

Paper as a Learning Tool

Reading and learning from reading are complex processes. From our initial experiences learning to read, to getting a college education and engaging in work at our jobs, we rely on our ability to comprehend, remember and make use of what we read. The skills and strategies we are taught to employ while reading have developed over centuries of interaction with print on paper. As a result, our reading skills and strategies are not simply tied to the written word, but are also intimately tied to the medium of paper. Over the years, paper has proven to be a particularly potent learning tool and continues to be the most effective medium for reading.

- In a study of 6th graders reading e-books and paper-based books, researchers found that the students who read print books had “better reading comprehension of the text, performed better on quizzes about the content of the material, and suffered less eye fatigue. Students expressed a preference for paper-based books.” (Jeong, 2012)
- “When eighth-grade students were asked to extrapolate information from science and social studies texts read in either paper or electronic format, it was found that students reading digitally performed worse than those reading traditional texts when recalling and identifying specific details, main ideas, and supporting details from their text.” (Fisher, Lapp, and Wood, 2011, cited in Schugar, Schugar, and Penny, 2011)
- In the University of Washington’s Amazon Kindle Pilot Study, researchers testing the Kindle e-reader “found it difficult to switch between reading techniques, such as skimming an article’s illustrations or references just before reading the complete text. Students frequently made such switches as they read course material in print.” (Hickey, 2011).
- In fact, the Kindle was found to hinder readers’ abilities to utilize 4 of the 5 common reading strategies -- skimming, scanning, search reading and responsive reading. (Thayer et al., 2011, cited in Olsen, Kleivset and Langseth, 2012, p. 4)
- In Princeton University’s Amazon Kindle Pilot Study, it was concluded that retention of information was decreased when using a Kindle e-reader due to its lack of flipping and skimming functionality. These functional limitations of the e-reader also made it more difficult to review material later in semester. (The Trustees of Princeton University, 2010, p. 3)

Students commonly employ 5 different reading strategies, and frequently switch between them, while engaging with a text academically. Paper is superior to electronic text in supporting these strategies.

Paper-based materials promote reading comprehension, information retention, and learning for students.

- Students felt that “flipping through the pages” in print would continue to be important in order to get a general sense of a text’s content and organization prior to reading it more fully. (Marmarelli and Ringle, 2010a, p. 4-5)
- Several studies cited the lack of skimming functionality in e-texts and e-readers as problematic for students. (Clark et al., 2008; Foasberg, 2011; Mallett, 2010)

College students prefer paper-based reading materials to electronic for academic work.

- Students prefer to study using print texts rather than study on screen. (Ackerman and Goldsmith, 2011)

- In a study of undergraduate students at the College of Mount Saint Joseph, 66% of respondents preferred using a book in print format over electronic (Gregory, 2008)
- A study of 91 undergraduate students found that they do not prefer e-texts over print textbooks “regardless of their gender, computer use or comfort with computers.” (Woody, Daniel and Baker, 2010).
- In a 2009 Student Public Interest Research Group survey, 70% of students preferred print textbooks to e-texts “when cost was not a factor.” (Weinman, 2009)
- Two surveys of first year dental students conducted at Louisiana State University Health Sciences Center School of Dentistry found that 66% and 57% of students preferred reading print textbooks over e-textbooks. They preferred print textbooks for reading large amounts of text. (Brunet et al, 2011)
- In a study conducted at Oxford University, undergraduate students preferred print over electronic for reading lengthy text. (Keller, 2012)
- Research at the University of Agder revealed that 54% of students preferred print on paper for academic study. 28% preferred a combination of print and e-reader and 11% preferred using an e-reader. (Olsen, Kleivset and Langseth, 2012)
- In online interviews with 600 Millennials conducted by TRU research, 78% of interviewees preferred print over electronic books. (TRU, 2011)

Some of the most effective tools in a student’s arsenal are “active reading” strategies such as bookmarking, highlighting, note-taking and annotating text. Print-based texts are superior to e-texts and e-readers in facilitating the use of these strategies.

