Athletic Training Students' Perceptions of Electronic Textbooks and Computer use in the Classroom

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Abstract

Purpose: Academia is currently seeing a surge in technology integration in the classroom. Electronic textbooks (e-textbooks) is expected to grow exponentially in the future. Although there is a rush in use of technology in academia, few studies have evaluated perceptions of electronic textbooks especially among athletic training students. The purpose of this study is to identify athletic training student computer use, if athletic students are using electronic textbooks, and to help understand their perceptions of those electronic texts. **Method**: A cross sectional survey design was utilized. Participants completed a self-reported online survey. A survey link was emailed to athletic training faculty in 360 undergraduate programs to be forwarded to their students. The survey contained an informed consent item followed by 37 items (6 demographic) related to perceptions of electronic textbooks. Data analysis used descriptive statistics. **Results**: A total of 861 athletic training students completed the survey. When students were asked about their preference for e-textbooks or traditional textbooks, 69% prefer a traditional textbook while 22% state they had never had the opportunity to work with an e-textbook. A majority of students (96.4%) feel comfortable with computers. A large number of students (43.1%) respond they are not aware e-textbooks exist for athletic training courses. The primary reasons students prefer traditional textbooks over e-textbooks are ease of reading, followed by ease of note taking. **Conclusions**: The majority of athletic training students, who fall in the age range of the Millennial Generation, prefer traditional textbooks over e-textbooks. Educators should continue to utilize traditional textbooks as a primary method of learning while incorporating technology such as e-textbooks as secondary methods.

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ABSTRACT

Purpose: Academia is currently seeing a surge in technology integration in the classroom. Electronic textbooks (e-textbooks) are expected to grow exponentially in the future. Although there is a rush in use of technology in academia, few studies have evaluated perceptions of electronic textbooks especially among athletic training students. The purpose of this study is to identify athletic training student computer use, if athletic students are using electronic textbooks, and to help understand their perceptions of those electronic texts. **Method**: A cross sectional survey design was utilized. Participants completed a self-reported online survey. A survey link was emailed to athletic training faculty in 360 undergraduate programs to be forwarded to their students. The survey contained an informed consent item followed by 37 items (6 demographic) related to perceptions of electronic textbooks. Data analysis used descriptive statistics. **Results**: A total of 861 athletic training students completed the survey. When students were asked about their preference for e-textbooks or traditional textbooks, 69% prefer a traditional textbook while 22% state they had never had the opportunity to work with an e-textbook. A majority of students (96.4%) feel comfortable with computers. A large number of students (43.1%) respond they are not aware e-textbooks exist for athletic training courses. The primary reasons students prefer traditional textbooks over e-textbooks are ease of reading, followed by ease of note taking. **Conclusions**: The majority of athletic training students, who fall in the age range of the Millennial Generation, prefer traditional textbooks over e-textbooks. Educators should continue to utilize traditional textbooks as a primary method of learning while incorporating technology such as e-textbooks as secondary methods.

INTRODUCTION

There has been much advancement in the athletic training classroom over the first years of the new millennium especially in the realm of technology integration. Concepts such as mobile learning, e-learning, webinars, text-messaging in the classroom, and audience response systems (clickers) are becoming more popular in athletic training education.[1-5] Despite the new advancements in technology and "e-learning," it seems that one aspect of education is changing little throughout this technology surge. Paper textbooks continue to be widely used throughout the academic community as a primary study method.

The landscape of books has been slowly shifting towards e-books since first introduced more than a decade ago. Since the production of handheld reading devices such as Kindles, iPads, Nooks, etc. began, access to electronic versions of traditional paper books has increased.[6] This increased access to electronic learning media coincided with the media immersion (TV, internet, etc.) common among the generations of children and young adults filling the United States public school system.[7] With use of electronic media listed as the most common waking activity for children school ages K-12, it is no wonder that more and more literary works are being converted to the digital fold. This immersion helped to propagate the dependence upon technology seen in many students who currently, or will soon, major in a variety of allied health professions.[7]

Electronic textbooks (e-textbooks) accounted for 2% of overall textbook sales in 2009.[8] A 2012 survey of 1200 college students conducted found that e-textbook sales comprised 9% of total textbooks sales.[9] This trend is expected to increase in the market in the next decade and may pass 25% in 2015.[10,11] E-textbooks may offer many possible benefits and potential problems for both students and academicians, such as those listed in Table 1.

