Implementation Factors and Faculty Perceptions of Electronic Textbooks on the iPad

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Abstract

A federally managed university in the United Arab Emirates implemented a one-to-one iPad program. In an effort to increase access to interactive digital learning resources on the iPads, they next transitioned from paper-based textbooks (pTexts) to electronic textbooks (eTexts) on the iPad for all course delivery formats. The goal of this study was to survey and report on faculty perceptions among three university divisions with the intent of highlighting factors and barriers influencing adoption of iPad-accessed eTexts in the classroom. The objective was to enhance understanding of factors that both contributed to or hindered successful implementation of eTexts. The main findings of this study were that increased training was not perceived as needed by faculty, but instead better support of technical challenges, more efficient workflows in implementation, and usability and interactive features of the eTexts were all the barriers to successful adoption of eTexts in the classroom. Suggestions for project management approaches are given, with reviews on specific factors that influenced successful adoption. The results of this study may be used to improve project management workflows and faculty support in similar implementation projects.

Keywords: electronic textbooks; ebooks; eTexts; faculty support; digital resources

Introduction

The United Arab Emirates provides three federally managed universities for national citizens that serve more than 41,000 students (Cavanaugh, Hargis, Munns & Kamali, 2012). In an effort to utilize the latest learning technologies that increase access to engaging and interactive learning opportunities, iPads were initially implemented across all these institutions in basic math and literacy programs in September 2012 (Hargis, Cavanaugh, Kamali & Soto, 2014). iPad use was expanded to other bachelor programs a year after. At one of the three federally managed universities in the United Arab Emirates, since there was a one-to-one iPad program, in an effort to increase access to interactive learning resources on the iPad, the university transitioned from paper-based textbooks (pTexts) to electronic textbooks (eTexts) to be accessed from the iPad or a browser. No printed books were bought for any courses that used iPads, excepting cases where no digital resource was available. The goal was to have only electronic textbooks and publisher digital learning resources for students, to be accessed from iPads or laptops in the classrooms in all delivery formats (face-to-face, flipped, hybrid and online).

Based on the above developments, the goal of this study was to survey and report on faculty satisfaction among three of the system's divisions, with the intent of highlighting faculty perceptions about the use of iPad-accessed electronic textbooks in the classroom. The objective is to enhance understanding of factors that both contributed to or hindered successful use of the electronic books towards a goal of reporting on lessons learned, improved project management workflows, and adjusted faculty support plans.

Review of Literature

The traditional textbook is a paperbound learning resource. In recent decades it was often coupled with a computer disk (CD) that included teaching resources and access to PowerPoint lectures. Over the last decade, increases in access to the Internet and hand-held devices have facilitated the possibility of using digital resources for textbooks in place of traditional paper-based books and CDs. Electronic textbooks (eTexts) and online learning digital resources are increasingly replacing traditional paper textbooks (pTexts). As the use of eTexts and digital resources expands then the necessity of training, connectivity and technical support for using eTexts also increases. Over the last decade several studies have looked at the success and self-reported satisfaction with the growing use of digital learning resources.

Such as the study by Noyes & Garland (2006) that found students preferred to learn with printed vs. electronic textbooks. In another study participants felt the usability of electronic textbooks wasn't equivalent to a paper textbook (Buzzetto-More, Sweat-guy & Elobaid, 2007). In these studies, the term usability referred to ease of access to the learning content within the text, such as the ability to quickly flip to a page and read the content, or compare two pages in the book. Later, Woody, Daniel and Baker (2010) found that students preferred paper textbooks over electronic textbooks regardless of gender or computer skill levels. However, since the year 2010, studies have started to show the converse. Porter (2010) found that students preferred the electronic textbook vs. the hardcopy textbook, though both versions provided similar learning outcomes and achievement. Further, the study also reported that students preferred classroom group problem-based activities over similar activities as independent exercises in the electronic textbook. Rockinson-Szapkiw, Courduff, Carter and Bennett (2013) reported a comparative study of electronic vs. printed textbooks that found that students' grades were comparable between pTexts vs. eTexts, but that students perceived learning increased with the eText. In another study, Daniel and Woody (2013) looked at the performance and use of eText vs. pTexts with students, and found that while achievement remained consistent between the groups, the reading time was significantly higher with eTexts than pTexts, both in the lab and at home. Stone and Baker-Eveleth (2013) also found that the perceived usefulness and satisfaction with an eText influenced intention to continue using them. In a study with similar findings, Baek and Monaghan (2013) found that students were satisfied with eTexts as long as they were high quality and easy to use. These studies show an evolution in greater acceptance of eTexts as their use becomes more common. However, dissatisfaction is still reported in recent studies. In a recent study on student satisfaction with an open eText, Illowsky, Hilton, Whiting and Ackerman (2016) found that 70% of the study participants felt the open eText used was the same quality as the pTexts. In a second related paper that reviewed studies in student satisfaction and perception of eTexts, Baglione and Sullivan (2016) found that pTexts were perceived by respondents as easier to read, understand and navigate, even though eTexts were cheaper. The students in that study also preferred the long-term access that a pText offers over eTexts. These studies highlight that over time perception and acceptance of eTexts has improved, but that still, while students and faculty value the lower cost of eTexts, the limits in usability, features, and long-term access weigh as more important than reductions in costs and prohibit eText adoption.