- Active reading strategies help students identify what information is important, think about and assimilate information, and facilitates review of materials during activities like studying, organizing a term paper, discussing readings in class, and reviewing for exams.
- Print-based texts are “well suited to student needs” because highlighting and annotating can be performed right on the paper. (Demski, 2010, p. 3; Fisher and Harris, 1973; Wesley, 2012)
 - A researcher at the University of Washington has shown that writing by hand, as in note-taking, activates a much larger area of the brain than keyboarding -- including regions used for thinking, language, and working memory. (Bounds, 2010)
 - Active reading skills are less effective with e-text than with print-based materials. (Hoseth and McLure, 2012; Schugar, Schugar, and Penny, 2011, p. 174)
 - In the University of Washington’s Amazon Kindle Pilot Study, researchers found that three quarters of students marked up print texts as they read. “This included highlighting key passages, underlining, drawing pictures and writing notes in margins.” (Hickey, 2011)
 - Participants in the Ohio State University Kindle Pilot Study rated the e-reader poor for annotating e-text. (Noble, 2010)

- Participants in the Princeton University Kindle Pilot Study rated print-based texts more highly than e-texts for their ease of highlighting, annotating, and navigation within and between documents. (The Trustees of Princeton University, 2010, p. 3)
- The Reed College Kindle Pilot Study revealed, “the use of PDFs renders many of the functions of e-readers unusable, such as annotation, highlighting, text-resizing, and text-to-speech.” (Marmarelli and Ringle, 2010, p. 4)
- Researchers for the Princeton University Kindle Pilot Study noted that “students want to ‘skim’ or ‘flip’ rapidly through a reading to see highlights and notes” and that print textbooks facilitate these review behaviors better than the Kindle e-reader. (The Trustees of Princeton University, 2010, p. 5)
- A survey of students using e-texts in engineering courses revealed user dissatisfaction with highlighting, note-taking, and note sharing. (Carter et al., 2012)

The classroom experience is enhanced by print-based textbooks, which allow students to easily follow along with lectures and participate in class discussions.

- Students can more effectively follow along with a classroom lecture or participate in a class discussion when they can quickly flip to the correct page or passage being discussed. With e-readers students find it difficult to navigate between sections.
- “When reading traditional books, it’s easy to take the act of flipping pages for granted; it’s an inherent part of the process. In academic reading, it’s also essential. Whether students are studying for exams, comparing passages in separate texts, or following along in class, they need to be able to thumb quickly through their books so they can access the information they need.” (Demski, 2010, p. 4)
- Students frequently need to view more than one text at a time, both in class discussion and when studying (The Trustees of Princeton University, 2010, p. 5). This is difficult to do with e-texts, because e-reading devices often do not allow more than one reading to be viewed on the screen at a time.
- In the Reid College Kindle Pilot Study, “three courses in the study were upper-division seminars centered around careful reading and discussion of the assigned texts; in such courses, students typically are expected to support their claims with specific textual evidence, and everyone in the class needs to be able to quickly locate the same passages in the texts in order to keep the discussion moving. The Kindle DX did not facilitate either of these needs because of the difficulty of navigating from one point in a text to another.” (Marmarelli and Ringle, 2010, p. 5)
- In the Arizona State University Kindle Pilot Study, students found page-flipping difficult with the e-reader and remarked that it was a problem in the classroom, where they need to be able to quickly locate text passages being referenced by their professor (Demski, 2010, p. 5). Similar results were found in the Princeton Kindle Pilot Study. (The Trustees of Princeton University, 2010, p. 3)
- A Kindle Pilot Study at the Ohio State University noted that the lack of page numbers in e-texts accessed on the e-reader made it difficult for students to follow class discussion. (Noble, 2010)

College students engage deeply with texts – they read, study, assess, discuss, critique and create their own written products from them – so it is important that they have access to the format that delivers the best learning outcomes. Paper-based books and readings are more conducive to success in an academic setting than their electronic counterparts.

