TESTING AN INTEGRATED MODEL OF E-LEARNING ADOPTION DECISION

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ABSTRACT

This study investigates the impact of content richness and access ubiquity on e-learning course satisfaction and intention to take additional e-learning courses. Content richness and access ubiquity were incorporated into the technology adoption model along with the perceived usefulness and perceived ease-of-use factors. Path analysis was employed as the statistical tool to evaluate the hypothesized relationships regarding the influence of the content richness and access ubiquity factors. The results from this study suggest that content richness was a primary factor in predicting student satisfaction with e-learning courses and the intention to take another e-learning course. Additionally, access ubiquity was shown to influence student satisfaction with e-learning courses.

Keywords: perceived ease-of-use, perceived usefulness, TAM, Lisrel, Path Model, e-learning, access ubiquity, content richness

Introduction

In this knowledge-based economy characterized by rapid and continual change, knowledge acquisition and its strategic use is a source of sustained competitive advantage for the organization. Therefore, it becomes critical for the organization to develop a method to easily educate and exchange information among organizational members (Heinrichs & Lim, 2005;

Virkus & Wood, 2004). To accomplish this information exchange in a timely manner, the utilization of information technology tools and techniques for electronically transferring learning opportunities and instructional content to knowledge workers and also for developing a supporting infrastructure is required (Leidner & Jarvenpaa, 1995; Ong, Lai, & Wang, 2004). This method of providing learning opportunities delivered via leading-edge information technologies incorporating the internet, intranet, and / or extranet is commonly referred to or defined as e-learning, online learning, or web-based learning (Schweizer, 2004; Selim, 2007; Trombley & Lee, 2002). E-learning, then, can be viewed as using various information technology tools and techniques along with media ranging from simple text-based web pages with images and graphics to complex websites incorporating both real-time video and podcasting as well as web presence capabilities and includes the use of question and answer polling techniques, electronic discussion boards, blogs, wikis, and email (Trombley & Lee, 2002).

E-learning tools and techniques have become one of the most significant educational developments in the information technology industry (Selim, 2007). Yet, as businesses and educational institutions move instructional delivery to a synchronous e-learning format, there exists a need to better understand the critical success factors associated with the e-learning adoption decision (Arbaugh, 2000; Saadé, 2007). The identified critical success factors must facilitate understanding of the various reasons for acceptance of the e-learning technology tools and associated delivery methods.

Many businesses and educational institutions are embracing the challenge of offering and delivering e-learning content synchronously, so the question of when e-learning will become an established and integrated component of the total educational process is raised. Successfully integrating e-learning into the organization's learning culture does not result from isolating and focusing solely on e-learning information technology concerns and issues but rather from infusing e-learning concepts and technology into the overall culture of the organization.

While past studies have applied the technology acceptance model (TAM) in various contexts such as internet use, e-commerce, software productivity tools, and ERP systems (Lim, Lim, & Heinrichs, 2005), the applicability of TAM to facilitate understanding of the e-learning adoption decision has only recently begun to receive attention from researchers. Several researchers have reported the application of TAM in the context of e-learning and online education (Arbaugh, 2000; Gao, 2005; Saadé, 2007; Roca, Chiu, and Martínez, 2006). Gao (2005) reported

results that suggest that TAM is an effective tool for predicting student acceptance of web-based course support systems. Saadé (2007) investigated student behavior and attitudes toward online learning. Roca, Chiu, and Martínez (2006) uncovered that the influence of perceived quality (which was defined as being composed of information quality, service quality, and system quality) on student satisfaction was strong.

