Using eReaders in Education

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Abstract

With our ever faced paced society and constant technology advancements it is predicted that the future textbooks, reference books and manuals will be mainly digital (Davidson, Shields, & Biscos, 1997; Levy, 2000; Nunberg, 1993; Press, 2000). It is important to determine if and how these digital reading devices affect reading process (Birkerts, 2 94; Davidson et al., 1997; Levy, 2000) and how.

Using eReaders in Education

Purpose

A dedicated eReader is an electronic device that can store books, even textbooks that can be viewed electronically. There are many different variations of eReaders available on the market today. They range in size anywhere from 4" x 7" to 10" x 12" and have a variety of viewing options available to the user. Some features include: highlight and underline text, copy and paste, search functionality, and bookmarking ability.

The purpose of this research study is to review the use of e-reader technology such as using a Kindle for education vs. the traditional textbook to see if it is beneficial and effective for students as a new reading method. The goal is to see if the features of e-readers influence the process of reading and learning and determine using dedicated electronic reading devices (e-readers) offer new possibilities to users and what strategies are needed for effective use of this new learning method.

Justification for the Study

This research topic is important because education today is so geared toward technology. The truth is that we live in a very fast paced world that it is ever evolving, so the more efficient we can make it the better. Using eReaders in education hopefully will do just that, create a fun and efficient learning environment for students to learn from an electronic delivery channel, yet still have the ability to take their textbooks with them on vacation, to sports events or to friends houses without having to carry heavy textbooks.

According to the Advisory Committee on Student Financial Assistance (ACFSA), the average annual textbook cost for a college student is between $700 - $1000. High school

textbooks are definitely cheaper, averaging between $100 - $200. Electronic textbooks are much more cost effective due to the reduced or no shipping charges. Publishers are able to offer a lower cost for textbooks and upgrades.

The e-reader technology goes farther than just digitized text. This technology allows the user to perform searches within the text; some also include interactive tables and figures, hyperlinks to related topics, examples, and links to videos. The e-text also allows the student to cut and paste information from the book into other documents for reports and presentations. .

Hypotheses and Research Questions

Using an electronic delivery method for textbooks in education vs. continuing to use paper textbooks increase student confidence in reading and have an impact on grades.

Some research questions to consider during this research study are:

- Are the characteristics of the e-reader a benefit or a hindrance?

- How do the features of the e-reader influence the process of learning?

- Are some educational topics better comprehended and understood using eReaders vs. traditional textbooks?

Definitions of Key Terms

1. E-reader: a digital handheld portable electronic device that allows reading of documents and books on the display. The device can store multiple books and have the ability to download books from the internet.

2. E-book: electronic book refers to digitized content related to printed books. This would include electronic text, graphs, illustrations, etc. The content can be viewed on a desktop or notebook personal computer, on a PDA, or on a dedicated, portable e-reading device.

3. Textbook: refers to a physical paper textbook.

4. Skimming: conduct a fast visual examination the text in order to pick out the main points from it. (Feuerstein & Schcolnik, 1995).

Assumptions

Assumptions during this study are that participants:

1. Will have access to the internet.

2. 12th grade students that are in required courses.

3. Will have enough knowledge of digital media to be able to comprehend and answer the questions on the survey.

4. Will not have to carry as many physical textbooks with the use of e-readers.

This research study will look at the overall use, functionality, advantages and disadvantages of e-readers in education.

Prior Review of Literature

Is the use of eReaders in education as a textbook source an effective and efficient learning tool?

Introduction

In today's fast paced technological educational environment, educators, parents, and students want the latest and greatest technologies available that will help students learn more efficiently. Physical textbooks are outdated so quickly these days, so schools are constantly updating and replacing them with the latest versions which is costly (EduKindle, 2010). And on top of that, many students today complain that their books are too heavy and cause back pain and strain which pose a risk to health (Freedman, 2009). And in some districts, students are not allowed to remove the textbook from the classroom because they do not have a sufficient supply. So the question is, 'Now that there are electronic devices such as eReaders like Kindle, NookColor, or Alurtek Libre that are capable of loading the latest electronic version of a textbook with the click of a button to one device for all a student's classes, are eReaders an effective and efficient learning tool?'

Review of the Literature

There are many advantages to school districts moving towards this type of technology. One benefit is the ability of a student to access all their textbooks from one device, eliminating the need to carry so many heavy books around, and the easy access to update textbook versions via a quick online download.

Electronic e-reader devices, such as the Kindle, have been primarily designed for the use of consumers on a one on one basis vs. an academic environment which makes registering numerous devices a very time consuming and daunting process for the educator (EduKindle, 2010). Kindle has tried to corner the market with their technology and even offer text-to-speech options which enable the devices to be used by students with vision problems, language barriers, and lack of reading fluency (Scholastic Administrator, 2011).