- In a comprehensive study of students at 5 major universities (Cornell University, Indiana University, University of Minnesota, University of Virginia and University of Wisconsin), most students expressed a preference for print textbooks, and generally had a negative experience with e-texts.
 - 54% of Wisconsin students reported print textbooks provided a better learning outcome than e-texts. (Internet2.edu, 2012, p. 23)
 - Negative aspects of e-texts included “poor readability, eyestrain, insufficient resolution for graphics, zooming and scrolling difficulties, difficulty annotating, not readable on some mobile devices, and a dislike of reading on a computer or other device.” (Internet2.edu, 2012)
 - Minnesota students reported they would only purchase an e-text in the future if it were the cheapest option. Some would not buy an e-text regardless of cost (Internet2.edu, 2012)
 - Minnesota faculty expressed the belief that e-texts did not enhance student outcomes. Some professors reported that their students actually read less than their counterparts reading a print textbook. As a result, faculty preferred printed texts for class instruction. (Internet2.edu, 2012,p. 24)
- The results from the Kindle Pilot Studies at Reed College, Princeton and UVA “found the device unsuitable for the rigors and expectations for college-level teaching and learning. Researchers cited issues with text formatting (PDFs), highlighting and annotating, as well as text skimming and previewing as issues and reasons why these devices could not meet academic demands.” (Schugar, Schugar, and Penny, 2011 p. 178)
- A professor in the Reed College Kindle Pilot Study “felt that his students' comprehension of the reading materials suffered from use of the Kindle DX. He speculated that the difficulty students encountered with highlighting and taking notes on the device eventually caused them to read passively, thereby reducing their ability to reflect on and retain complex information. He saw evidence of this in assignments as well as in class discussion.” (Marmarelli and Ringle, 2010, p. 6)
- In the UC Library’s Springer E-book pilot study, “Many undergraduate respondents commented on the difficulty they have learning, retaining, and concentrating while in front of a computer.” (Li, 2011)
- In a pilot study conducted with students from Cranfield University and The Open University, students reported that e-readers “were limited by their functionality and did not fit in with their current study practices.” (Mallett, 2010)
- Research at Gettysburg College found that students find e-readers awkward for classroom use. (Foster and Remy, 2009)

Reading on screen is fundamentally different than reading on paper. When people read on screen, they spend less time actually reading, and more time browsing and scanning text, which leads to less comprehension and recall.

- “The average times that users spend on e–book and e–journal sites are very short: typically four and eight minutes respectively. It is clear that users are not reading online in the traditional sense, indeed there are signs that new forms of ‘reading’ are emerging as users ‘*power browse*’ horizontally through titles, contents pages and abstracts going for quick wins. It almost seems that they go online to avoid reading in the traditional sense.” (Rowlands, *et al.*, 2008, cited in Cull, 2011).
- “A typical ‘*screen–based reading behaviour*’ is emerging, characterized by more time spent on ‘browsing and scanning, keyword spotting, one–time reading, non–linear reading, and reading more selectively’, while less time is spent on in–depth reading, and concentrated reading.” (Z. Liu, 2005, cited in Cull, 2011)
- “It has been suggested that speed reading and browsing —typical online reading behaviour — results in an overall decline in the level of comprehension.” (Dyson and Haselgrove, 2000, cited in Cull 2011)
- “When online, people switch between two poor kinds of reading — ‘*tunnel vision reading*’ in which one reads a single bit of text without a sense of the context, and ‘*marginal distraction*’, which happens, for example, when a person reads textual feeds on the sidebar of a Web site such as a blog.” (A. Liu, *et al.*, 2009, cited in Cull, 2011)
- “When working with digital information people also switch activities every three to 10 minutes, pointing to an obvious conclusion: ‘It is just not possible to engage in deep thought about a topic when we’re switching so rapidly’.” (A. Liu, *et al.*, 2009, cited in Cull 2011)
- A study of college students at Oxford University found: “All participants agreed that reading on screen was different than reading in print. The general opinion was that reading on screen was conducive to a more *superficial reading style*. Students used terms like ‘skimming’, ‘browsing around’ or ‘reading quickly’ when talking about reading on screen. Attention span and reading sessions were shorter. Someone described them as ‘short bursts’; texts were often not read linearly or to the end.” (Keller, 2012)
- These students reported that with e-texts they generally read short passages only, and usually in a non-linear fashion. (Keller, 2012)
- They also reported it required more effort to concentrate when reading on screen. (Keller, 2012)
- Mark Bauerlein, author of *The Dumbest Generation*, notes that onscreen reading impedes intellectual processes: “We need to recognize that screen scanning is but one kind of reading, a lesser one, and that it conspires against certain intellectual habits requisite to liberal-arts learning. The inclination to read a huge Victorian novel, the capacity to untangle a metaphor in a line of verse, the desire to study and emulate a distant historical figure, the urge to ponder a concept such as Heidegger's ontic- ontological difference over and over and around and around until it breaks through as a transformative insight — those dispositions melt away with every 100 hours of browsing, blogging, IMing, Twittering, and Facebooking.” (Bauerlein, 2008)

Readers “information graze” on screen, rather than actively engage in reading as they do when reading from paper.