The above summarized research is all related to student views on use of eTexts. A search of the literature found few studies related to faculty perceptions on the adoption and use of eTexts until recent years when the interest in using Open Educational Resources (OER) and Open Textbooks (usually electronic) has expanded. Many studies found were related to use of OER to reduce the costs of education. In one study, the reductions in the cost of education

was a prime reason for open textbook adoption (Ozdemir & Hendricks, 2017). In another recent study of faculty perceptions by Jung, Bauer and Heaps (2017) on adoption of OpenStax open textbooks, the results found that 82% of faculty said they spent the same time on using the open textbook, 50% said there was no change in instructional time and investment, 68% said that students were equally prepared with either open textbook or traditional, and 64% said students had equal performance with the open textbook. In these studies, the focus is slightly different than the current study, as the main goal is educational cost reduction using open textbooks of variable quality and interactivity from a digital standpoint. There is a gap in the research on studies related to faculty perception on adoption of publisher eTexts and digital resources across multiple domains wherein cost reduction is not the primary focus but instead usability/features, access, and interactivity are instead the main focus.

In relation to the usability of technology, Davis (1989, Chuttur, 2009) proposed the Technology Acceptance Model (TAM) and found that technology use can be predicted by user motivation, which is directed by their perception of the technology usefulness. In TAM the actual use of a system is determined by its features and the user motivation (Davis, 1989; Chuttur, 2009). Studies by Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur and Sendurur (2012) reported similar findings. Ertmer et al. (2012) found a direct relationship between willingness to use technology in education and faculty beliefs or attitudes towards technology and their current skill level with technology. The perceptions of both faculty and students concerning the value of electronic books should be studied since their perceptions could directly affect their willingness to sustain eText use in education. A look at faculty perceptions on use of publisher digital resources allows administrators and project managers to obtain a clear list of factors for planning successful adoption processes and training programs related to wide-scale eText adoption.

To address this research gap area, the current study analyzed the perceptions of faculty at a federally managed university in the United Arab Emirates concerning satisfaction, usability, and reported perspectives on using publisher eTexts with students on either iPads or laptops in the classroom. This study focused on the self-reported perceptions concerning the value and usefulness of eTexts in all delivery formats (face-to-face, flipped, hybrid and online) after implementation, with the intent to better understand possible barriers to adoption and provide suggestions for adoption.

Methodology

Context

eTexts were implemented fall semester across the system of 17 campuses at a federally managed higher education institution in the United Arab Emirates. The project was implemented in just under four months. All first year courses already had a one-to-one iPad program in place (Hargis et al, 2014). eTextbooks were implemented using digital textbook platforms and publishers with iPad apps, including (though not limited to): McGraw-Hill, Pearson, Oxford University Press, Cambridge University Press, Wiley, ALEKS, VitalSource (aggregator), CourseSmart (aggregator). All the eTexts chosen required an active Internet connection to use and could not be used offline. The eTexts covered topics such as: basic science, English (ESL), and math. Training reps for VitalSource and CourseSmart were contracted to provide system-wide training sessions for faculty and staff. Educational Technology support staff at each campus were also given further training to enhance support processes. All courses had printed texts. Where possible, an eText was used in place of the printed text. The eTexts were used for courses in all delivery formats; face-to-face, flipped, hybrid, and online.

Research Design

The research was a non-experimental survey study designed to analyze the self-reported perceptions on eText use in the classroom by higher education faculty. Open-ended questions were included to look for patterns and relationships between the study constructs with the intent to better understand internal versus external barriers to eText use in the classroom, and to triangulate the results.

The study had the following *research questions* to guide the study:

1. What factors supported or inhibited use of eTexts in the classroom?
2. What approaches could be adjusted to better facilitate eText adoption in the future?