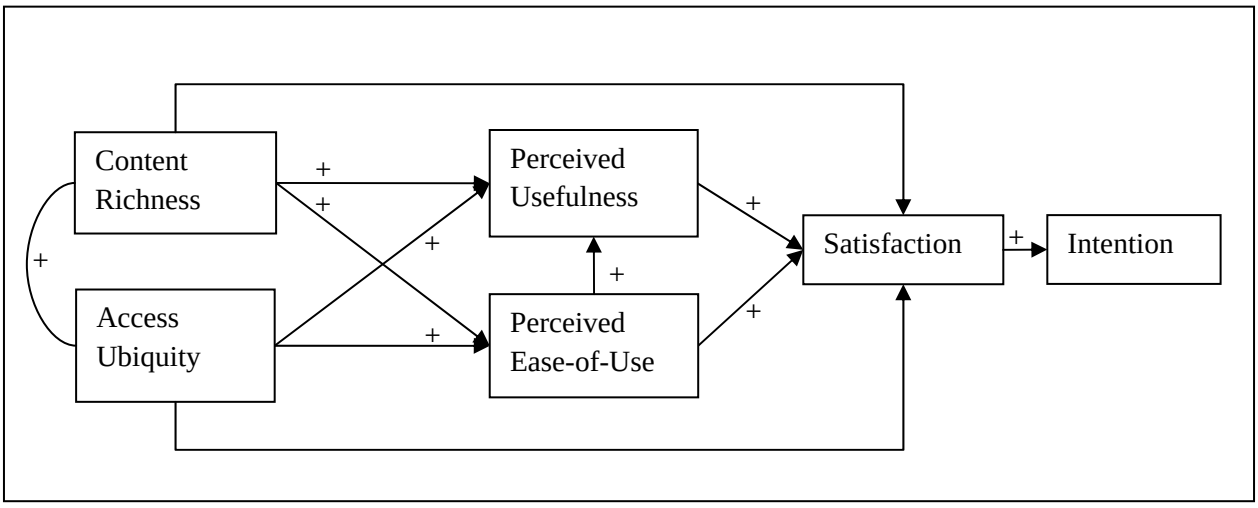
The determining factors related to e-learning course content and the delivery mode need to be well integrated into the research model. Arbaugh (2000), Selim (2007), and Sun and Cheng (2007) initiated this line of research as they evaluate various factors of e-learning such as flexibility, student-faculty interaction, online course content, and various delivery mode factors. It is important to continue this stream of research. Therefore, this study contributes to this stream of research and extends TAM to the online course adoption decision by incorporating e-learning determinant factors. In addition to testing TAM in the context of online course adoption, this study assesses the impact of e-learning course factors on the original TAM factors.

Literature Review

Many educational offerings such as lecture series, academic courses, training seminars, and certificate programs are being delivered to the students using Internet technologies (Saadé, 2007). To investigate the students' usage of and the various factors associated with e-learning technology, many research studies have adopted the Technology Acceptance Model (TAM) developed by Davis (1986, 1989). This study expands the TAM by incorporating the additional factors of content richness and access ubiquity into the investigation of e-learning effectiveness. The proposed integrated e-learning adoption decision model (see Figure 1) posits content richness and access ubiquity as the antecedents of the two TAM factors, perceived ease-of-use and perceived usefulness.

Figure 1

Hypothesized Integrated e-Learning Adoption Decision Model



Two Original TAM Factors

The technology acceptance model (TAM) originally developed by Davis (198x) posits that beliefs and attitudes are key determinants as to whether a specific technology will be adopted or rejected. Davis, Bagozzi, and Warshaw (1989) demonstrated that the initial attitudes of the user regarding the factors of perceived ease-of-use and perceived usefulness will influence attitudes towards the use of the technology (Lee, 2006). Recent research on e-learning and TAM has provided support for the links between the TAM factors of perceived usefulness and perceived ease-of-use and the student's intention to use the e-learning system (Gao, 2005; Ong, Lai, & Wang, 2007; Saadé, 2007). In the context of e-learning, the perceived usefulness factor of TAM is described as the degree to which students believe that using an online course will enhance their learning performance; whereas the perceived ease-of-use factor is described as the degree to which students believe that the use of the online course application is relatively effortless. Therefore, perceived usefulness and perceived ease-of-use influences the student's intention to accept and adopt the e-learning courses either directly or indirectly.

