Student Academic Reading Preferences: A Study of Online Reading Habits and Inclinations

Tim Podolsky and Karen Soiferman

The University of Manitoba

September 26, 2014

Abstract

The purpose of this study was to explore student preferences regarding reading print materials or online reading materials for academic purposes, as well as to examine how students adapt traditional reading strategies such as underlining, highlighting, and taking marginal notes when reading electronic texts. A total of 61 participants (32 undergraduate and 29 graduate) completed a survey between March 2011 and March 2013. The results indicate that for academic readings the majority of students prefer to read paper based texts because it is easier to take notes, it is easier on the eyes, they are in the habit of reading paper documents, they have a better spacial understanding of where they are in the text, and there are less distractions when reading paper documents. When students do read academic texts electronically, the most common reading strategy employed for retaining information is to take notes on a separate piece of paper. Students claimed that the online reading and note-taking process could be improved with better software that was easier to use.

Introduction

The discussion of electronic reading habits is a growing area of interest for many college and university educators, yet it is a relatively unexplored area of research. Although portable online devices are ubiquitous in University hallways and classrooms, and people can be seen reading from these devices nearly every day, it appears that the preference for paper-based print materials remains strong in academic contexts (Aase, 2011; Foderaro, 2011; Kawase, Herder, & Nedjl, 2009; Liu & Huang, 2007; Wolfe & Neuwirth, 2001).

Vernon (2006) observed that by the time students get to university they have developed particular reading habits and are often reluctant to change those habits. In his study, of 23

students in a Master of Social Work class, he found that the majority of students did not read their texts online even when provided with the means to accomplish the task. His students preferred to print the text and read it in paper format. The reasons they cited for this fact were problems highlighting and taking notes; interface design problems that led to fatigue and headaches; convenience and access issues related to internet service; wait times for computers in computer labs; as well as, e-mail distractions associated with online reading tasks. Similarly, Woody, Daniel, and Baker (2010), in their study of undergraduate students found that students preferred textbooks over e-books for learning when given the option of purchasing an e-book or a more expensive textbook. There is an assumption that the current generation of students embraces technology unequivocally, but to date the research suggests that for academic purposes, students prefer to read paper based texts.

The purpose of this research study was to further investigate the prevalence of online reading habits amongst university students. The study aimed to explore learner preferences by answering the question of whether students actually preferred to read online in comparison to reading paper based texts. This study also aimed to explore the strategies that students do currently employ when they choose to read online. As technology changes the way students interact with text, it is important to adapt study techniques in order to maintain the benefits that are provided from traditional study approaches like highlighting and taking marginal notes. This study aimed to explore how students adapt and modify their reading habits when reading electronically.

Literature Review

Marshall (1997), conducted a survey of 150 different used textbooks, and she outlines a number of functions that are served by different highlighting and annotation practices. According

to Marshall (1997), annotations can be "procedural signals" that indicate which sections of text require further study or "future attention" (p.5). Annotations can serve as "place markings" of information that needs to be remembered; they can involve on the spot "problem-working" for courses like Chemistry or Calculus; they can serve as a record of "interpretive activity" for literature or language courses in which students need to translate unfamiliar language, reflect on a text's structure, or comment on a work's ideas; extensive underlining and highlighting can facilitate focus and serve as a "visible trace of the reader's attention" especially for difficult and complex texts; and finally, annotations can involve "incidental reflections" of things unrelated to the course in question (pp. 6-7).

Underlining, highlighting, and making marginal notes are important strategies for students who are trying to master academic content because they help to facilitate comprehension. According to Kawase, Herder, and Nejdl (2009), students commonly mark their textbooks in four typical ways: (1) by underlining or highlighting titles and headings; (2) underlining or highlighting words or phrases; (3) taking notes in the margins or near figures; and, (4) taking notes in the margins or between lines of text (p.241). These reading habits serve a variety of functions that can vary depending on the nature of the specific reading task. However, as reading evolves from a paper based activity into an online activity, what becomes less evident is how readers are able to maintain these habits with online media.

Although it is becoming increasingly possible to annotate online texts, the nature and quality of these annotations, has not yet surpassed or matched the intuitive ease of annotating a paper based document (Aase, 2011; Kawase, 2009; Diacono, 1997; O'Hara & Sellen, 1997). One main issue that arises from trying to annotate documents online is that the task itself is not seamless; it competes with the reading process and hinders comprehension (Aase, 2011; Kawase,

Herder & Nedjl, 2009; O'Hara & Sellen, 1997). It appears that the enhanced physical tangibility of a paper document allows the reader to conduct multiple activities simultaneously (note-taking while reading) whereas the current online annotation tools tend to slow down and impede the reading process (Kawase, Herder & Nedjl, 2009; O'Hara & Sellen, 1997), which makes online reading less appealing for students who need to master content under tight time restrictions

More specifically, the issue could be that free form annotations with a pen are often considered better because they require less cognitive capacity than annotations that need to be typed and therefore detract from the reading task (Schilit, Golovchinski, & Price, 1997). Subjects who are required to type annotations with a mouse and a keyboard have reported that this arrangement lacks the flexibility that paper and pen annotations provide (O'Hara & Sellen, 1997). The option of using a stylus to take notes on a tablet could eventually become appealing for readers, but at present it seems that handwritten notes are easier to produce and more legible (Kawase, Herder & Nedjl, 2009).

