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Divya P
University of Calicut, divya.bipin09@gmail.com

Mohamed Haneefa K
University of Calicut, dr.haneefa@gmail.com

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Divya P* and Mohamed Haneefa K**

*Librarian, Govt. Engineering College, West Hill P.O., Kozhikode, Kerala, India
E-mail: divya.bipin09@gmail.com

**Associate Professor and Head, Department of Library & Information Science,
University of Calicut, Kerala, India, E-mail: dr.haneefa@gmail.com

Abstract

This study investigates students' preference of reading print and digital resources. A questionnaire survey with a stratified random sample of 700 postgraduate students of the universities in Kerala state of India was used to conduct the study. Comparison on media provided a fascinating insight into the way students read. The students reported a better comprehension, concentration, higher content absorption and comfort levels, if they read on print resources as opposed to digital resources. Majority of the students download the documents, take notes, and copy and paste contents while reading digital resources. There is no significant gender difference in their level of comprehension while reading both print and digital resources. However, there is significant gender difference in the choice of reading media under the circumstance like depth and concentrated reading, casual reading, reading lengthy documents, one-time reading, speed reading, relaxed reading, and reading something very important. This study provides useful information for developing improved interfaces for online reading and enhancing the online reading skills of students.

Keywords: Print resources, Digital resources, Reading, Preference, Reading behavior, E-reading, Reading techniques, Students

1. Introduction

Reading is not a solitary action rather, it can appear in assorted structures, and readers who are talented are aware of these reading styles and strategies used by them in various circumstances for various purposes. Reading in the 21st century networked society is no more restricted to the print reading. The extent of the reading has reached out to the Internet sources that changed the conventional reading culture of the readers (Loan, 2012). There is a continuous transition of reading from print to screen and the book is challenged by an expanding number of advanced reading gadgets like personal computers, laptops, tablets, and smart phones. The worldview of reading, specifically for youngsters, is progressively screen-based rather than paperbound.

The amount of text-based information available online is steadily increasing. The widespread use of the Internet and alternative reading resources with hypertexts and multimedia has made drastic changes in reading patterns. Gradual decrease in reading habit of individuals is a typical phenomenon in the developing nations as well as in the developed ones. Among the youngsters, this decline is most perceptible, since they are the population who are most influenced by the developing digital technologies and advancements, particularly the Internet. Many university libraries are reporting a decline in the usage of print journals and magazines as more users, especially the younger generations are using more online media (De Groote & Dorsch, 2001).

Reading on screen is indeed different to reading on paper. Each medium provides its own benefits. Reading on the digital media presents numerous positive impacts; for example, improved user experience through media rich content, efficiency, increased reading capacity, flexibility, cost effectiveness, and comprehension; and also negative aspects such as impact on short and long term memory, lack of comprehension, inability of annotation, and absence of concentration.

De Groote and Dorsch (2003) reported the following reasons behind utilising printed documents: better quality design, document portability, and capacity to highlight the article, original formatting retained and more legible tables. Reasons for preferring online publications included quicker and easier to locate, 24-hour access, lower cost, access from home/office, efficiency and convenience. Liu (2005) finds that in the print environment annotating and highlighting while reading is a typical action. In any case this "traditional" pattern has not yet moved to the digital environment when individuals read electronic documents, most likely in light of the fact that technology as of now does not permit easy annotating. Readers' decisions and inclinations for reading on screen and reading on paper are contextual. Currently, the exponential growth of information and entertainment created in a digital format is gaining importance particularly among younger people. Students have distinctive perceptions and preferences in their choices of print and digital resources. In view of the development of online materials and the increased availability of devices that allow reading from the screen, there has been growing academic interest in focusing on students' preference of reading print and digital resources. The main objective of this study is to assess the students' preference of reading print and digital resources in the universities in Kerala.

2. Related Literature
The arrival and proliferation of e-resources and digital libraries have various noteworthy effects on the use of print resources. Students seem to expect a hybrid of print and e-resources, despite the fact that the reasons for supplementing another type of resources differ. In a study, Deval (2011) shows that print resources is the primary choice of users of Jamia Millia Islamia University, New Delhi because of simplicity to use, quality and functionality, conduciveness, satisfaction while reading, physical comfort in handling, and best medium for conveying data and so forth., is concerned. Jeong (2012) in a study compared the influence of e-books and p-books (paper books) on reading comprehension, eye fatigue and perception among the school students of Korea. It was found that there is a significant "book impact" on quiz scores, compared to e-books, p-books seem to empower better reading comprehension. With respect to eye fatigue, students had significantly greater eye fatigue after reading e-books than after reading p-books. Rho and Gedeon (2000) conducted a survey among 80 postgraduate research students at the University of New Smith Wales in Australia, to see whether researchers find research articles from the web, which formats they were using and also attempted to identify their reading activities. Results show that the structural formats employed by most papers in the web are against reader's preferences.

Saputra and Witten (2012) in their study examined whether book models with realistic page turning offer quantifiable point of advantage over physical books and other electronic forms, a light weight Adobe-Flash based application, called Realistic book was constructed. Findings reveal that subjects favoured realistic books over the

other formats, and were found to finish tasks significantly quicker. Readers can navigate and annotate realistic books as easily as printed books while holding the benefit of an electronic environment such as searching, editing, accessing multimedia and automatic semantic enrichment.

