

WILL THE ELECTRONIC JOURNALS REPLACE THE PAPER-PRINT VERSION IN LEBANON?

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Abstract

University libraries in Lebanon are at the edge of important modernization as information transfer increasingly into electronic format. In this study, based on Davis Technology Acceptance Model (TAM), we developed a modified model for using electronic journals. Survey data from 281 student's business students in different universities in Lebanon demonstrate that significance of age, type of university and duration of stay are good predictors of intention to use e-journals. A somewhat surprising finding was that at the cognitive dimension, the participant's perceived usefulness and perceived ease of use did not make a significant contribution to the explanation and prediction of intention to use e-journals.

Keywords: e-journal, Technology Acceptance Model, Factor Analysis, e-environment

Introduction

Arab universities, with few exceptions, are on the whole 10-25 years old and are still maturing and struggling to go along with international standards of higher education (Al Shamsi, 2004). Computerization of library and application of IT is a very recent phenomenon. In a survey of Jordanian libraries it is found that only nine out of 20 libraries established a department for computer application (Younis, 1999). Automation of Libraries in Saudi Arabia started at the end of the 1980s (Al-Zahrani, 2000). People in Syria, began to use Internet for their first time inside Al Assad National Library after 1998 (Askhita, 2000). The Saab Medical Library (SML) at the American University of Beirut (AUB) in Lebanon developed its virtual medical library site in 1997 (Farha, 2001). Professor Charbaji, the founder of "CHARBAJI Consultants" in Lebanon happened to use the free trial services of Emerald Library in 1998, then he had his first publication in this library in 2001 (Charbaji, 2001). Arab Universities are witnessing, today, a transition from print to a hybrid situation in which both print and electronic journals are present at the same time. Their services are tremendously influenced by rapid technological innovations over the years (Siddiqui, 2003). In fact, electronic journals offer a solution to some of the problems facing our librarians, faculty and students. They provide powerful searching tools, they enhance the speed of communication and they are space saving (Sweeney, 1997) as compared to a print situation in which faculty and students must complete a number of steps in order to find a periodical in a print format (Lombardo and Condic, 2001). Given the problems that faculty and students face in accessing printed literature (Valentine, 1993; Dimartino and Zoe, 1996; Fister, 1992; Bane, 1995; Person, 1981; Pullinger, 1999 and Adalian et al, 1985), then, it is not surprising that students favor the convenience of full-text databases over print periodical literature. Besides, electronic journal is sometimes the only alternative available and more attractive from an economic viewpoint (Von Ungern-Stemberg and Lindquist, 1995). Technologies, including e-journals, are not inherently exclusive preserve of developed countries. Entrée to online full text in Lebanon may take the form of on campus university subscription or the mode of off campus free trial. Most faculties and a good number of graduate students in few private American universities have access to international electronic journals, such as Emerald Library inside their specific college. Graduate as well as undergraduate students in private universities have direct access to e- journals through library

resources. Mohammad Ramzan noted that access to public information in developing countries "is still limited mainly due to bureaucratic culture where officials remain reluctant to disseminate information. Many people still find it difficult to obtain data or information from government institutions. Lack of technological sophistication, including incompatibility of systems, unreliability of telecommunications, interrupted electrical supply, insufficient maintenance of equipment; lack of depth in collections; shortage of competent information professionals; and difficulty in getting local published materials are major problems in libraries" (Ramzan, 2004). Based on the conclusions of previous research we may expect that online international electronic journals will dominate libraries and change the way in which knowledge is going to be circulated in our countries. It is unclear, however, whether Lebanese university students are using online international electronic journals when the printed version is still readily available? Some authors in Lebanon argue that a revolution is taking place world-wide but Lebanon and the Arab region are still far behind (Abouchedid and Eid, 2004). Others, noted that management feel that professionalism, i.e. the use of archivists, is not necessary in so far as experience is the equivalent of a diploma (Gladys Saade, 2004). Alternatively, different researchers are more optimistic and have formed different impressions of Lebanon. They believe that "Convenience, customer satisfaction and low cost are the name of the game in this information age." (Charbaji, 2001). It has been suggested that the new era brings hopes and different meanings. Competition in Lebanon will be in innovation, convenience and customer service (Charbaji, 2003). E-environment is in Lebanon already. We can feel it, but it is a matter of degree as to when all of the Lebanese people understand it (Charbaji, 2002). Digital libraries are the buzzwords of these days (Ramzan, 2004). And E-journals were selected as the subject of this paper because Internet use is escalating world wide and traditional methods are being displaced by remote forms of contact. Everybody agrees library in our country needs to change, but how? The answer may lie in e-journals.