Another key advantage to using a paper based document is the concept of "information fixity" (Diacono, 1997, p. 4) or "relative position" within a text (Dillon, 1992, p.14). Although Kindles and iPads have made digital devices as equally portable as paper based documents, the three dimensional nature of paper based documents, allows a reader to more easily locate and find their position within a text (Kawase, Herder & Nedjl, 2009). As electronic media continues to experiment with providing better navigational markers that enhance the spatial layout of online documents, preferences may begin to change, but at present a standard method of organizing online texts has not significantly changed the culture of reading for academic purposes where readers are required to relocate important areas of text quickly and easily.

The issue of standardization is perhaps one problem that prevents the wide scale adoption of online annotation strategies. There currently exists a proliferation of online annotation tools that can be used for various purposes; however, being able to annotate PDF and word documents, videos, maps, websites, and PowerPoint text cannot necessarily be accomplished easily by one standard resource. This dissatisfaction has led scholars at the University of Illinois to establish the Open Annotation Collaboration, a project that aims to facilitate the "interoperability" of annotations for web resources by creating specifications for interoperability and encouraging the widespread adoption of better applications (The Open Annotation Collaboration, 2009).

If anything is going to promote and encourage users to adopt online annotation strategies, it will be the ability to more easily share resources and work collaboratively with an online community (Brunvand & Abadeh, 2011; Kawase, Herder & Nejdl, 2009). Another clear advantage afforded by digital annotations will be a user's ability to catalogue, file, and search for annotations at the touch of a button (Kawase, Herder & Nejdl, 2009), as opposed to sifting through mounds of paper. In his discussion of online e-reading, McFall (2005) listed several features that students could employ when reading e-texts that are not available when reading textbooks: (1) the ability to un-highlight a portion of the text when students made mistakes and highlighted more of the text than they intended; (2) the ability to name the highlighter colours based on their purpose such as definitions, questions, and major points; (3) the ability to display only the highlighted portions of the text, sorted by the name of the highlighter; and, (4) enhanced note-taking that allows the reader to create notes directly in the text or to display the notes in a separate window. These are clear benefits to using electronic texts that will become more apparent as digital annotation tools become more widely adopted.

Methodology

Participants

The participants for this study were 32 undergraduate and 29 graduate students at the University of Manitoba. The undergraduate participants worked as peer study group leaders, writing tutors, or teaching assistants for the *Student Academic Success* department. The graduate participants were students who used the services of the *University's Academic Learning Centre* between September 2010 and March 2012. A gender breakdown of the sample is not available because the survey was administered anonymously.

Procedure

A paper-based copy of the survey questionnaire composed of 10 multiple choice and short answer questions was administered anonymously to the undergraduate participants. For the sake of convenience, an electronic copy of the survey was also sent out to graduate student visitors of the Academic Learning Centre, and the results were collected anonymously. The questionnaire was completed by 45 students at the end of the 2011-2012 academic year, and once again by 16 new students at the end of the 2012-2013 academic year. Students were asked questions about their preferred methods of reading (electronic or paper-based), and they were asked questions about the strategies that they employ when they do choose to read paper documents or digitally for academic purposes.

Results and Discussion

When asked if they ever used electronic devices to do readings for their course, the majority of the respondents (93.44%) reported that they use a laptop, 32.79% said that that they

use a home computer, 11.48% stated that they use an iPad, 9.84% indicated that they use a mobile device, and 3.3% use a Kindle to read for their courses. The percentages do not indicate absolute numbers since it was assumed that more than one device could be used, and respondents were instructed to check all devices that applied (see Table 1).

Students were then asked if they preferred to read textbooks in paper form or online. The majority of the respondents (85.25%) chose paper as their preferred medium. Only 14.8% of the students indicated that they would choose to read electronically (see Table 2). Respondents were asked to list as many reasons as possible for their preference. The reasons that were given by respondents to explain a preference for paper fell into five main categories:

1. The most common reason listed by 44.82% of the respondents was that it is easier to take notes when working with a paper document.
2. The second most common explanation listed by 39.65% of the respondents was that reading a paper document was easier on the eyes.
3. A significant percentage (20.68%) claimed that they simply preferred to manipulate documents manually out of habit.
4. Another reason given by 10.34% of respondents was that reading paper based documents gave them a better spatial understanding of where they were in the text.
5. Some respondents (5.17%) said that they found reading on a computer distracting because they were tempted to access the web for other purposes.