The usability of e-books was evaluated by Kang, Wang and Lin (2009). With target measures an experiment was designed to compare the distinction between reading an e-book and a c-book (conventional book). The outcome shows that reading an e-book created significantly higher eye fatigue than reading a c-book. Results also reveal that reading efficiency for an e-book was lower than that of c-book. Since the reading habit for c-book was built up in childhood, individuals were more used to reading c-books than e-books. Female exhibited better reading efficiency in both type of books than male.

Liu (2006) in a study measured the degree to which graduate students in a metropolitan university setting use print and e-resources. Digital library offer an extensive variety of new access opportunities that are absent in the traditional environment, including remote access, 24 hours access, and multiple users for single resources. Zha, Zhang and Yan (2014) investigated the impact of individual differences on user's perceptions of print and e-resources regarding ease of use, usefulness and usage. Information was gathered from 273 Chinese university library users. Findings assist the Chinese university libraries to recognise and meet the diversified information needs of their users all the more suitably. De Groote and Dorsch (2001) tried to determine the impact of e-journals on the use of print journals in the library of the Health Science, University of Illinios at Chicago. Results indicated print journal usage decreased significantly with the introduction of e-journals and interlibrary loan requests have also significantly decreased. Under active reading conditions, Eden and Eshet-Alkalai (2012) studied the comparison between print and digital reading among 93 university students from Israel. The results reveal that in both the two format there is no significant distinction found between the performances of participants. Similarly, for all categories of text errors and for gender no significant differences were found. From the results it was also found that the digital readers finished their tasks faster than the print readers, but their performance was not lower as compared to print readers. In another study, Bhatt and Rana (2011) revealed that utilization of e-resources improved the scholastic and expert competency of engineering academics in Rajasthan state of India.

Vandenhoek (2013) endeavored to examine the general perspectives of university students concerning screen reading compared to paper reading among 630 students of University of Limerick, Ireland. A focal finding of the study was a clear preference for reading academic journal articles from paper instead of from a screen. Students in this study also report that they do not print more articles because of financial pressures. Cull (2011) opined that reading online screen has a tendency to be fundamentally not quite as the same as reading printed texts as the Internet is a content saturated world. Polonen, Jarvenppa, and Hakkinen (2012) in their study compared a small sized multimedia display and a hardcopy. The outcome indicates that the most comfortable experience was reading from a printed copy. All near to eye readers shows induced eye strain and disorder symptoms, yet the greatness of these symptoms changed by device.

Nadeem and Abdul Rahman (2014) tried to find out to what extent the university students prefer books/printed materials to digitally available information through Internet, required both in their social and academic life in Pakistani context. The study concludes with the comments that in present period Internet is giving all opportunities to seek information to overpower learning through books, which is a source of seeing instead of knowing, and is supporting present era to overlook printed materials/books exactly at the cost of agony the information seekers need to persist through visiting libraries which is time consuming however might be terrible for third worlds new generation.

There have been many studies conducted in the scholarly environment with specific consideration given to surveying students and faculty members. It was found that reading on screen and reading on print differs significantly in an extensive variety of viewpoints. However, there are still many gaps persist to explore the students' preference of reading print and digital resources.

3. Research Design
The population of the study comprises of postgraduate students of universities in Kerala state of India. There are 17 universities approved by UGC in Kerala. Out of the 17 universities, four state universities were selected based on their geographical location, year of establishment and the similarity of the nature of courses they offer. They are University of Kerala, Mahatma Gandhi University, University of Calicut and Kannur University. Total number of the students in campus of the four selected universities was 4507. Subsequent to determining the sample size of the students by taking into account the Krejcie and Morgan table, 700 questionnaires were distributed to the students of University of Kerala (214), University of Calicut (183), Mahatma Gandhi University (115), and Kannur University (188). Out of which 634 questionnaires were returned. Due to deficiencies existing in the answers, properly filled 588 questionnaires were taken as sample for the final study, constituting 84 per cent return rate. Survey method with a fully structured questionnaire was adopted for data collection. The data collected were segregated and consolidated with Microsoft Excel and statistically analysed with SPSS.

4. Results and Discussions
4.1. Preference of Print and Digital Resources
Considering the advancement of digital resources, it is vital to analyse reading in this environment with the end goal of recognising which resources and strategies are used in this environment. Liu (2005) clearly suggests that print and digital formats ought to be viewed as two distinct entities that vary from each other in an extensive variety of aspects such as reading pace, comprehension, uneasiness and disorientation of reading, cognitive load and readers preferences. Table 1 detailed the results of students' preference among print and digital resources while reading. As per the results, a dominant part (71.3%) of the students likes to read books in printed form. Nicholas and Lewis (2008) in their study about the attitudes of Millennial toward books and e-books, concluded that although millennial students are quite familiar with and use many types of innovation day by day, when it comes to reading a book even they slant toward good, old fashioned print. More than 40 per cent of the students still prefer to read magazines, theses and dissertations in the format of print. Substantiating to this finding, Spencer (2006) detailed a survey of

distance education students showing preference for printed content materials for reasons, among others, of portability, flexibility, and less eye fatigue.