Selim (2002) tested the two original TAM factors of perceived usefulness and perceived ease-of-use as predictors of student acceptance of online course websites. Selim (2002) reported results

supporting TAM. Ong, Lai, and Wang (2007) and Lee (2006) suggest expanding the overall applicability of TAM by investigating additional factors beyond the two original factors. It is believed that learning using online tools involves a multitude of additional factors including a knowledge worker's knowledge of and experience with information technology. Saadé (2007) expanded the perceived usefulness factor with three additional dimensions labeled performance related outcome expectations, personal-related outcome expectations, and intrinsic motivation and reported that the effects of content quality on perceived usefulness were significant.

Since online learning systems can be viewed as technology applications, TAM argues that knowledge workers will only use the system if they perceive that its use will enhance their learning performance. Such learning performance enhancement may be measured in terms of learning productivity, the effectiveness of learning, and/or improvements in test scores.

Content Richness

Acceptance and overall effectiveness of e-learning courses requires quality course content (Drago, Peltier, & Sorensen, 2002; Tricker, Rangecroft, Long, & Gilroy, 2001). In addition to utilizing either paper-based or electronic textbooks coupled with electronic discussion boards, effective e-learning courses should integrate multimedia into the course content so as to engage the learner. The multimedia content in these e-learning courses can be in the form of animation, video lectures, podcasts, PowerPoint presentations, and/or simulations. However, to be effective, the multimedia course content should be integrated judiciously into the course (Schweizer, 2004).

Media richness is a key characteristic that learners consider when working with e-learning course websites (Palmer, 2002). Richness is defined as the ability of presented information to change the learner's understanding within a specific time interval (Daft & Lengel, 1986). Media richness, then, refers to the e-learning course's multimedia content's capacity to facilitate shared meaning and understanding (Daft & Lengel, 1984). It refers to the content's ability to convey key concepts to the learner. The e-learning course websites can provide the learner with various levels of richness ranging from simple text-based to complex multimedia presentations.

Media richness theory developed by Daft & Lengel (1986) suggests that the low media richness achieved by only using text-based content and by eliminating nonverbal cues would make tasks

like discussion of issues difficult. While multimedia content material in e-learning courses has been shown to attract a learner's attention and interests, the use of multimedia content alone does not necessarily result in significant positive satisfaction with the e-learning course (Sun & Cheng, 2007). As such, this range of capacities makes a website difficult to position along the media richness continuum originally proposed by Daft and Lengel (1986).

Achieving communication efficiency required to convey concepts in a defined time interval can be affected by the usefulness of the chosen media and the specific characteristics of the required communication task (Daft & Lengel, 1984, 1986; Trevino, Lengel, & Daft, 1987). Communication tasks that are designed to clarify ambiguous concepts so that understanding of the material is achieved in a timely manner are considered high on the media richness continuum; whereas, communication tasks that require a significant time to develop the learner's understanding are considered low on the media richness continuum. With regard to the characteristics of these communication tasks, media richness theory proposes that the purpose of the multimedia content is to reduce uncertainty and equivocality. Uncertainty is associated with the insufficient level of required information; whereas, equivocality is associated with determining the meanings of potentially ambiguous situations. Effective e-learning course design and structure then facilitates the flow of information in a timely fashion reducing uncertainty. So, the role of multimedia content in uncertainty reduction should be to convey a sufficient amount of correct information. The e-learning course with high uncertainty and equivocality in course concepts or material requires the use of material that is rated high on the media richness continuum.

One of the key characteristics of e-learning courses is the capability to integrate different types of media thereby creating rich multimedia course content material. However, since multimedia does not have consistent effects on promoting a learner's learning performance, it does not necessarily produce significant effects on the learner's understanding of the course content (Sun & Cheng, 2007). Furthermore, research has shown that unnecessary multimedia elements in instructional content may actually distract learners and decrease overall learning performance.