One semester after the initiation of eTexts over pTexts the eText Satisfaction Survey was distributed to 733 full- and part-time faculty of three divisions system-wide across 17 campuses, including: 1) Engineering Division, which included Aviation, 2) Foundations Division, which included basic and general studies, and 3) Computer Information Systems and Applied Communications, which included Business Studies. These divisions were selected as they housed the most courses using eTexts. The survey was anonymous and online. Data related to division was collected, but no other identifying data was collected to protect respondent identify. The survey requires consent to participate. Having an eText in a course was a pre-requisite to completing the survey. The survey asked respondent if their course had an eText, and those who selected no were disqualified from completing the survey. The survey was distributed as an email link to all faculty in these three divisions at approximately one-week intervals three separate times. After the third email reminder, the data was combined and analyzed for results. Participation was anonymous and voluntary. The survey allowed participants to select a Likert scale of Strongly Agree to Strongly Disagree, with Neutral as the middle undecided option. Each question also included the option to list Not Applicable, so that in cases that the faculty member felt a question did not apply to their situation they could list that instead of Neutral. All Not Applicable data was removed from the total n that was analyzed for each question.

Results

Across the three divisions a total of 733 full- and part-time faculty were invited to participate. Of those invited to participate a total of 288 accessed the survey. Of that, 18 were disqualified as they selected that they did not have an eText in their courses, and 35 were partially completed, leaving 235 fully completed surveys. That gave 81.6% (235/288) survey completion within survey attempts, and a 32% (288/733) completion rate among all invited faculty. At least one survey was received from a faculty member from each of the 17 campuses in the university system, and 13 of the campuses had 10 or more faculty submit a survey. This means the data shows a nice cross-section of viewpoints from all 17 campuses in the system. Of the 235 completed surveys submitted, 78 were from the Engineering Division, 69 were from the Foundations Division, and 88 were from the Computer Information Systems & Applied Communications Division (n=235).

Following is the analyzed data by survey question, and then an analysis centered on the research questions in the discussion section, based on the survey data as outlined in this section. In the analyzed results, where n does not equal 235, the remainder had chosen Not Applicable and were removed from the analysis. In the following analysis of data, SA= Strongly Agree, A=Agree, N=Neutral (not to be confused with the lower-case n, which is the number of respondents to that question), D=Disagree, and SD = Strongly Disagree.

The first question *(Q1) was: The eText has been used as much by the students as the paper-based books were used (n=232).* This question asked if the faculty perceived that the students were reading the eText as much as they had the pText. This question in conjunction with questions that follow helped to distinguish between a general lack of reading regardless of book format (digital or paper) from a lack of reading that was due specifically to the format. Of the respondents, 34% agreed (SA & A; n=80) that the eText was read as much by the students as the pText had been, while 49% disagreed (SD & D; n=114) and 16% (n=38) were neutral or had no strong opinion (Figure 1).
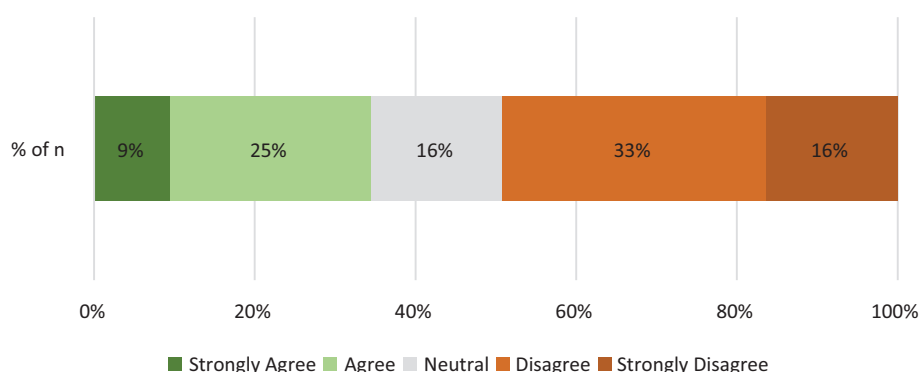

Figure 1: Use of eText vs pText by students

The second question *(Q2) asked: My students and I were able to open and access the eText and related resources easily (n=234).* This question was asked to determine if technical barriers and usability challenges were a possible barrier to the use of the eTexts. Of the respondents, 52% (SA & A) agreed that they could easily access the eText, 37% disagreed (SD & D), and 11% were neutral or had no strong opinion (Figure 2).
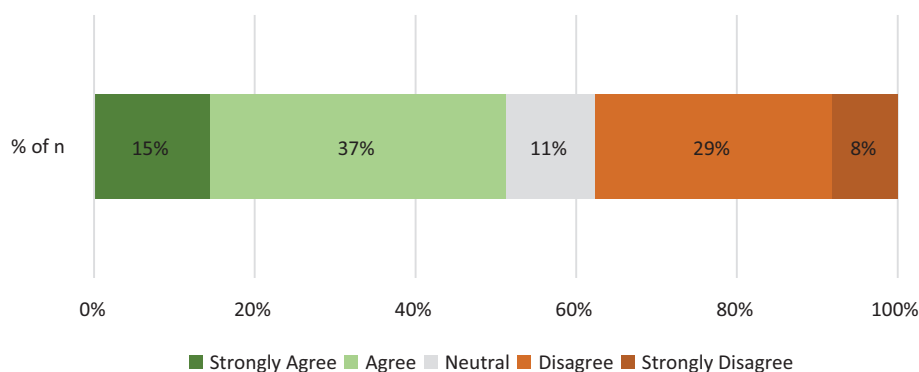