- A study by Rowlands et al. (2008) found that “although young people demonstrate an apparent ease and familiarity with computers, they rely heavily on search engines, view rather than read and do not possess the critical and analytical skills to assess the information that they find on the web.”
- “Several studies of college student use of e-books indicates they use text search features to focus in on brief passages, tend to skim e-book content, and generally do not read an entire e-book cover to cover unless it is for a literature course.” All of these practices can limit recall. (Hoseth and McLure, 2012)
- In a review of the scholarly literature on e-books, Staiger found “academic users typically search e-books for discrete bits of information, a behavior summed up by the formula ‘use rather than read’.” (Staiger, 2012)
- People who read on screen “tend to skim, bounce from source to source, and hunt and peck for information.” (Wexelbaum, Miltenoff, and Parault, 2011)
- In the CIBER survey, 55% of students indicated they “dipped in and out of several chapters” while only 6% indicated they read the entire book. (Wexelbaum, Miltenoff, and Parault, 2011)
- “Web site users tend to browse pages rapidly, and read only about 20 percent of the text on an average page.” (Nielsen, 2008; Weinreich, *et al.*, 2008; both cited in Cull, 2011).
- According to the CIBER study, on average, readers only spend about four minutes on a particular e-book site. (Wexelbaum, Miltenoff, and Parault, 2011)

Print resources are perceived as more authoritative than electronic resources.

- Students at Oxford University generally believed that there was something “a bit more authoritative about print” than electronic text. “Printed media were more likely to get the facts right; electronic texts were perceived as more ephemeral or disposable, containing ‘so much trivial stuff’.” (Keller, 2012)
- In online interviews with 600 Millennials conducted by TRU research, interviewees considered print documents more official and more trusted than electronic documents. (TRU, 2011)

Technical limitations of e-readers and certain features of e-books have a negative impact on reading comprehension and recall.

- The screen size of e-readers, poor zoom capabilities, difficult to read graphics, and the use of continuous scrolling to navigate texts (particularly in PDF format) make it difficult for students to make use of text features and cognitive mapping to retain information.
 - Text features (such as chapter and section headings, captions, illustrations, charts, tables, and graphs) help readers comprehend and remember what they’ve read. (Fisher and Frey, 2008; Morrison and Nunnery, 2011; Yang, Chen and Li, 2011).

- “Cognitive mapping” is a technique in which readers use text features and physical cues such as the location of information on the page and the position in the book to go back and find a section of text or even to help retain and recall the information they had read. Cognitive mapping is more difficult with e-texts. (Hickey, 2011)
- Some of the common features and content of electronic storybooks are distracting to young readers, may lead to passive participation in reading, and may reduce reading comprehension when compared to paper-based materials. (Zucker, Moody, and McKenna, 2009; Moody, 2010).

Print newspapers remain more popular with readers than digital newspapers and promote greater recall.

- The World Association of Newspapers and News Publishers (WAN-IFRA) reports that over 2.5 billion people read print newspapers at least once a week, versus 100 million who read digital newspapers exclusively. 500 million read both print and digital newspapers. (RIT, 1/1/2013)
- In a study of 45 consumers reading a newspaper either in print or on the web, it was found that the group reading the print version remembered significantly more of the topics presented and more of the main points contained within the stories. (Santana, Livingstone and Cho, 2011)

SOURCES

Ackerman, R., & M. Goldsmith (2011). Metacognitive regulation of text learning: On screen versus on paper. *Journal of Experimental Psychology. Applied* 17(1): 18-32.

Bauerlein, Mark (2008). Online literacy is a lesser kind. *Chronicle of Higher Education* 9/19/2008.

Brown, Randy (2011). Student acceptance and use of e-reader technology and e-books as an alternative to textbooks. *Academy of Educational Leadership Proceedings* 16(2).
<http://alliedacademies.org/Public/Proceedings/Proceedings29/AEL%20Proceedings%20Fall%202011.pdf>

Bounds, Gwendolyn (2010). How handwriting trains the brain: Forming letters is key to learning, memory, ideas. *The Wall Street Journal* 10/5/2010.
<http://online.wsj.com/article/SB10001424052748704631504575531932754922518.html?KEYWORDS=bounds>