Table 1
Preference of Print and Digital Resources

Type of Resources	Print Resources	Digital Resources	Both
Books	419 (71.3%)	38 (6.5%)	131 (22.3%)
Journals	129 (21.9%)	329 (56.0%)	130 (22.1%)
Newspapers	244 (41.5%)	67 (11.4%)	277 (47.1%)
Magazines	259 (44.0%)	235 (40.0%)	94 (16.0%)
Theses/Dissertations	238 (40.5%)	233 (39.6%)	117 (19.9%)

However on account of newspaper, nearly fifty per cent of the students like to read in both print and digital format. However it does not agree with the study of Shaikh and Chaparro (2005) in which they indicate that the number of e-newspaper readers is increasing while the conventional print newspaper publishing is significantly decreasing. But in the case of journals a good number (56%) of the students are choosing e-journals. Sathe, Grady and Giuse (2002) in a study of print vs. e-journals, report that fellows, students, and residents favour e-journals. Easy accessibility, simplicity of printing, and ease of searching are among the most commonly cited reasons behind preferring e-journals.

4.2. Techniques Used while Reading Print and Digital Resources
Reading as often as possible involves not just looking at words on a page, but also underlining, highlighting and commenting, either on the text or in a different notebook. Strategies are found to be a concern for some students, while choosing whether to read on a computer screen or printed copy. Chou (2009) in a study about onscreen reading behaviours in academic settings revealed that reading on a computer screen restricted their application of reading strategies. Dominant part of respondents expressed that they could not apply reading strategies they normally utilised on printed copy text (e.g., writing notes in the margins, underlining or highlighting to screen-based text). The students were asked to state the different types of techniques used while reading print resources.

By observing table 2, it is clear that a majority (75.9%) of the students use the technique like taking notes on separate paper while reading print resources. A good number (60.5%) of them also use the techniques of highlighting and underlining. It is also noted that more than quarter of the respondents are taking notes on computer while reading. Chi-square test conducted to understand whether there is any gender difference in the use of different techniques while reading print resources. Results show that there is a significant gender difference in the use of techniques like highlighting/underlining, writing in margins, taking notes on a separate paper, and for

not using any techniques while reading print resources either at 0.01 and 0.05 level of significance.

Table 2
Techniques Used while Reading Print Resources

Type of Techniques	Male (n=262)	Female (n=326)	Total (n=588)	Chi-square	p-value
Highlighting/ underlining	144 (55%)	212 (65%)	356 (60.5%)	6.165*	0.013
Writing in margins	65 (24.8%)	114 (35%)	179 (30.4%)	7.08**	0.008
Taking notes on separate paper	169 (64.5%)	277 (85%)	446 (75.9%)	33.21**	< 0.001
Taking notes on computer	72 (37.5%)	84 (25.8%)	156 (26.5%)	0.219^{ns}	0.640
None	54 (20.6%)	24 (7.4%)	78 (13.3%)	21.16**	< 0.001
Any other	1 (0.4%)	--	1 (.2%)	--	--

** Significant at 0.01 level; * Significant at 0.05 level; ns non-significant at 0.05 level

Compared to male students, vast majority (85%) of the female students are taking notes on separate paper while reading printed text. Both the genders use the techniques like highlighting/underlining and writing in margins at the time of reading, but majority of them are female students. Korbin and Young (2003) in their study observed that students use the print version did underlining and taking notes about the important information more frequently, possibly indicating a greater comfort with actual as opposed to virtual interaction with a text. Surprisingly, it is also seen that a few respondents have not used any techniques for reading printed resources.

Also there is no significant gender difference in taking notes on computer while reading print resources, as the test produced a p-value of 0.640, which is greater than 0.05. It is further clear from the result that the female students use techniques higher than the male students while reading print resources. Poole (2009) in a study about reading strategies used by male and female Columbian University students reported that the use of various reading techniques or strategies is significantly higher among the female students than the male students.

Students when reading from screen are not able to use as many techniques as they can when reading printed resources, they built up some unique strategies that can be used in a screen-reading environment, for example, copying and pasting, downloading, tagging, and typing notes into the computer documents. These types of reading techniques appear to help the students to assemble and retrieve information (Sheorey & Mokhtari, 2001). ChanLin (2013) opined that students with various reading necessities and great load from courses taken have been found to use numerous reading strategies and use studying techniques such as note-taking, underlining, writing in the margins and highlighting the significant parts of the text to improve their reading efficiency.

As Murphy et al. (2003) have stated the strategies essential for comprehending conventional printed text are not the similar strategies required to comprehend computerised texts. Several studies have demonstrated that students can probably read also on screen as they do on paper, if they are instructed the vital strategies. Instructors and teachers may need to be aware of the strategies for comprehension required for computerised texts, because they appear to be different from those for comprehending printed copy texts.

Many students have learned how to read in a printed copy environment, but lack the knowledge and awareness of how to read in a screen-based environment. Hence, instructing new strategies that empower students to read effectively in this new reading environment is critical. Here the researcher tried to explore whether the application of reading techniques while reading digital resources varied according to gender differences and the results are depicted in table 3. A staggering (96.1%) per cent of the students indicated that they use the technique of downloading while reading digitally. Majority of them also use the techniques like taking notes on separate paper (75.3%) and copy and paste techniques (74.3%) while reading digital resources.