The results of many empirical studies have indicated that content quality is important in determining learner's level of satisfaction (Katerattanakul & Siau, 1999; McKinney et al., 2002). A major dimension of e-learning course content quality is associated with content richness. Content richness positively affects a learner's level of satisfaction with the e-learning course

(Arbaugh, 2000). The special characteristics of IT tools such as the use of the internet with hyperlinks permit learners to share and access numerous resources, in addition to accessing the fundamental course contents (Lee, 2006). Collectively, these described concepts are identified as content richness. This discussion then leads to the following hypotheses.

Hypothesis 1: Content richness is positively related to (a) perceived usefulness and (b) perceived ease-of-use.

Hypothesis 2: Content richness is positively related to satisfaction.

Access Ubiquity

Ubiquitous access to online course content is anticipated to expand in the coming years as information technology continues to advance and as learners demand anytime / anywhere learning opportunities (Hill & Roldan, 2005). Access ubiquity can be simply defined in terms of e-learning course, computer system, and information availability (Palmer, 2002) with library support contained in the information availability component (Selim, 2007). The potential benefits provided to the learner as a result of access ubiquity include shortened response time between the learner and the instructor as well as increased real-time interaction opportunities and among learners in the course.

For ubiquitous access to be a key factor, the efficient and effective use of information technology in delivering the e-learning-based components is important. Critical to the success of e-learning is ensuring that the IT infrastructure required to deliver e-learning content is reliable and capable of delivering the multimedia content. The IT infrastructure then must include accessibility, bandwidth, course management systems, internet availability, and security (Selim, 2007). For the learner acceptance of the e-learning systems, the learner must have confidence in the learning system and must have confidence that the data captured during the e-learning course will not be compromised. As such, access ubiquity also is defined to include perceived credibility (Ong, Lai, & Wang, 2007).

With anytime / anywhere access being provided by mobile computing, it becomes possible to develop course delivery applications that not only are capable of responding to learners anytime / anywhere but that also actively seeks out and engages learners. As a primary tool for collaborative learning environments, in which knowledge is developed and evolved by the

learners, online threaded discussion is a prime candidate for e-learning (Leidner & Jarvenpaa, 1995). Yet, a number of challenging issues must be addressed in designing such an environment to ensure learner acceptance (Hill & Roldan, 2005).

There are major concerns revolving the design and development of quality e-learning content (Trombley & Lee, 2002). First, learners must take initiative and must have the necessary technical skills to participate in an e-learning course. Learners having access to an e-learning system can now interact with instructional materials in various formats anywhere / anytime (Lee, 2006). Furthermore, given the functionality of the information technology infrastructure, they can interact with teachers and classmates both individually and on a simultaneous basis. This discussion leads to the following hypothesis regarding the impact of access ubiquity on the factors in TAM including satisfaction and intention.

Hypothesis 3: Access ubiquity is positively related to (a) perceived usefulness and (b) perceived ease-of-use.

Hypothesis 4: Access ubiquity is positively related to satisfaction.

Based upon the literature review, a proposed path model describing the factors that influence the learner's satisfaction with and intention to take another e-learning course was developed. The hypothesized model links the factors of content richness and access ubiquity with the independent factors from the technology acceptance model of perceived usefulness and perceived ease-of-use on the dependent factors of satisfaction and intention.

Methodology

This study adopted the path analysis approach to describing the e-learning adoption data and the relationships among the various factors. There were four dependent factors that were identified and the study focused on the predictive ordering of the variables in relationship to the technology acceptance model.

Subjects and Procedures

This research study used a self-administered questionnaire method to obtain responses. A total of 173 students from two midwest universities participated in the study. In this study 15% of the respondents were males and 85% of the respondents were females. The respondents were

20% undergraduate students and 80% graduate students. The students were invited to participate in the study via an email message from the researchers. Neither monetary nor non-monetary incentives were provided to the respondents.

