

# Electronic Textbooks: A Pilot Study of Student E-Reading Habits

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The day when students can trade their 30-pound book bags for lightweight portable reading devices no longer seems far in the future. Several companies are now marketing appliances that may be suitable for use in education and textbook publishers are cautiously converting some of their print titles into e-book formats. While few doubt the willingness of students to trade atoms for bits, little is known about how they might use e-books and the value digital technologies might add to the reading and learning experience. A few enterprising educators have begun conducting pilot studies to address these questions. The author shares the results of one e-textbook study.

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**F**or several years, it has been anticipated that electronic books will gain wide spread use as an educational tool, but this has not yet actually come to fruition. It seems that, for the first time, all of the necessary elements are in place: inexpensive but highly functional portable reading devices, an increasing number of available book titles, and a technologically literate student population hungry for new media. The stage thus appears to be set for the single most widely used tool in the history of education, the printed textbook, to follow the slide rule and mimeograph machine down into the pit of obsolescence.

The college classroom is an obvious target for e-book implementation because college students typically embrace new technologies and also purchase a high volume of expensive, cumbersome and rapidly discarded books. Few stud-

ies have yet been conducted, however, of what effects replacing standard textbooks with e-books would have on students' study habits. In order to better understand the e-reading habits of college students, a pilot study was conducted to test which e-book features students used and valued.

## **The Study**

This study was conducted at Fordham College at Lincoln Center, located in midtown Manhattan, during the fall 1999, spring 2000 and summer 2000 semesters. The student body in general, and the participants in this study in particular, contained roughly equal numbers of traditional, full-time and non-traditional, part-time students spanning a wide range of age and background. The test population contained a majority of commuting students who spent an aver-

age of one hour traveling to campus via public transportation. This is significant because commuters often desire to use their travel time as productive study time, increasing the demand for new media tailored to this lifestyle.

The participants were drawn from my nonmajor one-semester introductory science course, Perspectives: Biology. During the first meeting of each semester, one brand of electronic book, the Rocket eBook, was demonstrated. The units used in this study were loaned by NuvoMedia, Inc. (recently acquired by Gemstar International and now known as Gemstar eBook Publishing). Volunteers were solicited to use a Rocket eBook as their sole source of reading material for the class.

All of the assigned reading for the course was written by me and converted into e-book format using software provided by the manufacturer. This avoids relying on publishers to provide e-content. During the school-year semesters, students downloaded a reading chap-

ter every week through their PCs via a supplied dock. During the summer semester, students were provided with an e-book pre-loaded with the entire set of course materials and were not given a dock, allowing verification of their usage by monitoring the dwindling battery level.

At the end of each of the three one-semester courses, the participants were polled using anonymous questionnaires about their e-book reading habits. A total of 20 surveys were completed.

## Use of Features

It is my experience that when educators are shown an e-book, they are immediately concerned whether it can reproduce common functions associated with printed books such as underlining, writing in the margins, tabbing pages, etc. In a 1998 survey (published in the *Future of Print Media Journal*, Fall 1998), Dr. Stanley Wearden polled Kent State University students about what features were important to them in a hypothetical electronic book. A majority of re-

## About the Author

**Dr. Eric Simon**, an assistant professor of biology, has been a member of the Fordham faculty since 1997. He teaches nonmajor courses in biology and chemistry and upper level biology courses in genetics and molecular biology, all of which make heavy use of student-centered technology.

Dr. Simon earned his Ph.D. in biochemistry from the Department of Biochemistry and Molecular Biology at Harvard University, where he also served as a Teaching Consultant within the Derek Bok Center for Teaching and Learning. He has an M.A. in Biology and a B.A. in Biology and Computer Science from Wesleyan University. He is currently working toward an M.S.Ed. in Educational Psychology at Fordham's Graduate School of Education.

Dr. Simon's current research involves novel uses of instructional technologies in the science classroom. He has pioneered an ongoing project whereby students collaboratively design and construct instructional technology projects that are then integrated into the classrooms of their peers. He is an active speaker and writer on creative ways to apply innovative technologies to teaching and learning.

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spondents indicated, in decreasing order of importance, that glossary lookup, bookmarking, highlighting, and annotation were very or somewhat important potential features.

After using their e-books for a semester, student poll respondents in my course were asked whether they had ever made use of the four features just mentioned. The data, along with survey results reported by Wearden (1998), are presented in Table 1.

It is interesting to note that both sets of data showed the same relative importance of the listed features. The ability to look up words in the built-in dictionary, which the previous survey found to be the most desired of the four features, was also found to be most used of the listed features in the present study. It is worth noting, however, that several students expressed dissatisfaction with the included general purpose dictionary because it did not have many scientific terms. The ability to augment the standard dictionary with terms relevant to a particular course would be a highly useful feature for future versions of e-books. In fact, when asked about this potential addition, 83% of respondents agreed that it would be useful.

