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A Bridge over Troubled Waters: Learning Technologies in the Middle East

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The proliferation of communication technologies in the last decade has opened new horizons for learners and instructors, offering new modes for learning and communication. With modern open and distance learning technologies, instruction and learning hold new dimensions and new meanings. For the first time, education becomes independent of time and space and can be delivered anytime, anywhere, and to anyone. Nevertheless, despite their great potential, the use of learning technologies raises a wide range of questions regarding the traditional learning paradigms, and it poses challenges for learners, instructors, and policy-makers, who need to develop new teaching and learning strategies that fit the new synchronous and asynchronous ODL platforms.

Educational technologies are used today in most educational systems for a large variety of purposes, including delivering knowledge and managing the teaching/ learning process, as well as for communication between learners and instructors and between learners and their peers. Present-day studies on the use of educational technologies in educational systems indicate that they have become an inseparable part of the teaching/learning process. However, a meta-analysis of the last-decade's research on the integration of ODL technologies suggests that it suffers from a series of severe pedagogical, political, cognitive, and technological problems, which hinder their successful implementation and lead to frustration among educators, decision-makers, and learners. The major problems are outlined below:

Users face problems in reading effectively from a digital display of text and coping with graphic user interfaces.

Learners and instructors are not proficient in making effective use of ODL platforms.

Learners face problems in gaining knowledge from the hyper textual and non-linear learning environments, which are most common in ODL learning.

Most present-day ODL environments are ineffective for learning due to their design as a simplistic conversion from the “good old” traditional, face-to-face teaching & learning paradigms, and there is no educated use of the pedagogical possibilities that are offered by the ODL technologies.

Learners suffer from feelings of loneliness and non-ownership and face learning difficulties when no instructor is physically present.

Learners face problems screening the huge volumes of information available in ODL environments and constructing coherent bodies of knowledge from them.

As indicated by a great majority of recent studies, the key issues in developing effective distance learning models are the adoption of adequate pedagogical paradigms that make educated use of the special technological features of ODL technologies and the consideration of state-of-the-art knowledge about designing effective distance learning environments. These studies also indicate the pivotal role that local conditions, such as the cultural, political, economical, sociological, ethnographical and geographical circumstances, play in designing effective ODL.

In this respect, the Middle East is a unique and challenging geographical, economical, cultural, and political region, mainly because of its heterogeneous nature. It is composed of a variety of cultures, languages and religions, so there are special considerations in designing effective open and distance learning environments that are available to all. Economically, countries in the region range from very poor to extremely wealthy, requiring the adoption of special integration policies to ensure the ability of the poor countries to cope with the high cost of ODL. Technologically speaking, the region consists of very advanced countries and others that are only in the early stages of adopting ODL systematically.

The above-listed problems and considerations illustrate the challenges that educators, designers, and decision-makers face in developing policies, strategies, and models for distance and open learning, which make an educated use of the available educational technologies on the one hand and which fit the unique capabilities and needs of countries in this extremely heterogeneous region. In this respect, the major challenges are the following: (1) to develop and improve the technological infrastructures to enable using state-of-the-art educational technologies, (2) to develop adequate models for distance ODL, and (3) to develop adequate policies and strategies for a proper integration of ODL in educational systems.

This special issue of IRRODL aims to describe and analyze current trends and issues in ODL in the Middle East. It seeks to detail the actual and potential contribution of ODL to the educational, social, and economic development in the region, and it does so by discussing the challenges and obstacles to ODL’s optimal utilization in various countries in the region.

Overview of this Issue’s Articles

The articles included in this special issue mainly cover evaluations of ODL implementations in the region, online students' characteristics, such as gender, computer literacy and so forth, and ideas for designing ODL.

The articles involving evaluation studies provide not only details about ODL implementations in the region but also some insights about how effective and efficient these initiatives are. For instance, Muneer Mahmood Abbad, David Morris, and Carmel de Nahlik introduce ODL implementations in the Arab Open University in Jordan (AOUJ). Abbad and his colleagues investigated the factors that influence the students' adoption of e-learning and found that prior experience was an important factor among AOUJ students who prefer e-learning. Another overview of AOUJ was presented by Khalil M. Dirani and Seung Won Yoon, who focused on the quality of ODL implementations. Dirani and Yoon classified their findings in three areas: (1) the existence of adverse conditions, (2) the presence of strong instructional practices, and (3) the need to improve administrative support. Another article that concentrated on quality issues and provided insights about an ODL implementation in the region was Mehmet Gültekin's paper on the evaluation of the Preschool Teacher Training Program at Anadolu University in Turkey. Gültekin examined the students' opinions regarding the quality of the support services and the materials provided to them. His survey study has shown that students had positive attitudes regarding the support services and the materials. The last evaluation article is about campus-wide implementation of Web-supported academic instruction at Tel Aviv University (TAU) of Israel. Rafi Nachmias and Judith Ram describe the scope and outcomes of Virtual TAU, a campus-wide project that aims to integrate information and communication technologies into the academic instruction at Tel Aviv University. The authors provided data, insights, and conclusions from research and evaluation studies at the institutional and pedagogical levels as well as the costs and benefits of the integration of Web-supported academic instruction.