When the respondents first accessed the electronic survey, they were presented with web pages containing an overview of the research study, information regarding informed consent, and contact information they could use if they had questions regarding the survey. After the initial explanatory web pages, the respondents were presented with the survey web pages containing the instructions regarding completing the survey and the survey questions. The respondents were asked to answer all of the questions carefully.

Construct Measures

The instrument used in this study contained question items measuring six different conceptual areas. Those six constructs were perceived usefulness, perceived ease-of-use, content richness, access ubiquity, satisfaction, and intention to take another online course (Table 1). Also included in this survey were various classification questions such as age, gender, and distance from campus.

Table 1

Variable and Factor Listing

Variable	Questionnaire Item	Associated Factor	Factor Description
A1	Taking an online course is very easy for me.	Factor 1	
A2	I believe that an online course site helps me in my understanding of the class material.	Factor 1	Perceived Usefulness
A3	Using the online course sites increases my academic performance.	Factor 1	
A4	The online course website is useful for taking classes.	Factor 1	
B1	I find it easy to use the online course website.	Factor 2	
B2	It was easy for me to become skillful at using online course sites.	Factor 2	Perceived Ease-of-Use
B3	I find the online course website easy to use.	Factor 2	
C1	Technical content delivery quality of online courses.	Factor 3	
C2	Descriptive content delivery quality of online courses.	Factor 3	
C3	Effectiveness of providing explanation in online courses.	Factor 3	
C4	Quantity of learning in online courses.	Factor 3	Content Richness
C5	Quality of learning in online courses.	Factor 3	
C6	Effectiveness of the video material delivery in online courses.	Factor 3	
D1	Online course availability for effective access.	Factor 4	Access Ubiquity
D2	Information availability for effective access.	Factor 4	
E1	Overall, how satisfied are you with this online course?	Factor 5	
E2	How satisfied are you with the course content?	Factor 5	
E3	How satisfied are you with the course delivery?	Factor 5	
E4	How satisfied are you with the course requirements?	Factor 5	Satisfaction
E5	How satisfied are you with the access to the online course?	Factor 5	
E6	How satisfied are you with the additional course materials available in the online courses?	Factor 5	
F1	How willing are you to take another online course?	Factor 6	
F2	How willing are you to recommend online courses to your peers?	Factor 6	Intention
F3	How likely is it that you will take another online course in the next 12 months?	Factor 6	

The questions used to measure perceived usefulness and perceived ease-of-use were adapted from Davis (1986) and Igbaria, Iiarvi and Maragahh (1995). Respondents were asked to indicate

their agreement or disagreement with the presented statements using a 5-point Likert-type scale which ranged from (1) strongly disagree to (5) strongly agree. The questions used to measure content richness and access ubiquity were adapted from Drago, Peltier, & Sorensen, (2002), Lee (2006), Palmer (2002) Roca, Chiu, and Martínez (2006). Respondents were asked to indicate their willingness to recommend or take another online course using a 5-point scale ranging from (1) not at all willing to (5) extremely willing. Respondents were asked to indicate their satisfaction with various aspects of online course with various statements that used a 5-point Likert-type scale ranging from (1) very dissatisfied to (5) very satisfied.

Analysis and Results

Path analytic model analysis via LISREL was used to analyze the data (Joreskog & Sorbom, 1989, 1993). The hypothesized enhanced learning adoption model was developed and presented in Figure 1. In evaluating the hypothesized model, overall fit indices of the model as well as the individual factor coefficients were determined and evaluated.

Factor Analysis, Mean Values, and Reliabilities

Responses to the multi-item measures were factor analyzed using a principal component factor analysis. The factors in each of the dependent and independent variables were varimax rotated. Results of the factor analysis are shown in Table 2. As a part of the measurement item purification process, any items cross loading to other factors or factor loadings of .50 or lower are deleted from the final scale items. A brief description of the final scale items resulting from the item purification procedure follows.

