books versus printed books primarily focus on short-term outcomes, like how well students remember information right after reading. However, there are not many studies that follow students over a longer period, like a semester or even an entire year, to see how each type of book affects their performance over time. Long-term studies would help us understand if using e-books or printed books has a lasting impact on things like learning, memory, and overall performance.

METHODS

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically (Kothari, 2004). The dependent variables of this study are e-books and printed books whereas the independent variable is academic performance. This study employs a quantitative research approach to assess the students' perceptions of e-books and printed books and their impact on academic performance (Mahat & Aithal, 2022). This study employs a quantitative research approach to assess the students' perceptions of e-books and printed books and their impact on academic performance. This research also follow a deductive approach because it begins with existing theory of hypothesis and then test the hypothesis through data collection. A comparative research design is used to analyze the difference between e-books and printed books users, while a descriptive research design is used to explore the students, preferences and experiences. The data collected in this study is primary data where a structured questionnaire is distributed both online and offline. The questionnaire includes Likert-scale questions. A sample of 210 students of university students from Shanker Dev Campus, Pulchowk Engineering Campus, Saraswoti Multiple Campus, and KIST college was taken in order to compute the analysis .A stratified random sampling technique is used to ensure representation from different academic levels. The data collection was conducted following the ethical consideration towards respondents. Informed consent is obtained from all participants before data collection.

Table 1: Reliability Statistics

E-book	
Cronbach's Alpha	N of Items
.705	5
Printed Book	
Cronbach's Alpha	N of Items
.755	5
Academic Performance	
Cronbach's Alpha	N of Items
.604	5

The reliability analysis of the scales measuring eBook usage, printed book usage, and academic performance reveals varying levels of internal consistency. For eBooks, the Cronbach's Alpha of 0.705 suggests an acceptable level of reliability, indicating that the five items used to assess eBook usage consistently measure the same construct. Printed book usage shows a higher Cronbach's Alpha of 0.755, which indicates good internal consistency and suggests that the five items assessing printed book usage are highly reliable. In contrast, the Cronbach's Alpha for academic performance is 0.604, which is somewhat lower. While this still falls within an acceptable range, it suggests moderate reliability, implying that the five items measuring academic performance may have some variability in how they capture the construct (Mahat & Aithal, 2022).

RESULTS AND DISCUSSION

Table 2: Demographic Information

Education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under Graduate	202	96.7	96.7	96.7
	Post Graduate	5	2.4	2.4	99.0
	Other	2	1.0	1.0	100.0
	Total	209	100.0	100.0	

Gender

	Frequency	Percent	Valid Percent		Cumulative Percent
Valid	Male	95	45.5	45.5	45.5
	Female	114	54.5	54.5	100.0
	Total	209	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Semester	209	1	8	4.34	2.169
Age	209	3.00	27.00	20.8565	2.20761

The demographic data for the sample of 209 participants reveals the following: In terms of education level, the majority of respondents are Under Graduate (96.7%), with Post Graduate participants making up 2.4%, and those selecting other accounting for 1%. This shows that most participants are at the undergraduate level. For gender, there is a slightly higher proportion of Female participants (54.5%) compared to Male participants (45.5%), indicating a relatively balanced gender distribution.

Regarding the descriptive statistics, the semester data shows that participants are distributed across a range of semesters, with a mean of 4.34 and a standard deviation of 2.169, indicating that most participants are in the middle of their academic program. The age data has a mean of 20.86 years, with a minimum of 3 years and a maximum of 27 years, suggesting a relatively young age group. The standard deviation of 2.21 indicates some variability in age within the sample.

Perception of students on e-books, printed books and academic performance E-book

Table 3: Perception of Printed book

	N	Minimum	Maximum	Mean	Std. Deviation
Eb1	209	1.00	5.00	3.6364	.98636
Eb2	209	1.00	5.00	3.5072	.97625
Eb3	209	1.00	5.00	3.1866	1.05549
Eb4	209	1.00	5.00	3.2632	1.02029
Eb5	209	1.00	5.00	3.3636	1.13587

The table presents descriptive statistics for five variables related to e-books (Eb1 to Eb5), each based on 209 observations. The minimum value for all variables is 1.00,

indicating the lowest possible score, while the maximum value is 5.00, representing the highest possible score. The mean scores, which reflect the average responses, range from 3.1866 (Eb3) to 3.6364 (Eb1), suggesting that respondents generally provided positive ratings across all variables. The standard deviation, which measures the spread of the data, ranges from 0.97625 (Eb2) to 1.13587 (Eb5), indicating moderate variability in responses. Overall, the data shows that respondents tend to rate e-book-related factors favorably, with Eb1 having the highest average rating and Eb3 the lowest.