Cater, David et al. (2012). E-textbooks for engineering courses. *Michigan Library Association Meeting. Academic Libraries, Ann Arbor, Michigan, May 10-11, 2012.*
<http://www.mla.lib.mi.us/sites/default/files/Session%202015%20Presentation.pdf>

Clark, Dennis et al. (2008). A qualitative assessment of the Kindle e-book reader: Results from initial focus groups. *Performance Measurement and Metrics* 9(2): 118-129.
<http://www.emeraldinsight.com/journals.htm?articleid=1736795&show=abstract>

Cull, Barry W. (6/6/2011). Reading revolutions: Online digital text and implications for reading in academe. *First Monday* 16(6).
<http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/3340/2985>

Demski, Jennifer (5/1/2010). The device versus the book. *Campus Technology*.

Dyson, Mary and Mark Haselgrove (2000). The effects of reading speed and reading patterns on the understanding of text read from screen. *Journal of Research in Reading* 23(2): 210–223. <http://onlinelibrary.wiley.com/doi/10.1111/1467-9817.00115/abstract>

Fisher, Douglas and Nancy Frey (2008). What does it take to create skilled readers? Facilitating the transfer and application of literacy strategies. *Voices from the Middle* 15(4): 16-22. <http://www.fisherandfrey.com/wp-content/uploads/2010/01/vm-skilled-voices.pdf>

Fisher, D., D. Lapp and K. Wood (2011). Reading for details in online and printed text: A prerequisite for deep reading. *Middle School Journal*, 42(3): 58-63.

Fisher, Judith L. and Mary B. Harris (1973). Effect of note taking and review on recall. *Journal of Educational Psychology*, 65(3): 321-325. <http://psycnet.apa.org/journals/edu/65/3/321/>

Foasberg, N. M. (2011). Adoption of e-book readers among college students: A survey. *Information Technology & Libraries*, 30(3): 108-128.

Foster, Gavin and Eric D. Remy (2009). E-books for academe: A study from Gettysburg College. *Educause Research Bulletin* 22. <http://www.educause.edu/Resources/EBooksforAcademeAStudyfromGett/187196>

Gregory, C. L. (2008). 'But I want a real book': An investigation of undergraduates' usage and attitudes toward electronic books. *Reference & User Services Quarterly* 47(3): 266-273.

Hickey, Hannah (May 2, 2011). College students' use of Kindle DX points to e-readers role in academia. <http://www.washington.edu/news/2011/05/02/college-students-use-of-kindle-dx-points-to-e-readers-role-in-academia/>

Hoseth, Amy and Merinda McLure (2012). Perspectives on e-books from instructors and students in the social sciences. *Reference & User Services Quarterly* 51(3): 278-288.

Internet2.edu (August 1, 2012). *Internet2 eTextbook Spring 2012 pilot final project report*. <http://www.internet2.edu/netplus/econtent/docs/eText-Spring-2012-Pilot-Report.pdf>

Jeong, Hanho (2012) A comparison of the influence of electronic books and paper books on reading comprehension, eye fatigue, and perception. *The Electronic Library* 30(3): 390-408. <http://www.emeraldinsight.com/journals.htm?articleid=17036371&show=abstract>

Keller, Alice (2012). In print or on screen? Investigating the reading habits of undergraduate students using photo-diaries and photo-interviews. *Libri* 62: 1-18.

Li, Chan et al. (May 2011). University of California Libraries academic e-book usage survey: Springer e-Book pilot project. http://www.cdlib.org/services/uxdesign/docs/2011/academic_ebook_usage_survey.pdf

Liu, Alan et al. (2009). Does the brain like e-books? *New York Times* 10/14/2009. <http://roomfordebate.blogs.nytimes.com/2009/10/14/does-the-brain-like-e-books/>

Liu, Ziming (2005). Reading behavior in the digital environment: Changes in reading behavior over the past ten years. *Journal of Documentation* 61(6): 700–712. <http://www.emeraldinsight.com/journals.htm?articleid=1529390&show=abstract>

Mallett, E. (2010). A screen too far? Findings from an e-book reader pilot. *Serials* 23(2): 140-144.

Marmarelli, Trina and Martin Ringle (2010a). The Reed College Kindle study. http://www.reedinstitute.org/cis/about/kindle_pilot/Reed_Kindle_report.pdf

Marmarelli, Trina and Martin Ringle (2010b). The Reed College iPad study. http://134.10.2.252/cis/about/ipad_pilot/Reed_ipad_report.pdf

McCullough, E. (2005). E-books and e-content: A panel discussion at Charleston. *Against the Grain* 17(1): 50-52.