Table 3
Techniques Used while Reading Digital Resources

Type of Techniques	Male (n=262)	Female (n=326)	Total (n=588)	Chi-square	p-value
Digital highlighting/ Underlining	109 (41.6%)	95 (29.1%)	204 (34.7%)	9.957**	0.002
Taking notes on separate paper	179 (68.3%)	264 (81%)	443 (75.3%)	12.53**	< 0.001
Adding digital comments	36 (13.7%)	23 (7.1%)	59 (10%)	7.192**	0.007
Copy and paste	192 (73.3%)	245 (75.2%)	437 (74.3%)	0.266^{ns}	0.606
Book marking	138 (52.7%)	108 (33.1%)	246 (41.8%)	22.799**	< 0.001
Tagging	67 (25.6%)	44 (13.5%)	111 (18.9%)	13.832**	< 0.001
Downloading	249 (95%)	316 (96.9%)	565 (96.1%)	1.387^{ns}	0.239
Enlarging	104 (39.7%)	103 (31.6%)	207 (35.2%)	4.178*	0.041
Taking notes on computer	153 (58.4%)	167 (51.2%)	320 (54.4%)	3.011^{ns}	0.083
Any other	--	1 (0.3%)	1 (0.2%)	--	--

*** Significant at 0.01 level; * Significant at 0.05 level; ns non-significant at 0.05 level*

Dilevko and Gottlieb (2002) found that students incline towards e-resources over their print equivalents when they want to copy and paste quotations directly into their essays. By applying Chi-square test, it is found that there exists a significant gender

difference in the use of techniques like digital highlighting/underlining, taking notes on separate paper, adding digital comments, bookmarking, and tagging while reading digital resources, since the p-value is less than 0.01 level of significance. It can be seen that comparatively male students show superior to female in the use of techniques like digital highlighting/underlining, adding digital comments, bookmarking and tagging while reading digital resources.

In a study about gender differences in the online reading environment, Liu (2008) indicated that male students tend to bookmark electronic documents for future reading more than female. Regardless of obvious technological advances in digital text, Woody, Daniel and Baker (2010) reported that students tended to underutilise different enhanced features of e-texts or other on-screen readings, for example, digital highlighting/underlining and note taking.

Note-typing, for instance, may be a more appropriate skill to use than the conventional note-taking skill when students read digital materials on screen since they can hardly apply conventional note-taking aptitude in a screen-based environment. Surprisingly, technique like taking notes on separate paper during the process of digital reading is reported by a good number of female students than male students. Taking notes helps readers to extract the text structure during reading. It is a process which facilitates understanding and supports text re-reading.

The test also revealed that in the use of techniques like copy and paste, downloading and taking notes on computer there is no significant gender difference, since the p-value is greater than 0.05. Overall, from the above mentioned table 2 and 3 it can be concluded that female students are practicing more techniques while reading print resources and male students are practicing more techniques while reading digital resources.

4.3. Frequency of Annotations while Reading Print and Digital Resources
Annotations make an essential part of the writing-reading process. They have a vital part for their author, the reader adds at the margins his/her own particular ideas that evolve while reading the printed writings.

Table 4 given below displays the results stated by the respondents regarding the frequency of annotations while reading print resources. Nearly 40 per cent of the students opined that they sometimes annotate while reading print resources and 30 per cent of them will often annotate the same. Only a few number of the students stated that they never annotate print resources while reading. To test the significance of variables comprising gender and their frequency of annotations while reading print resources, Chi-square test applied. The Chi-square value of 17.627 and p-value of 0.001 indicate a significant association at 0.01 level between the gender and their frequency of annotation. This makes it clear that the frequency of annotation while reading print resources among male and female students is statistically significant.

Table 4
Frequency of Annotations while Reading Print Resources

Frequency	Responses (n=588)		
	Male	**Female**	**Total**
Always	22 (8.4%)	56 (17.2%)	78 (13.3%)
Often	76 (29%)	105 (32.2%)	181 (30.8%)
Sometimes	100 (38.2%)	118 (36.2%)	218 (37.1%)
Rarely	41 (15.6%)	34 (10.4%)	75 (12.8%)
Never	23 (8.8%)	13 (4%)	36 (6.1%)
Total	262 (100%)	326 (100%)	588 (100%)
Chi-square = 17.627** ; p-value = 0.001			

** Significant at 0.01 level

It is revealed that nearly 40 per cent of the male students stated that they sometimes annotate the printed text and around 32.2 per cent of the female students reported that they often annotate the document. Also nearly twenty per cent of the female students said that they always annotate printed text, and it is mentioned only by a few number of the male students. In printed environment, female students tend to annotate more often and always than male students, which clearly indicates that female students are likely to be more serious readers than male students.

Annotating digital text is completely achievable, yet it requires significantly more resources and expertise than a simple pencil or highlighter. Herath (2010) reports that advanced digital media give the flexibility to read and choose annotations which prompts better comprehension. Table 5 shows the tabulated results of frequency of annotations while reading digital resources. When considering digital resources, more than fifty per cent of the students sometimes annotate the digital documents, and nearly quarter per cent of them often annotate while reading digitally. However, the Chi-square test results (Chi-square=10.031; p=0.040<0.05) indicate that there is a significant gender difference in their frequency of annotations while reading digital resources.