Figure 2: Easy access to eText

The third question *(Q3) asked: I had access to my eText and Bb Learn course shell (and related resources) in a reasonable time to start planning lessons and curriculum before I needed to teach (n=232).* This question was included to determine if some frustrations might stem from not having access to the digital resources early enough to prepare for lectures and lesson planning, so early access vs. usability. Some of the eTexts were accessed via laptop or iPad, but also some Blackboard courses had eText links within the course. Of the respondents, 41% agreed (SA & A) that they had timely access, 43% disagreed (SD & D), and 17% were neutral or had no strong opinion (Figure 3).
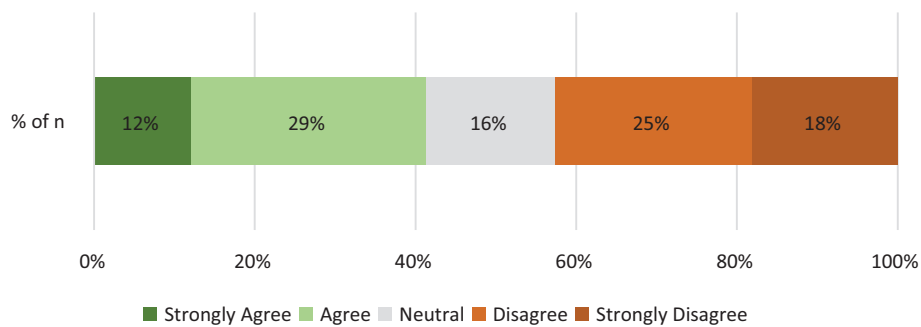
Figure 3: Early access to eText

The fourth question *(Q4) asked: I was given sufficient training allowing me to access and use eTexts with confidence (n=228)*. This question was to determine if enough training was granted to faculty or if more training might be necessary. Of the respondents, 50% agreed (SA & A) that they had been given sufficient training, and 25% were Neutral, with just 25% disagreeing (SD & D) (Figure 4).
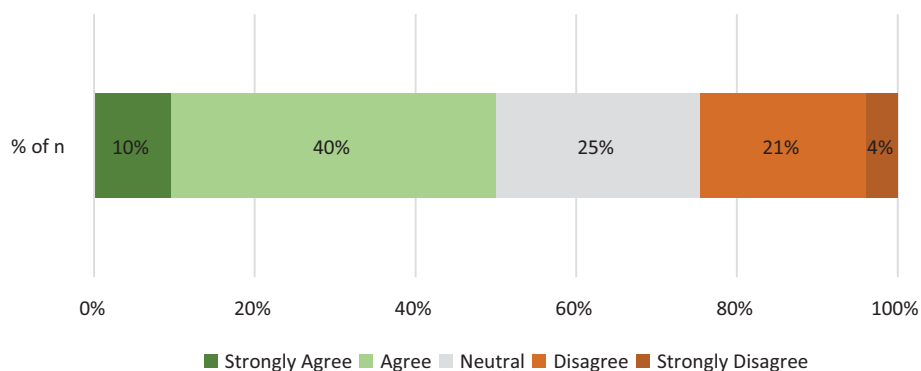

