

Is acceptance of e-textbooks discipline-dependent? Comparing business and non-business student perceptions

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ABSTRACT

Researchers have looked extensively into the adoption and satisfaction level of academic electronic textbooks (e-textbooks) by students. The majority of research to date has indicated that either students prefer print textbooks to e-textbooks or the results are inconclusive. In this study a survey consisting of questions related to the use of an e-textbook was administered to a group of business majors and non-business undergraduate college students at a regionally accredited Mid-South university with a total of 313 valid responses. All students had used e-textbooks in one or more of their courses. The results of this study indicate that students who are not business majors (non-business students) are more satisfied with an e-textbook than business majors. Non-business students who use one of the e-textbook's electronic features are also more satisfied with the ease of use of the e-textbook. In addition, non-business students are more likely to use an e-textbook again in the future compared to a business major. Although there is no significant difference between the two groups for the price they are willing to pay for an e-textbook, non-business students on average are willing to pay a higher price for a printed textbook.

Keywords: e-textbooks, business majors, student satisfaction

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INTRODUCTION

A growing trend across schools at all levels and of all sizes is the adoption of academic electronic textbooks (e-textbooks). School administrators tout the cost savings to cash-strapped students and parents, while educators look at these as finally a means by which students will be motivated to read required material. However, the primary population of e-textbook users—namely students—have not always demonstrated the same excitement about e-textbooks. In several studies students have indicated a preference for the printed page over the electronic screen for their academic reading source.

This study compares how different populations of students use and perceive e-textbooks. Can the acceptance or rejection of e-textbooks be attributed to different groups? Is there one population of students who find e-textbooks more beneficial and desirable? Are those who use the unique features of an e-textbook more likely to be satisfied with it? This study examines the differences between business majors and non-business students at a regionally accredited Mid-South university.

LITERATURE REVIEW

The popularity of consumer-based electronic books (e-books) that are read on e-readers such as the Kindle and Nook continues to increase. Over 21 percent of Americans read an e-book in 2011-2012, and sales of e-books in 2012 increased 188 percent over the previous year (Bradley, 2012). E-books offer many significant advantages to readers. Multiple e-books can be stored on a single electronic device, both saving shelf space and allowing users to conveniently travel with reading material. In addition, users can quickly download books from virtually any location. Also, e-books offer enhanced features unavailable in printed books, such as the ability to conduct fast electronic searches on the text or resume reading on a different device than what was used initially. Most e-books are less expensive than paper books: the cost of a printed book ranges from \$3.24 to \$28.57 on average, while the initial cost of an e-book ranges from \$0.25 to \$4.80 on average (Bunkell & Dyas-Correia, 2009).

In addition, there are situations where e-books are more environmentally friendly than printed books. Moberg et al. (2011) noted that an e-book is better in terms of “resources used, global warming, energy, eutrophication, human toxicity, marine aquatic ecotoxicity and terrestrial ecotoxicity” while paper books were better in terms of “acidification, ozone depletion, freshwater aquatic ecotoxicity and photochemical ozone creation” (p. 242).

As well as providing advantages to readers, advantages to publishers are also postulated. It is assumed that e-books will provide publishers with a means of addressing the used book market. The “first sale doctrine” is one of the specific statutory restrictions of the U.S. Congress for providing owners of copyrighted material—who have legitimately purchased such material—the right to sell it to others. In this case a person who purchases a copy of a printed book can then sell that book as a used book to another person without involving the publisher, thus denying the publisher any additional revenue. E-books can be electronically restricted through Digital Rights Management (DRM) to prevent them from being passed to another user or to cause them to expire after a certain date, thus providing the publisher an opportunity to contend with the used book market.

Conventional wisdom would suggest that in the same way consumer e-books are increasing in popularity that academic electronic textbooks (e-textbooks) will likewise be

warmly embraced by today's students. The rapid acceptance of new electronic technologies by the "Net Generation" of students, who have been continually exposed since birth to media such as video clips that have been the foundation of their learning experiences (Nicholas, Preferred learning methods of the millennial generation, 2008), would seem to indicate that e-textbooks would be preferred over printed textbooks. In other words, students grew up with the Internet so e-textbooks should be preferred.