Table 5
Frequency of Annotations while Reading Digital Resources

Frequency	Responses (n=588)		
	Male	**Female**	**Total**
Always	12 (4.6%)	25 (7.7%)	37 (6.3%)
Often	54 (20.6%)	91 (27.9%)	145 (24.7%)
Sometimes	143 (54.6%)	159 (48.8%)	302 (51.4%)
Rarely	44 (16.8%)	47 (14.4%)	91 (15.5%)
Never	9 (3.4%)	4 (1.2%)	13 (2.2%)
Total	262 (100%)	326 (100%)	588 (100%)
Chi-square = 10.031* ; p-value = 0.040			

Significant at 0.05 level

It is noted from the table that compared to male students more female students stated that they were always and often annotate digital documents. A total of 27.9 per cent of the female students often annotate digital documents, compared to 20.6 per cent of the male students. But this result is not confirmed with the findings of Liu's study of gender differences in online environment (2008), which reports that female readers tend to annotate not as frequently as male readers. It is also observed from the results that a few numbers of the respondents never annotate digital resources while reading. Through overall analysis it is also evident from table 4 and table 5 that students annotate more in print resources than digital resources, which seems to be similar to the results of study revealed by Shabani et al. (2011). Their study reports that there is significant difference in the amount of annotation from printed and digital resources.

4.4. Level of Comprehension while Reading Print and Digital Resources

Due to the increased accessibility of devices that permit reading from the screen, the study explores if there are differences in the quality of reading a scholarly and literary text, specifically in reading comprehension, concentration and absorption in print and digital environment. However, in a recent study it was found that subjects who read from the paper accomplished better comprehension (Mangen et al., 2013). Results from a similar study of reading comprehension across paper, tablets, and computer among college students in China also demonstrate a significantly better performance when reading in print than on other electronic formats in both shallow and deep levels of comprehension (Chen et al., 2014). It is observed from the table 6 that more than 50 per cent of the students stated that they have high level of comprehension while reading print resources and moderate level of comprehension is reported by more than 30 per cent of the students.

When data subjected to Chi-square test, to understand the gender association in their level of comprehension while reading print resources, it is noticed that there is a significant association between the variables since the p-value is less than 0.01.

Table 6
Level of Comprehension while Reading Print Resources

Level	Responses (n=588)		
	Male	**Female**	**Total**
Low	5 (1.9%)	6 (1.8%)	11 (1.9%)
Moderate	102 (38.9%)	80 (24.5%)	182 (31%)
High	117 (44.7%)	187 (57.4%)	304 (51.7%)
Very high	38 (14.5%)	53 (16.3%)	91 (15.5%)
Total	262 (100%)	326 (100%)	588 (100%)
Chi square = 14.548** ; p-value = 0.002			

*** Significant at 0.01 level*

When considering print resources, a good number (57.4%) of the female students reported that they had high comprehension level when reading print resources and in the same way very high comprehension is also opined by 53 female students. While low and moderate level of comprehension is reported by more male students than female students. Thus it can also be inferred from the table that the level of comprehension while reading print resources is high among the female students than the male students.

Dissimilar to linear reading of printed content from the earliest starting point to the end, digital text requires skills of non-linear reading and thinking that is spreading in different directions, by skipping sentences and paragraphs, changing or switching to other articles and coming back to the previous ones. Individuals on the Internet are "scanning", speed browsing the text to single out individual words and sentences (Liu, 2005). Eshet-Alkalai and Geri's investigation of comprehension when reading news on the Web or on print, indicates high school students performing better using online format, however, college students comprehending better when reading the news in print (2007).

Results regarding the gender wise differences in the level of comprehension while reading digital resources are displayed in table 7. It is evident from the results that there is no significant gender difference in their level of comprehension while reading digital resources (Chi-square=5.309; p=0.257>0.05). Consistent with these results, some researchers found in their study that there are no significant gender differences, and thus the male and female groups had approximately the same comprehension level while reading digital resources (Huang, Liang & Chiu, 2013; Joshi & Aaron, 2000).

Table 7
Level of Comprehension while Reading Digital Resources

Level	Responses (n=588)		
	Male	**Female**	**Total**
Very low	3 (1.1%)	1 (0.3%)	4 (0.7%)
Low	17 (6.5%)	30 (9.2%)	47 (8%)
Moderate	125 (47.7%)	172 (52.8%)	297 (50.5%)
High	98 (37.4%)	104 (31.9%)	202 (34.4%)
Very high	19 (7.3%)	19 (5.8%)	38 (6.5%)
Total	262 (100%)	326 (100%)	588 (100%)
Chi-square = 5.309[ns] ; p-value = 0.257			

ns non-significant at 0.05 level

It is also evident from overall analysis of table 6 and table 7 that respondents reported a better comprehension in print resources than digital resources. Consistent with these findings, Dillon, Richardson and McKnight (1990) found that reading comprehension is slower from screen reading than from paper. This, in any case, is contradicted to the research finding by Margolin et al. (2013). They found that there is no significant difference in reading comprehension in print and digital versions.

