

E-Reading is a Tool for Academic Study- A study of Davanagere University Students

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Abstract

This article reports e-readers as a tool for academic study. E-readers (Kindle DX and iPad) were suggested with texts from required reading lists in two courses with 90 participating students. Initially, 84 students responded to the invitation to participate in a survey, but eventually 13 of these submissions had to be removed, as the degree of completion was not sufficient. The final response rate achieved was 79%. Students were in general positive to the use of e-readers but still show a preference for print on paper as the best medium for serious academic study. When reading books, 56% preferred print, 24% a combination of print and e-reader, and finally only 9% were satisfied solely using an e-reader.

Introduction

The entry of e-book readers is a realistic alternative for content deliver; it gives us the opportunity to reexamine usability issues with regard to e-books and other e-texts. My main research question is whether current e-book readers loaded with curriculum-based e-books and articles can provide an effective learning experience for students in higher education.

Academic libraries have been purchasing e-books for quite a few years back electronic versions of major reference work such as encyclopedias and dictionaries were natural candidates for purchase in the beginning. Pioneering vendors such as Ebrary and Netlibrary were successful in launching subscription-based collections for academic libraries at an early stage. An expansion of interest in the field seemed to occur around the year 2000. The number of offerings from vendors and publishers and the percentage of library funds devoted to e-books have grown considerably the last few years.

One factor that still limits the use of e-books in higher education is the limited availability of e-textbooks. Only 10% of the subject books on the required reading lists are available at the Davanagere University.

Review of Past Studies

There is a quite extensive body of literature that has studied digital reading. The transition from the physical book or print on paper to screen reading confronts one with a series of questions on how this changes the way we read and how this influences comprehension and learning outcomes.

A. Dillon (1992) provides a detailed review and synopsis of early research on reading speed, accuracy, and comprehension when reading from paper in contrast to VDUs (Visual Display Units). These early studies generally favored paper for better performance in regard to the metrics mentioned above. Today's high-quality LCD- and LED-based screens are very different from the VDUs of the 1980s and 1990s. Despite great improvement in display technology, users still seem to dislike on-screen reading for extended periods.

Results regarding learning outcomes have recently been reported by Ackerman and Goldsmith (2011). Their study shows that test performance was just as good for on-screen as paper reading when study time was fixed. However, when study time was self-regulated, the results changed for the worse in regard to on-screen reading. The authors explain this difference in terms of the varying quality of metacognition, in this case monitoring one's comprehension while reading. It seems that readers often overestimate their progress when reading on-screen.

Another recent study (Schugar, Schugar, & Penny, 2011) is one of the first that has analyzed differences in reading comprehension between print on paper and a modern e-reader based on e-ink. One group of students read the required texts on the Nook e-reader while the control group read printed books. Formal testing showed no discernible differences in reading comprehension levels between the e-reader and none-reader groups. One significant difference between the groups was the level of interaction with the texts; readers of the traditional texts were much more active as regards bookmarking, highlighting, and annotations. This result could be linked to limited and cumbersome functionality for interaction in the Nook e-reader.

The goal of reducing printing was achieved but students reported many unsatisfactory aspects of the e-readers in regard to the active learning process. Reading was deemed to be acceptable but interaction with the texts in the form of comments, highlighting, and annotation was difficult and much less intuitive than with paper-based documents.

The first long-term study of the Amazon Kindle DX reader has been published by a group at the University of Washington (Thayer et al., 2011). The study examines the academic potential of e-readers by making use of A. K. Pugh's notions of reading strategies. Pugh identifies five student reading techniques—scanning, search reading, skimming, receptive reading, and responsive reading (Thayer et al., 2011). The study suggests that the Kindle DX supports receptive reading but is poor on skimming, scanning, search reading, and responsive reading. Students switch between reading techniques rapidly. A successful future for e-

readers in academia “depends on understanding how to support students’ varied reading practices more effectively” (Thayer et al., 2011, p. 2925).