Another factor that is often promulgated regarding the acceptance of e-textbooks by students is their lower costs over printed textbooks. Prices of printed textbooks have continued to increase. Whereas college textbook publishers were the single source of these materials for many years, that is no longer the case. Online sites such as Half.com and Halfpricebooks.com offer students the opportunity to conveniently purchase or resell used printed textbooks, while other sites such as Chegg.com offer printed textbooks on a rental basis. Organizations such as Textbookfree.org and FlatWorldKnowledge.com are enticing students to use their e-textbook products for free while only charging for study aids and printed versions.

Bills have even been introduced in the U.S. Senate and House of Representatives that would make e-textbooks free to the general public and provide grants to faculty who publish open access textbooks. Faculty at the University of Wisconsin Oshkosh are writing and editing e-textbooks that will be offered at a reduced cost for students as part of a two-year program funded by a grant from the U.S. Department of Education's Fund for the Improvement of Postsecondary Education (FIPSE). California State University is also campaigning for affordable solutions through pilot testing of e-textbooks that aim to enhance student learning, reduce the cost of texts and support the university's sustainable practices.

It is assumed that technology-savvy college students will embrace e-textbooks as a more convenient means of accessing course materials. In addition, textbook publishers who create and distribute e-textbooks will be able to reduce their costs and better compete with free textbooks and textbook rental sites, address concerns regarding book prices, and ameliorate the used textbook market.

However, despite all these reasons for adopting e-textbooks, the acceptance of e-textbooks by students and faculty has so far been limited (Nicholas & Lewis, 2007). A study from the National Association of College Stores indicated that a significant difference in the sales of e-textbooks compared to printed textbooks still exists. This study found that only 2-3 percent of course material sales at member stores were accounted for by e-textbooks in 2009 (National Association of College Stores, 2010), while other studies place the penetration of e-textbooks at approximately 9 percent of total textbook purchases (Abutaleb, 2012). The textbook rental organization Chegg.com has elected not to enter the e-textbook market because, according to their predictions, that market will remain small for the near future (Levi, 2012)

Researchers have looked extensively into the adoption of e-textbooks by students and faculty and their satisfaction with e-textbooks. Although the results of research on student interest for e-textbooks conducted by Shrimplin et al., (2011), Kang et al., (2009), and Lam et al. (2009) seemed to be inconclusive, studies by Gregory (2008), Wilson et al., (2003), Carlock and Perry (2008) and others indicated that students prefer print textbooks to e-textbooks. Brown (2011) said that multiple studies have revealed that, broadly-speaking, students do not want e-textbooks. Although Lewis (2008) stated that student preference for e-textbooks depends upon age, gender, and several different demographics, Woody et al. (2010) said their research demonstrated that regardless of their gender, computer use or comfort with computers, students still do not prefer e-textbooks to printed textbooks. Even participants who had previously used an

e-textbook still preferred printed textbooks for learning. Additionally, despite the ability to easily access supplemental content through e-textbooks by hyperlinks and other electronic features, students were more likely to use the special features contained in printed textbooks than in e-textbooks. Altonen et al. (2011) attributed the observed resistance to technical difficulties brought on by the incompatibilities between different e-textbook formats and the limitations with sharing, lending, and even selling e-textbooks. Yet student resistance to e-textbooks is not an indication of their dislike for any electronic media; Foasberg (2011) and Mallett (2010) found that students are receptive to the use of e-readers but only for leisure reading.

There are several examples of studies regarding student resistance to e-textbooks. One of the largest studies to date was conducted between 2007 and 2010 by the Joint Information Systems Committee (JISC) Survey National E-Books Observatory Project, which licensed a collection of 36 textbooks in four subject areas (business, media, engineering, and medicine). These e-textbooks were made freely available for a two-year period to 127 universities in the United Kingdom. Data from the study indicated that 85 percent of users were spending less than one minute per page. It also indicated that e-textbooks were used in a non-linear fashion by only searching for a specific word or phrase, leading the researchers to conclude that “if a user wants to read in a constant, frequent or linear way they will still buy or borrow the printed book” (Estelle, Rowlands, & Woodward, 2009, p. 391).