Figure 4: Perception about training to use eText

The fifth question *(Q5) asked: eTexts are easier to access and use in the classroom than paper-based books were (n=233)*. This question was to determine perspectives on the usability of the eText during classroom lessons and teaching time. Of the respondents, just 28% agreed (SA & A), while 48% (SD & D) disagreed that the eTexts were as easy to access in the classroom as pTexts books in the classroom, and 24% were neutral or undecided (Figure 5).
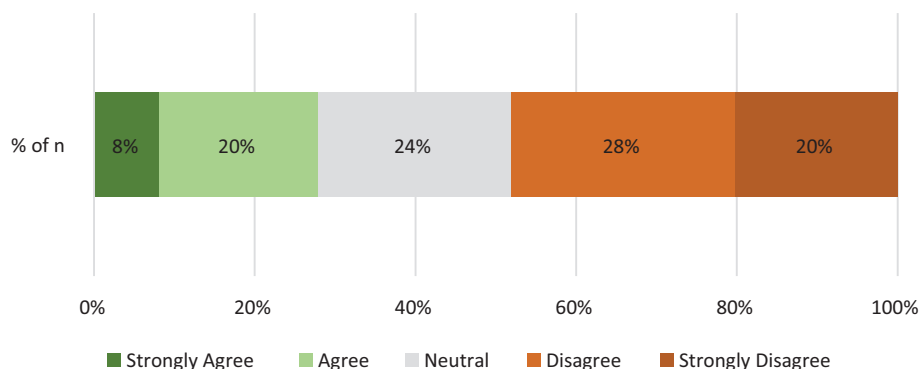

Figure 5: Easy use of eText vs pText

The sixth question *(Q6) asked: I feel that eTexts are an improvement over paper-based books (n=234).* This question was a direct question to ascertain faculty opinion of eTexts as compared to pTexts. Of the respondents, 30% agreed (SA & A), while 41% (SD & D) disagreed that they preferred the eText over the pText, and 29% were Neutral, or undecided (Figure 6).
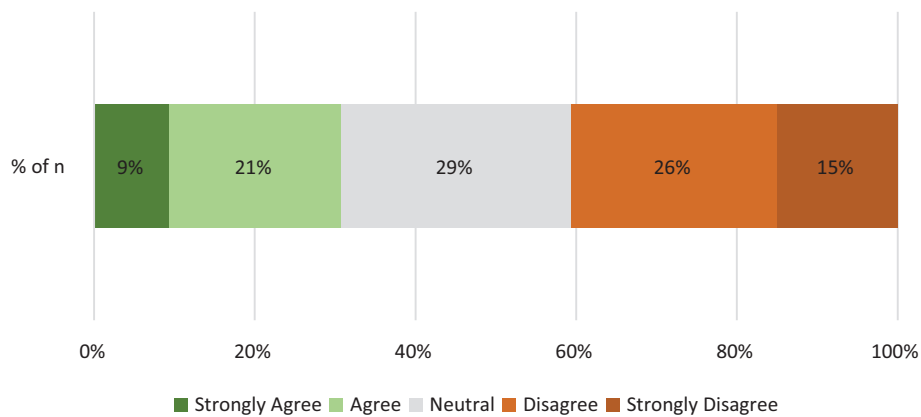

Figure 6: eTexts vs pTexts improvement

Question 7 (Q7): I find it difficult to use the eText for any one of the following reasons (select all that apply). This question was included so as to offer teaching staff the opportunity to express that challenges may pose a barrier to use of eTexts with students and in the classroom. Faculty were allowed to choose multiple items. The top 4 barriers listed were 1) Too hard to take notes and keep/share them (52% of respondents chose this one), 2) that student lack of time spent on reading regardless of text format (49%), 3) too many technical difficulties (47%), and 4) access to eText too late (36%) (Table 1).

Table 1: Reasons for difficulties in using eTexts
Faculty response to Question 7– I find it difficult to use the eText for anyone of the following reasons (select all that apply)

Item	f	%
Too hard to take notes and keep/share them	122	52
Student lack of time spend reading the course text is the same regardless of whether it was paper-based or digital	115	49
Too many technical difficulties	110	47
I needed access to my book sooner than I was able to get it.	85	36
I had access to the eText but not associated support materials & resources	78	33
I didn't have my book by the first day of the term	75	32
I need more technical support to solve bugs and errors	69	29

Item	*f*	%
The content isn't the best and it would be better to choose the in-house material created by faculty and staff.	52	22
The content isn't the best and it would be better to choose a new book for the course.	47	20
My eText isn't optimized for use on the iPad.	47	20
I need more training on use of the eTexts and eResources	37	16
None of the above	9	4
Other (list reason in other comment box below).	37	16
Prefer not to say	1	.04

f = frequency. % is calculated by f/235 since respondents could choose multiple answers.

In Question 7 faculty could list other challenges. The comments were analyzed for themes, and categorized into the following five main themes:

- **Interactivity**: many eTexts were nothing more than PDF files and did not have any of the interactivity that faculty would expect, and many commented that there was no reason to use them if they are not a true eText with all the interactive graphic and video capabilities that eTexts can provide.
- **Usability:** many faculty reported complaints that students preferred a traditional book that is easy to highlight, take notes from and flip to specific sections; all difficult with the eTexts. In other comments, faculty said that in science, math and engineering texts, students were supposed to write on graphs but the eText did not have that capability.
- **Supplemental Resources:** several of the study participants noted that the eTexts did not come with the same teaching resources that the traditional textbooks came with.
- **Choices:** in several cases faculty reported that since the preferred book was not yet in eText format, they were forced to choose a less optimal book for the course.
- **Technical Errors:** eTexts access required use of iPads. Together they could comprise a long list of possible technical errors and glitches that faculty had to support and deal with, and this detracted from time that should instead be spent learning the course content. In other comments, faculty noted that eTexts did not keep pace with iPad system upgrades which caused errors when students upgraded to the latest iOS version.