Moody, Amelia K. (2010). Using electronic books in the classroom to enhance emergent literacy skills in young children. *Journal of Literacy and Technology* 11(4): 22-52.

Morrison, Gary and John Nunnery (2011). The implications of generative learning strategies for integrating cognitive load and self-regulation theory into educational innovations. Paper presented at 24th International Congress of School Effectiveness and Improvement Limassol, Cyprus.

Nielsen, Jakob (5/6/2008). How little do users read? <http://www.useit.com/alertbox/percent-text-read.html>

Noble, Robbie (9/27/2010). Amazon Kindle 2 pilot: E-readers in higher education. <http://digitalunion.osu.edu/files/2010/09/Amazon-Kindle-2-Pilot.pdf>

Olsen, Arthur N., Birgitte Kleivset, and Henry Langseth (2012). E-Book readers in higher education: Results from a project and the University of Agder. http://brage.bibsys.no/hia/bitstream/URN:NBN:no-bibsys_brage_29484/1/E-Readers-Agder-Submit_%202012.pdf

RIT (1/1/2013). Global newspaper trends: Readership remains high. *Print in the Mix*. <http://printinthemix.com/Fastfacts/Show/660>.

Rowlands, Ian et al. (2008). The Google generation: the information behaviour of the researcher of the future. *Aslib Proceedings* 60(4): 290 – 310. <http://www.emeraldinsight.com/journals.htm?articleid=1733495&show=abstract>

Santana, Arthur D., Randall Livingstone and Yoon Cho (2011). Medium matters: Newsreaders' recall and engagement with online and print newspapers. Paper presented at the Annual Meeting of the Association for Education in Journalism and Mass Communication, St. Louis, Missouri, 8/10/2011. http://www.slate.com/content/dam/slate/archive/media/2011/08/66_mediummatters.pdf

Schugar, J. T., H. Schugar, and C. Penny (2011). A nook or a book: Comparing college students' reading comprehension level, critical reading, and study skills. *International Journal of Technology in Teaching and Learning* 7(2): 174-192.

Staiger, Jeff (2012). How e-books are used: A literature review of the e-book studies conducted from 2006 to 2011. *Reference & User Services Quarterly* 51(4): 355-65.

Thayer, A. et al. (2011). The imposition and superimposition of digital reading technology: The academic potential of e-readers. Paper presented at the Proceedings of the 2011 annual conference on Human factors in computing systems, Vancouver, BC, Canada.

TRU research (2011). *Millennial paper usage and attitudes*. Paper presented at Paper2011, sponsored by the American Forest & Paper Assn and the National Paper Trade Alliance, March 2011.

The Trustees of Princeton University (2010). The E-reader pilot at Princeton. Final report (Executive Summary). <http://www.princeton.edu/ereaderpilot/eReaderFinalReportShort.pdf>

Weinman, Sarah (2009). E-books go to college, but books still rule the campus, not Kindle. *Daily Finance* 11/19/2009. <http://www.dailyfinance.com/2009/11/19/e-books-go-to-college-but-books-still-rule-the-campus-not-kind/>

Weinreich, Harald et al. (2008). Not quite the average: An empirical study of Web use. *ACM Transactions on the Web* 2(1): 5.1–5.31.
<http://portal.acm.org/citation.cfm?id=1326566&coll=ACM&dl=ACM&retn=1#Fulltext>

Wesley, Charlie (2012). Mark it up. *The Chronicle of Higher Education*. Do Your Job Better Advice Column 10/18/2012. <http://chronicle.com/article/Mark-It-Up/135166/>

Wexelbaum, Rachel, Plamen Miltenoff, and Susan Parault (2011). Ebooks and reading comprehension: Perspectives of librarians and educators." *Bibliosphere*, No. 14.
<http://bibliosphere.eu/?p=238>

Woody, William Douglas, David B. Daniel, and Crystal A. Baker (2010). E-Books or textbooks: students prefer textbooks. *Computers & Education* 55(3): 945–948.

Zucker, T., A. Moody, A. and M. McKenna (2009). The effects of electronic books on pre-kindergarten-to-grade 5 students' literacy and language outcomes: A research synthesis. *Journal of Educational Computing Research* 40: 47-87.