The independent variables were composed of four factors labeled as perceived usefulness which is represented by three items; perceived ease-of-use which is represented by three items; content richness which is represented by six items; and access ubiquity which is represented by two items. The dependent variables were composed of two factors labeled satisfaction which is represented by six items and intention which is represented by three items.

For the various variables under investigation, the scale means were calculated. Table 2 presents factor analysis results, the scale mean values and reliability for each of the constructs. The scale mean values for the independent variables ranged from 3.80 to 4.32 based upon a 5 point scale with 1 defined as Strongly Disagree and 5 defined as Strongly Agree. The scale mean values for

the dependent variables ranged from 4.08 to 4.12. The Cronbach alphas for the independent variables were calculated as 0.729 for access ubiquity, 0.826 for perceived usefulness, 0.847 for perceived ease-of use, and 0.914 for content richness. The Cronbach alphas for the dependent variables were calculated as 0.757 for intention and 0.896 for satisfaction. The Cronbach alphas for the six scales are greater than the recommended guideline of 0.70 (Nunnally, 1978). Therefore, it can be concluded that all six scales show adequate reliability.

Table 2

Factor Analysis Results

	Independent Variables				Dependent Variables	
Variable	Factor 1: Perceived Usefulness	Factor 2: Perceived Ease-of-Use	Factor 3: Content Richness	Factor 4: Access Ubiquity	Factor 5: Satisfaction	Factor 6: Intention
A1	**.758**	.127	.119	.250	--	--
A3	**.719**	.228	.311	.036	--	--
A2	**.712**	.149	.393	.093	--	--
B3	.112	**.908**	.146	.026	--	--
B1	.181	**.878**	.124	.054	--	--
B2	.386	**.640**	.190	.272	--	--
C2	.356	.124	**.811**	.013	--	--
C1	.026	.211	**.805**	.136	--	--
C6	.000	.177	**.777**	.265	--	--
C4	.445	.085	**.768**	.128	--	--
C3	.451	.119	**.734**	.135	--	--
C5	.488	.000	**.694**	.094	--	--
D1	.100	.067	.112	**.916**	--	--
D2	.287	.169	.431	**.682**	--	--
E1	--	--	--	--	**.833**	.087
E3	--	--	--	--	**.822**	.221
E6	--	--	--	--	**.780**	.446
E2	--	--	--	--	**.769**	.192
E4	--	--	--	--	**.763**	.175
E5	--	--	--	--	**.698**	.223
F3	--	--	--	--	.006	**.844**
F1	--	--	--	--	.379	**.817**
F2	--	--	--	--	.556	**.662**
Mean	3.85	4.32	3.80	4.12	4.12	4.08
Std. Dev.	0.81	0.69	0.82	0.84	0.74	1.08
Measure of Sampling Adequacy	0.880				0.881	
Reliability	0.826	0.847	0.914	0.729	0.896	0.757

Path Analysis

The literature on content richness and access ubiquity views these factors as being merely correlated. As such, these two factors were linked but no directional connectors were associated with them. These factors were then added as antecedents to the TAM structure.

Each factor should be normally distributed and this model meets the assumption required of path analysis (Stevens, 1996; Bentler & Chou, 1987). Kline (1998) recommends at least four tests be performed to evaluate the goodness of fit of the proposed model. These multiple fit criteria are used to rule out measuring biases inherent in the various measures (Hair, Anderson, Tatham & Black, 1995). The fit criteria test groups include chi-square; goodness of fit index (GFI), normed fit index (NFI), or comparative fit index (CFI); non-normed fit index (NNFI); and standardized root mean square residual (SRMR).

