The Antecedents of Students' Expectation Confirmation Regarding Electronic Textbooks

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Abstract: Continuance intention is the attitude of an individual who has performed an act, adopted a behavior or used a technology in the past to once again perform the act, adopt the behavior or use the technology. In studies of continuance intentions a key variable is expectation confirmation. Expectation confirmation is the degree to which an individual's attitudes or experiences pre adoption or use match those after adoption or use. Expectation confirmation has routinely been found to be meaningful in explaining continuance intentions. Yet, little is understood about the variables influencing expectation confirmation. The question addressed in this research examines the variables influencing expectation confirmation in the specific environment of students attitudes toward electronic textbooks. A theoretical model grounded in social cognitive theory is developed and estimated using a structural equations approach. The data were provided by a questionnaire distributed to students of a medium-size university in the western United States. All the included respondents had used an electronic textbook in the past. The results showed that electronic textbooks' perceived usefulness and self-efficacy directly influence expectation confirmation in meaningful ways. Furthermore, self-efficacy was found to indirectly influence expectation confirmation through perceived usefulness. The standardized paths from the antecedents of ease of use, arousal, and access speed significantly influence self-efficacy. Similarly, the standardized path coefficients for the antecedents of social norm and arousal had meaningful influences on perceived usefulness.

Keywords: Expectation Confirmation; Expectation Confirmation Model; Continuance Intentions; Social Cognitive Theory

1. Introduction

A textbook creates an instructional device for learning in a university environment [5]. Instructors selectan appropriate textbook based on how well the content meets the course objectives, the accuracy and currency of the material, and the cost for a student [20]. The Government Accounting Office [12] found the cost of college textbooks has been rising 6% per year, close to the rise in post-secondary tuition at 7% per year. As the cost of textbooks rise, students carefully weigh the purchasing decision. Costs, coupled with the expansion of electronic reading devices such as the iPad and the Kindle have provided an opportunity for textbook publishers to offer a broad range of electronically formatted materials such as electronic textbooks (e-textbooks) for students. E-textbooks are less expensive than the paper-based version and provide supplemental information not available in a paper-based version such as video and audio files [25, 32].

There has been research examining the factors influencing initial e-textbook adoption compared to print textbooks [10, 29]. What has not received much attention is the factors which influences a student to continue using an e-textbook once adoption has occurred. Continuance intention is the attitude of an individual who has performed an act, adopted a behavior or used a technology in the past to once again perform the act, adopt the behavior or use the technology. The foundation for this is that if the act, behavior, or technology is perceived by an individual as useful, it is more likely that the individual will once again act, use, or adopt it in the future [17]. The expectation confirmation model (ECM), which includes the construct of expectation confirmation, is a theoretical model used to explain and understand the differences between initial and continued acceptance, use, or adoption [6, 7, 14, and 21].

The ECM has been applied to a variety of contexts, including information systems and e-learning. Halilovic and Cicic [14] extended the ECM to examine the antecedents of information systems user behaviours. Lee [21] also extended the ECM, but to study students and e-learning. Similarly, Lee and Kwon [22]use the ECM to examine web-based services. As a final example, Stone and Baker-Eveleth [31] used the ECM to study students' continuance intentions regarding electronic textbooks.

In the application of the ECM, a key variable or construct is expectation confirmation. Expectation confirmation is the degree to which an individual's attitudes or experiences pre adoption or use match those after adoption or use. In other words, it captures the consistency of attitudes or experiences pre and post adoption or use. While expectation confirmation is an important variable in ECM and has been routinely found to be meaningful regarding continuance intentions, little is understood about the variables influencing expectation confirmation. The research question addressed here examines the variables influencing the development of expectation confirmation in the specific technology environment of students attitudes toward e-textbooks. Such an understanding will add to our knowledge of the ECM and the process underlying continuance intections.

2. Theory

There is a difference between initial acceptance of technology as in the Technology Acceptance Model [35, 36] and a user's attitude to continue using the technology [6, 7]. Understanding the use of technology beyond initial adoption provides potential for the technology to further provide the intended outcomes of performance. Extending the Bhattacherjee and Premkumar[7] findings beyond the original information technology usage, related research on continuance of online learning, online communities, and mobile services have been investigated [9, 21, and 37].