A 2011 study of the Health Sciences Library System at the University of Pittsburgh revealed that users in information-intensive roles—clinical, research, or study—were the heaviest users of both print books and e-textbooks. Most e-textbooks were being used like reference books, regardless of their official designation as a textbook. Respondents stated a preference for print textbooks but preferred digital format for research protocols, pharmaceutical, and reference texts. Interestingly, over half the respondents indicated a paradox regarding e-textbooks, namely that the ability to print sections of the e-textbooks was extremely important to them. Bookmarking, highlighting, and annotation were all given lower importance ratings by the users (Folb, Wessel, & Czechowski, 2011).

Beginning with the first-year class of 2005-06, students at the Louisiana State University School of Dentistry (LSUSD) participated in a digital textbook program in which each entering class of dental students was required to purchase e-textbooks instead of printed textbooks. In a study of four classes of students conducted in 2010, Strother et al. found an “overwhelming criticism” to e-textbooks as students clearly indicated a preference for printed textbooks (Strother, Brunet, Bates, & Gallo, 2009, p. 1363). The researchers found that LSUSD students mainly used the e-textbooks to search for specific words or concepts but few students relied on their digital library to prepare for class or study for quizzes and tests. Students disliked reading large portions of text or reading for extended periods of time online. Although highlighting and newer note-sharing features have been highly touted, only 7.3 percent of students indicated that these tools were attractive enough to override their reservations about reading e-textbooks online. Finally, many LSUSD students wanted to buy books required by instructors in order to own a collection of printed dental textbooks to display on their office bookshelves. (Strother, Brunet, Bates, & Gallo, 2009).

A study at the University of Denver reported that about half of the campus used e-textbooks and liked the convenience of the searching capability and access to the materials from off-campus. However, they also indicated they were used only occasionally and then only to read small portions of the text. Over 60 percent of the respondents reported preferring print to e-textbooks (Levine-Clark, 2006). Sheppard et al. (2008) noted in their study that only one-third

of students who used an e-textbook indicated that they would purchase one again. A similar study revealed that over half of the students polled (53 percent) would not consider buying e-textbooks if they were available or were unsure (National Association of College Stores, 2010).

There are several problems noted for students using e-textbooks. First, it requires the student to own either a computer or e-book reader. Shepperd, Grace, & Koch (2008) note that, “Unless students have laptops, electronic texts also can be inconvenient for students accustomed to bringing their textbook to class or reading from it during breaks between classes” (p. 2). Other problems include eyestrain from computer monitors or e-readers, lack of portability due to battery limitations, and a general reluctance to read or study digital text. In many cases it can be difficult and expensive to print sections of text from e-textbooks. Also, the use of e-textbooks is heavily regulated and access usually expires after a set time period. This means that students who purchase e-textbooks—even at a reduced cost—do not have the ability to resell that electronic book, nor can they retain it for future reference.

Hernon et al. concluded from their study that most students use e-textbooks for reading smaller segments of material or skimming portions of material. If they find content they deem useful they will print out those pages. For intensive reading, they prefer printed textbooks (Hernon, Hopper, Leach, Saunders, & Zhang, 2007).

Faculty members likewise have shown a resistance to using e-textbooks. One study showed only limited usage (13.3 percent) of e-textbooks by faculty and very little interest in implementing the technology in the near future. In fact, 83.3 percent of the faculty respondents had no plans to use an e-textbook in the next year (Nicholas & Lewis, Faculty and Staff - Articles and Papers, 2010). Another reason for the slow adoption of e-textbooks by faculty is the fear of technical problems. Instructors worry that when students encounter a variety of technical problems regarding e-textbooks, not only will it affect the student’s ability to study or do homework (Carlock & Perry, 2008) but it will also turn faculty into “tech support” personnel, a role that few faculty relish.