4.5. Level of Concentration while Reading Print and Digital Resources
Reading a printed material by and large requires discipline to concentrate on the material. Researchers express that development of digital media and the nature of hypertext have altered the reading behaviour of people and has resulted in less in-depth and concentrated reading (Levy, 1997). With this view the students were asked to indicate their level of concentration while reading printed resources and the results are detailed in table 8. Out of 588 survey respondents, 471 students stated that they have high and very high concentration level while reading on paper. The finding is very steady with other statistics from similar study directed by Herath (2010) about online reading, in which survey respondents reported having high or very high concentration levels while reading printed materials. Here in this study only a few respondents were recorded for having low and very low concentration, while nearly 20 per cent of the students indicated that they had moderate level of concentration level while reading print resources.

Table 8
Level of Concentration while Reading Print Resources

Level	Responses (n=588)		
	Male	**Female**	**Total**
Very low	1 (0.4%)	--	1 (0.2%)
Low	5 (1.9%)	2 (0.6%)	7 (1.2%)
Moderate	59 (22.5%)	50 (15.3%)	109 (18.5%)
High	129 (49.2%)	180 (55.2%)	309 (52.6%)
Very high	68 (26%)	94 (28.8%)	162 (27.6%)
Total	262 (100%)	326 (100%)	588 (100%)
Chi-square = 8.757[ns] ; p-value = 0.067			

ns non-significant at 0.05 level

Meanwhile it is clear from the Chi-square test results that there is no significant association between the variables, since the p-value is greater than 0.05. By analysing these findings, it is clear that the perceptible change is the dropping number of responses for low concentration levels and the increasing number of responses for moderate, high and very high level of concentration while reading printed resources. Further it is also observed that from both the male and female students have comparatively similar responses regarding their level of concentration while reading printed resources.

Eveland and Dunwoody (2001) found that it is extremely troublesome for readers to devote full attention to online reading and they were confronting decreasing in-depth and concentrated reading in general. This raises a big concern that the online reading is disrupting individuals' natural sustained reading behaviour. Students were asked to indicate their level of concentration while reading digital resources and the responses are shown in table 9. When considering digital materials, only quarter per cent of the students stated that they had high concentration level when reading online. More than fifty per cent of them indicate a moderate level of concentration. A total of 94 respondents reported that they have low level of concentration while reading digitally.

Table 9
Level of Concentration while Reading Digital Resources

Level	Responses (n=588)		
	Male	**Female**	**Total**
Very low	2 (0.8%)	--	2 (0.3%)
Low	34 (13%)	60 (18.4%)	94 (16%)
Moderate	150 (57.3%)	171 (52.5%)	321 (54.6%)
High	70 (26.7%)	81 (24.8%)	151 (25.7%)
Very high	6 (2.3%)	14 (4.3%)	20 (3.4%)
Total	262 (100%)	326 (100%)	588 (100%)
Chi-square = 7.692[ns] ; p-value = 0.104			

ns non-significant at 0.05 level

Carr (2008) argues that web based reading has decreased users' ability to concentrate and contemplate, and engage with information resources. Chi-square results reveals that there is no significant gender difference in their level of concentration while reading digital resources (Chi-square=7.692; p=0.104>0.05).

However it does not agree with the results of study, gender differences in online environment done by Liu (2008) in which a higher proportion of male students report lower in-depth reading (57.5 per cent vs. 50.4 per cent) and decreasing concentrated reading (45.0 per cent vs. 36.6 per cent) than female students. Overall it is evident from table 8 and table 9 that students reported a better concentration level when they read printed resources than digital resources.

4.6. Choice of Reading Media under Different Circumstances
Readers' decisions and preferences for digital reading and reading on paper are contextual. Students in the selected universities have different perceptions and preferences in their choice of print and digital resources in different circumstances. The challenge is to determine the relevance and applicability of a particular medium in a given circumstance or condition. For instance, digital media tend to be more useful for searching, while print media are favoured for actual consumption of information.

Table 10 furnished below displays the male and female students' choice of reading media in different circumstances. It is clearly seen from the table that in the circumstances like for getting recent information, and also when the information is needed at the last time almost majority of the students highly prefer digital resources than print resources. But at the same time, majority of the students prefer print resources for depth and concentrated reading, for relaxed reading, and for reading lengthy documents.

Table 10
Choice of Reading Media under Different Circumstances (Gender-Wise)

Circumstances for Reading	Male			Female			Chi-square	p-value
	Print	Digital	Both	Print	Digital	Both		
For reading short documents	75 (28.6%)	151 (57.6%)	36 (13.7%)	102 (31.3%)	196 (60.1%)	28 (8.6%)	4.04ns	0.133
For depth and concentrated reading	208 (79.4%)	25 (9.5%)	29 (11.1%)	287 (88%)	11 (3.4%)	28 (8.6%)	11.24**	0.004
For casual reading (news & entertainment)	62 (23.7%)	128 (48.9%)	72 (27.5%)	123 (37.7%)	146 (44.8%)	57 (17.5%)	16.27**	<0.001
For most recent information	15 (5.7%)	212 (80.9%)	35 (13.4%)	19 (5.8%)	281 (86.2%)	26 (8%)	4.54ns	0.103
For lengthy documents	166 (63.4%)	37 (14.1%)	59 (22.5%)	232 (71.2%)	51 (15.6%)	43 (13.2%)	8.82*	0.012
Something that is difficult to understand	147 (56.1%)	55 (21%)	60 (22.9%)	209 (64.1%)	66 (20.2%)	51 (15.6%)	5.63ns	0.06
Need information at the last minute	17 (6.5%)	209 (79.8%)	36 (13.7%)	20 (6.1%)	270 (82.8%)	36 (11%)	1.06ns	0.589
For one-time reading	75 (28.6%)	118 (45%)	69 (26.3%)	93 (28.5%)	188 (57.7%)	45 (13.8%)	9.25**	0.01
For speed reading	51 (19.5%)	159 (60.7%)	52 (19.8%)	97 (29.8%)	182 (55.8%)	47 (14.4%)	16.22**	<0.001
For taking notes (annotation)	136 (51.9%)	60 (22.9%)	66 (25.2%)	217 (66.6%)	73 (22.4%)	36 (11%)	21.98**	<0.001
For relaxed reading	178 (67.9%)	43 (16.4%)	41 (15.6%)	267 (81.9%)	29 (8.9%)	30 (9.2%)	15.44**	<0.001
For reading something very important and interesting	100 (38.2%)	75 (28.6%)	87 (33.2%)	169 (51.8%)	96 (29.4%)	61 (18.7%)	18.09**	<0.001