Question 8 (Q8): Give any general comments you have, PRO or CON, about eText access, support, and training needs (n=96). The comments for this question were analyzed and themes pulled to create the following list of pros and cons that faculty associated with use of eTexts in the classroom (Table 2).

Table 2: Pros and Cons of eTexts *Faculty reported Pros and Cons of eTexts*

Category	Pros	Cons
Access	Portable	Open-book exam difficult
	Quick access to exercise answers	Difficult to flip or browse

Category	Pros	Cons
	Good for presenting content in class	Hard to reference vocabulary
	iPad can carry all textbooks at once	Hard to take notes
	Easily available	Lack of offline access
	Integrated case studies	eText access late in term
	Engages students more	Access to answers too easy
	In time can be a huge benefit	Hard to read (font, colors) Glorified PDFs Students study better from pText eText popup windows blocked Wifi access sporadic and unreliable Older devices lose access
Support	*No Pros given*	Technical errors prohibitive Lack of teaching resources Complicated to use
Training	*No Pros given*	Not enough training provided Training by non-teaching staff More time needed to adopt

Question 9 (Q9): Which publishers and/or eText platforms are you using? (Select all that apply). The faculty were asked to list which of the publishers or publisher aggregators they were using. Results are in Table 3. The two most listed (McGraw-Hill and Pearson) with the highest numbers of participants using them were compared to Q6 in Figure 7.

Table 3: Publishers and/or eText platforms used
Which publishers and/or eText platforms are you using? (Select all that apply).

Item	*f*	%
McGraw-Hill	105	45
Pearson	110	47
Oxford University Press	31	13
Cambridge University Press	20	9
Wiley	34	15
ALEKS	10	4
VitalSource	43	18
CourseSmart	20	9
Other	9	4

f=frequency. % is calculated by f/235 since respondents could choose multiple answers.
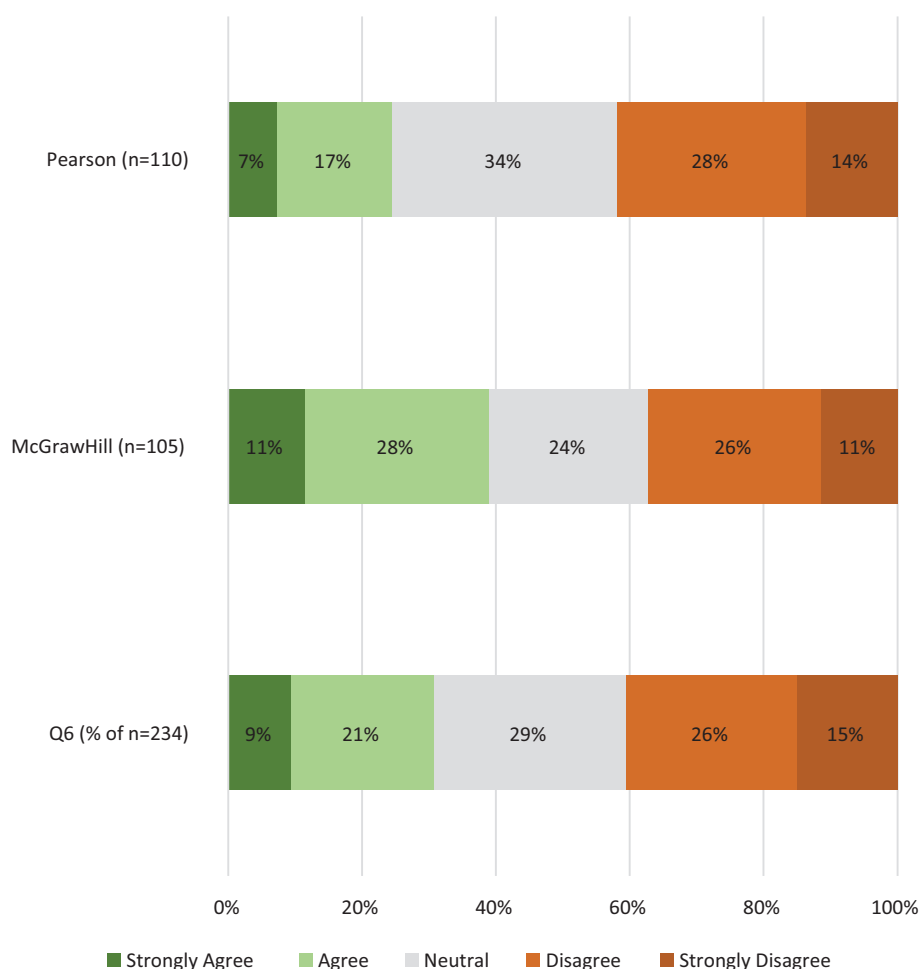
Figure 7: *Comparison of Q6 (I feel that eTexts are an improvement over pTexts) by the two most used publishers to determine if dissatisfaction centered on use with one over another.*