Printed book

Table 4: Perception of Printed book

	N	Minimum	Maximum	Mean	Std. Deviation
Pb1	209	1.00	5.00	3.6220	.92284
Pb2	209	1.00	5.00	3.7321	.96326
Pb3	209	1.00	5.00	3.6507	.90273
Pb4	209	1.00	5.00	4.2297	.90132
Pb5	209	1.00	5.00	3.9569	.91097

The table provides descriptive statistics for five variables related to printed books (Pb1 to Pb5), each based on 209 observations. The minimum value for all variables is 1.00, representing the lowest possible score, while the maximum value is 5.00, indicating the highest possible score. The mean scores, which reflect the average responses, range from 3.6220 (Pb1) to 4.2297 (Pb4), suggesting that respondents generally provided positive ratings across all variables, with Pb4 receiving the highest average rating. The standard deviation, which measures the spread of the data, ranges from 0.90132 (Pb4) to 0.96326 (Pb2), indicating relatively low variability in responses. Overall, the data shows that respondents tend to rate printed book-related factors favorably, with Pb4 standing out as the most highly rated variable.

Academic performance

Table 5: Perception of Academic performance

	N	Minimum	Maximum	Mean	Std. Deviation
Ap1	209	1.00	5.00	3.7751	.91576
Ap2	209	1.00	5.00	4.0574	.87517
AP3	209	1.00	5.00	2.7081	1.07685
AP4	209	1.00	5.00	3.3828	1.06378
Ap5	209	1.00	5.00	3.8278	1.00432

The table provides descriptive statistics for five variables related to academic performance (Ap1 to Ap5), each based on 209 observations. The minimum value for all variables is 1.00, representing the lowest possible score, while the maximum value is 5.00, indicating the highest possible score. The mean scores, which reflect the average responses, range from 2.7081 (AP3) to 4.0574 (Ap2), suggesting that respondents generally provided positive ratings for most variables, with Ap2 receiving the highest average rating. However, AP3 has a notably lower mean score, indicating less favorable perceptions or outcomes for that specific aspect of academic performance. The standard deviation, which measures the spread of the data, ranges from 0.87517 (Ap2) to 1.07685 (AP3), indicating moderate variability in responses. Overall, the data shows that respondents tend to rate academic performance-related factors positively, with Ap2 being the most highly rated and AP3 the least favored.

Relationship between e-books printed book on academic performance

Table 6: Correlations

		eBook	printed book	academic performance
eBook	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	209		
printed book	Pearson Correlation	.172*	1	
	Sig. (2-tailed)	.013		
	N	209	209	
academic performance	Pearson Correlation	.406**	.449**	1
	Sig. (2-tailed)	.000	.000	
	N	209	209	209

***. Correlation is significant at the 0.05 level (2-tailed).**

****. Correlation is significant at the 0.01 level (2-tailed).**

The correlation matrix presents the relationships between eBook usage, printed book usage, and academic performance among 209 participants. The Pearson correlation coefficient between eBook usage and printed book usage is 0.172, indicating a weak positive correlation that is statistically significant at the 0.05 level ($p = 0.013$). This suggests that students who use eBooks tend to also use printed books, albeit to a small extent. The correlation between eBook usage and academic performance is 0.406, which is a moderate positive relationship and statistically significant at the 0.01 level ($p < 0.001$). This implies

that higher eBook usage is associated with better academic performance. Similarly, printed book usage has a 0.449 correlation with academic performance, also a moderate positive relationship, significant at the 0.01 level ($p < 0.001$). This indicates that students who rely more on printed books tend to perform better academically. Overall, both eBook and printed book usage positively relate to academic performance, with printed books showing a slightly stronger association.

Impact of e-book and printed book on academic performance

Table 7: Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.560[a]	.313	.306	.51298

a. Predictors: (Constant), printed book, eBook

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.714	2	12.357	46.957	.000[b]
	Residual	54.209	206	.263		
	Total	78.922	208			

a. Dependent Variable: academic performance

b. Predictors: (Constant), printed book, eBook

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.129	.253		4.466	.000
	eBook	.297	.051	.339	5.780	.000
	printed book	.368	.055	.391	6.668	.000

a. Dependent Variable: academic performance

The regression analysis examines the impact of eBook and printed book usage on academic performance. The model summary indicates that the two predictors explain 31.3% of the variance in academic performance ($R^2 = 0.313$, Adjusted $R^2 = 0.306$), suggesting a moderate effect. The ANOVA results show that the overall model is statistically significant ($F(2, 206) = 46.957$, $p < .001$), meaning that eBook and printed book usage together significantly predict academic performance.

The coefficients table reveals that both eBook usage (β = 0.339, p < .001) and printed book usage (β = 0.391, p < .001) have positive and statistically significant impacts on academic performance. This suggests that higher engagement with both formats is associated with better academic outcomes, with printed books having a slightly stronger effect. The constant (B = 1.129, p < .001) represents the baseline academic performance when both predictors are at zero. Overall, the findings suggest that while both eBooks and printed books contribute positively to academic performance, printed books have a slightly greater impact.