Teachers have been skeptical of the devices durability for being dropped repeatedly by the student. Amazon says that the Kindle can survive repeated drops from up to 30 inches high. However, there have been many reports from teachers that devices have broken shortly after the device was dropped by a student (Scholastic Administrator, 2011). It is expected that with new models in the future the devices will be made more durable by design. The use of eReaders for Textbooks over time could deliver a regularly updated and interactive 21st-century education to our children. The acting dean of Southwest Baptist University conducted a study to determine how many college students prefer the use of an e-reader vs. the traditional textbook. The study found that 67.5% of the students in the study preferred using a Textbook over an e-reader (Nelson and Educause, 2008).

Below are the findings from a study what was conducted at Southwest Baptist University that evaluated student and faculty preferences for using paperback books or e-books.

Student and Faculty Preferences for P-books Versus E-Books			
College Students	Conduct Research	Textbook	Leisure Reading
Ratio	2.3/1	3.6/1	30.8/1
P-book	56.3%	67.5%	80.1%
E-book	24.5%	18.5%	2.6%
No Preference	13.2%	7.9%	11.3%
No Response	6.0%	6.0%	6.0%
College Faculty	Conduct Research	Textbook	Leisure Reading
Ratio	10.0/1	N/A	N/A
P-book	80.0%	92.0%	92.0%
E-book	8.0%	0.0%	0.0%
No Preference	8.0%	4.0%	4.0%
No Response	4.0%	4.0%	4.0%

These data show a distinct and dramatic difference between faculty and student preferences related to p-books and e-books. It may also help explain why e-book adoption for textbooks has been so low. Data from the National Association of College Stores continually reconfirms that

While all the articles reviewed had variations on the perspective on using an e-reader in education, the review of these articles led to a common skepticism by educators of the true success of the use of eReaders in the classroom due to loss of device, durability and usability for student note taking. All of the studies agree, however, that there is a big benefit from a long term cost reduction standpoint for school districts and that eReaders offer the latest in most current version and being interactive for students to help with attention and retention of information through the education process.

Research Design

They type of study for this research will incorporate interviewing and correlational research. It will be important to survey participants, including: students, teachers and parents. It will also be important to review how introducing and using a dedicated e-reader to education varies from the traditional learning method in education of using the traditional physical textbooks.

Procedures

There will be a cross-sectional survey where information is collected at just one point in time. It will be designed to find out the knowledge users have about e-readers and what experience they have had with them in the past. Additional information such as, participant type (i.e. student, teacher, parent) age, gender, hobbies, and technical experience will be collected as well. The survey will be available to participants for at least a month.

There will also be a two part reading comprehension and usability test conducted pre and post testing. The initial test will be given at the beginning of the semester when the class begins and the same test will be given at the end of the semester. This will allow measurement of usability and ability to search and find information on the e-reader device.

Sample Population

The desired sample population for this study would be young 1st year college students and 12th grade students from both the public and private environment. Because the criteria, funding and requirements are so different amongst colleges, public and private schools this may not be justified. So for this research, to assist in maintaining a more controlled population the population that will be studied will be from the public school district for all required courses in the 12th grade and teachers also. The study will focus on History/Government and English/Literature courses. Elective and advanced courses will be excluded from this study.

The purpose to keep the study to a controlled environment of only required courses is to limit the number of teachers that will need to be involved and trained on using this technology in the classroom.

The study will be conducted with public school students in 12th grade classrooms in the Charlotte School District. The sample will include all students in 12th grade required courses.

Instrumentation

Instrumentation for this study will include the use of both web surveys and reading comprehension and usability testing. The surveys will be something along the lines of a Zoomerang Survey or Survey Monkey. This type of survey should assist with the participants feeling of invasion of privacy. The questions in the survey will be primarily closed ended questions but will have sections for additional comments. Some advantages of using a web

survey are that they can be appealing in design and user friendly. This study will also use reading

comprehension testing to both the student and teacher population regarding the generalized

thought of using eReaders in education. The reading testing will happen at pre-implementation

of the use of eReaders at the beginning of the school year, at the middle of school year and at the

end of the school year. These tests will measure the improvement or lack thereof reading

comprehension and improvement, for students using e-reader technology in education.

Validity

The survey will be given to a panel of school administrators, Reading, English, Literature,

and History teachers to review for content validation and recommendations. The survey content

will be revised to incorporate any suggestions made. It will then be resubmitted for final review.

The reading comprehension and usability test will specific to the text. The test will be

compiled of questions that can be found in the text.