As defined earlier, expectation confirmation is an attitude regarding the experiences of use or adoption of a specific behavior or technology. As an individual's attitude, expectation confirmation may be explained and predicted using social cognitive theory [1, 2]. Social

cognitive theory explains a variety of behavioral and affective outcomes by tying an individual's cognitive state to outcomes [30]. Measures of self-efficacy and outcome expectancy or perceived usefulness have been shown to influence and help predict individual behavior [34]. In relation to expectation confirmation in a technology environment, if a technology is seen as useful, an individual is more likely to initially adopt it as well as adopt it again in the future [17].

There are a significant number of technology contexts in which social cognitive theory has been applied [3, 4, 15, 16, 23, 24, and 27]. Bandura [3]defined two separate influences, one affective and one behavioral, self-efficacy and outcome expectancy or perceived usefulness. Self-efficacy is the belief that an individual possesses the skills and abilities to successfully accomplish a specific task. Outcome expectancy or perceived usefulness is the belief that a desired outcome is attained by accomplishing a task. Self-efficacy and outcome expectancy or perceived usefulness each have their own influence on behavior and effect, however, self-efficacy typically has the larger influence[3]. Furthermore, self-efficacy has a direct influence on outcome expectancy or perceived usefulness[33].

In the technology context of e-learning environments, research has found satisfaction interacting online as a significant predictor of intention to continue learning online [21]. With a dropout rate as high as 75%users interacting in an e-learning environment need to see a connection between perceived performance and satisfaction with the system or the underlying technology[9]. This was particularly important in a patient medical care education learning environment where ease of use of the system impacted continuance [8]. Satisfaction is closely linked to how easy a technology is to use and the perception of usefulness. If the technology is useful and easy it affects a user's desire to continue using the technology [37].

In order to examine the earlier proposed research question, we apply social cognitive theory to students' use of e-textbooks. The ultimate objective is to explain the determinants of expectation confirmation of students who have used an e-textbook. Social cognitive theory proposes four groups of antecedents which directly influence self-efficacy and outcome expectancy or perceived usefulness and indirectly attitudes and intentions. These antecedent groupings are personal mastery, vicarious experience, emotional or physiological arousal, and verbal persuasion or social norms. However, in the relatively solitary online learning environment of e-textbooks, the vicarious experience was difficult to consistently conceptualize, capture and measure. As a result, we propose that the remaining three antecedents influence the students' attitudes of expectation confirmation through self-efficacy and outcome expectancy or perceived usefulness. These antecedents, interrelationships, and corresponding hypotheses are presented in Figure 1.
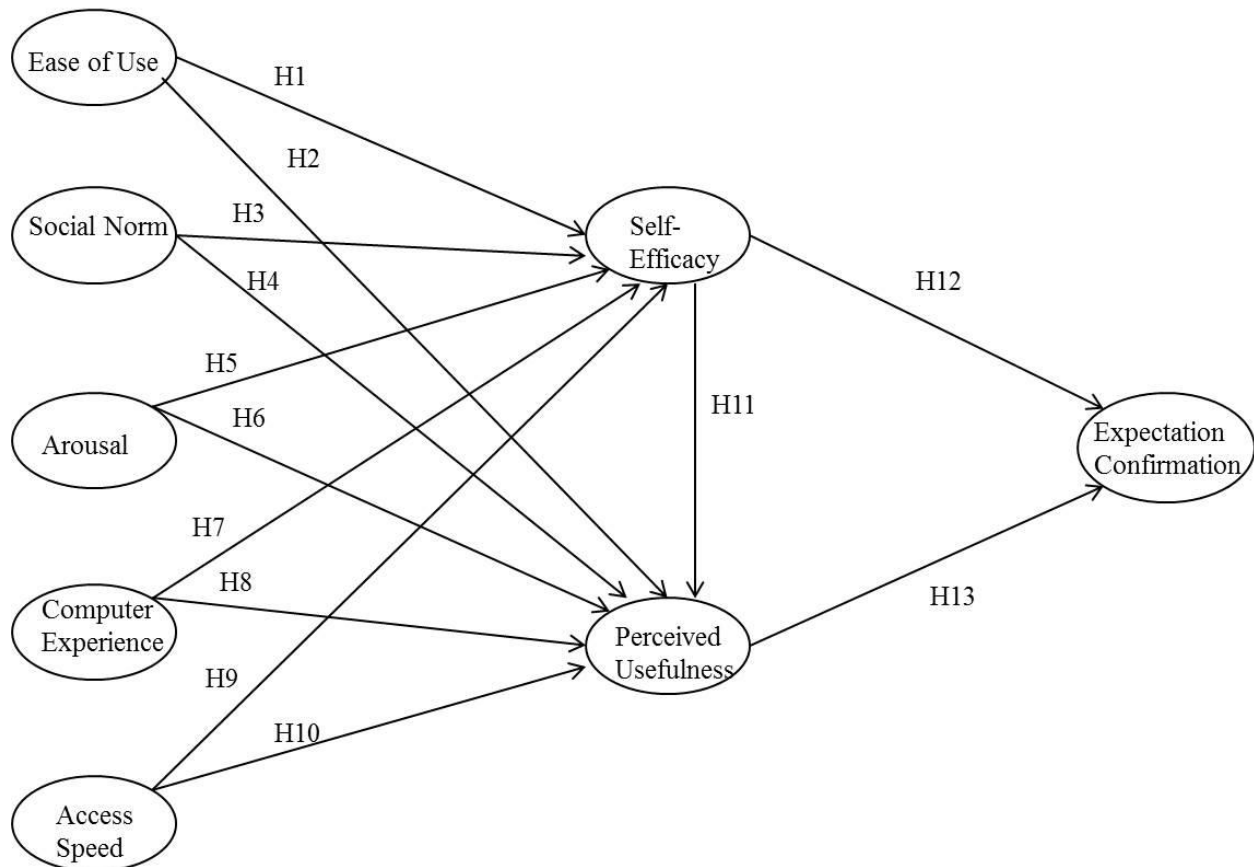
Figure 1 The Model and Hypotheses

