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Motivating Students to Learn: Is There a Difference between Traditional Books and e-Books?

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Abstract: Electronic books have been identified as a current trend in education and are being increasingly adopted by students as their textbook format of choice. However, limited studies on electronic books as a learning tool exist. Thus, this pilot study compares the use of e-books and traditional books as a learning tool in an undergraduate classroom on undergraduate students' motivation.

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Introduction

Electronic books have been identified as a current trend in education, and experts in the field have projected an influx of adoption of electronic books within the next two to three years (Becker 2010). To this generation of students, known as digital natives, the integration of digital technology and books is appealing (Prensky, 2001). E-books are also appealing to students who are on a budget since they are lower in cost than the traditional paper-based books. Furthermore, e-books are a more cost effective publication choice for publishers since electronic means no manufacturing costs, no storage costs for unsold inventory, and unlimited virtual inventory. Despite the actual increased adoption of e-books and the projected growth of their adoption, little research has investigated the e-book as a learning tool for the higher education classroom (Woody, Daniel, Baker, 2010). And, since research on traditional text-based books has demonstrated that features and graphics can influence learning; differences in processing and eye strain from computer screens can influence students' preferences, learning, and motivation (Kropman, Schoch, & Teoh, 2004; Mayer, Steinhoff, Bower, & Mars, 1995), there is a need effectiveness research to be conducted.

Effectiveness of a learning tool can be investigated in a variety of ways. Research has shown that motivation is associated with student learning and achievement (Schunk, Pintrich, & Meese, 2007) and is important to consider when studying literacy. Cox & Guthrie (2001) found that learners' motivation to read was a major contributor to reading achievement. Analogously, Wang and Guthrie (2004) examined the extent that motivational processes facilitate the comprehension of texts of 384 Chinese and American students and found that intrinsic motivation predicted text comprehension. Thus, motivation can be used when evaluating the effectiveness of an e-

book as a learning tool. This pilot study compares the use of e-books and traditional books on undergraduate students' motivation.

E-books in Research

Electronic books, or e-books, are books in digital format that can be read on a computer or portable device. Research on e-books has emerged; however, much of the research is focused on library-usage as librarians have been early adopters of e-book technology. A few exploratory studies have examined the use of e-books in the educational environment. Both challenges and benefits of e-book adoption have been noted. Students have reported that e-books are anytime assessable and portable; thus, convenient and easy to use when compared to traditional text books (Ashcroft, & Watts, 2004; Pattuelli, & Rabina, 2010; Clark, 2009; Kimball, Ives, & Jackson, 2010; Kang, Want, & Lin, 2009). The ease of searching and finding information quickly has also been identified as a benefit of e-books over traditional text books (Nicholas, Rowlands, & Jamali, 2010; Armstrong, Nardini, McCracken & Lugg, 2009). However, research has also noted negative impressions of e-books for educational use. Students have reported discomfort when reading an e-book and the faster occurrence of reading fatigue (Gunter, 2005; Kang, Want, & Lin, 2009; Jamali, Nicholas, & Rowlands, 2010; Clark, Goodwin, Samuelson, & Coker, 2008). Some students report simply preferring a text based book (Jamali, Nicholas, & Rowlands, 2010). Clearly, researchers have been primarily focused on users' usage and perception of e-books with little empirical research on e-books' effectiveness as a learning tool (Woody, Daniel, & Baker, 2010).

Motivation

Motivation has been defined in numerous ways. One popular framework of motivation that is related to instructional methods is the ARCS Model of Motivational Design. This framework is based on the assumption that learner and instructional material interaction is essential and that attention, relevance, confidence, and satisfaction are key elements for motivation (Keller, 1987). Attention is the response of the learner to the instructional material's stimulus. It refers to the ability of the instructional material to gain the learner's attention. Relevance refers to the learner's perceived applicability to current and future tasks of the learning material. Confidence has to do with the learner's positive expectations of the instructional material, and satisfaction refers to the learner's positive attitude (Keller, 1987). Applicable to learner's motivation as it related to instructional methods the ARCS Model of Motivational Design is an appropriate framework upon which to examine the effectiveness of e-books and traditional textbooks for instructional purposes.

Since motivation cannot be directly observed, self-reports are most commonly used to measure motivation. Numerous motivation instruments have been developed and validated (Schunk et al., 2007). An instrument derived from the ARCS Model of Motivational Design and that has been widely used and validated is Instructional Materials Motivational Survey (IMMS) (Keller, 1983). Thus, the IMMS will be useful to examine learned motivation in this study.

Methodology

The participants for this study were a convenience sample of undergraduate students who participated in an educational history course during Fall 2010 at a university in central Virginia. The undergraduate history course examined in this study was traditional in nature and taught by a Caucasian male. It is 16 weeks in length. The course explored teaching strategies for teaching history at a secondary level. The focus of this study was one of the course sessions. During the course session, students learned about instructional strategies via lecture and small group projects using the text book.

Students enrolled in the educational history course received an e-mail from the researcher requesting their participation in the research study. The letter requested their voluntarily participation in the study and completion of an informed consent. The course instructor also informed students about the study and encourage their participation.