Table 1: Benefits and Problems Associated with Electronic Textbooks

Benefits	Problems
Lower cost	Require computer or e-reader
Readily Available	May require portable device
Many books fitting on a single reader/computer	Copying/printing is usually restricted
Integrated dictionaries	Some e-readers are black and white only
Electronic highlighting or annotation	Technology platforms used to read e-textbooks may become obsolete
Web or multimedia tie-ins	May require internet access
Environmentally friendly	
Downloadable e-textbooks	
Downloadable updates	

Few studies directly compare preference and use of e-textbooks and paper textbooks. South African secondary school students, undergraduate general students, dental school students, and junior doctors, all prefer traditional resources instead of electronic options.[12-18] However, these results are somewhat at odds with the current research regarding the new generation of undergraduate students. Monaco and Martin identified the current millennial generation (students born after 1982) as being used to having technology at their fingertips and demanding to stay connected throughout their time in college.[19] Based upon this statement, the inclusion of e-textbooks in the curriculum should be a welcome change for today's student learners. This apparent division between the academic and non-academic lifestyles may become problematic when educators try to engage their students with an electronic textbook while their students may prefer a traditional textbook. As students use more technology, cognitive processes are also changing.[20] In 2008, Baulerlein found that reading proficiency has dropped from 40 to 35% due to technology integration.[21] Skills such as deep thinking are slowly evaporating and being displaced with fast scanning and browsing which are skills used in Instant Messaging, Twittering, and Googling.

On the reverse side of this issue, new student dependence upon technology may sometimes be a burden on educators who did not grow up in the same technology dominant society. This is found to create distance between the students and the educators.[22] Some believe educators need to utilize as many electronic education tools as possible in order to communicate effectively with students.[23] Others support this idea by discussing ways to motivate a 21st century student through full technology integration with internet and multimedia access.[24] One way for these educators to potentially help reach their students through the "technology void" is to introduce or allow e-textbooks into the athletic training curriculum as a means of engagement through multi-media.

There has been dichotomy among students in higher education on the integration of e-textbooks, with no studies evaluating specifically athletic training students' perception of e-textbooks or use of technology in the educational process.[13,14] This information is important to determine the worth of using electronic media in the athletic training curriculum. It also helps identify if athletic training students follow the millennial generation's trend of being "technology integrated", but still seemingly "paper dependent".

Objective

The purpose of this study was to identify if athletic training students are using electronic textbooks as well as understand their perceptions of electronic texts. Our main goals for the study were to:

1. Identify and assess athletic training students' attitudes regarding computer and tablet use.
2. Identify the prevalence of e-textbook use within athletic training education.
3. Assess entry-level athletic training students' attitudes and experience as it related to e-textbook technology.

METHODS

A cross-sectional survey design was used to understand athletic training students' perceptions of computer use and e-textbooks. The survey was constructed using a detailed review of the current literature and modification of an established survey to evaluate electronic textbooks.[15] New items were developed using the guidelines suggested by Dillman et al.[25] Content validity was established using both content experts and cognitive interviewing procedures. After slight modifications were made, three content experts were asked to evaluate the survey items. Content experts were selected based on their experience as athletic training educators and research interests in technology. New items were created while old items were reworded based on the experts' recommendations. The survey included an informed consent item followed by a total of 37 (six demographic) items including a combination of closed ended (i.e., multiple choice, select all that apply) and open-ended questions.

Following the feedback from content experts, the instrument was piloted to eight, second year, graduate, athletic training students (mean age: 23.75 ± 0.71). Cognitive interviewing was used to establish trustworthiness. Students were asked to read the items and identify any items or words that seemed confusing. They were then asked to describe what they thought each question was asking to ensure that the students and researchers each understood the items. There were few misunderstandings but the items were modified based on their feedback.

Data Collection and Analysis

Once a psychometrically sound instrument was developed, the survey was emailed to athletic training faculty, who were asked to forward the email on to their students via a link to Qualtrics. Two reminder emails were sent two weeks apart to faculty. The study was approved by University of Southern Mississippi institutional review board. Informed consent was obtained from all participants.

Descriptive statistics were used (i.e., mean, standard deviation, percentages) to compare data. The open-ended questions were coded using inductive content analysis using reoccurring terms.

RESULTS

A total of 861 athletic training students completed the survey. Inclusion criteria included students over the age of 18 who were enrolled in an athletic training program. Table 2 describes the sample. Because participants were forwarded emails from their faculty members we are unable to calculate an accurate response rate.