Figure 1 The model and hypotheses

Three of the antecedent measures are from the theoretical construct of emotional or physiological arousal. The specific antecedents relate to e-textbooks in terms of ease of use, access speed, and inherent arousal of students' interests when they use an e-textbook. The e-textbook's characteristic regarding ease of use positively influences the students' self-efficacy and perceived usefulness. Similarly, the characteristic of the e-textbook's access speed positively influences the students' self-efficacy and perceived usefulness. The final arousal variable uses the same label of arousal referring to how meaningful and stimulating students find the use of an e-textbook. The relationships between these antecedents and self-efficacy and perceived usefulness are expressed below as hypotheses and on the model shown in Figure 1.

Hypothesis 1 (H1): Students' perceived electronic textbook's ease of use has a significant, positive influence on their self-efficacy regarding the e-textbook.

Hypothesis 2 (H2): Students' perceived electronic textbook's ease of use has a significant, positive influence on their perceived usefulness of the e-textbook.

Hypothesis 5 (H5): Students' arousal regarding an electronic textbook has a significant, positive influence on their self-efficacy regarding the e-textbook.

Hypothesis 6 (H6): Students' arousal regarding an electronic textbook has a significant, positive influence on their perceived usefulness of the e-textbook.

Hypothesis 9 (H9): The access speed of an electronic textbook has a significant, positive influence on the student's self-efficacy regarding the e-textbook.

Hypothesis 10 (H10): The access speed of an electronic textbook has a significant, positive influence on the student's perceived usefulness of the e-textbook.

Another category of antecedent in social cognitive theory is social norm. In this context, social norms relate to the attitudes toward e-textbooks of others important to the student. Examples of these important other individuals include friends, classmates, and professors. The related hypotheses are stated below and shown on Figure 1.

Hypothesis 3 (H3): Students' level of perceived social norm regarding electronic textbooks has a significant, positive influence on their self-efficacy regarding the e-textbook.

Hypothesis 4 (H4): Students' level of perceived social norm regarding electronic textbooks has a significant, positive influence on their perceived usefulness of the e-textbook.

The final category of antecedents included in the study comes from the category of personal mastery in the form of computer experience. The underlying concept for including this antecedent is that the level of a students' prior computer experience will influence their perceptions of personal mastery in the use of an e-textbook. The related hypotheses are listed below and shown on Figure 1.

Hypothesis 7 (H7): Students' level of computer experience has a significant, positive influence on their self-efficacy regarding e-textbooks.

Hypothesis 8 (H8): Students' level of computer experience has a significant, positive influence on their perceived usefulness of e-textbooks.