A project based at Oslo University College (2015) has explored whether the use of an iPad could improve students’ study habits. The iPad was chosen as it was the e-reader/tablet that had the greatest degree of utility as regards the licensed e-resources at the institution. After a semester of use by students in two study programs, the students received an electronic survey and participated in focus group meetings. A major finding was that students thought that facilities for taking notes, printing, and accessing documents were less than ideal. The participants found that the iPad worked well for reading online documents and shorter articles but not so well for books. DRM-related issues contributed to reduced user satisfaction.

The earlier studies above regarding e-readers based on e-ink seem to point to the fact that this technology is now mature enough for immersive leisure reading but still deficient as far as serious study is concerned. Tablets such as the iPad are a different class of device with a stronger feature set for vital functions such as navigation, highlighting, and annotation. Very few studies have been done based on the iPad or other tablets, but these devices seem to have potential for higher education as the study at Oslo University College shows.

Chosen E-Book Readers

Describing current e-book readers is a challenge as technical specifications change rapidly. The number of offerings worldwide has grown immensely but the number of major players is limited. Readers based on e-ink screens have been available since 2004 but Amazon’s launch of the Kindle e-book reader in late 2007 was a major turning point for market penetration. Most users prefer e-ink screens for better readability and ergonomics for extended reading, but there is little research that shows a definitive advantage in comparison with modern LCD/LED/HD screens as regards visual fatigue.

Two different readers were chosen for the study at Davanagere University based on a study of availability and features. I focused on readers that were marketed as suitable for use in higher education. Delays were encountered due to limited availability in Davanagere. In all, 20 Amazon Kindle DX readers were installed in April 2018 and 20 Apple iPad tablets were installed in April 2018.

Research Goals and Methodology

As stated above, our main research focus for this study was to establish whether current e-book readers loaded with the relevant electronic texts could replace printed books and journal articles in an academic setting. A correct analysis of the realism in the transition from print to e-reader is vital for academic libraries

when establishing a future library media acquisition policy. Secondary research questions were related to a variety of usability issues of the studies' e-readers.

The **Davanagere** University has more than **3800** (in campus) students. Teaching and research cover a wide range of subjects. In this study, we **took 90** students from four course to use the **Kindle or iPad for one month**. Participants were **told** the opportunity to download books and articles from the reading list, or other types of relevant resources that they might want, if available. Due to limited availability in compatible e-formats, only about 40% of the reading list material was accessible for the students on electronic reading devices. Students in **Two** courses were given **choice to install the** Kindle DX or iPad:

Results Initially, **84** students responded to the invitation to participate, but eventually **8** of these submissions had to be removed, as the degree of completion was insufficient.

In total, **90** students were invited to participate, thus leaving the survey with a final response rate of 79%. No incentives were offered for completing the survey, but the students were made aware of the obligation they had upon receiving the reading device. A total of 46% of the participants left a comment using the open-ended question at the end of the survey.

Sample Surveyed

In all, 77% of the students were between 20 and 30 years of age, and there were slightly more female respondents (54%) than male. On average, the students had been studying for 2 years. In terms of how the students access the Internet, 91% of the sample surveyed use a Smart Phones several times a day for this purpose. In addition, 6% of respondents use a smartphone and 3% a traditional mobile phone for surfing.

Device Characteristics

The students were enthusiastic about receiving the e-reader and were asked to describe their first impressions regarding some of the features. In total, 61% categorized the design as either good or very good, and 64% were also satisfied with the weight of the device. The Kindle DX and the iPad used in this survey weigh 540 and 680 grams, respectively. Only 3% found the screen to be poor. As many as 81% were also pleased with battery capacity.

Navigation and Coverage

As students were asked to rate different features of the e-reader. Only 40% found general navigation satisfying. However, 66% stated they were satisfied with finding the main menu on the device. Opening a document was found to be poor among only 9% of the students and 66% thought turning pages were either

good or very good. The percentage of students who were less satisfied with the time it took to load a new page was 29%. As for zooming, 56% were satisfied with this feature. Switching between different documents was found to be poor or very poor by 30% of the students. In all, 69% were satisfied with returning to a document they had previously opened. The possibilities to take notes within a document were categorized as either poor or very poor by 46% of the students, and also 23% found it neither poor nor good. Furthermore, only 21% thought the possibility to highlight text was satisfactory.