Discussion

Initial discussions among support staff centered on the need for more training. This study was done to verify if that was accurate or if other factors were more important barriers to eText adoption. The study had the following research questions to guide the survey construction:

1. What factors supported or inhibited use of eTexts in the classroom?
2. What approaches could be adjusted to better facilitate eText adoption in the future?

In actuality, the majority of faculty in this survey said they (75%) had sufficient training (Q4; SA, A, N), and only 25% (SD & D) felt they had not been given sufficient training already to use the eTexts with confidence. To compliment this fact, only 16% (Q7) of the faculty listed the need for more training as a barrier. Therefore, contrary to conversations based on anecdotal experiences among support staff, and regardless of the importance of training, the survey did not find increased training to be the most important factor for better adoption of eTexts, and instead other barriers seemed to pose more challenges to faculty. In answer study question 1, training did not seem to be a prohibitive factor to adoption of eTexts.

In this study, 52% (Q2; SA & A) agreed that they could easily open and access the eText in class, however, 49% (Q1; SD & D) of respondents said the eText was not used as much by the students as the pText. In a subsequent question (Q7) 49% reported that student lack of time spent reading the course material was the same regardless of the format (paper or digital). This means that lack of motivation and study time may be an important internal barrier to student achievement regardless of the format of the textbook.

Lack of usability was a main barrier to use as evidenced by the open comments in Q7 and Q8. The Q7 comments were categorized into themes, including: 1) interactivity, 2) usability, 3) supplemental resources, 4) choices, and 5) technical errors. Usability and technical errors were the most highly reported challenges. In the next question, Q8, respondents were asked to list pros and cons among three themes, 1) access, 2) support, and 3) training. In answer to the first study question, the most common comment related to access and usability of the eText. Faculty felt that unusability and lack of features were a major barrier to adoption. While interactivity would be a benefit of eTexts, many faculty commented that their eText was in some cases just a "glorified PDF", or in other cases a non-interactive digital book, and therefore did not offer up any of the digital benefits available while also having all the disadvantages of inaccessibility that digital books can pose. iPad upgrades also caused technical problems if the eTexts were not upgraded to keep pace. Several faculty also reported that the font and other visual graphics could be difficult to read. Of the respondents, 56% (Q7) claimed that it was too hard to take and share notes, and that this also limited the usability of the eTexts. In Q7 and Q8 many of the open comments said that the eText was too hard to browse and flip through and that it took too much time to try and quickly reference or look something up in them. Faculty also found that trying to refer to multiple pages at one time was too hard, where in pTexts that is easy to do. Faculty reported that a lot of class time was wasted on helping students get to the right page in the eText, or learn how to use the eText, or access the eText, where in pTexts this is quick and easy. Faculty felt there was a detraction to student learning in that valuable and limited class time was spend on access and technical errors rather than just learning the course content.

In answer to study question 1, technical issues, lack of offline access, and Internet connectivity issues were barriers to using the eText effectively with students in the classroom. Enhanced technical support was requested by several of the respondents. Finally, 36% (Q7) of respondents and 43% (Q3; SD & D) reported not having their eTexts soon enough to prepare for class, and 32% (Q7) said they did not have their eText by the first day of the term and they needed earlier access in order to prepare lectures and lessons. Respondents reported a need to access the eText and related resources earlier so as to better prepare for classes. For many the eText is accessed only through Bb Learn for which the course shells were made only a few days before the term start, so this delayed faculty preparedness. Changing learning management system procedures to open course shells (and related eText links) much earlier would alleviate this frustration.

Further comments also mentioned that eTexts did not come with any supplemental teaching resources that the respondents felt were important to class prep, and which respondents claim came with pTexts. Faculty also commented that it was hard or impossible to copy and use any of the graphics and information from the eTexts, and since they did not get any as a teaching resource to accompany the eText, and that meant they had to spend a great deal of time re-creating many of the graphics in the eText to use during lectures and classroom lessons.