General Background

Lebanon is not internationally recognized on the technological levels with the rest of the world. Lebanon's score on the Industrial Production Country Index is absent (CIA Factbook, 2003) and there is no mention of Lebanon on The 2003 A T Kearney/Foreign Policy Magazine Globalization Index (Global-

ization Index, 2003). The failure to notice Lebanon on international technological indexes is attributed to the fact that Lebanon's main industries are banking; food processing; jewelry; cement; textiles; mineral and chemical products; wood and furniture products; oil refining; and metal fabricating (The World Fact book, 2003). As a developing country, Lebanon is not different from other Arab countries. All accumulation in Arab countries is based on traditional, basic commodities that do not require advanced skills or technology. Lebanon suffers from miserly R&D expenditure. The state spending on R&D does not exceed 0.2 percent of GNP, most of which pays only for salary (AHDR 2003). As a consequence, the average number of scientific papers per unit of population (per million inhabitants) is roughly two per cent of that of an industrialized country (Al Shamsi, 2004). In the ancient times, Lebanon was the initiator of alphabet letters and off its shores, the alphabet materialized to spread throughout the world (Khalaf, 2004). At present, computer lessons are very common in schools. Lebanon has more than 40 universities (UNDP, 2003), one of which is the state owned Lebanese University. Some of the most reputable private universities are: American University of Beirut (AUB), Lebanese American University (LAU), Beirut Arab University (BAU), and Saint Joseph University (USJ).

Internet Users in the Middle East don't exceed 2.1% of the Internet Users in the world (Internet world Statistics, 2004). TABLE

I shows that Internet Users in Lebanon is just 2.4% of the Internet Users in the Middle East and Lebanon is ranked 8th among 15 Middle Eastern countries (Internet World Stats, 2004).

Review of Literature

Many universities now offer virtual academic services via the Internet and the World Wide Web (Cohen, 1998; Mayo and Cahony, 2003; Moore, 2000; Christensen and Bailey, 1998). Modern information technology provides users with an easy and fast access to stored information in international, national, or local databases (Murray, 1998; Abdoulaye and Majid, 2000). In line with these sentiments, various models have been developed to tackle diffusion of innovation and technology (Abrahamson and Rosenkopf, 1997; Mahajan et al. 1990). A great part of literature has focused on the use of computer technology and the determinants of its acceptance (Ajzen and Fishbein, 1980; Moore and Benbasat, 1991; Mathieson, 1991; Taylor and Todd, 1995). Daviis (1989) proposed the Technology Acceptance Model (TAM) that was adapted from the Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980). According to the TAM, perceived usefulness and perceived ease of use of the information system determine adoption and intention to use technological systems. When it comes to information technology and individual differences we find that previous research concluded different findings regarding individuality and its effect on implementing technology (Agarwal and Prasad, 1999; Harrison and Rainer 1992; Venkatesh and Davis, 2000;). Chen and his

TABLE I

MIDDLE EAST	Population (2004 Est.)	Usage, Dec/2000	Internet Usage, Latest Data	Use Growth (2000-2004)	Penetration (% Population)	(%) of M.E.
Bahrain	699,400	40,000	195,700	389.3 %	28.0 %	1.2 %
Iran	67,477,500	250,000	4,300,000	1,620.0 %	6.4 %	25.5 %
Iraq	27,139,200	12,500	25,000	100.0 %	0.1 %	0.1 %
Israel	6,867,200	1,270,000	2,000,000	57.5 %	29.1 %	11.9 %
Jordan	5,642,200	127,300	475,000	273.1 %	8.4 %	2.8 %
Kuwait	2,429,200	150,000	567,000	278.0 %	23.3 %	3.4 %
Lebanon	4,432,000	300,000	400,000	33.3 %	9.0 %	2.4 %
Oman	3,234,500	90,000	180,000	100.0 %	5.6 %	1.1 %
Palestine(West Bk.)	3,827,900	35,000	145,000	314.3 %	3.8 %	0.9 %
Qatar	649,600	30,000	126,000	320.0 %	19.4 %	0.7 %
Saudi Arabia	22,287,100	200,000	1,500,000	650.0 %	6.7 %	8.9 %
Syria	19,229,200	30,000	220,000	633.3 %	1.1 %	1.3 %
Turkey	75,058,900	2,000,000	5,500,000	175.0 %	7.3 %	32.7 %
United Arab Emirates	3,341,900	735,000	1,110,200	51.0 %	33.2 %	6.6 %
Yemen	16,677,800	15,000	100,000	566.7 %	0.6 %	0.6 %
TOTAL Middle East	258,993,600	5,284,800	16,843,900	218.7 %	6.5 %	100.0 %