Print or Electronic

A total of **74%** thought the e-reader was good or very good for reading journal articles but a little less, **66%**, had a similar opinion as regards reading books. Despite a high degree of satisfaction with the e-readers, fewer saw themselves as solely relying on such a device. Having been given the opportunity to read literature from the reading list on an e-reader, **50%** replied that they still preferred paper in terms of books. Only **14%** would rely solely on the device, and **26%** found that combining paper and an e-reader was best for study purposes. Seven percent answered that they did not know what kind of format they preferred.

The results for reading journal articles were somewhat more positive for e-readers. In all, 24% preferred just using the e-reader, and 32% saw themselves using a combination of print and the e-reader. However, 41% still wanted to stay with paper versions of journal articles, and 3% were not sure which format they preferred such documents.

Learning Outcomes

Place

In regard to location of use, **it** shows that 59% of the students never or seldom brought it with them to class. A total of 44% sometimes or often used it outdoors, and 50% had also used it when traveling. Interestingly, 49% had also taken the e-reader with them to bed.

Need

The students had the e-readers in their possession from 1 to 4 weeks, depending on which course they were attending. In my study, I wanted to find out, that to what extent the e-readers had been used for entertainment. Surprisingly, 56% never or seldom used the e-reader for entertainment; however 26% stated they did sometimes. Of the sample surveyed, 19% used it either often or all the time for entertainment. When asked to what extent they had used it for academic purposes, only 19% seldom or never used it for academic studies and 46% replied that they used it sometimes for this purpose. There were 27% who used it often for academic studies while 8% used the e-reader all the time.

Kindle Versus iPad

Although this study has not had its main focus on the student's perceptions of the Kindle and iPad, some findings should still be mentioned as the results clearly show differences between the two reading devices. First, the iPad receives better scores in terms of turning pages. In total, 46% thought this feature was very good using the iPad and 20% gave the similar score for the Kindle. Next, zooming receives far better score with iPad. A total of 61% thinks this is very good, in sharp contrast to only 4% giving the same score for the Kindle. Taking notes and highlighting text are two very important needs students have when studying. As for the possibility of taking notes, this was categorized as either good or very good by 28% using the iPad. Only 7% answered with these categories when using the Kindle. Highlighting text also received better scores with the iPad, 32% of iPad users finding this feature good or very good versus only 11% with the Kindle. Last, the reading devices did not score very differently as regards reading books, but for reading articles 92% of the iPad users found this to be either good or very good in contrast to 72% saying the same about the Kindle. We also observe the iPad is more of an entertainment device in comparison with the Kindle, but this should not be a surprise to anyone familiar with these devices.

Learning Outcomes.

Only 4% of the students participating in the project thought they had a better learning outcome using the e-reader for studying. But 46% thought they had learned about the same, and as many as 41% stated they had learned less well using the e-reader in comparison with printed text. 9% did not know.

Discussion Despite the fact that students in general were positive to the use of e-readers, my research suggests that current e-book readers loaded with curriculum-based e-books, provide for an efficient learning experience in higher education. Students report unsatisfactory aspects of the e-readers in regard to active reading.

The main results of my study are student preferences are still in line with what other investigators have found. Students of today still seem to prefer print on paper as the primary delivery mechanism for texts as part of their education. The current technological infrastructure as to e-readers and content is not yet as functional as traditional printed media.

Due to student preferences and uncertainty as to learning outcomes, the field is still in a state of flux. The major publishers of academic textbooks have still not embraced e-readers. Universities and academic libraries should possibly moderate plans and projects for a transition to e-texts and continue studying current e-book readers.

In this study, the iPad received better scores than Kindle DX as to taking notes and highlighting. The students also reported that they brought the iPad to class. This might point to this device's potential as an effective study and reading tool, and should be more thoroughly investigated.

Recent developments in smartphone technology are also of great interest. The widespread adoption of smartphones with large screens, powerful processors, and a sophisticated software environment means that most students will already have a device that could be a suitable tool for academic study. An added advantage of smartphones as a learning tool is that students already know how to use them. A new study focusing on these ubiquitous devices would be of great interest.

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