These findings are similar to the findings of Vernon (2006) in his study of graduate level students. According to Vernon, his students complained that reading online caused anxiety about not being able to underline or take notes, reading online for an extended time led to eye

strain and headaches, and when reading online students were tempted to do other things like check emails.

The various reasons that were given by respondents who preferred to read electronically were that documents could be stored and carried more easily (6.89%), there was less of an environmental impact (1.72%), and the search functions on a computer made it easier to find information (3.44%). Some of these results are similar to the ones reported by McFall (2005) who argued that many of the functions of an e-reader did make it easier to locate information especially when using the software tools that allowed students to highlight and keep track of information.

When the respondents were asked which type of reading they thought was better for studying and retaining information, most chose paper (91.23%) as their response (see Table 3). When asked to explain why they chose one form over the other, the most common response listed (47.16%) was that it was easier to take notes when reading paper based documents. The other response that was listed by 9.43% of the respondents was that reading a paper document is less distracting than reading on a computer.

The students were then asked if they used any special software to facilitate or assist the online reading process (ex: Evernote, Readibility, OneNote, Spring Pad, etc.). Although some do use software while reading online, most of the respondents (85.25%) do not use any special software to assist with their online reading (see Table 4). For the respondents (14.75%) who do use online reading software to assist with the reading process, some of the software listed included OneNote, Dragon, Adobe, Evernote, Papers for Mac, Microsoft Word, Evernote, Readibility, Insta Paper, Zotero, Endnote, PDF Xchange Viewer, and Delicious.

Participants were also asked to indicate if they used a special software specifically to highlight information or take notes when reading electronic documents (ex: Awesome Highlighter, iAnnotate, Adobe Reader, etc.). The responses to this question show that 67.21% of respondents do not use software to highlight or take notes, 21.31% reported that they do use software, and 11.48% reported that they "sometimes" use a software for highlighting and taking notes while reading online (see Table 5). The most common tool used for this purpose, mentioned by 19.67% of respondents, was the Adobe Reader software.

Respondents were also asked if they used any special strategies when reading electronically to retain important information; 50.82% of the participants responded by saying "no", 39.34% responded by saying "yes", and 9.84% responded with "sometimes". The most common open-ended response given by students who do use a special strategy was that they take notes (53.33%). Of those responses, 26.66% indicated specifically that they take notes in a separate Word document.

When asked in an open-ended question how the electronic reading process could be improved, the most common response (40%) was that the software needed to be better and easier to use. Some respondents (14%) indicated that they wanted to become more familiar with the available online reading software, and 4% wanted more consistency in terms of what software could be used for online reading.

The participants were asked to indicate which strategies were most beneficial for retaining information when reading in general (underlining or highlighting, taking marginal notes, and/or taking notes on a separate piece of paper). The responses varied with all three options being popular choices. Underlining or highlighting was chosen by 71.7% of the participants, 68.3% chose taking marginal notes, and 71.7% claimed that taking notes on a

separate piece of paper was beneficial. Again, these numbers are not absolute since participants were instructed to check all that applied (see Table 6).

When asked if they use any of these strategies while reading electronic texts, the respondents (83%) were more likely to choose the option taking notes on a separate piece of paper, while 45.3% chose underlining or highlighting, and 24.5% chose taking marginal notes. Again, participants were allowed to choose more than one option (see Table 7). Lastly, respondents were asked to list any other specific note-taking strategies that they use when reading electronically (they could list more than one strategy); 69.23% stated that there were none. Otherwise, the most common response (12.82%) was "taking notes on a separate piece of paper".

Conclusion

The purpose of this study was to investigate the prevalence of online reading habits amongst university students, and to explore how students adapt and modify their reading habits when reading electronically. This study found that despite the students having access to numerous electronic devices (e.g., iPads, smart phones, laptops) they prefer to read information from paper sources as opposed to online in academic contexts (82% of participants). The reasons cited for their preference for a paper copy was that it was easier to take notes, it lead to less eye strain and headaches, it was simply a habit that was hard to break, it was easier for spatial understanding, and there were less distractions when reading from a paper source. The reasons for choosing an electronic version was that the document could be more easily stored and carried, electronic texts were more environmentally friendly, and the search function made it easier to locate information. The interesting finding from these reasons is that only one pertained

to using electronic texts to learn the material in a more efficient manner, while the other two were reasons that had nothing to do with making it easier to learn and retain information.

McFall (2005) proposed that one of the benefits of using electronic e-books was to make taking notes easier and more efficient. The findings of this study do not corroborate his hypothesis. In this study, 83% of the participants said that they took notes on a separate piece of paper when reading electronically which seems less efficient than using one of the software packages that are available. In addition, 40% of the participants in this study said that the software needed to be more user friendly before they would be able to use it, and 14% said they did not use the software because they were not familiar enough with all the features that were available in the different packages.