The ability to annotate, the least important of the four features in the Kent State study, was found to be the least used feature by the Fordham

participants. The Rocket eBook requires hunt-and-peck tapping on a small on-screen keyboard with a stylus to input notes. Most students found this uncomfortable—perhaps addition of a Palm-style handwriting interface could increase satisfaction with this feature.

About half of student respondents indicated they used the bookmarking and highlighting features (55% and 50%, respectively). For each of the four mentioned features, 20-30% fewer students actually used a feature in my study than said it was important in Wearden's study. This "fickleness gap" between what users said they wanted and what they actually used is probably typical of new technologies.

### Perceived Satisfaction and Value

Table 2 lists responses received to questions designed to gauge the student users' satisfaction with the e-book experience. Every one of 19 respondents to these questions indicated that they "would recommend using an e-book in college courses to a friend." All but one respondent (95%) indicated that they "wish[ed] other courses offered an e-book option."

Table 2 also lists two questions designed to measure the perceived value of the e-book experience. When asked "would an e-book option ever affect your selection of a course (i.e., would

| Feature  | Reported Importance* | Actual Usage** |
|--|----------------------|----------------|
| Glossary lookup  | 87.3%                | 65%            |
| Bookmarking  | 84.4                 | 55             |
| Highlighting   | 71.7                 | 50             |
| Annotation   | 64.5                 | 40             |
| <p>*Percentage of 276 students who indicated that a feature was very or somewhat important, as reported by Wearden (1998).</p> <p>**Percentage of 20 students who had used an e-book for a semester when asked "Have you ever made use of the ability to [lookup words / bookmark / underline / annotate] on your e-book?"</p> |                      |                |

**Table 1:** Electronic book features, their reported importance and actual usage.

| Question   | Percentage Responding Yes |
|--|---------------------------|
| Would you recommend using an e-book in college courses to a friend?  | 100 %                     |
| Do you wish other courses offered an e-book option?  | 95                        |
| Would an e-book option ever affect your selection of a course?<br>(i.e. would you ever be more inclined to take a particular section if it offered an e-book option.)                                  | 58                        |
| If you knew that every one of 4 courses that you were taking next semester had the option of using an e-book, would you be willing to spend \$200, in addition to any textbook costs, to purchase one? | 84                        |

**Table 2:** Responses received from 19 study participants to questions concerning their satisfaction with and perceived value of using an e-book for one semester.

you ever be more inclined to take a particular section if it offered an e-book option)” 58% of students answered in the affirmative. It is difficult to imagine that use of an e-book would take precedence over other factors that students use when choosing a course, such as meeting time, instructor reputation, word-of-mouth, etc., but the responses do indicate that most students placed a positive value on the e-book experience.

The final question listed in Table 2 tested whether students valued the e-book experience enough to pay for it. At the time this study was conducted, the Rocket eBook retailed for \$199. The students were asked “if you knew that every one of the four courses that you were taking next semester had the option of using an e-book, would you be willing to spend \$200, in addition to any textbook costs, to purchase one?” A clear majority (84%) indicated they would.

These results are consistent with Wearden’s finding that students were willing to pay over \$600 for an electronic book. This higher amount is consistent with the price of the newest generation of e-books that feature color displays, such as the RCA REB 1200, which retails for \$699. Effective use of e-books in the science

classroom requires a color display, since science texts often rely on complex visuals.

It is important to note, however, that the willingness of Fordham students to pay was predicated on the e-book being widely used across the curriculum. This points to the biggest hurdle to widespread e-book implementation in the educational realm: the chicken-and-egg paradox of publishers being hesitant to introduce more titles until e-books are widely used, but widespread use being unlikely until more titles are available.

## Conclusions

The results presented here involve less than two dozen participants and so are clearly preliminary. I hope to expand the study in the future to include greater numbers of students and a wider variety of subject areas.

Despite the small sample size, several trends are clear. The student volunteers who used an e-book for a semester in my introductory science course were clearly pleased with the experience and wanted more. They indicated that they wished more courses incorporated this new medium and that such inclusion could affect their course choice. More importantly, they were will-

ing to pay the \$200 necessary to purchase the model they had tried.

In order for e-books to gain widespread acceptance as an educational tool, they must reproduce the many easy-to-use features of a printed book. A majority of students used the glossary lookup (65%) and bookmarking (55%) features, while exactly half used highlighting and less than half (40%) annotated content. The relative order of popularity of the features among student Rocket eBook users was the same as that reported by an earlier study of student preferences.

Once users are convinced that e-books can

successfully reproduce familiar features they have come to expect from the printed medium, they can begin to look toward enhanced utility. E-books offer several features of considerable value to college students, such as the ability to store large amounts of material, high-quality screens with backlighting for reading in many situations, and a lightweight and easy-to-use design. Once the final piece of the puzzle falls into place, namely a large catalog of e-textbooks, college students can look forward to a future where backpacks are unencumbered by the printed medium.



This article can be found on the Future of Print Media website at:

<http://www.futureprint.kent.edu/articles/simon01.htm>

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