NOTES: (1) The Middle East Statistics were updated on September 1, 2004. (2) Detailed data for individual countries and regions may be found by clicking on each country name. (3) The demographic (population) numbers are based on data contained in gazetteer.de. (4) The usage numbers come from various sources and are consolidated here, see the surfing and site guide. (5) The most recent usage information comes mainly from the data published by Nielsen//NetRatings, ITU, and other reliable sources. (6) For growth comparison purposes, the usage data published by ITU for the year 2.000 is furnished. (7) Data may be cited, giving due credit and establishing a link back back to InternetWorld Stats .

Source: <http://www.internetworldstats.com/stats5.htm>

associates concluded that the effects of individual differences on using technology are yet to come (Chen et al., 2000) while Zumd believes that the truly critical difference come when one considers such things as demographic and personality variables (Zumd, 1979). Davis (1989) noted that future research needs to tackle other factors that affect technology usefulness and ease of use. Logically speaking duration of students inside university should be recognized and taken as an adoption facilitator. Duration is hypothesized to be a predictor of perceived ease of use and perceived usefulness. Harris and Wilkinson argue that "Computing has a masculine history. The use of such words as "crash," "abort," "terminate", and "kill" are derived from military applications" (Harris and Wilkinson, 2004).). When it comes to age then, it is reasonable to expect that generation gap is one of our major issues. Lack of technology education or technology literacy cause younger and older generations to differ in their acceptance of technology, but when it come to using e-journals, we can expect that the older the student is then the higher the possibility of exposure to the phenomenon of using e-journal.

Conceptual Model and Hypotheses Dependent and Independent Variables Intent to use e-journal

The dependent variable in the conceptual model is intent to use e-journal. E-journal was defined to include "peer-reviewed or edited international journals" (Tomney and Burton, 1998). Intent to use e-journal is the endogenous variable that we are interested in predicting and explaining its variation. This article surveyed the use of e-journals in general with emphasis on intention to use emerald library. Other electronic journals are new in Lebanon and some of which are still going through preliminary market assessment.

Perceived Ease of Use

Perceived ease of use is defined as the extent to which a university student believes that using e-journals will be free of effort (Wang et al, 2003). Perceived ease of use is treated as an independent variable. Previous research confirms the positive relation between ease of use and intention to use technology (Agarwal and Prasad, 1999; Venkatesh and Davis, 1996; Venkatesh and Morris, 2000).

Hence, we hypothesize that the larger the perceived ease of use, the greater the intention to use e-journal

H1: The higher the ease of use the higher the intention to use journal.

Perceived Usefulness

Perceived usefulness is defined as the extent to which a university student believes that using e-journals will enhance his/her research (Wang et al, 2003). Perceived usefulness is treated as another independent variable. In the existing literature, Usefulness has been consistently demonstrated as an important factor for successful adoption (Agarwal and Prasad, 1999; Venkatesh and Davis, 1996; Venkatesh and Morris, 2000). Our study posited usefulness as an adoption driver, which, as conceptualized to be determine intention to use e-journal.

Hence, we hypothesize that the larger the perceived usefulness, the greater the intention to use e-journal

H2: Students with higher levels of perceived usefulness are more likely to use e-journals.

Need for the Study

Lebanese students who attend colleges and universities are often faced with the reality that scholars in our country are not producing sufficient research to meet our need; hence, we are dependent on Western sources. Arab countries as a group are receivers and not originators of science. They produce very little literature that is not well organized. Besides, students in our countries come to universities without being adequately prepared to function in academic and research environment. As can be expected, being unprepared causes a variety of problems. Students come from a high school that has a different academic environment where they learn differently. Certainly teaching does not make up the only contrasting differences in academic environment. The truly critical differences come when one considers such things as research. More than often, Lebanese students experience difficulty in identifying and locating research materials. The physical library itself may act as a barrier to accessing periodical literature (Valentine, 1993; and Pullinger, 1999). Research presents a particular problem for many university newcomers. Ease of using library cannot be ignored when one considers academic writing. Unless university students have research facilities, they will live with constant frustration. To deepen the problem, most students are not aware of the usefulness of electronic library. Consequently, duration of stay in the university could be factor that facilitates the use of e-journals.