Reliability

An analysis will be performed to determine if certain variables can be grouped together,

like reading strategies, ability to highlight and mark text, searching for information, etc. The

results of the comprehension and usability testing will be compiled and analyzed to measure user

understand of content and ability to find information on e-reader. During the comprehension and

usability testing, observation will be conducted of the participants to evaluate overall ease of

device functionality for the user. If the device has the ability to pull data from it such as number

of pages opened, etc that data could be extracted. However, e-readers with that capability usually

are more costly and the budget may not allow for those models to be purchased.

Internal Validity

The one main threat to this study is location. For the survey it is a threat because there is no way to predict where the participant is taking it at or what the surrounding influences may be. Is it a quiet place where they can concentrate? Are others helping them with the survey? Do they have access to the internet survey? The only thing we will know is that they will be responding online. The only way to reduce this threat is to wait until the school year begins and give the survey in a controlled classroom environment.

As far as the reading comprehension and usability test, the threat here may be instrumentation decay. The plan is to give a test at the beginning of the semester when the e-readers are first introduced and again at the end of the semester. Because the students will have the ability to mark and highlight text and items in the e-book, it may increase the score for the end of the semester test. Unfortunately, there is no evident way to reduce this threat.

Process Details

1. Define purpose of the study. Identify hypothesis and questions.
2. Research e-readers and create a comparison chart to illustrate the differences. Comparison char will include: device type, weight, size, battery life, price, features, screen features, memory, format compatibility, and connectivity.
3. Create a cover letter for the survey.
4. Create survey questions and draft of survey.
5. Select survey panel review team. Present survey questions, seek feedback and make revisions as appropriate based on feedback from review team.
6. Compile questions for content related reading comprehension and usability test.
7. Select research study participants prior to academic school year start date.
8. Since participants are minors, ask parents' permission for participation in study.
9. After survey panel team review of questions, make revisions to the questionnaire.
10. Approximately one month prior to the school year beginning, send participants cover letter explaining reason for survey and post survey so it is available to students from school website.
11. Collect and analyze data collected from survey.
12. One month prior to school beginning, train the teachers that are participating how to use the e-reader. Download desired textbooks to dedicated e-readers.
13. At begin of school year, teach students functionality of e-reader, roles and responsibilities.
14. Administer reading comprehension and usability test.
15. Analyze and measure results of test.
16. Teach topic during semester.

17. Create an Observation Tracking Sheet to document observations and notes of participant e-reader use, techniques, triumphs and challenges during class while using e-reader for education. Tracking Sheet would include things like: consult previously marked pages, use of online dictionary, use of search functionality, using bookmarks, using paper to make notes, table of content use, etc.
18. At end of semester, give reading comprehension test again, analyze and measure results.
19. Compare measured results from pre and post test.
20. Document results and findings.
21. Present findings to school administrative committee.
22. Await decision on future funding and usability.

Data Analysis

Data Collection

Data will be collected from the surveys and respondents answers will be anonymous from the survey site and organized by similar questions. If Zoomerang is the web survey channel used, it has the capability to organize and measure data collected. It will need to be analyzed for similar characteristics in responses from participants. Scores from students reading comprehension and usability test will be collected and entered into a spreadsheet to measure percentages and generate graphs to illustrate results of testing.

Analysis

Descriptive statistics will be analyzed and frequencies of variables will be computed. The data will also be analyzed to try to identify participant's e-reading strategies, text type preference, perceived sense of efficiency when using e-readers, and helpful or annoying features of the e-reader. The ratings for the ranked items were correlated with demographic data (Spearman rho correlation) to check for possible relationships. Where appropriate, t-tests for independent samples and ANOVA will be ran to compare groups. The ratings for the ranked items will be correlated with gender, age, hobbies, technical experience and participant type (i.e.

student, teacher, parents) data to check for possible relationships. The data will be presented through frequency tables, bar charts and pie charts.

Budget

Currently curriculum and student needs drive the allocation and use of Technology and staff training is a priority in the school district. The level of funding will be dependent upon the anticipated senior class size for the research study year. Funding would come from the Eaton Intermediate School District's technology budget for the year. Below is the projected funding and technology budget already established for 2009-2012. Source:

http://www.charlottenet.org/technology/techplan.pdf

PROJECTED FUNDING & TECHNOLOGY BUDGET
2009-2012

The Chart below outlines general fund expenditures that are planned for the next 4 years. More specific plans are available from the District Technology Office.