*ns non-significant at 0.05 level; ** Significant at 0.01 level; * Significant at 0.05 level*

Chi-square test results depicted that there is no significant gender difference in their choice of reading media in the circumstances like for reading short documents, most recent information, for reading something that is difficult to understand and when the information is needed at the last minute, since the p-value is greater than 0.05 level of significance. This is somewhat contradictory to the past study done by Islam (2013) in which the findings showed that there is significant gender difference in terms of their opinion regarding their preference of reading digitally over reading on print in the circumstances like need information at the last minute and for reading something that is difficult to understand.

Results also indicate that there is significant gender difference in the choice of reading media under the circumstance like depth and concentrated reading, for casual reading, for reading lengthy documents, for one-time reading, speed reading, for taking notes, for relaxed reading, for reading something very important, since the p-value derived from the Chi-square test are associated either at 1 per cent and 5 per cent level of significance.

It is further clear from the table that in contrast to male students, majority of the female students likes to read print media for depth/concentrated reading (88%) and for relaxed reading (81.9%). At the same time digital media are chosen to read by male students for casual reading (48.9%) and for speed reading (60.7%). Also compared to male students more female prefer print resources for reading lengthy documents (71.2%), for taking notes (66.6%) and for reading something very important and interesting (51.8%). For one time reading more than fifty (57.7%) per cent of the female students likely to prefer digital media and it was only 45 per cent among the male students. Similarly, in a study about reading habits and attitudes in the digital age done by Islam (2013) found that there is significant gender difference in their preference of reading print over digital, when they read lengthy documents.

4.7. Advantages of Reading Print and Digital Resources
In this information-saturated environment, a good amount of information can be acquired and the time assigned to reading the e-resources has increased. Nevertheless, people's time for reading is restricted and they cannot enhance reading time unlimitedly. At the same time, print resources and digital resources have their own particular novel focal points and limitations; they fulfill the information needs of users in different circumstances. Each assumes a different role and each serves the necessities of users in different ways. A thorough and careful study of table 11 provides the results as far as categorization of the lowest and highest advantages of print and digital resources.

Table 11
Advantages of Reading Print and Digital Resources

Advantages	Response
Print Resources	
Tangibility (physical existence)	461 (78.4%)
Portable	291 (49.5%)
No power is required	444 (75.5%)
No vision problem	403 (68.5%)
Content quality	253 (43.0%)
Flipping pages	260 (44.2%)
Physical comfort	452 (76.9%)
Sentimental value	374 (63.6%)
Digital Resources	
24 hours access	521(88.6%)
Quick access to information	493 (83.8%)
Portable	340 (57.8%)
No limit on storage	340 (57.8%)
Ability to browse	352 (59.9%)
Up-to-date information	451 (76.7%)
Link to additional information	319 (54.3%)
Time saving	410 (69.7%)
Download possibilities	436 (74.1%)
Multimedia information	345 (58.7%)

Analysing the respondents' reply, majority of the students give more priority to the advantages like tangibility (78.4%), physical comfort of print resources (76.9%) and no power requirement (75.5%). Nunberg (1994) notes that browsing a document database will never be quite as informative as browsing a bookstore or library stacks, since electronic documents don't bear physical traces of their provenance the way print books do. Nearly 70 per cent of them said that they have no vision problem and 64 per cent have sentimental value for print resources while reading.

A comprehensive review by Ziefle (1998) reached the conclusion that paper is superior to computer, in light of the display screen qualities whereby the eyes tire all the more rapidly. Next priority was given to the portability of print medium and it was supported by nearly fifty per cent of the respondents. Darnton (2014) opined that almost 50 per cent of French students consider the smell of a print book to be a key part of their reading experience. Nearly 45 per cent of students replied content quality and feature of flipping pages while reading print resources are the advantages attracted to them.

Further result also clearly reveal that a staggering per cent of students stated that 24-hour access (88.6%) followed by quick access to information (83.8%) is the main advantage of digital resources for reading. Majority of them also revealed that up-to-date information (76.7%) and download possibilities (74.1%) are the next following advantages of digital resources. This supported the statement made by Liu (2006)

that digital resources have a number of advantages that are absent in printed resources such as remote access, 24-hour access, and multiple users for a single sources. Concerning the advantages of digital reading which is listed in the table, lowest priority is reported by 54.3 per cent of students for link to additional information. Ismail and Zainab (2005) found that reasons for reading digital resources include online access, rapid and easy access to new titles, no need to visit libraries, quick search, convenience, user-friendly, and 24-hour access.