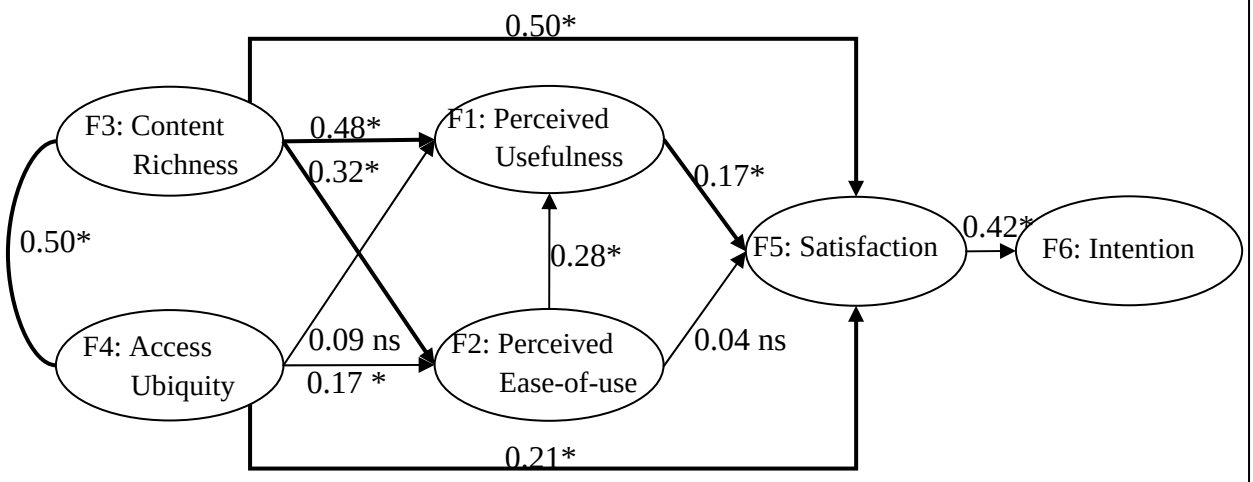
The overall fit of the path model was judged to be satisfactory based on the overall goodness-of-fit criteria. The ratio of chi-square to degrees of freedom was 1.68 (Chi-square of 6.72 with 4 df, $p = .15$). The Goodness of Fit Index (GFI) was 0.99; the Normed Fit Index (NFI) was 0.99; and Bentler's Comparative Fit Index (CFI) was 0.99. Each of these indices were above the desired minimum acceptable 0.90 level used to accept the model (Bagozzi & Yi ,1988; Hair, Anderson, Tatham & Black, 1995). CFI are less sensitive to sample size than the other tests so it was used when the sample size is less than 200 (Fan, Thompson, & Wang, 1999). The Non-Normed Fit Index (NNFI) was 0.98 and the Standardized Root Mean Square Residual (SRMR) was 0.029. By convention, there is a good model fit if the SRMR is less than or equal to 0.06 (Hu & Bentler, 1999).

Figure 2 presents the path analysis results. Based on the goodness of fit indices and the recommended values, the fit of this proposed model was determined to be acceptable (Bagozzi & Yi, 1988; Hair, Anderson, Tatham & Black, 1995). The significance of individual path coefficient was also evaluated. Figure 2 shows that five of the hypothesized paths are significant at the 0.05 level. One of the hypothesized paths was not significant at the 0.05 level. The sign for all path coefficients are in the expected direction. The paths from content richness to perceived usefulness (0.48), to perceived ease-of-use (0.32), and to satisfaction (0.50) are positive and significant at the 0.05 level providing support for the hypotheses 1 and 2. The path coefficients from access ubiquity to perceived ease-of-use and satisfaction were 0.17 and 0.21

respectively. These two coefficients are significant at the 0.05 level and in the expected direction supporting hypotheses 3b and 4. However, the path coefficient from access ubiquity to perceived usefulness was not significant at the 0.05 level. Therefore, hypothesis 3a is not supported by the result.