The remaining relationships and hypotheses are among self-efficacy, perceived usefulness and the attitude of expectation confirmation. Students' self-efficacy regarding e-textbooks is predicted to positively influence students' perceived usefulness of e-textbooks. Students' e-textbook self-efficacy and perceived usefulness positively influence their attitudes captured as expectation confirmation regarding e-textbook use. These hypotheses are stated below and shown on Figure 1.

Hypothesis 11 (H11): Students' e-textbook self-efficacy has a significant, positive influence on their perceived usefulness of e-textbooks.

Hypothesis 12 (H12): Students' e-textbook self-efficacy has a significant, positive influence on their expectation confirmation of e-textbooks.

Hypothesis 13 (H13): Students' e-textbook perceived usefulness has a significant, positive influence on their expectation confirmation of e-textbooks.

3. Materials and Method

3.1 Sample

The data were collected using a web-based questionnaire distributed to students enrolled in a medium-sized university in the western United States. An email invitation to participate was sent to these students which included a link to access the questionnaire. The invitation was distributed using a student listserv containing 11,456 student email addresses. Responses numbering 1434 were received producing a 12.52% response rate. The respondents were divided into e-textbook users and non-users based on

responses to the question "Please indicate if you have ever purchased or used an electronic textbook (for academic purposes)." A total of 862 individuals or 60% of the respondents reported prior e-textbook use. Among these questionnaires there were 162 returned that had missing responses to items needed for the study. These responses were deleted from the sample. As a result, the sample contained 700 questionnaire responses.

The demographics of the respondents are shown in Table 1. Almost 23% of the respondents work fulltime while in school, over 48% work part-time, and over 27% work less than part-time. Nearly 74% of the respondents receive financial aid, and almost 75% receive scholarships. Just less than 47% of the respondents receive financial help from their parents or family. As for the college affiliation of the respondents, the majority were from the College of Literatures, Arts, and Social Sciences at over 28%. Over fourteen percent of the respondents were from each of the Colleges of Engineering and Education. The College of Business & Economics provided over 10% of these respondents as did the College of Agriculture and Life Sciences. These were followed by respondents from the College of Science at 8.42%, the College of Natural Resources at 6.12%, and the College of Art and Architecture at 6.99% of the sample respondents.

Additional questionnaire items regarding technology ownership and use by respondents were also asked. Just less than 36% of the respondents own a desktop computer and almost 97% own a laptop computer. Netbooks are owned by nearly ten percent of the respondents while more than 34% own a tablet computer. Over 75% of the respondents have a smart phone and more than 32% have an e-reader. The final two items examined more personal aspects of the respondents. Over fifty-four percent of the sample respondents were males. The average age of the respondents was 24.40 years with a minimum age of 18 years and a maximum age of 59 years. The respondents' self-reported grade point average (GPA) was 3.38 ranging from 1.00 to 4.00.

Table 1   The sample demographics

Please indicate the resources available to pay for your college expenses:

Working fulltime while in college

	Frequency	Percentage
Yes	140	22.58
No	480	77.42
Total	620	100.00
Missing Values	80	

Working part-time while in college

	Frequency	Percentage
Yes	297	48.29
No	318	51.71
Total	615	100.00
Missing Values	85	

Working less than part-time while in college

	Frequency	Percentage
Yes	160	27.40
No	424	72.60
Total	584	100.00
Missing Values	116	

Receiving financial aid

	Frequency	Percentage
Yes	466	73.62
No	167	26.38
Total	633	100.00
Missing Values	67	

Receiving scholarships

	Frequency	Percentage
Yes	464	74.72
No	157	25.28
Total	621	100.00
Missing Values	79	

Parental or family aid

	Frequency	Percentage
Yes	288	46.98
No	325	53.02
Total	613	100.00
Missing Values	87	

College	Frequency	Percentage	University Percentage
Agriculture and Life Sciences	87	13.26	10.35
Art and Architecture	20	3.05	6.99
Business and Economics	142	21.65	10.53
Education	90	13.72	14.61
Engineering	70	10.67	14.62

Literatures, Arts, and Social Sciences	154	23.48	28.35
Natural Resources	31	4.73	6.12
Science	62	9.45	8.42
Total	656	100.01[a]	99.99[a]
Missing Values	44		

a. Details do not sum to 100% due to rounding.