A majority of the respondents were under the age of 25 (92%). Respondents were primarily completing undergraduate athletic training programs (93.3%) with a balanced distribution of year in the program. Most students (62.9%) report being allowed to use laptops or tablets in their athletic training classes while 30.9% say it "depends upon the course." A total of 99.8% of students reported having access and using computers for school related activities. In addition, 96.4% of students reported being comfortable or very comfortable with computers.

When we asked students about their preference for e-textbooks or traditional textbooks, 69% prefer a traditional textbook while 22% state they never had the opportunity to work with an e-textbook. The primary reason students prefer traditional over e-textbooks is ease of reading followed by ease of note taking. Students who prefer e-textbooks instead of traditional textbooks state that e-textbooks are more portable and cost less than traditional textbooks. Table 3 further illustrates the students' preferences.

Table 2. Demographic Characteristics of Students in Study

Variable	Number (Percentage)
Gender	
Male	261 (30.3%)
Female	599 (69.7%)
Race (n = 860)	
White, non-Hispanic	750 (87.2%)
Black, non-Hispanic	36 (4.2%)
Hispanic	44 (5.1%)
Asian/Pacific Islander	25 (2.9%)
Native American/Alaska Native	5 (0.6%)
Age Group (n = 860)	
18-19 years	149 (17.3%)
20-21 years	449 (52.2%)
22-24 years	196 (22.8%)
25-35 years	49 (5.7%)
36+ years	17 (2.0%)
Program Type (n = 860)	
Undergraduate	803 (93.3%)
Graduate Entry Level	57 (6.6%)
Year in Program (n = 848)	
Undergraduate Freshman	57 (6.7%)
Undergraduate Sophomore	276 (32.6%)
Undergraduate Junior	257 (30.3%)
Undergraduate Senior	202 (23.8%)
Graduate Year 1	27 (3.2%)
Graduate Year 2	29 (3.4%)

Table 3. Textbook Habits

Variable	Number (Percentage)
Hours per week of textbook use (n = 838)	
0 hours	19 (2.3%)
1-5 hours	523 (62.4%)
6-10 hours	219 (26.1%)
11-15 hours	53 (6.3%)
16+ hours	24 (2.9%)
Institutional textbook preference (n = 838)	
My school only uses e-textbooks	5 (0.5%)
My school only uses traditional (paper) textbooks	207 (24.7%)
My school uses both e-textbooks and traditional textbooks	297 (35.4%)
I am given the option to choose which type of textbook I prefer	329 (39.3%)
Which best describes what YOU do? (n = 630)	
I do not use the e-textbook if the instructor provides detailed material/handouts	163 (25.9%)
I use e-textbooks only if the instructor does not provide much detailed material/handouts	124 (19.7%)
I use e-textbook even if the instructor provides detailed material/handout	69 (11.0%)
I do not use e-books regardless of the material provided by the instructor.	274 (43.5%)
Have you ever purchased a traditional (paper) textbook that you already had as an e-textbook? (n = 837)	
Yes	109 (13.0%)
No	728 (87.0%)
Have you ever purchased an e-textbook that you already had as a traditional (paper) textbook? (n = 830)	
Yes	43 (5.2%)
No	787 (94.8%)
Which statement best describes your preference regarding reading from e-textbooks? (n = 828)	
I prefer to print e-textbook material rather than read on a computer or tablet screen	439 (53.0%)
I prefer to read on the computer or tablet screen	66 (8.0%)
I prefer to combine printed material with reading from a computer or tablet screen	323 (39.0%)
If you have ever had the opportunity to experience using e-textbooks, which do you prefer? (n = 828)	
E-textbook	74 (8.9%)
Traditional textbook	572 (69.1%)
I have not had an opportunity to use e-textbooks	182 (22.0%)
Even if you have not used them, what are some reasons that you would WANT to use e-textbooks compared to traditional textbooks? (n = 861)*	

More comfortable	479 (52.3%)
Cost	583 (67.7%)
Ease of reading	124 (14.4%)
Ease of note taking	153 (17.8%)
Availability	359 (41.7%)
More easily portable	631 (73.3%)
None	66 (7.7%)
Other (Open-ended Response)	24 (2.8%)
Access to the internet	377 (43.8%)
Even if you have not used them, what are some reasons that you would WANT to use traditional textbooks compared to e-textbooks? (n = 861)*	
More comfortable	479 (55.6%)
Cost	67 (7.8%)
Ease of reading	653 (75.8%)
Ease of note taking	544 (63.2%)
Availability	286 (33.2%)
More easily portable	100 (10.9%)
None	37 (4.3%)
Other (Open-ended Response)	41 (4.8%)
Access to the internet	49 (5.4%)
*percentage is not cumulative	