Figure 2

Integrated e-Learning Adoption Decision Model



* p < .05 -- ns = not significant

Fit Statistics & Measures for the Enhanced Learning Adoption Path Model	Value	Recommended Value
Chi-square/degrees of freedom	1.68	≤3.0
Bentler – Bonet's Normed Fit Index (NFI)	0.99	≥.90
Goodness of Fit Index (GFI)	0.99	≥.90
Comparative Fit Index (CFI)	0.99	≥.90
Tucker-Lewis Non-Normed Fit Index (NFFI)	0.98	≥.90
Root Mean Square Residual (RMR)	0.029	≤.10

Direct and Indirect Effects

Path coefficients can be used to highlight direct and indirect effects in the discovered model. The direct and indirect effects are reflected in the arrows shown in the model. The total causal

effect of the factor "i" on the factor "j" is the sum of the values of all the paths from "i" to "j". Considering "satisfaction" as the final dependent factor "i" in the presented model and considering "content richness" as the independent factor "j", the indirect effects are calculated by multiplying the path coefficients for each path from content richness to satisfaction.

The total indirect effect of content richness on satisfaction is calculated to be 0.10 and the direct effect is calculated to be 0.50. Thus, the total effect of the independent factor content richness on the dependent factor satisfaction is the sum of the direct effect and indirect effect (0.50 + 0.10) for a value of 0.60. The total effect of the independent factors access ubiquity, perceived usefulness and perceived ease-of-use on the dependent factor satisfaction are similarly calculated for the values of 0.24, 0.17, and 0.09.

Similarly, the total effect of the factors content richness, access ubiquity, perceived usefulness, perceived ease-of-use, and satisfaction on intention to take another course can be calculated. The total effect of these factors is 0.25, 0.10, 0.07, 0.04, and 0.42 respectively.

Table 3: Direct and Indirect Effects

	F3: Content Richness			F4: Access Ubiquity			F2: Perceived Usefulness			F1: Perceived Ease-of-Use			F5: Satisfaction		
	TE	DE	IE	TE	DE	IE	TE	DE	IE	TE	DE	IE	TE	DE	IE
F2: Usefulness	**.57**	**.48**	**.09**	.14	.09	.05	--	--	--	**.28**	**.28**	**--**	--	--	--
F1: Ease-of-Use	**.32**	**.32**	**--**	**.17**	**.17**	**--**	--	--	--	--	--	--	--	--	--
F5: Satisfaction	**.60**	**.50**	**.10**	**.24**	**.21**	.03	.17	**.17**	--	.09	.04	.05	--	--	--
F6: Intention	**.25**	**--**	**.25**	**.10**	**--**	**.10**	**.07**	**--**	**.07**	.04	--	.04	**.42**	**.42**	**--**

TE = Total Effect DE = Direct Effect IE = Indirect Effect

Discussion

Path analysis is a powerful statistical tool to aid in the analysis of effect decomposition for models with two or more dependent variables. Reviewing the total effects for the factors shows that the content richness factor is the most significant factor in determining satisfaction. Satisfaction is a significant factor in determining intention to take another online course.

Content richness involves the various methods used to deliver the content, explain the material, and the quality and quantity of information presented to the student. To help ensure satisfaction with the course, the instructor should devote resources to ensure the multimedia component of the course is of high quality. As with any other course, the instructor should be focused on providing high quality delivery of the content and should ensure that the online tool facilitates the technical and descriptive content delivery.

This study expands the TAM for use in understanding online course delivery. With 65% of schools identified online education as key to their long term strategy, it is crucial for programs to develop and maintain a high degree of satisfaction (Allen & Seaman, 2005). This study provides support for the importance of content richness and access ubiquity to the delivery of online courses.

In interpreting the findings of this study, care should be given. Due to the nature of the sample, the generalizability of the results is somewhat limited. The findings may not be applicable to other disciplines or other categories of students taking online classes. Future research should test the proposed model with expanded sample base. As users are more concerned about how an e-learning system provides information and how it will make them more productive in their tasks In an e-learning context (Roca, Chiu, & Martínez, 2006), future research should measure the increased productivity in e-learning tasks in addition to the satisfaction with and intention to take additional e-learning courses.

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