Granted there have been many studies done on university students in general, or on university students from a specific country in particular; however, there was no attempt to study university students and e-journals in Lebanon per se. A study such as the one conducted here is recommended by experts who urge teachers to provide students with experience in using educational technology (Campoy, 1992 and Kruat et al, 1998). The researchers in this study believe that there are issues that have not been well studied in the literature. In particular, what is missing from the existing literature about Lebanon is (1) a theoretical framework specific to using e-journal, and (2) measurement of factors affecting the use of e-journal. Our study seeks to reduce these gaps. It is our belief that research on using e-journal is needed in Lebanon in order to serve policy formation. No doubt that "The consideration of people with different or unusual circumstances, capabilities, cultures, languages, and backgrounds forces the scientist and the designer to look at the world in a new light" (Scholtz and Thomas, 2000). In order that electronic journals become a first choice for document and information delivery, it becomes imperative to determine the variables that lead to a wide use of electronic journals.

Purpose of the Study

To better understand these issues, we developed a modified regression model for using electronic journals incorporating five adoption drives, based on Davis Technology Acceptance Model (TAM). (Davis et al, 1989; Wang et al, 2003). The purpose of this study then, is to test this modified model using survey data from 211 valid responses from students at different universities in Lebanon.

RESEARCH METHOD

Data Collection

The data of this research were collected by means of personal interviews using questionnaire. The researchers in this study succeeded in collecting 281 valid questionnaires from university students in public (42.0 percent) and private (58.0 percent) universities in Lebanon. The average age is 22.96 years with standard deviation of 2.98 years. The minimum age of undergraduate student is 19 years while the maximum age of a graduate student is 36 years. The average duration of student in university is 2.67 years with standard deviation of 1.867 years. The minimum duration of student is 1 year while the maximum duration of student is 8 years. Fifty four (19.2 per cent) responded agree and strongly agree to the statement "Assuming I have access to e-journals, I intend to use it". Only sixty (21.4 per cent) responded agree to the statement "I intend to increase the use of e-journal in the future". Forty two (14.9 per cent) responded agree and strongly agree to the statement "Using e-Library would facilitate my review of literature". Forty (14.2 percent) responded agree and strongly agree to the statement "I would find e-Library useful in conducting research". Ninety students (32.03 per cent) responded agree and strongly agree to the statement "It would be easy to become skillful at using e-journals". One third (37.4 per cent) responded agree and strongly agree to the statement "Learning how to retrieve e-journals is easy for me". Two hundred and six (73.3 percent) responded agree and strongly agree to the statement "I trust e-journals", but almost one third (35.59 percent) responded agree and strongly agree to the statement "It would be easy to become skillful at using e-journals". One hundred and four (37.02 percent) responded agree and strongly agree to the statement "Learning how to retrieve e-journals is easy for me".

Results

Factor analysis was carried out as a data reduction technique. Two statistical tests were conducted in order to determine the suitability of factor analysis. First, the Kaisers-Meyer-Olkin (KMO) measure of sampling adequacy score of 0.677 was well above the recommended level of 0.5. Second, the Bartlett test of sphericity was significant (Chi Square = 1420.831, $P = 0.000$), indicating that there are adequate inter-correlations between the items which allow the use of factor analysis. Principal axis factoring was used as an extraction method and oblique rotation was used as a rotation method. Five factors were extracted using Eigenvalue greater than one criterion. For factor one Alpha was 0.859, for factor two Alpha was 0.896, for factor three Alpha was 0.739, for factor four Alpha was 0.464, and for factor five Alpha was 0.462. Scores for the last two factors are below the accepted level of 0.7. It is believed that if factors four and five had more items then, it would have been more reliable. The five factor solution accounted for 73.3 per cent of the total variance.

The five factors were easy to label (See TABLE II). The first factor accounts for 28.732 percent of total variance and is defined by four items with factor loadings greater than 0.70. We call factor one "Perceived ease of using e-journals". The second factor accounts for 14.818 percent of total variance and is defined by its two items with factor loadings greater than 0.70. We call this factor "e-journals credibility". The third factor accounts 12.01 percent of total variance and is defined by

three items with factor loadings greater than 0.70. We call factor three "Quality and sophistication of e-journals". The fourth factor accounts 9.391 percent of total variance and is defined by two items with factor loadings greater than 0.70. We call factor four "Intention to use e-journals". The last factor accounts 8.35 percent of total variance and is defined by two items with factor loadings greater than 0.70. We call the last factor "Perceived usefulness", because its 2 items measure the usefulness using e-journals.

Table III shows the the results of multiple regression. The regression is highly significant ($RSQ = 0.402$, $F = 60.514$, $P < 0.01$). The statistical tests of the partial regression coefficients show that three predictors are significant in predicting the variation in using e-journals.

