



E-textbooks at what cost? Performance and use of electronic v. print texts

David B. Daniel^{a,*}, William Douglas Woody^b

^aJames Madison University, Department of Psychology, 91 E. Grace St, MSC 7704, Harrisonburg, VA 22807, United States

^bUniversity of Northern Colorado, United States

ARTICLE INFO

Article history:

Received 16 March 2012

Received in revised form

22 October 2012

Accepted 25 October 2012

Keywords:

E-book

Electronic text

Print text

Textbook

Student learning

College students

ABSTRACT

While e-book sales continue to increase, electronic textbooks are not very popular with college students. This may be due to the fact that e-textbooks are read for different reasons and with different strategies than are e-books. Although previous research has documented this lack of preference for e-textbooks, student performance and use of electronic texts has yet to be thoroughly investigated, especially in naturalistic settings. This study examines students' use and performance on a variety of print and electronic formats in both laboratory and at-home conditions. Although students scored similarly across formats and conditions, reading time was significantly higher in the electronic conditions with this difference increasing for the home conditions. Similarly, self-reports of multi-tasking were significantly higher for electronic conditions in the home condition, possibly accounting for the disparities in reading time. We conclude by urging caution in the rush to assume that electronic textbooks are equivalent substitutes for traditional textbooks and argue for further investigation into the unique ways that students may interact with electronic texts to promote more effective design.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

Since April of 2011, e-book sales have outsold printed books on Amazon.com (Miller & Bowman, 2011) and continue to grow throughout the marketplace (Publisher's Weekly, 2012). Yet, e-textbook sales have yet to take-off at the college level (National Association of College Bookstores, 2011). Reviews of student perceptions e-textbooks consistently demonstrate this lack of preference, which seems not to be positively affected by familiarity and or prior use (Shepperd, Grace, & Koch, 2008; Woody, Daniel, & Baker, 2010). Clearly e-books and e-textbooks are not equivalent products (see also Daniel & Willingham, 2012). Unlike regular e-books, which are commonly read for personal goals and enjoyment, e-textbook readers have the additional goals of learning, even memorizing, portions of the text. Indeed, textbooks are constructed with these goals in mind. Although often a simple copy of the textbook page, most students do not prefer e-textbooks as productive alternatives for meeting these goals (Woody et al., 2010).

Student preferences, however, are not necessarily the best criteria upon which to make pedagogical decisions. Students, whose goals often revolve around efficiency moreso than learning impact (Kvavik, 2005), have often been demonstrated to prefer pedagogical strategies that are not associated with learning (Gurung, 2003, 2004; Gurung & Daniel, 2005; Gurung, Weidert, & Jeske, 2010; Wesp & Miele, 2008). This is not unique to college students: Humans in general are poor judges of how much they know (see Dunning, Johnson, Ehrlinger, & Kruger, 2003, for a review). Although students may not make the best initial choices, there is evidence that they do shift toward more productive decisions with appropriate feedback (Daniel & Woody, 2010). In the case of students who have had experience with e-textbooks (Woody et al., 2010), is their aversion to electronic textbooks warranted?

What are some known benefits of using student-level technology in an educational setting? Clyde (2005) noted a number of potential advantages that e-textbooks have over their paper-based counterparts. One advantage is the superior flexibility and accessibility of e-textbooks over paper-based textbooks (Coleman, 2004; see also Cavanaugh, 2002; Long, 2003; Myers, 2009). The common reasoning among these and many other authors is that characteristics such as attractiveness, cost, flexibility, features, and ease of availability encourage students to consult a computer for textbook information rather than a paper textbook. Hence, some students may be attracted to this new technology, but what effect does this attraction have on learning?

* Corresponding author. Tel.: +1 540 568 7359; fax: +1 540 568 4916.

E-mail address: danieldb@jmu.edu (D.B. Daniel).

If e-textbooks are to become a constructive option for college-level students, it is important to investigate the potential learning impact of text delivered in this medium. The relatively few studies that have directly assessed student performance and/or retention for material delivered via e-textbooks indicate that learning may not be impeded in this delivery mode (e.g., Shepperd et al., 2008; Taylor, 2011).