DISCUSSION

Many people have been predicting that e-books and e-textbooks will become more integrated inside the classroom of the future.[26,27] However, there is a great amount of friction from both educators and students as to e-textbooks implementation and access. Our study found that given a choice, 64.3% of the athletic training students preferred using traditional paper textbooks for their athletic training courses. These results mirrored previous studies on e-textbook preference in a variety of populations.[12-18] Ditmyer et al and Strother et al found a majority of dental school students preferring printed textbooks instead of e-textbooks.[15,17] Ditmyer et al stated their results could have been skewed by the fact that there may have been a large portion of students who would not have fallen in the age range defined for the Millennial Generation.[15] However, in our study, 93.3% of responses were from students under the age of 25, which puts them decidedly as Millennials. Woody, Dennis, and Philip and Moon report undergraduates prefer traditional textbooks over e-textbooks.[13,14,28] Another telling factor that speaks to how much students prefer traditional textbooks is the amount of students who purchased a traditional textbook when they already had an e-textbook was more than double that of students purchasing an e-textbook when they already owned a traditional textbook (n=109 vs n=43). While there could be many reasons for this behavior, we suspect that one of the more prevalent is students' overall preference for these textbooks.

We measured students' computer use and comfort to make sure that was not a factor in preferring a non-electronic textbook format. Our results showed that 99.8% of students use computers for various reasons such as writing papers, research, watching course related videos, online learning management systems (e.g. Blackboard, Moodle, etc.), and class projects to name a few. (Table 4) We also found that 96.4% of students are comfortable or very comfortable with computers. This leads us to believe discomfort with technology is not a primary reason for choosing traditional textbooks over e-textbooks. In addition, 97.5% of students report spending more than 1 hour per day using their computer or tablet to complete schoolwork during the semester.

Table 4. Reported Computer Use

Variable	Number (Percentage)
Access to computers or tablets	
You purchase own laptop/tablet	681 (80.6%)
School provides you with laptop/tablet	4 (0.5%)
You use desktop computer ONLY	6 (0.7%)
You do not use computer or tablet	2 (0.2%)
You use a combination of desktop and laptop/tablet	152 (18.0%)
School related activities performed on computers (n = 861)*	
Writing Papers	831 (90.8%)
Research	812 (94.3%)
Watching course related videos	660 (76.7%)
Online Learning Management Systems (ie. Blackboard, Moodle, etc.)	666 (77.4%)
Class Projects	742 (86.2%)
Taking Notes	371 (43.1%)
Reading for class	433 (50.3%)
Other (open ended answer)	29 (3.4%)
E-reader or tablet ownership (n = 839)	
Yes	356 (41.3%)
No	483 (57.6%)
Allowed to use laptops/tablets in the athletic training classroom (n = 839)	
Yes	528 (62.9%)
No	52 (6.2%)
Depends upon the course	259 (30.9%)
Hours in a typical day spent on a computer/tablet doing schoolwork during semester (n = 837)	
Less than 1 hour	21 (2.5%)
Between 1-2 hours	186 (22.2%)
Between 2-3 hours	249 (29.7%)
Between 3-4 hours	168 (20.1%)
Between 4-5 hours	97 (11.6%)
Between 5-6 hours	50 (6.0%)
More than 6 hours	66 (7.9%)
Current comfort level with computers (n = 837)	
Very comfortable	416 (49.7%)
Comfortable	391 (46.7%)
Uncomfortable	26 (3.1%)
Very Uncomfortable	4 (0.5%)
*percentage is not cumulative	

Another factor that could have influenced our results is the students' potentially greater acclimatization or experience with traditional textbooks compared with e-textbooks. Berg et al reported students found it easier to work with print books because of familiarity.[29] Our results indicate that this may be occurring within higher education and may be particularly true for athletic training. With 71.7% of students reporting their athletic training program uses only traditional textbooks (Table 5), it is easier to imagine why students may prefer these compared to e-textbooks. This bias is also highlighted when 43.1% of students responded they were not aware that e-textbooks existed for athletic training courses. This follows a trend in elementary and secondary schools, where in 2011, e-textbooks made up less than 10% of the total textbook market.[30] This makes it a simpler transition for students who have grown up with traditional textbooks to continue the trend in higher education. This propensity to utilize traditional textbooks may be reinforced by educators who are less comfortable using e-textbooks compared to traditional textbooks.[15]