Discussion

The results of this paper are especially valuable now when Lebanon is moving fast into e- environment (Charbaji, 2002 and 2003). The purpose of this study was investigates intention to use e-journals among business students in different universities in Lebanon. Regression coefficients did not provide strong support for the two hypotheses that were drawn from the Davis Technology Acceptance Model. A plausible explanation is that, alternative independent variables are antecedents of intention to use e-journals in our culture. Our effort was to bring up into view every rational explanation. This study demonstrates that "perceived usefulness" and "perceived ease of use" don't exhaust all the causal possibilities. Our study provides evidence that type of university substantially related to intention to use e-journals. Instructors in the state owned Lebanese University often requires at least limited use of e-journals in their courses. The findings that students in private universities are more likely to use e-journals than their counterparts in the state owned Lebanese University could easily be explained by the fact that later is more of a French oriented as compared to the English speaking private universities. It can be reasoned that faculty and students whose second language is French may not be familiar with electronic libraries such as Emerald. This call for having a variety of electronic journals in different languages otherwise people will simply dismiss technology because they do not understand English.

With respect to age and duration of stay inside university, it can be reasoned that longer duration means more exposure. Undergraduate students are more likely than graduate students to have difficulties in retrieving journals. It can be said that the university system and the e-environment are new to the undergraduate, and the longer a student is enrolled in university, the more skills he will gain.

To guard against accepting a false conclusion as true, or rejecting a true conclusion as false, the researchers in this study recommend that future research elaborate the simple relation between "Intention to Use e-Journals" and other independent variables by controlling for additional explanatory variables such as "Lack of Skills", "Educational Level", "Exposure to American Systems", "Major field of study", "Participation in Classroom Discussions", "Carrying Heavy Study Loads", "Having a Residence Inside University". For subsequent research, the results of this study suggest that having a larger sample from all fields of study seems to crucial in similar studies.

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Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3.735	28.732	28.732	3.735	28.732	28.732	3.217
2	1.926	14.818	43.549	1.926	14.818	43.549	1.961
3	1.561	12.010	55.559	1.561	12.010	55.559	2.331
4	1.221	9.391	64.950	1.221	9.391	64.950	1.658
5	1.086	8.350	73.300	1.086	8.350	73.300	1.496
6	.795	6.115	79.415				
7	.715	5.500	84.915				
8	.600	4.618	89.533				
9	.441	3.390	92.923				
10	.339	2.607	95.529				
11	.256	1.972	97.501				
12	.191	1.472	98.973				
13	.134	1.027	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

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Structure Matrix

	Component				
	1	2	3	4	5
Learning how to retrieve e-journals is easy for me	.872	.214	.302	-.275	-.178
It would be easy to become skillful at using e-journals	.866	.218	.236	-.425	-.220
I need assistance in retrieving e - journals	.841	.220	.326	-.327	-.183
It is easy to search through e-Journals	.769	.048	.172	.142	-.143
I trust e-journals	.181	.955	.023	-.028	-.011
All journals are alike	.139	.947	-.064	-.016	-.009
e-Journals is Sophisticated----Common	.251	.009	.832	-.206	.100
e-Journals is High Quality-----Low Quality	.374	-.004	.815	-.009	-.060
e-Journals is High status----- Low Status	.144	-.024	.763	-.004	-.061
Assuming I have access to e-journals, I intend to use it	-.224	-.077	-.279	.817	.025
I intend to increase the use of e-journal in the future	-.154	.015	.085	.724	.148
I would find e-Library useful in conducting research	-.169	-.024	-.108	-.024	.824
Using e-Library would facilitate my review of literature	-.176	.002	.089	.196	.802

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.573 ^a	.328	.326	.82124635
2	.613 ^b	.376	.371	.79285317
3	.634 ^c	.402	.395	.77755801

- a. Predictors: (Constant), Age
 b. Predictors: (Constant), Age, type
 c. Predictors: (Constant), Age, type, Duration of Stay

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4.382	.383		-11.426	.000
	Age	.191	.017	.573	11.523	.000
2	(Constant)	-4.943	.390		-12.671	.000
	Age	.207	.016	.621	12.636	.000
	type	.452	.099	.224	4.564	.000
3	(Constant)	-5.209	.390		-13.343	.000
	Age	.208	.016	.627	12.998	.000
	type	.429	.097	.213	4.410	.000
	Duration of Stay	.086	.025	.162	3.430	.001

- a. Dependent Variable: REGR factor score 4 for analysis 1

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