Leo (2005), McFall (2005), and others note that faculty members want e-textbooks to be flexible enough to allow for customization to the course and personalization in order for the students to be successful. However, the lack of ability to integrate customized content, as well as lack of reliable access for students to electronic content, is a major issue in usage (Carlock & Perry, 2008). While many faculty members are adopting supplementary electronic materials such as textbook Web sites that provide online quizzes, slides and other networked materials, few have embraced e-textbooks.

In addition, the promised savings of e-textbooks has failed to broadly materialize. Although earlier studies suggested that the price of e-textbooks would be 20 percent to 50 percent lower than printed textbooks (Buczynski, 2006), that prediction has not proven to be accurate. Murray and Perez (2011) noted that the National Association of College Stores (NACS) tracks the breakdown of printed textbook costs and attributes 22.4 percent of total printed textbook costs to the bookstore, of which 18 percent is for personnel costs and store operations and 4.4 percent is income. Whereas students who purchase e-textbooks out of their own pocket can use online sites to avoid these bookstore markups, students who are on financial aid often are required to purchase all textbooks—both electronic as well as print—from the bookstore, where these costs are still passed on to the students.

For college textbook publishers the costs that go into the production of any book—editorial efforts, artwork, quality assurance, author royalties, etc.—are called “plate development costs” and remain constant for both printed as well as e-textbooks. Unit manufacturing costs,

which include paper, printing, and binding, are a very small percentage of the total costs, so dramatic savings are not achieved through the development of e-textbooks.

In fact, in many instances the costs associated with creating an e-textbook are higher while the revenue is lower. Creating a full-featured e-textbook is not the same as printing a PDF file: rather, the technology infrastructure needed to support a variety of e-readers and platforms can result in millions of dollars, costs that textbook publishers must still recoup. And, whereas for printed textbooks limited licensing rights for third-party material can be obtained for a book that will only be distributed domestically, that may not be the case with e-textbooks. Because the distribution of e-textbooks may not always be limited to one area this means that higher worldwide licensing costs may be incurred. In general an e-textbook only generates one-third of the revenue compared to the same printed textbook. This elusive savings of e-textbooks has impacted the secondary market. The organization FlatWorldKnowledge on January 1, 2013 announced that they would no longer offer e-textbook content free of charge.

METHODOLOGY

Research Question

Although prior research has explored student satisfaction with e-textbooks, to date very limited research has been conducted comparing how different populations of students perceive e-textbooks. Can the acceptance or rejection of e-textbooks be attributed to different groups? Is there one group of students who find e-textbooks more beneficial and desirable than others? This study examines the differences between business majors and those students not pursuing a business degree (non-business students) at a regionally accredited Mid-South university. The research question for this study asks if there a difference in how business majors and non-business students perceive an e-textbook used in a course.

This study used the following research hypotheses:

H₀1 – There is no difference in the satisfaction level of business majors and non-business students using an e-textbook.

H₁1 – There is a difference in the satisfaction level of business majors and non-business students using an e-textbook.

H₀2 – There is no difference in the perceived level of usefulness of an e-textbook between business majors and non-business students.

H₁2 – There is a difference in the perceived level of usefulness of an e-textbook between business majors and non-business students.

H₀3 – There is no difference in the perceived ease of use of an e-textbook between business majors and non-business students.

H₁3 – There is a difference in the perceived ease of use of an e-textbook between business majors and non-business students.

H₀4 – There is no difference in the likelihood to reuse an e-textbook between business majors and non-business students.

H₁4 – There is a difference in the likelihood to reuse an e-textbook between business majors and non-business students.

Data Collection

A survey consisting of questions related to the use of and satisfaction with an e-textbook was administered to a group consisting of undergraduate business majors and non-business students at a regionally accredited Mid-South university. All students surveyed used e-textbooks in one or more of their courses. Included in the survey were 27 questions on basic demographics, the usage of the e-textbook, and satisfaction with the use of the e-textbook. A total of 313 valid responses were received. Responses from incomplete surveys were rejected.

Analysis and Results

An ANOVA test was generated on the business majors and non-business students to identify demographic differences in the responses between the two groups as indicated in Table 1 (Appendix). There is a significant difference in the age, the year of high school graduation, and the number of hours worked in a week between the two groups. Non-business students are older, graduated high school earlier, and work more hours during the week when compared to the business majors. Based on this data it may be surmised that a non-business student in this sample can be categorized as a nontraditional student while the business major in this sample can be placed in the category of a traditional student. One interesting observation was that the non-business student on average is willing to pay a higher price for a printed textbook, but there is no significant difference between the two groups for the price they are willing to pay for an e-textbook.