User preferences between e-books and printed books

Table 8: User preferences between e-books and printed books

Paired Samples Statistics

			Statistic	Bootstrap[a]			
				Bias	Std. Error	95% Confidence Interval	
						Lower	Upper
Pair 1	EB	Mean	3.3914	-.0009	.0482	3.294	3.486
		N	209				
		Std. Deviation	.70173	-.0021	.0419	.6224	.7791
		Std. Error Mean	.04854				
	PB	Mean	3.8383	-.0001	.0461	3.747	3.927
		N	209				
		Std. Deviation	.65403	-.0035	.0488	.5622	.7480
		Std. Error Mean	.04524				

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Paired Samples Correlations

		N	Correlation	Sig.	Bootstrap for Correlation[a]			
					Bias	Std. Error	95% Confidence Interval	
							Lower	Upper
Pair 1	EB & PB	209	.172	.013	-.008	.102	-.044	.360

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Paired Samples Test

	Paired Differences	t	df	Sg.

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				(2-tailed)
					Lower	Upper			
Pair1	EB- P	-.44689	.8305	.0603	-.56594	-.3278	-7.40	208	.000

Bootstrap for Paired Samples Test

		Mean	Bootstrap[a]				
			Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
						Lower	Upper
Pair 1	EB - PB	-.44689	-.00081	.05687	.001	-.56553	-.33971

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

The paired samples analysis compares user preferences between eBooks and printed books. The mean rating for printed books (M = 3.8383, SD = 0.65403) is higher than that for eBooks (M = 3.3914, SD = 0.70173), indicating a stronger preference for printed books. The paired samples t-test shows a significant difference between these preferences ($t(208) = -7.400$, $p < .001$), suggesting that users prefer printed books over eBooks. The paired correlation ($r = .172$, $p = .013$) indicates a weak positive relationship between preferences for eBooks and printed books, meaning individuals who prefer one format may also slightly prefer the other. The confidence interval (-0.56594, -0.32783) confirms a statistically significant difference, as it does not include zero. Overall, the findings suggest that while users engage with both formats, printed books are generally preferred over eBooks.

CONCLUSION

The study aimed to explore students' perceptions of eBooks and printed books, their impact on academic performance, and user preferences between the two formats. Descriptive statistics revealed that students generally rated both eBooks and printed books favorably, with mean scores indicating a positive perception of both formats. Printed books received slightly higher average ratings, particularly for specific aspects, indicating a strong preference for certain printed materials. Academic performance variables also

received positive ratings, with some aspects being rated higher, while others stood out as less favorable. Correlation analysis demonstrated moderate positive relationships between both eBook usage and printed book usage with academic performance, suggesting that engagement with either format is associated with better academic outcomes. Regression analysis further confirmed that both eBooks and printed books significantly predict academic performance, with printed books having a slightly stronger impact. Finally, paired samples analysis revealed a significant preference for printed books over eBooks, with a statistically significant difference.

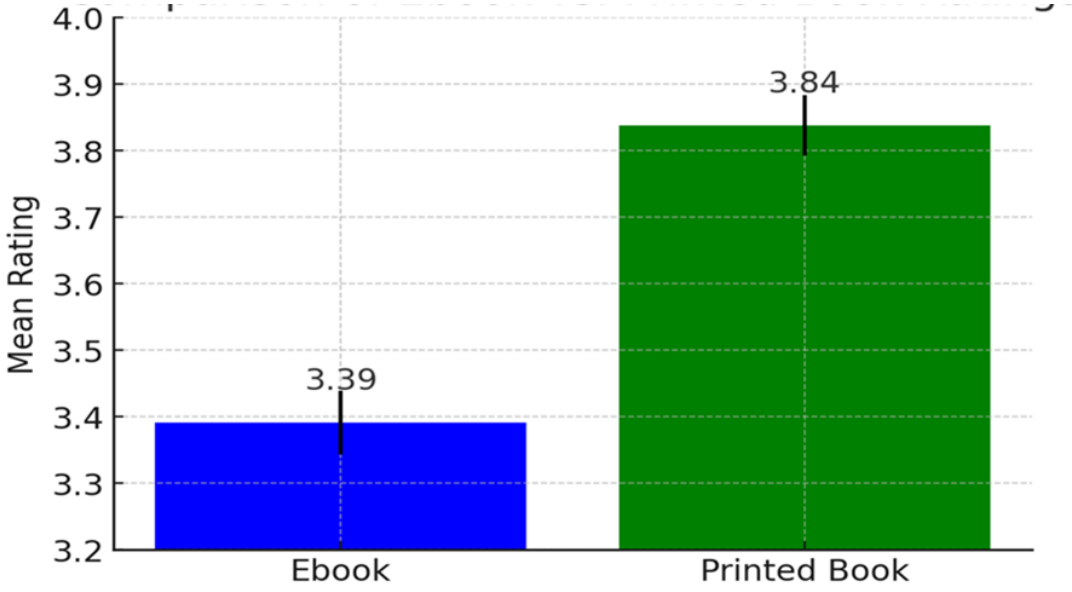

Figure 2: Comparison of E-book and Printed book

Overall, the findings suggest that while both formats positively influence academic performance and are used by students, printed books are preferred and have a marginally greater impact on academic success.

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