Conclusions and Future Directions

As outlined in the Technology Acceptance Model (TAM), technology use can be predicted by user motivation, which is directed by their perception of the technology usefulness, wherein increased

use of a technology can be directly influenced by its features and usability, which drive user motivation to adopt it (Davis, 1985; Chuttur, 2009). In the cases where usability was a barrier, publishers could work to improve those features and this may improve satisfaction rates with digital books. In a study on e-books in education, Kissinger (2013) found that students perceived the e-book as metacognitive and individualized due to the keyword searching, book marking, and other referencing features that were reported as quick and easy. In a second similar study, Philip and Moon (2013) found that while eTexts have potential for reducing student educational costs, they needed more improvement in features and usability to make them more appealing to students. Where those usability features were improved, users report higher levels of satisfaction. In a related recent study of faculty perceptions by Jung et al. (2017) on adoption of OpenStax open textbooks, the results found that 82% of faculty said they spent the same time on studying the open textbook, and 18% said they spend more time. Of those that spent more time they claimed the following reasons as barriers: 1) eText access, 2) updated content, 3) interactivity, 4) curriculum alignment of eText, 5) content quality, 6) user convenience, and 7) customization of content. And 22% of the faculty surveyed had the following concerns: 1) lack of alignment with tests, 2) low quality of attached test banks, 3) lower student engagement, and 4) missing instructor resources. Most of these barriers inhibiting adoption of the digital open text in the study by Jung et al. (2017) correlate to the reported barriers in the current study. Interactivity, access, usability, and access to aligned teaching resources are all reported barriers to eText adoption, and per TAM, eText adoption would be facilitated if the system features and capabilities met with the users' needs (Davis, 1985; Chuttur, 2009).

One limit of this research is that it was a volunteer-based survey. In the comment fields there were few benefits of eTexts listed, but there were many challenges, frustrations and complaints listed. Those who responded may have done so because they were feeling frustrated by the challenges the eText was providing. Those who did not respond may not have because they did not see anything to report on and were more satisfied with eTexts. Due to it being a volunteer-based census sampling method the results cannot be applied to the greater population and may be skewed toward the frustrated population of users.

Finally, in answer to study question 2, and as a consequence of the study results, the following recommendations are made for others beginning eText implementation on their campus, divided into four main categories: 1) faculty perceptions, 2) factors for successful use, 3) efficient workflow, and 4) faculty support. First, faculty perceptions will negatively or positively affect successful implementation of any project. Faculty are busy, and care about student learning as a top priority. If they perceive a value to student learning from a new innovation, thenthey are more likely to support project implementation successfully. If they do not see the value, or find the new tool or innovation more difficult to use than its value merits (in their view), implementation will stagnate. First and foremost is to get bottom-up faculty support as the project is then more likely to integrate more successfully. Next, 2) factors for successful use should be analyzed. In this case, the institution as a whole chose to not conduct pilots of the technology prior to full implementation. Therefore, testing of the new technology fell to all the faculty, some of which were already busy with full teaching loads. It is recommended to first have pilots in advance of full implementation. This will allow the opportunity for a select few innovative faculty to test the new technology, and make recommendations about faculty needs. Next, 3) efficient workflows are required for smooth implementation. Faculty reported in the survey comments that they got access to eTexts after the term had already started, or lost access half-way through the term, or could not access some associated learning resources, or that connectivity caused interruptions in access during class. As so many different types of eTexts, from a variety of publishers, were implemented at once, that meant that support staff and IT services were

overloaded in learning how to deal with the glitches and issues of each. This all created backlogs in support tickets and faculty needs, leading to reported frustration. Improving support workflows would smooth implementation. Finally, 4) faculty support is paramount to the success of a new technology implementation. Training was provided to the faculty and staff on how to use the eText apps on the iPad, as well as the browser platforms. In this study, 50% (Q4; SA & A) of the surveyed faculty said they agreed that they had sufficient training. However, due to delays in access to the eTexts, and reported frustration with lack of technical support with issues and glitches, it is recommended to increase the training of the support staff and faculty not on how to use the eTexts but on how to troubleshoot the technical issues that can arise.

In summary, of the faculty surveyed, only 30% (Q6; SA & A) reported that eTexts were an improvement over pTexts, and felt that usability and interactivity should be improved, technical support should be expanded, offline access added, and that there should be earlier access to the eTexts prior to a new term. Adding in these usability features would help relieve some of the barriers to use, and this result is supported by other research in the field. More technical support would have helped address the reported challenges effectively. Future directions in research could include surveying the students for their perceptions. Ultimately, they have to study and learn from the course texts, and their perceptions on what format they prefer is important.

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