I have my own:

Desktop Computer

	Frequency	Percentage
Yes	221	35.53
No	401	64.47
Total	622	100.00
Missing Values	78	

Laptop

	Frequency	Percentage
Yes	636	96.95
No	20	3.05
Total	656	100.00
Missing Values	44	

Netbook

	Frequency	Percentage
Yes	57	9.95
No	516	90.05
Total	573	100.00
Missing Values	127	

Tablet

	Frequency	Percentage
Yes	209	34.32
No	400	65.68
Total	609	100.00
Missing Values	91	

Smart Phone

	Frequency	Percentage
Yes	484	75.39
No	158	24.61
Total	642	100.00
Missing Values	58	

e-Reader

	Frequency	Percentage
Yes	192	32.38
No	401	67.62
Total	593	100.00
Missing Values	107	

Gender

	Frequency	Percentage	University Percentage
Male	274	41.52	54.30
Female	386	58.48	45.70
Total	660	100.00	100.00
Missing Values	40		

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Grade Point Average	633	3.38	0.50	1.00	4.00
Age	478	24.40	7.54	18.00	59.00

3.2 Measures

All of the questionnaire items used to form the measures in the study were developed based on previously published scales. These scales are from the work of Stone and Baker-Eveleth (2013). Respondents were presented with a statement or questionnaire item and a scale upon which to respond. The response scale had the anchors of 1-Strongly Disagree; 2-Disagree; 3- Neither Agree or Disagree; 4-Agree; and 5-Strongly Agree. The items forming the measures and the psychometric properties of these measures are shown in Table 2.

Table 2 The questionnaire items, measures, and their psychometric properties

Questionnaire Items & Measures	Standardized Path Coefficients	Reliability Coefficient	Shared Variance Extracted
Ease of Use		0.90	74%
1. I find e-textbooks easy to use.	0.90		
2. I find it easy to do what I want using an e-textbook.	0.90		
3. It is easy to find the information I need on the e-textbook.	0.78		
Social Norm		0.87	69%
4. My friends think I should use an electronic textbook.	0.83		
5. My classmates think I should use an electronic textbook.	0.72		
6. My professors think I should use an electronic textbook.	0.93		
Arousal		0.91	84%
7. I have found using an e-textbook to be...-stimulating	0.89		
8. I have found using an e-textbook to be...-meaningful	0.94		
Computer Experience		0.88	79%
9. I have used computers throughout my academic experiences.	0.84		
10. I have used computers over a long period of time.	0.93		
Access Speed		0.82	70%
11. Consider one e-textbook from a course you have used to respond to the following questions. The e-text...-loads quickly	0.76		
12. Consider one e-textbook from a course you have used to respond to the following questions. The e-textbook displays the information at a rate that is fast enough	0.91		
Self-Efficacy		0.81	68%
13. In general, I am able to / successfully use e-textbooks.	0.80		
14. Using the e-textbook, it is simple to accomplish the task I want to accomplish.	0.85		
Perceived Usefulness		0.97	90%
Using an e-textbook helps….			
15 Me do a better job in my classes.	0.94		
16. Improve my quality of academic work.	0.95		
17. Make me more successful in class.	0.95		
18. Improve my academic performance.	0.95		
Expectation Confirmation		0.92	86%
19. My experience using an e-textbook was better than I expected.	0.94		
20. The academic usefulness of an e-textbook was better than what I expected.	0.91		

The psychometric properties of these measures were calculated using the results of a confirmatory factor analysis. The confirmatory factor analysis allowed all measures to pair-wise correlate and be reflective in their own indicants or questionnaire items. Estimation was done using PC SAS version 9.2, procedure Calis, and maximum likelihood estimation. The fit of the factor analysis model to the data was good as illustrated by several fit statistics [13, 18]. The goodness of fit index was 0.94 and this index adjusted for the degrees of freedom was 0.92. The root mean square residual and its standardized

counterpart were both 0.02. The parsimonious goodness of fit index was 0.71 and the chi-square statistic was 366.71 with 142 degrees of freedom. It was statistically significant at a 1% level. The normed chi-square statistic was 2.58. The root mean square error of approximation was 0.05 and its 90% confidence interval was 0.04 to 0.06. Bentler's comparative fit index was 0.98 and the incremental fit indexes (i.e., Bentler & Bonnet's normed and non-normed indexes and the Bollen normed and non-normed indexes) ranged from 0.96 to 0.98.