Another aim of the study was to explore how students adapt and modify their reading habits when reading electronically. It appears that many students did not change their reading habits and continued to use traditional and familiar techniques while reading electronically. Students listed taking notes, underlining or highlighting, and writing notes in the margins as the three most popular ways of retaining information. However, only 32.79% of the respondents were likely to use electronic features to highlight or take notes while reading electronically. One other interesting finding was that when it comes to reading electronically, students were more likely to choose the strategy of "taking notes on a separate piece of paper" although this did not necessarily appear to be a primary strategy when reading paper documents.

The findings from this study are similar to the findings from other studies on the use of online texts and the reasons why students have not embraced online texts in their courses (Howard, 2004; McFall, 2005; Vernon, 2006; Woody, Daniel & Baker, 2010). It appears that

university students are used to reading textbooks a certain way and see no reason to change since what they have been doing has proven to be successful. They are also comfortable with the process of interacting with the physical text. The participants in this study listed the factors that made reading online difficult for them and these reasons are similar to previously reported findings (McFall, 2005; Vernon, 2006). However, these concerns do not seem to be a factor when it comes to the personal use of electronic devices (Joliffe & Harl, 2008). More research needs to be conducted regarding students' reluctance to use electronic devices for school related reading, considering how prevalent electronic devices have become.

References

Aase, S. (2011). Print vs online: can there be a cohabitation of competing media and how readers can benefit. *Journal of the American Dietetic Association*, *111*(4), 500–4. Doi:10.1016/j.jada.2011.02.017

Brunvand, S., & Abadeh, H. (2010). Making Online Learning Accessible: Using Technology to Declutter the Web. *Intervention in School and Clinic*, *45*(5), 304–311. Doi:10.1177/1053451209359075

Diacono, V. (1997). An analytical summary of A Comparison of Reading Paper and On-line Documents by Kenton O ' Hara and Abigail Sellen , and a fast-forward to the age of e-paper. O'Hara's and Sellen's study: the background. *I Can*, 1–10.

Dillon, A. (1992). Reading from paper versus screens: a critical review of the empirical literature.*Ergonomics*, *35*(10), pp.1297-1326.

Foderaro, L. W. (2010, 10-20-2010). In a Digital Age, Students Still Cling to Paper Textbooks., *The New York Times*. Retrieved from http://www.nytimes.com/2010/10/20nyregion/20textbooks.

Howard, J. (2004). Just-in-time teaching in sociology or how I convinced my students to actually read the assignment. *Teaching Sociology*, *32*, 385-390.

Jolliffe, D., & Harl, A. (2008). Studying the "reading transition" from high school to college: What are our students reading and why? *College English*, *70*(6), 599-617.

Kawase, R., Herder, E., & Nejdl, W. (2009). A Comparison of Paper-Based and Online Annotations in the Workplace, 240-253. Retrieved from http://www.l3s.de/~herder/research/papers/2009/comparison_paperbased_online_annotations.pdf

Liu, Z., & Huang, X. (2008). Gender differences in the online reading environment. *Journal of Documentation, 64*(4), 616–626. Doi:10.1108/00220410810884101

Marshall, C.C. (1997). Annotation: from paper books to the digital library. Proceedings of the 1997 ACM International Conference on Digital Libraries (DL 97). Retrieved from http://www.csdl.tamu.edu/~marshall/dl97.pdf.

McFall, R. (2005). Electronic textbooks that transform how textbooks are used. *The Electronic Library, 23*(1), 72-81.

O'Hara, K. & Sellen, A. (1997). A comparison of reading paper and on-line documents. In Proceedings of CHZ97 (Atlanta, GA, March 1997), ACM Press, pp.335-342.

The Open Annotation Collaboration (2009). *Guiding Principles.* Retrieved from: http://www.openannotation.org/index.html

Schilit, B. N., Golovchinsky, G., & Price, M. N. (1997). Beyond Paper : Supporting Active Reading with Free Form Digital Ink Annotations. *Most*, 1–8.

Vernon, R. (2006). Teaching notes: Paper or pixel? An inquiry into how students adapt to online textbooks. *Journal of Social Work Education, 42*(2), 417-427.

Wolfe, J. L., & Neuwirth, C. M. (2001). From the Margins to the Center: The Future of Annotation. *Journal of Business and Technical Communication, 15*(3), 333–371. Doi:10.1177/105065190101500304

Woody, W., Daniel, D., & Baker, C. (2010). E-books or textbooks: Students prefer textbooks. *Computers & Education, 55*(2010), 945-948.

Appendix A

Online Reading Strategies Survey

1. Do you ever use any of the following devices to do readings for your courses? (check all that apply)

   a) home computer _____
   b) laptop_____
   c) Kindle _____
   d) iPad _____
   e) mobile device _____

2. If you could choose between reading for your courses electronically or on paper, which would you choose (check one)

   _____ electronic
   _____ paper

   Why?
   _____
   _____

3. Between electronic reading and reading on paper, which type of reading do you think is better for studying and retaining information?
   _____ electronic
   _____ on paper

   Why?