Table 5. Textbook Habits within Athletic Training Programs

Variable	Number (Percentage)
Which best describes your Athletic Training program regarding e-textbooks? (n = 824)	
My athletic training program only uses e-textbooks	0 (0.0%)
My athletic training program only uses traditional textbooks	591 (71.7%)
My athletic training program uses both e-textbooks and traditional textbooks	233 (28.3%)
Are you aware that there are e-books available for some of the textbooks used in athletic training courses? (n = 824)	
Yes	469 (56.9%)
No	355 (43.1%)
If you had a choice, what format do you prefer for athletic training textbooks?	
E-textbook	47 (5.7%)
Traditional textbooks	530 (64.3%)
Combination of e-textbooks and traditional textbooks	247 (30.0%)

Some of the more prevalent reasons for preferring traditional textbooks were ease of reading and note taking. This may be explained in a 2007 study by Hernon et al who suggested, "selecting from an e-book title browse display becomes frustrating to students when images are slow to load" and "students become exasperated with limitations related to the display."[31] Students also found online reading to be "disjointed" because they "had to do too much scrolling and shifting of the display." A large number of students reported that the display screen was "hard on their eyes" or "gave them headaches", which mirror results by Brunet et al.[16] Students said they prefer abstracts of each chapter and information about searching chapters using specific keywords.

Other reasons students disliked e-textbooks were due to the difficulty in taking notes and learning from a screen. One student, included in our study, stated, "I don't like reading textbooks on the computer. I would rather have physical paper to write on, highlight, and it's just easier reading on the paper" while another student wrote, "It is easier for me to picture the placement of words [on a traditional textbook] page. It's better to help with memorization." In addition, students mentioned they prefer a traditional textbook because working on a computer can be a distraction. One student wrote, "I actually like reading from paper rather than a computer where I can get distracted by the internet."

Students also listed reasons for preferring e-textbooks over traditional textbooks. The most common were easier portability and the reduced cost of most e-textbooks compared to their print counterparts, which were reasons also noted in a previous study.[14] A few students stated, "Electronic textbooks make it easier because everything (i.e., text, notes, etc.) is all in one place" while another student wrote "An electronic textbook is easier to carry than having a heavy book in my backpack". Most students described preference for the e-book over the traditional text when they were using it as a reference because they "could use a quick search to find key words". Other students discussed the idea of being environmentally friendly. A student wrote "I only have to print the pages I need instead of the whole thing." An idea that had not been previously considered was e-books may be

useful for students with disabilities. One student wrote, "Using an electronic book is helpful because I can have the computer read the book to me which helps with my dyslexia."

Limitations

There were some limitations to our study. Since the survey was sent electronically, it was unlikely that students without computers would have been able to respond. This makes it more likely that students who did respond at least had access, basic knowledge, and a comfort level with computers and similar technology which may have skewed our data. This method of survey also only gives a cross-sectional view of what is happening at the time of data collection and does not provide information as to a series of events. While there were a large number of respondents, because the survey was distributed to athletic training faculty and they forwarded it to their students, an accurate sample size or response rate was unable to be calculated due to not being aware of how many students ultimately received the survey. That, and the use of voluntary respondents, reduced the chance that the data were representative of the population as a whole. Therefore caution is advised when generalizing this data to other populations or settings.

Future Research

Even though today's Millennial Generation of higher education students is technology savvy compared to previous generations they still tend to rely traditional media sources in some aspects of their lives. This may not continue to be true as future generations of students matriculate in technology dependent classrooms and school systems. These future generations of students could begin transitioning away from traditional textbook media much like past generations transitioned from radio to television. We believe future studies should focus on upcoming generations of athletic training students for changes in their perceptions of e-textbooks. This information would help prepare athletic training educators to deal with an ever-changing technological landscape. Another focus of future research should be on the socioeconomic status of athletic training students and how that influences their use of technology in the learning environment. Future studies should also explore potential barriers (e.g. socioeconomic status) to utilizing technology along with specific benefits that technology may impart on students (e.g. assisting students with disabilities).

CONCLUSIONS

Based upon these findings athletic training educators should continue to utilize traditional textbooks as a primary method of learning while incorporating technology such as e-textbooks as secondary methods. Even in a technology-centered generation of higher education, traditional printed textbooks were preferred by a majority of athletic training students both for their general classroom use and for their use within the athletic training classroom. Many students acknowledged being comfortable with computers, but it was posited that their previous experience with traditional textbooks, the large accessibility of traditional textbooks compared to e-textbooks, and potentially their educators' bias, were factors that influenced them to prefer traditional textbooks over e-textbooks. While e-textbooks were touted as being more portable and less expensive, traditional textbooks were preferred for their ease of reading and note taking.

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