The psychometric properties of these measures, calculated from the confirmatory factor analysis results, are also displayed in Table 2. The ease of use measure was formed by three questionnaire items with standardized path coefficients ranging from 0.78 to 0.90. Its reliability coefficient and the percentage of shared variance extracted were 0.90 and 74%. The social norm measure used three items with standardized path coefficients ranging from 0.72 to 0.93 with a reliability coefficient of 0.87 and extracted variance of 69%. The arousal measure was composed of two items with standardized path coefficients of 0.89 and 0.94, a reliability coefficient of 0.91 and shared variance extracted of 84%. The computer experience measure used two items with estimated standardized path coefficients of 0.84 and 0.93. Its calculated reliability coefficient was 0.88 and it shared variance extracted was 79%. The access speed measure also used two items that had standardized path coefficients of 0.76 and 0.91 and a reliability coefficient estimated to be 0.82. Its percentage of shared variance extracted was calculated to be 70%. The measure of self-efficacy also used two questionnaire items having estimated standardized path coefficients of 0.80 and 0.85. Its calculated reliability coefficient was 0.81 with shared variance extracted of 68%. The perceived usefulness measure was composed of four questionnaire items with estimated path coefficients ranging from 0.94 to 0.95. Its reliability coefficient was 0.97 and the percentage of shared variance extracted was 90%. The final measure was expectation confirmation which was formed using two items which had estimated path coefficients of 0.94 and 0.91. Its reliability coefficient was 0.92 and its shared variance extracted was 86%.

Since all the estimated standardized path coefficients are greater than 0.70, it can be argued that item reliability is satisfied [28]. In terms of measure reliability, all the measures demonstrate adequate values of this trait since the composite reliability coefficients are 0.81 or greater [28, 26]. These results indicate that the measures satisfy convergent validity [28, 19].

Discriminant validity was also examined by comparing, for each pair of measures, their squared correlation to their individual percentage of shared variance extracted. If discriminant validity is satisfied, the items within a measure share greater common variation among themselves than between the two measures. The measures demonstrate discriminant validity if for each measure pair the measures' percentage of shared variance extracted is greater than the squared correlation between the two measures [11]. Discriminant validity is satisfied for all pairs of measures except for self-efficacy and each of ease of use, perceived usefulness, and expectation confirmation. All the squared correlations are reported in Table 3 and the percentages of shared variance extracted in Table 2. All the values were calculated using the confirmatory factor analysis results.

Table 3 The squared correlations among the measures

Measure Pair	Correlation	Squared Correlation
Ease of Use-Social Norm	0.44	0.19
Ease of Use-Arousal	0.71	0.50
Social Norm-Arousal	0.50	0.25
Ease of Use-Computer Experience	0.70	0.49

Social Norm-Computer Experience	-0.06	0.00
Arousal-Computer Experience	0.03	0.00
Ease of Use-Access Speed	0.72	0.52
Social Norm-Access Speed	0.41	0.17
Arousal-Access Speed	0.60	0.36
Computer Experience-Access Speed	0.10	0.01
Ease of Use-Self-Efficacy	1.00	1.00
Social Norm-Self-Efficacy	0.46	0.21
Arousal-Self-Efficacy	0.76	0.58
Computer Experience-Self-Efficacy	0.12	0.01
Access Speed-Self-Efficacy	0.82	0.67
Ease of Use-Perceived Usefulness	0.74	0.55
Social Norm-Perceived Usefulness	0.54	0.29
Arousal-Perceived Usefulness	0.75	0.56
Computer Experience-Perceived Usefulness	0.003	0.00
Access Speed-Perceived Usefulness	0.61	0.37
Self-Efficacy-Perceived Usefulness	0.83	0.69
Ease of Use-Expectation Confirmation	0.82	0.67
Social Norm- Expectation Confirmation	0.51	0.26
Arousal-Expectation Confirmation	0.76	0.58
Computer Experience-Expectation Confirmation	0.02	0.00
Access Speed-Expectation Confirmation	0.70	0.49
Self-Efficacy-Expectation Confirmation	0.92	0.85
Perceived Usefulness-Expectation Confirmation	0.79	0.62