To determine support for Hypotheses 1, 2 and 3 the results of the ANOVA were examined. In addition, a regression was generated to determine if the use of a feature or age played a role in general satisfaction, ease of use, and usefulness of the e-textbook. The use of a feature in the e-textbook was used in the regression because it exposes the student to more aspects of the e-textbook, which should influence the student's view of each of the variables being examined. The age of a student was used in the regression because age may impact a student's view of technology and the change that comes from the technology. Younger students are exposed to technology from a very young age and tend to be more comfortable dealing with the changes new technology brings, whereas older students tend to be more resistive to changes brought on by newer technology, making them more uncomfortable with new technology.

When examining the results between business majors as indicated in Table 2 (Appendix) and non-business students as indicated in Table 3 (Appendix) there is a significant difference in general satisfaction with the e-textbook (H_01). Because the scale for the measures of satisfaction ranged from very satisfied to very dissatisfied, greater satisfaction is indicated by a smaller mean in an ANOVA and by a negative coefficient in a regression. Thus, a non-business student is more satisfied with an e-textbook than a business major. Examining the results of the regression shows that for non-business students both feature and age are significant. This indicates that if a feature was used by a student, the student was more satisfied with the e-textbook. For age, the older the student is the more satisfied the student is with the e-textbook. Neither variable was shown to be significant for a business major.

The result of the ANOVA examining e-textbook ease of use between business majors as indicated in Table 4 (Appendix) and non-business students as indicated in Table 5 (Appendix) indicates that there is a significant difference: non-business students were more satisfied with the ease of use of the e-textbook. The test did not provide support for H_02 . The results for the

regression for each group showed only the use of features to be significant only for non-business students. This indicates that non-business students were more satisfied with the ease of use of the e-textbook if they used at least one of the features.

H₀₃ was not supported by the results of the ANOVA test regarding a difference in how satisfied the students were with the usefulness of the e-textbooks. Once again, when compared to business majors as indicated in Table 6 (Appendix), the non-business students were found to be more satisfied with the usefulness of the e-textbooks as indicated in Table 7 (Appendix). Additionally, the regression showed that for non-business students, both feature and age played a role in how useful the student found the e-textbook. Similar to H₀₂, the non-business student is more likely to find the e-textbook useful if the student used at least one feature. And the older the non-business student is, the more likely the student is to find the e-textbook useful.

The ANOVA test did not support H₀₄: there is a significant difference between the two groups as to whether or not they would use an e-textbook again in the future. When compared to business majors as indicated in Table 8 (Appendix) the non-business students as indicated in Table 9 (Appendix) were more likely to use an e-textbook again. Another regression was generated to examine satisfaction, usefulness, ease of use, and the two e-textbook access methods as they impacted the two groups' likelihood to use an e-textbook again in the future. The results of the regression showed that the only factor significant for both groups was satisfaction. Prior use was insignificant in terms of influencing a student to use an e-textbook again. In either group, the more satisfied the student was with the e-textbook, the more likely they are to use an e-textbook again in the future.

CONCLUSIONS

The results of this study indicate that non-business students are more satisfied with an e-textbook than business majors. For non-business students, both e-textbook features and student age are significant, indicating that if a feature is used by a student then the student is more satisfied with the e-textbook and that satisfaction seems to increase with student age. Also, non-business students are more satisfied with the ease of use of the e-textbook if they have used at least one of its features. Non-business students were found to be more satisfied with the usefulness of the e-textbooks when compared to business majors. And non-business students were more likely to use an e-textbook again in the future than a business major. Although there is no significant difference between the two groups for the price they are willing to pay for an e-textbook, the non-business student on average is willing to pay a higher price for a printed textbook.