   _____
   _____

4. Do you use any special software to facilitate or assist the online reading process? (ex: Evernote, Readibility, OneNote, Spring Pad, etc.)

   _____ yes
   _____ no
   _____ sometimes

   If you answered “yes” or “sometimes” to question 4, please explain what software you use to aid the electronic reading process.

_____

_____

5. Do you use any special software when you are reading electronically to highlight important information or take notes? (ex: Awesome Highlighter, iAnnotate, Adobe Reader comment tools, etc.)

   _____ yes

   _____ no

   _____ sometimes

   If you answered "yes" or "sometimes" to question 4, please explain what software you use to highlight or annotate electronically.

   _____

   _____

6. Do you use any special strategies when you are reading electronically to retain important information?

   _____ yes

   _____ no

   _____ sometimes

   If you answered "yes" or "sometimes" to question 6, please explain what strategies you use when reading electronically.

   _____

   _____

7. How could the electronic reading process be improved for you?

   _____

_____

8. Which strategies do you feel are most beneficial for retaining information when reading in general? (check all that apply)

   a) Underlining or highlighting _____

   b) Taking marginal notes _____

   c) Taking notes on a separate piece of paper_____

9. Do you use any of the following strategies when reading electronically? (check all that may apply)

   a) Underlining or highlighting _____

   b) Taking marginal notes _____

   c) Taking notes on a separate piece of paper_____