Recently, Shepperd et al. (2008) assessed preference and inferred performance for an available e-textbook option within the context of an introductory psychology course. Students were not assigned to print or e-textbook conditions. Rather they were given the choice after a class presentation on the available e-textbook. With regard to preference, no students who had previously used an e-textbook opted to use one in this course, and end-of-semester evaluations indicated that students who did opt to use them would not do so again (see also Woody et al., 2010 for a more thorough assessment of print and e-textbook preferences in college students). Although there was no direct measure of student learning by condition, Shepperd et al. found no difference in final course grades between students using e-textbooks (see also Muter & Maurutto, 1991). The students in this study were not randomly assigned to conditions, and there was little control for other variables that could have influenced course grades; therefore, there remains a need for a more controlled investigation into learning and performance with regard to e-textbooks. Further, there was no report of how students used each medium to achieve their grades, leaving open the possibility that students use different strategies when interacting with printed textbooks compared with e-textbooks. Similarly, Taylor (2011) found similar levels of retention on a short multiple choice quiz for traditional vs. electronic textbooks in a lab-based study but did not assess reading time or other measures related to students potentially using different strategies for interacting with each medium.

Questions remain regarding differences between students' interactions with print and electronic media regarding subjective fatigue (Dillon, 1992), text scanning patterns (Nielson & Pernice, 2010), and other factors (Kropman, Schoch, & Teoh, 2004). If there are not differences in comprehension, e-textbooks may actually be less efficient than paper-based textbooks because students take significantly longer to read the e-textbook than the paper version (e.g., Clyde, 2005). This potential time difference could be due to the extra audio and visual components the e-textbooks have over the paper-based textbooks or to factors associated with reading from a screen. Further studies are needed in order to determine whether the extra time pays off, which would require consistent findings of higher comprehension scores in electronic versions over paper versions.

Measures of learning as well as methods of use are important considerations as e-textbooks increasingly include features that are not part of the traditional textbook experience, including links to supporting assets and interactive tutorials. We are currently unaware of all the repercussions of using technology as a learning tool at the student level, however, and even less aware of how students interact with pedagogical tools outside of the structure of the laboratory (e.g., Daniel & Poole, 2009). The current study examines differences in learning and differential usage that result from using a variety of print and electronic textbook modes in both lab and more naturalistic conditions.

2. Method

2.1. Participants

Participants were 298 students (124 males and 174 females) with no formal previous exposure to the target chapter's content. They participated to fulfill a course requirement at a medium-sized regional university in the United States. Additionally, 20 participants (6 males, 6 females, and 12 unreported) took only the quiz and did not read the chapter or complete any other measures. We treated all participants in accordance with American Psychological Association [APA] ethical guidelines (APA, 2002).

2.2. Materials

Participants in both conditions read a textbook chapter titled "Social psychology" from Myers's (2007) introductory textbook, *Psychology*, and were randomly assigned to one of five formats: print textbook, printed text pages, printed manuscript in Microsoft Word, electronic pdf file, or electronic textbook. Students reported their college Grade Point Averages [GPAs] and completed a questionnaire about their previous interactions with the print or electronic textbooks, motivation to perform well on the quiz, and perceived mastery of the reading material. Specifically, they used a Likert scale (1 = not at all, 9 = extremely) to report their perceptions of how well they remembered and understood the material and how motivated they were to pay close attention to the reading and to perform well on the quiz; they used a Likert scale (1 = not at all useful, 9 = extremely useful) to rate the usefulness of several common textbook features (e.g., photographs and figures). Additionally, students in the home condition also used a Likert scale (1 = never, 9 = always) to rate how often, if at all, they engaged in competing activities (see Table 3) as they read the chapter.

Participants completed a 30-question quiz that included equal numbers of easy, medium, and hard questions as identified by the accompanying testbank (Brink, 2007). Additionally, the researchers precisely recorded reading times for students in the laboratory condition, and students who read the chapter at home self-reported the amount of time they spent reading for the quiz.

2.3. Procedure

After being screened for previous exposure to the chapter's material, students were randomly divided into 2 groups: One group of students read in the laboratory and the other read at home. Participants in the lab condition read the chapter while being observed and immediately completed the survey followed by the quiz; participants in the home condition read the chapter at home and completed the survey and the quiz two days later when they returned to the classroom.

Students in the lab condition were either handed a packet containing the reading or sat in front of a computer, depending upon format. When told to do so, students read the material. Experimenters in the lab unobtrusively recorded reading time for each reader in all formats and distributed separate survey and then quiz packets to students upon completion of the previous task: Immediately after finishing the reading, students were given the survey materials and, upon completion, were then given the 30-question performance quiz.

Students in the home condition reported to a classroom where they were given instructions to read the provided material for a later quiz. They were then handed either a reading packet or a CD, depending upon condition, and a form to record their reading time and study and non-study-related (e.g., competing activities) activities that they may have been engaging in related to their attempts to master the material.

Download English Version:

<https://daneshyari.com/en/article/6835570>

Download Persian Version:

<https://daneshyari.com/article/6835570>

[Daneshyari.com](https://daneshyari.com)