Students who volunteered to participate listened to the class lecture for the first part of the class. During the second part of the class, the students were randomly assigned to a treatment or control group to complete small group projects. Half of the participants were assigned to use an e- book for their in-class small group projects and half were assigned to use a traditional text book for in-class projects. The students were separated according to their

group assignment and then broken into small groups. The text publisher provided e-books codes for half the class to conduct this study.

Regardless of the group assignment, students covered the same exact content and participated in the same learning tasks. Examples of the small group learning tasks included:

- **Learning Task 1:** As a group, define civics and citizenship education. Think back to your middle school and high school experiences. How was civics defined? How was it taught? Based on everyone's input identify one definition.
- **Learning Task 2:** Your text says that that citizenship education and good citizenship have been defined in numerous ways. It provides an overview of different definitions and conceptualizations. Highlight (e-book) or write them down (traditional). Revise definition based on what you find.
- **Learning Task 3:** Search for Westheimer and Kahne's (2002) 3 conceptions of good citizenship and the six promising approaches. Read about the 3 conceptions and the 6 promising approaches. Then, discuss the following with your small group:
 1. Do you agree with the conceptualization of good citizenship? Why or why not?
 2. Would you add anything to it or take anything from the conceptualization?
 3. Do you agree with the 6 promising approaches? Why or why not?
 4. Would you add anything to it or take anything from them?
 5. Think back to your middle and high school experiences, where the 3 conceptions and the 6 promising approaches taught/ discussed? If so, how?

Learning Task 4: Choose one concept and one approach to focus on from the textbook chapter and develop a lesson plan idea for how you would teach them in your class. Identify your objective and whether or not you hope that the students will develop a skill, knowledge, disposition, etc. Note that the traditional civics class has focused on teaching the structure of the government and relied heavily on textbooks. Most middle and high school students have thus deemed civics "BORING." Thus, as you are developing ideas, avoid relying on traditional methods, think outside of the box. Pursue your text for ideas. Read the recommended Practices Section and Teachers' Beliefs and Practices. Read about the "We the People" project or the "Our Courts" project in the text book, how could they be helpful? Type ideas in notes or highlight ideas to use (e-book) or write them down (traditional).

The only difference between the groups was the type of book they used for the class sessions. The traditional textbook group used the index to locate needed information and take traditional notes. The e-book group used e-books hosted on laptops and use features native to the e-books including the electronic search function, electronic highlights and electronic notes. At the end of the class session, students completed an online instrument.

Instrumentation

Participants completed an online instrument and indicated their level of motivation to use the text. Motivation was measured by the Instructional Materials Motivational Survey (IMMS; Keller, 1983). The IMMS is based on the ARCS Model and consists of 36 items. On a Likert (1 = Not True; 5 = Very True), participants are asked to rate their perception of the statement. The instrument has good reliability; Cronbach's alpha for this instrument is 0.96. Furthermore, the instrument, although developed for traditional class room use, has been found valid for use with computer-based and web-based instruction (Keller, 1999; Keller & Song, 1999; Knowlton, Shellnu, & Savage, 1999).

Research Design and Analysis

Quantitative methods are being employed in this pilot study. In this case study, a control group random posttest-only design was employed. A one-way analysis of variance (ANOVA) was used to determine the mean differences in IMMS scores between the two groups. Assumption testing yielded satisfactory results. Based on Levene's test the assumption of homogeneity of variance was not violated. The assumption of normality was tenable. Results yielded a statistically significant difference at the $p < .05$ level in the IMMS scores between the groups, $F(1,15) = 8.64, p = .01$. The mean scores for the e-book group ($n = 8, M = 128.38, SD = 11.87$) were

statistically significantly higher than the mean scores of the traditional textbook group ($n = 8$, $M = 111.38$, $SD = 11.26$), thus indicating the e-books may increase students' motivation to learn instructional material. It should however be noted that the effect size, using eta squared, was small, .38. The observed power was sufficient at .78.

Discussion

As can be seen from the data, a statistical significance ($p = .01$) was noted between the groups. After the treatment and survey had been completed, we discussed with the students their experiences using the different text books. Most notably the e-book groups really enjoyed the ease of navigation, search features, and overall usability of the system. These observations were then reflected in the resultant data. Discussions with the traditional book groups didn't fare as well. They seemed to have a harder time connecting with the text and organizing the information needed for their group works. While all were able to accomplish their goals for the group work not all were satisfied with the process.

While technology continues to evolve and change, it is important to determine whether it is just cool technology or is this something that has benefit to the learning process. While some may argue that technology cannot affect learning, this study's results demonstrate that it can make it more efficient; thus, allowing for more cognitive energy to be utilized in the actual processing of information. In the end, we found that not only are e-books more timely and affordable, but we found them to have a positive effect on the efficacy and efficiency of the learner in the learning process. While more research needs to be done on the user interface and multimedia aspects, it is clear that it has not hindered the process of motivating learning, only assisted it.

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