4. Results

The model displayed in Figure 1 was estimated based on the previously discussed measures and data using a structural equations approach. Specifically, the model was estimated using procedure Calis in PC SAS version 9.2 and maximum likelihood estimation. The model was formulated so that each measure was reflective in the questionnaire items forming that measure. Furthermore, the exogenous measures in the model were allowed to pair-wise correlate. The results for the fit of the model to the data are shown in Table 4. This fit was good as illustrated by the fit statistics [13, 18]. The goodness of fit index was 0.94 and its standardized counterpart was 0.91. The parsimonious goodness of fit index was 0.73. The chi-square statistic was significant at a value of 427.97 and 147 degrees of freedom. The normed chi-square was 2.91. The root mean square residual and its standardized counterpart were both 0.03. The root mean square error of approximation was 0.05 and its 90% confidence interval ranged from 0.05 to 0.06. Bentler's comparative fit index was 0.98 and the incremental fit indexes ranged from 0.96 to 0.98.

Table 4 The statistics summarizing the fit of the model to the data

Statistic	Value
Goodness of Fit Index	0.94
Adjusted Goodness of Fit	0.91
Parsimonious GFI	0.73
Chi-square Statistic	427.97**
Degrees of Freedom	147
Normed Chi-square Statistic	2.91
Root Mean Square Residual (RMSR)	0.03
Standardized RMSR	0.03
Root Mean Square Error of Approximation (RMSEA)	0.05
RMSEA 90% Confidence Interval	0.05 to 0.06

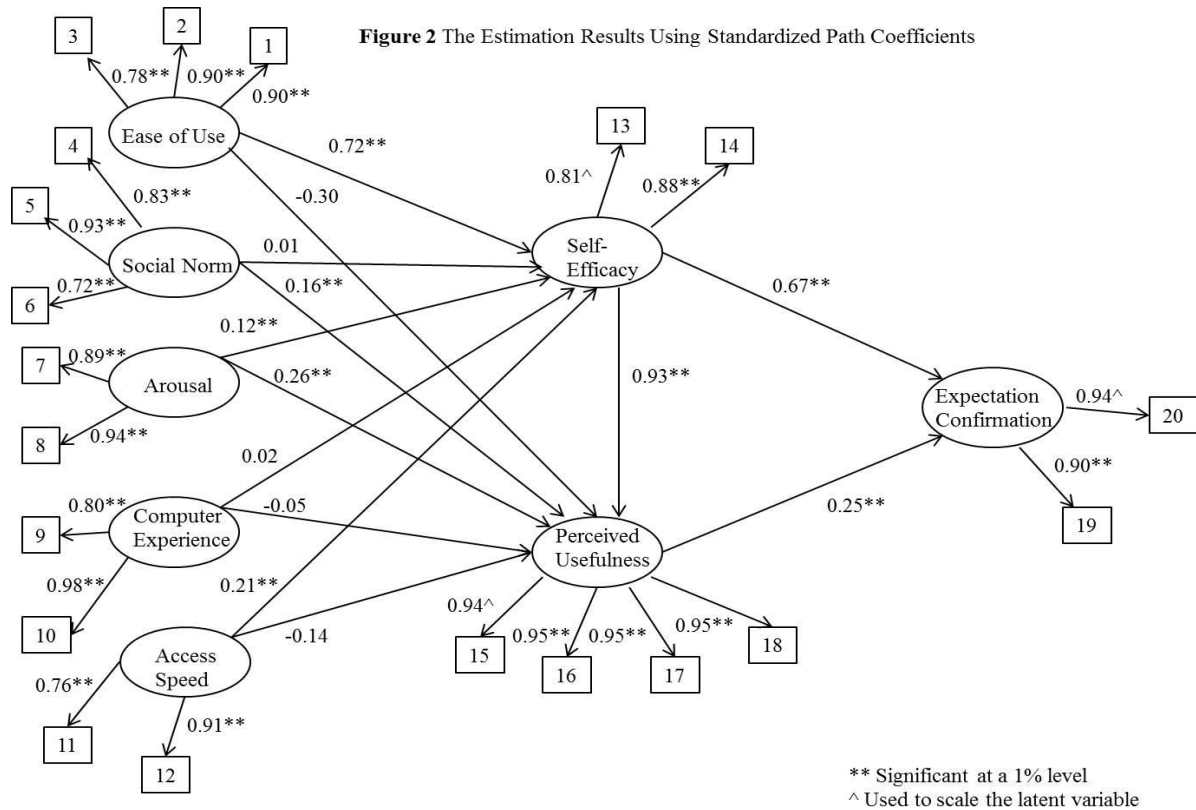|	
Bentler's Comparative Fit Index	0.98
Bentler& Bonnet's Normed Index	0.97
Bentler& Bonnet's Non-normed Index	0.97
Bollen Normed Index	0.96
Bollen Non-normed Index	0.98