10. Are there any other specific note-taking strategies that you use when reading electronically?

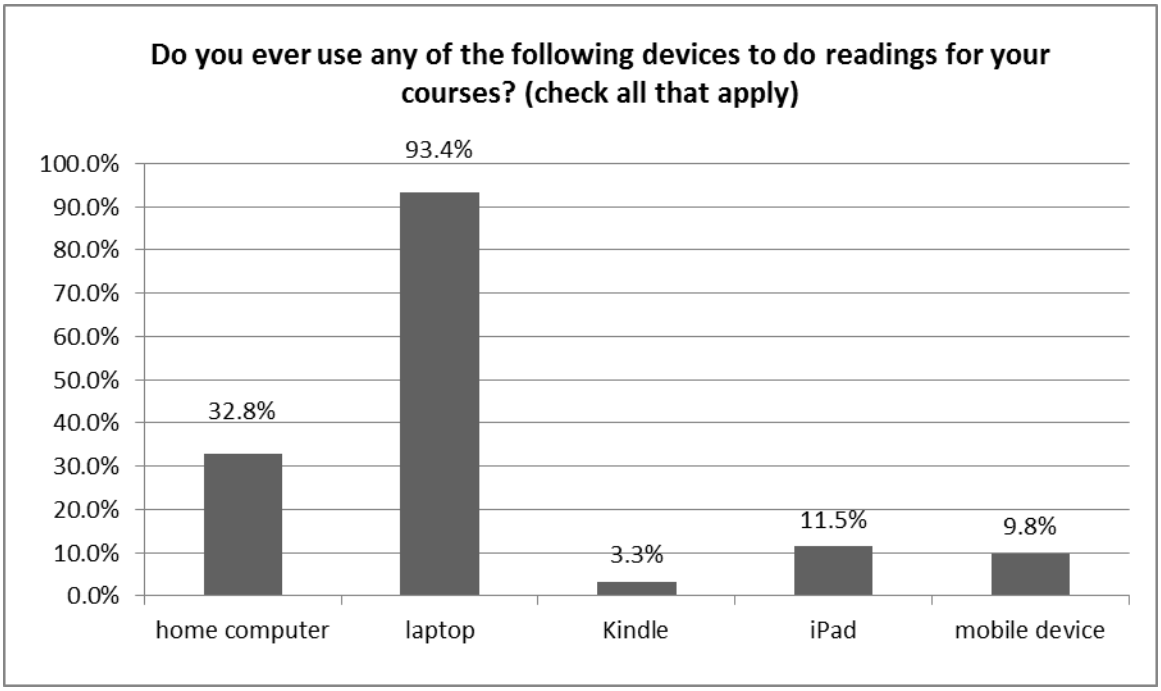
_____

_____

_____

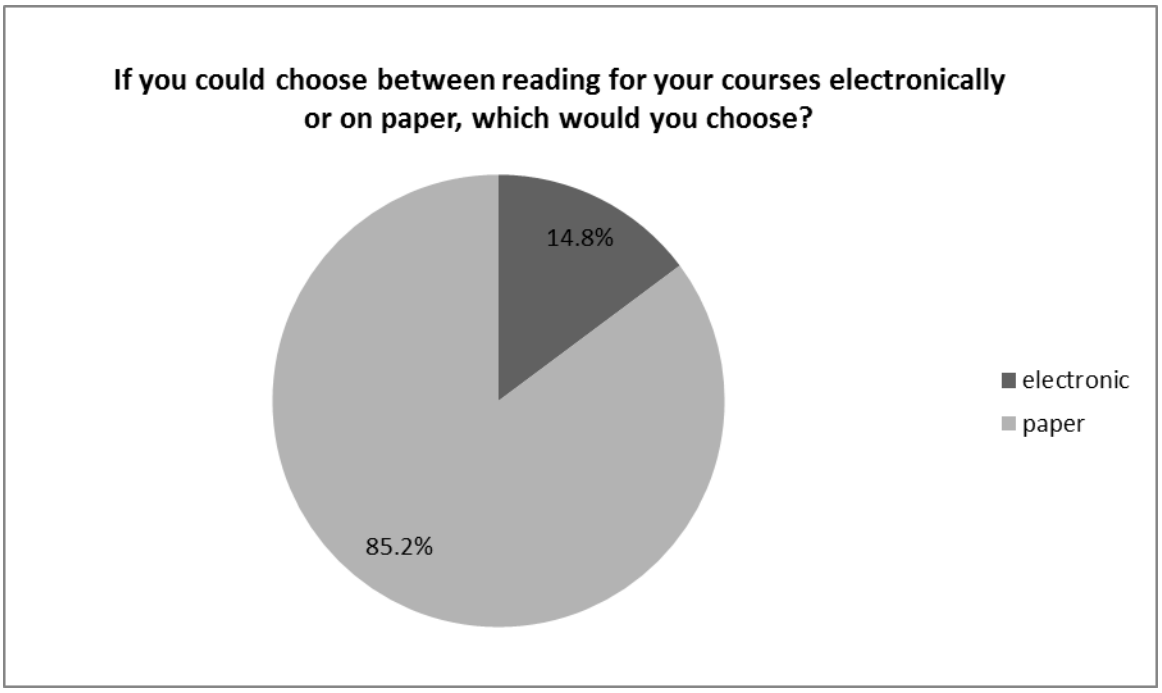
Appendix B

Table 1



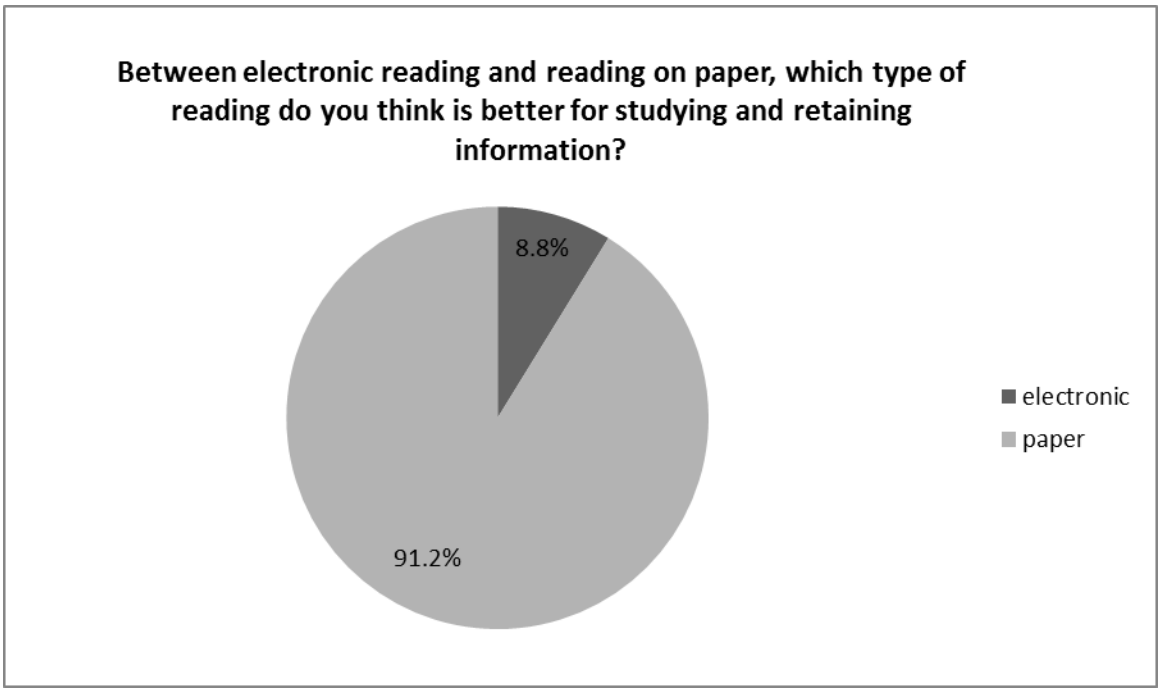
Appendix C

Table 2



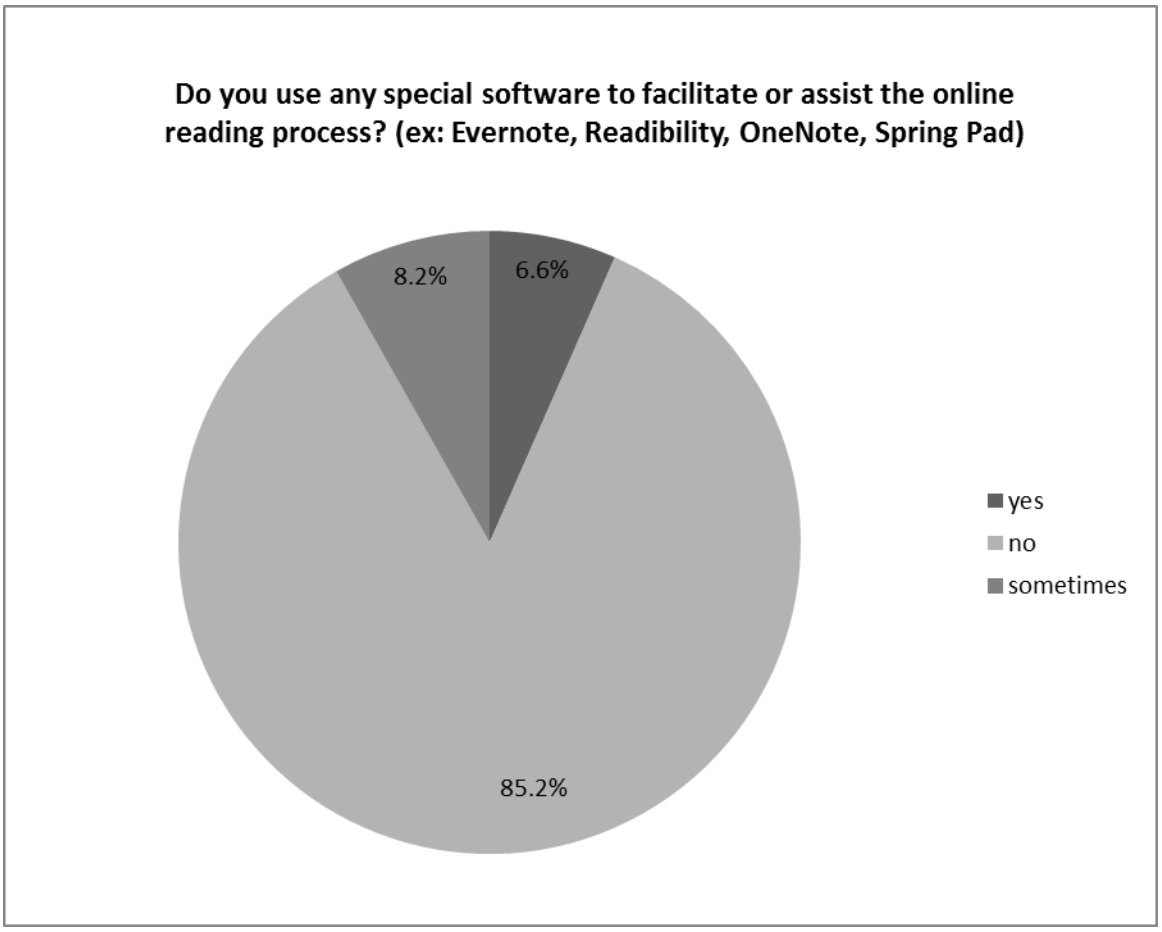
Appendix D

Table 3



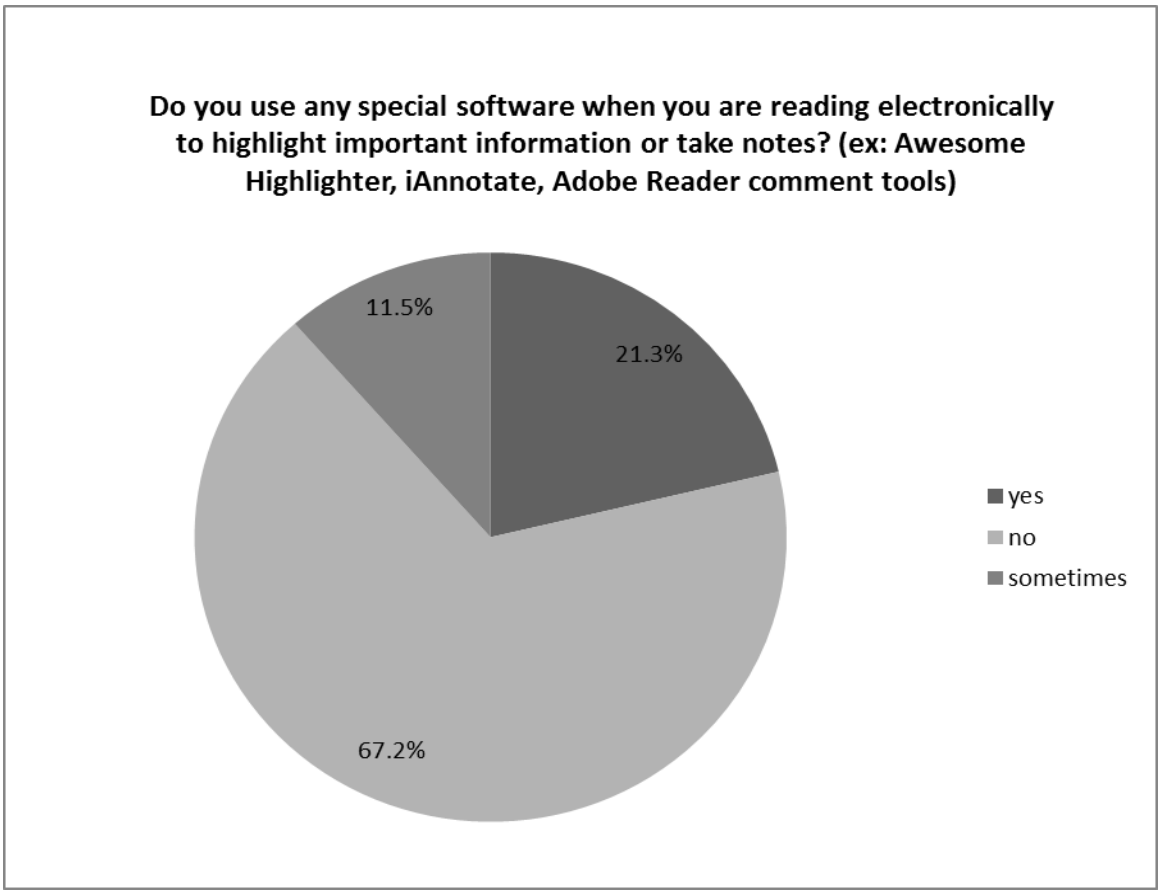
Appendix E

Table 4



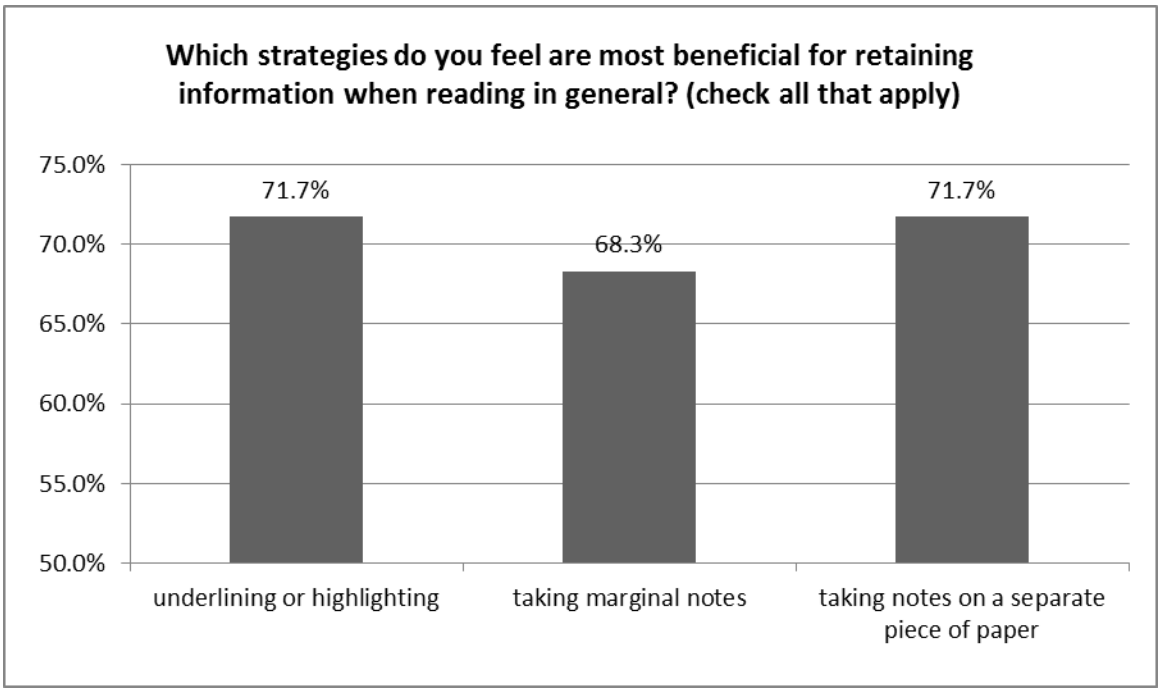
Appendix F

Table 5



Appendix G

Table 6



Appendix H

Table 7