GENERAL FUND DOLLARS

GENERAL FUND DOLLARS	2009/10	2010/11	2011/12	2012/13
Secondary Computers	98,000	139,000	111,000	82,000
Elementary Computers	31,000	7,000	0	71,000
Administrative Computers	11,000	0	0	0
Additional Instructional Technology Hardware	43,000	40,000	43,000	40,000
Network Operational Expenses, Hardware Maintenance, Expendables, Internet, etc.	52,000	55,000	58,000	61,000
Telephone System Maintenance	20,000	20,000	20,000	20,000
**Telephone-POTS PRI's, Long Distance	45,000	47,000	49,000	51,000
**Internet Access	12,000	12,000	12,000	12,000
Printer Maintenance and Tech Supplies	30,000	35,000	38,000	41,000
Software expenses & upgrades	140,000	145,000	150,000	155,000
Professional Development	6,500	6,500	6,500	65000
Network Tech Support Consultants	50,000	53,000	56,000	59,000
Tech Department & Support Personnel	450,000	484,000	520,000	560,000
Total General Fund Dollars	988,500	1,043,500	1,063,500	1,217,000

** Based on our Free and Reduced lunch figures, Charlotte Schools has received USF reimbursement of approximately 50% for telecommunications and Internet. The amounts listed in this budget reflect the anticipated USF reimbursement.

Charlotte Public Schools is committed to supporting, maintaining, and improving hardware, software, network infrastructure, telecommunications, and other services in support of instruction and student learning. Yearly adequate funding and long-range planning has allowed this to be our past practice and future expectation.

There will need to be a set allocation for this project that includes an e-reader for each student and teacher participant involved in the study. There will also need to be an allocation for replacement of lost, stolen or broken e-readers. In addition, funding for the textbooks will be reallocated to the cost of downloading the text to these devices versus purchasing traditional textbooks for the academic year.

Summary

  The goal of this study focused on using e-readers in education as new electronic technological delivery channel to senior grade students. The study will focus on the effects that the use of e-readers in education versus traditional paper textbooks have on students and the learning process. Will their use increase or decrease the level of learning? It will discover if the features of e-readers somehow influence the process of learning, reading development and in what way, what users do and how they use the device. The population of this study will be senior students in high school and only core classes will be used for the study (i.e. English/Literature and History/Government); all elective classes will be excluded from the study.

  This investigation into learning with a dedicated e-reader contributes to our knowledge about learning, the ways in which learning in the 21st Century is evolving, users' preferences and opportunities for educational improvement, and the effects of this new technology on learning practices. Technology is the way of the world today and is only growing day by day. Whether we want to admit it or not, our society is slowly becoming paperless. We are moving into an electronic world which is making huge contributions to being environmentally friendly.

References

Advisory Committee on Student Financial Assistance (ACFSA). (2007) *Turn the page: Making college textbooks more affordable, Washington, D. C.,* http://www.ed.gov/about/bdscomm/list/acfsa/turnthepage.pdf , accessed March 29, 2009.

Anderson, Charles & Johnson (2003). *The impressive psychology paper.* Chicago: Lucerne Publishing.

Birkerts, S. (1994). *The Gutenberg Elegies: The Fate of Reading in an Electronic Age* (Paper-cover ed.). New York: Ballantine Books.

Davidson, K. T., Shields, M. A., & Biscos, G. (1997). *Network, Screen and Page: The Future of Reading in a Digital Age* INTERQUEST and the University of Virginia.

Feuerstein, T., & Schcolnik, M. (1995). Enhancing *Reading Comprehension in the Language Learning Classroom.* San Francisco, CA: Alta Book Center, Publishers.

Fidler, R. (1998). *Electronic Books: A Good Idea Waiting for the Right Technology*. Kent State University. www.jmc.kent.edu/futureprint/1998fall/fidler.htm.

Freedman, Thomas (2009), A Kindle in Every Backpack, *The New Democratic Leadership Council*

Liana Victorino, Ekaterina Karniouchina & Rohit Verma (2009). *Exploring the use of the abbreviated Technology Readiness Index for Hotel Customer Segmentation*. Cornell Hospitality Quarterly, 50, 342-359.

Nelson, M and Educause (2008), *E-Books in Higher Education: Nearing the End of the Era of Hype?*, EDUCAUSE Review, vol. 43, no. 2 http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume43/EBooksinHigherEducationNearing/162677

Sanders, G., & Roush, W. (2000). eBook *Hardware Buying Guide. eBookNet.* http://www.ebooknet.com/ .

 Schcolnik, M. (2001). A Study of Reading with Dedicated E-Readers. http://www.planetebook.com/downloads/schcolnik.pdf

Simon, E. J. (2001). *Electronic Textbooks: A Pilot Study of Student E-Reading Habits. Institute for Cyberinformation - Future of Print Media*. Kent State University. http://www.futureprint.kent.edu/articles/simon01.htm

Smith, M. (2001). *Writing a successful paper.* The Trey Research Monthly, *53*, 149-150.

Scholastic Adminstator, *Will the Kindle Change Education?* http://www2.scholastic.com/browse/article.jsp?id=3752572

Willd (2010), *The Kindle in the Classroom,* EduKindle, http://www.edukindle.com/category/the-kindle-in-the-classroom/