** Significant at a 1% level

The estimated model is shown in Figure 2 using standardized path coefficients. All the paths from the measures to the indicants that were not used to scale a latent variable were statistically significant at a 1% level. The results for the structural model showed that perceived usefulness and self-efficacy directly influence expectation confirmation in meaningful ways. Furthermore, self-efficacy was found to indirectly influence expectation confirmation through perceived usefulness. The standardized paths from the antecedents of ease of use, arousal, and access speed significantly influence self-efficacy while social norm and computer experience had no such impacts. Similarly, the standardized path coefficients for the antecedents of social norm and arousal had meaningful influences on perceived usefulness while ease of use, computer experience, and access speed had no such meaningful influences. However, ease of use, arousal, and access speed were shown to have indirect influences on perceived usefulness through self-efficacy.

5. Discussion

The first result of interest are the three physiological or emotional arousal antecedents (i.e., ease of use, arousal, and access speed) directly influencing self-efficacy in a meaningful manner. The social norm and personal mastery (i.e., computer experience) antecedents had no meaningful influence on self-efficacy. The second interesting result is that social norm and one of the physiological or emotional arousal antecedents (i.e., arousal) significantly influence perceived usefulness. In addition, the three physiological or emotional arousal antecedents did influence perceived usefulness indirectly through self-efficacy. Of particular interest is self-efficacy and perceived usefulness having a direct, meaningful influence on students' attitudes toward e-textbooks of expectation confirmation. The final result of interest is computer experience having no meaningful influences on self-efficacy, perceived usefulness, and ultimately expectation confirmation.

Within the context of e-textbooks, students' self-efficacy regarding e-textbooks are influenced by the physiological and behavioral antecedents of ease of use, arousal, and access speed. Therefore, students' e-textbook self-efficacy is driven by the e-textbook's characteristics. The features and design of the e-textbook are important in influencing students' expectation confirmation through self-efficacy. These factors are controllable by textbook authors and publishers and need to be considered by adopting instructors. Students' perceptions of e-textbook usefulness are driven by their arousal from the e-textbook and the influence of peoples important to the student. While arousal can be influenced by the e-textbook features, the social norm variable influences cannot be so impacted. However, an instructor may influence students' social norms by the instructor's actions and words as well enlisting other students and professionals to describe the desirability of using e-textbooks. Finally, prior computer experience of the student has no influence on the student's self-efficacy, perceived usefulness and ultimately expectation confirmation. This could be potentially due to the familiarity of students with the technology required for e-textbooks. Thus, computer experience does not impact e-textbook self-efficacy, perceived usefulness, and ultimately expectation confirmation.

Figure 2 The Estimation Results Using Standardized Path Coefficients

** Significant at a 1% level
^ Used to scale the latent variable

Figure 2 The estimation results using standardized path coefficients

6. Conclusions

This research examined which antecedents to e-textbook self-efficacy and perceived usefulness influence expectation confirmation in a meaningful manner, which prior research has indicated impacts continuance intentions. With the continued expansion of digital learning material, improved and accessible electronic reading devices, and reduced e-textbook prices to students the demand for e-textbooks is likely to increase. Self-efficacy and perceived usefulness along with all the antecedents except computer experience had meaningful influences on expectation confirmation of e-textbooks by students once they have initially used these books. Specifically, ease of use, arousal, and access speed directly influence self-efficacy and arousal and social norm directly influence perceived usefulness. Ultimately, self-efficacy and perceived usefulness both influence expectation confirmation which in turn has been shown to influence e-textbook continuance intentions.

Thus, students' continued use of e-textbooks is influenced through managing students' self-efficacy and perceived usefulness via all the proposed antecedents except computer experience. Through the design and features of an e-textbook and the instructors' encouragement and support of e-textbook use, greater continued use of e-textbooks may occur through confirming students' expectations of e-textbook use. However, students are only able to continue using e-textbooks if a faculty selects a digital format as the principle textbook format. Additional research should investigate the decisions and reluctance of faculty to adopt e-textbooks.

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