This study seems to be consistent with the prior research that shows that students do not prefer e-textbooks over printed textbooks. It appears that students think of an e-textbook more as a reference manual than a textbook: they will use the special functions (search, print, etc.), but they do not like extensive reading from an e-textbook. There seems to also be support in this study for the research that suggests that certain student types like the idea of building a library of books from their collegiate studies: in this study business majors may be more likely to build a library for their first job than the non-business students.

It was shown in this study that a student who is more satisfied with e-textbooks is more likely to reuse an e-textbook, and using the features that an e-textbook provides seems to lead to greater satisfaction. Thus, this would indicate that both educators and e-textbook publishers should expose students to the special features incorporated as part of an e-textbook. This can be

done through a demonstration of the e-textbook features to the students and through an educator using the e-textbook as a tool during class. This exposure and use of the e-textbook should also help promote reuse by students.

For future research, because there was a significant difference between the business majors and non-business students for a number of variables, further investigation is encouraged to determine if this is occurring due to the type of material being taught in the different areas. A second area for future research is to determine if specific e-textbook features and/or the richness of the features play a role in a student's overall satisfaction with e-textbooks.

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Appendix

Table 1: Significance results from ANOVA test

Variable	Significance	Mean Non Business	Mean Business
Year Born	.000	1982.75	1991.58
Year Graduated	.000	2001	2009.93
Hours worked	.000	25.9	11.38
Max Pay for Hard Copy	.048	42.14	39.64
E-Text reuse	.038	2.99	3.22
Usage Per week	.000	95.02	83.73
General Satisfaction	.027	2.90	3.37
Usefulness	.048	2.89	3.30
GPA	.471	3.095	3.142
Max Pay for E-Text	.503	42.14	39.64
Ease of Use	.124	3.12	3.46
Access via Blackboard	.126	2.54	2.81
Access Via mobile device	.454	3.48	3.63

Table 2: Results of regression on general satisfaction by business majors

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	162.855	134.102		1.214	.228
	Feature	-.591	.360	-.166	-1.639	.105
	Q2_1Born	-.080	.067	-.120	-1.187	.238

Table 3: Results of regression on general satisfaction by non-business students

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	63.083	20.723		3.044	.003
	Feature	-1.386	.257	-.348	-5.395	.000
	Q2_1Born	-.030	.010	-.184	-2.856	.005

Table 4: Results of regression on ease of use by business majors

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	197.579	153.941		1.283	.202
	Feature	-.423	.414	-.104	-1.023	.309
	Q2_1Born	-.097	.077	-.128	-1.259	.211

Table 5: Results of regression on ease of use by non-business students

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	18.628	21.754		.856	.393
	Feature	-1.205	.270	-.299	-4.465	.000
	Q2_1Born	-.007	.011	-.045	-.672	.502

Table 6: Results of regression on usefulness by business majors

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	193.402	130.433		1.483	.141
	Feature	-.516	.351	-.149	-1.473	.144
	Q2_1Born	-.095	.065	-.147	-1.455	.149

Table 7: Results of regression on usefulness by non-business students

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	47.199	20.192		2.337	.020
	Feature	-1.540	.251	-.392	-6.142	.000
	Q2_1Born	-.022	.010	-.137	-2.140	.034

Table 8: ANOVA results on reuse by business majors

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.631	.256		18.062	.000
	Q17_1GeneralSatisfaction	-.292	.110	-.409	-2.665	.009
	Q17_2Usefulness	-.147	.126	-.200	-1.169	.245
	Q17_3EaseOfUse	-.110	.089	-.177	-1.230	.222
	Q17_4AccessBlackboard	.111	.099	.141	1.116	.267
	Q17_5AccessMobileDevice	-.026	.073	-.036	-.350	.728

Table 9: ANOVA results on reuse by non-business students

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.626	.204		22.710	.000
Q17_1GeneralSatisfaction	-.255	.100	-.324	-2.535	.012
Q17_2Usefulness	-.188	.108	-.237	-1.740	.083
Q17_3EaseOfUse	-.081	.085	-.105	-.963	.337
Q17_4AccessBlackboard	-.004	.080	-.004	-.048	.962
Q17_5AccessMobileDevice	.063	.068	.071	.914	.362