4.8. Disadvantages of Reading Print and Digital Resources
The arrival and proliferation of digital resources have a number of significant impacts on the use of print resources for reading. Students were asked about their opinion about the disadvantages they felt while reading print and digital resources and the results were depicted in table 12.

Table 12
Disadvantages of Reading Digital and Print Resources

Disadvantages	Response
Print Resources	
Difficulty of getting updated information	409 (69.6%)
Outdated materials	276 (46.9%)
Difficulty of indexing the contents	140 (23.8%)
Storage problem	400 (68.0%)
Physical damage	397 (67.5%)
Difficult to search	323 (54.9%)
Cost	419 (71.3%)
Lack of additional information	317 (53.9%)
Digital Resources	
Restricted accessibility	184(31.3%)
Unwanted information	313(53.2%)
Eyestrain	501(85.2%)
Physical strain	440(74.8%)
Outdated materials	154(26.2%)
Distraction	329(56.0%)
Lack of awareness	176(29.9%)
Power problems	367 (62.4%)
Software bugs	299(50.9%)
Not robust	164(27.9%)

Majority (71.3%) of the students acknowledged that cost is the main problem, a finding similar to that of Mizrachi (2015). Students in this study reported some factors influenced their preferences in favour of electronic format: strain caused by the weight of print material, and the cost of print material. Seventy per cent of the students opined about the difficulty of getting updated information in print media. These findings seems to match those of Herath (2010) in a study about effect of the Internet on reading behaviour, reported that up-to-date information was the major

reason for respondents to choose digital resources over printed resources. Storage problem and physical damage caused to printed text are the next main problem they felt while reading which is stated by nearly 70 per cent of the students. Difficult to search and lack of additional information in the printed resources is the next disadvantage mentioned by more than fifty per cent of the students.

At a close look at table 12, results regarding the disadvantages of digital resources for reading, majority of the respondents (85.2%) reveal that eye strain is the main disadvantage of digital resources for reading followed by physical strain (74.8%). Tseng (2008) concentrated the difficulties with reading text on the screen and depicted in five sorts, such as eyestrain and eyes-blurred, bright background colour, easy to skip lines, small font size and radiation from the screen and so on. Power problem is the next disadvantage mentioned by 367 students. This data supported Damilola's (2013) findings, which found that poor electricity supply greatly hindered the use of e-resources and poor Internet availability was another hindrance expressed by respondents. While more than fifty per cent of the students said that unwanted information, distraction and software bugs are the main problems they faced with reading digital resources. More than quarter per cent of the students reported that restricted accessibility, outdated materials, lack of awareness and not robust are the main problems while reading digital resources. These sorts of complaints guide research development departments of technology companies to enhance their products with digital screens, e.g., paper like screen provide lusterless vision so as to protect eyes and let students spend more time with their reading.

5. Conclusion
Reading mediums have reached a wider range of facilities in the last couple of decades, whereas paper has been almost the only choice for a long time. The comparison of print and digital media provided a fascinating insight into students' reading. The respondents recognized that they perceived changes to the way they read and how they felt while reading print and digital resources. Majority of the students prefer print medium while reading books, magazines and theses and dissertations. Almost all reading materials which used to be on the printed format before have digital versions now, which will be very helpful to students of higher institutions like university through the provision of online information resources, because of its flexibility in searching than their paper based counterpart, and they can be accessed remotely at any time for reading and research purposes.

Meanwhile, the results indicated lower comprehension and concentration levels with digital materials compared to print materials. The students also indicated a low content absorption and comfortably on digital materials as opposed to print materials. Majority of the students like to choose digital media under circumstances like gathering most recent information and at the time when information is needed at the last minute.

The main advantages of reading digital resources reported by students are 24 hour access followed by quick access and up-to-date information. Students admitted that they still prefer print media for depth reading, relaxed reading, for lengthy documents, for taking notes, etc. by indicating the physical discomforts related to digital materials. Vast majority of the respondents reveal that eye strain is the main disadvantage of reading digital resources followed by physical strain and power

problem. While reading on screen, it is imperative to adjust viewing conditions that minimize stress to the eyes such as brightness, contrast and convergence of screens.

The impacts of new medium were evident during the analysis. A good number of the students give more priority to print resources for the advantages like tangibility, no power requirement, physical comfort, no vision problem and sentimental value for reading. Meanwhile students also opined that cost is the main disadvantage of print resources for reading followed by difficulty of getting updated information, storage problem and physical damages.

This study investigated and validated that online reading behaviour is quite different from offline reading and has its own particular implications. It is apparent that online reading has certain impact on students' reading behaviour and they seem to demonstrate different reading patterns on both print and digital medium. The above mentioned findings lead the researcher to conclude that the students need to improve their reading in the digital environment. Therefore, educators and publishers will be better informed on students' reading behaviour and cooperate with each other for designing sound reading materials online, and recognize the need of skills and strategies required for reading and to develop a better digital reading behaviour.

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