The articles on student characteristics may help readers understand who prefers ODL in the Middle East and what their perceptions of ODL are. Ayelet Baram-Tsabari and Alaa Kaadni Kaadni, for example, compared Arabs and Israelis' interest in science in an asynchronous learning environment. They conclude that science interests are gender and age dependent but culturally independent in an asynchronous, open, and distant science learning environment. Gila Kurtz, Yair Amichai-Hamburger, and Jeffrey Kantor studied Israeli students' attitudes toward open and distance learning (ODL) and their perceived self-esteem and loneliness at the last stage of their online learning experience. The authors found a positive correlation between self-esteem and attitudes toward e-learning in general and toward online interaction with the instructor in particular. They also uncovered no correlation between loneliness and student attitudes toward e-learning. Yasemin Gülbahar and R. Orçun Madran examined student perceptions of communication and collaboration, satisfaction, equity, and autonomy in blended learning. The study shows the significance of computer and Internet literacy on ODL students' perception of interactions. The authors concluded that technology, instructors, students, and pedagogy are the four major areas that must be considered when developing a high-quality blended learning environment. In another study conducted in Turkey, Erkan Tekinarslan observed significant differences in the Turkish undergraduate students' perceptions of the Web as a learning tool based on gender, socio-economic background, and Web experience. The male students and the

students from higher socio-economic backgrounds indicated significantly higher attitude scores on the self-efficacy subscale of the Web attitude scale.

Two articles from Israel suggest ideas for designing various types of ODL. In the first article, Elaine Hoter, Miri Shonfeld, and Asmaa Ganayim present an online inter-group contact hypothesis (OICH) model that was developed to bring secular and religious Arabs and Jews in Israel together to work and learn collaboratively online. This multicultural interactive learning model intends to reduce the bias between groups and offers a gradual progression from completely online asynchronous interaction to face-to-face interaction for learning. The second article by Karen Precel, Yoram Eshet-Alkalai, and Yael Alberton focuses on the proper implementation of blended learning and the optimal proportions between online and F2F components in various learning scenarios. After having given details about a new model for blended learning, the authors revealed the results of a study they conducted to explore students' perceptions of pedagogical and design issues related to this new model. One of the major conclusions drawn in this study was the importance of completing the pedagogical and visual design of online learning in advance.

Finally, Latchem and his colleagues summarize the ODL initiatives in Turkey beyond Anadolu University's distance programs. The literature includes thorough coverage of ODL implementations in Anadolu University but lacks coverage of other ODL initiatives. This article provides insights about the development of, and lessons to be learned from, distance education provision by three other higher education providers: Ankara University, Sakarya University, and Ahmet Yesevi University.

In conclusion, this special issue of IRRODL attempts to provide the big picture as well as some details about what is happening in the Middle East in terms of open and distance learning. The articles included in this issue cover evaluations of ODL implementations, clues about the characteristics of ODL students, and ideas for designing ODL. We as the editors of this issue of IRRODL would like to thank all the contributors (the authors) as well as the IRRODL editorial community, especially Terry Anderson and Brigitte McConkey, for giving us this opportunity to present a glimpse of ODL culture in the Middle East to all. We hope IRRODL readers will benefit from the articles in this issue.



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Regional Focus Issue: Bridge over Troubled Waters ~ Cengiz Hakan Aydin and Yoram Eshet-Alkalai, IRRODL Regional Editors for the Middle East

Looking under the Bonnet: Factors Affecting Student Adoption of E-Learning Systems in Jordan

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Abstract

The primary questions addressed in this paper are the following: what are the factors that affect students' adoption of an e-learning system and what are the relationships among these factors?

This paper investigates and identifies some of the major factors affecting students' adoption of an e-learning system in a university in Jordan. E-learning adoption is approached from the information systems acceptance point of view. This suggests that a prior condition for learning effectively using e-learning systems is that students must actually use them. Thus, a greater knowledge of the factors that affect IT adoption and their interrelationships is a pre-cursor to a better understanding of student acceptance of e-learning systems. In turn, this will help and guide those who develop, implement, and deliver e-learning systems.

In this study, an extended version of the Technology Acceptance Model (TAM) was developed to investigate the underlying factors that influence students' decisions to use an e-learning system. The TAM was populated using data gathered from a survey of 486 undergraduate students, who were using the Moodle based e-learning system at the Arab Open University. The model was estimated using Structural Equation Modelling (SEM). A path model was developed to analyze the relationships between the factors to explain students' adoption of the e-learning system. Whilst findings support existing literature about prior experience affecting perceptions, they also point to surprising group effects, which may merit future exploration.

Keywords: E-learning; technology acceptance model; Structural Equation Modelling; system adoption; Middle East

Introduction

In educational institutions (e.g., high schools, universities, etc.) and in work life, the question of how to utilise modern information and communication technologies for learning purposes is

important. E-learning in its broadest sense refers to any learning that is electronically enabled. In a slightly narrower sense, it is learning that is enabled by the application of digital technologies. Narrowed down further, it becomes any learning that is Web-based or Internet-enabled. Instruction over the Internet is perceived by many to be a significant breakthrough in teaching and learning (Keller & Cernerud, 2002; LaRose, Gregg, & Eastin, 1998). Many higher education institutions adopt Web-based learning systems for their e-learning courses. However, there is a limited empirical examination of the factors underlying student adoption of Web-based learning systems (Ngai, Poon, & Chan, 2007). Successful implementation of a system and adoption by learners requires a solid understanding of user acceptance processes and ways of persuading students to engage with these technologies (Saadé & Bahli, 2005).

There is much research that has addressed the antecedents of technology use (Mahmood, Hall, & Swanberg, 2001) in general, but the overwhelming majority of studies have focused on users in developed countries. Whilst developing countries have much to gain from exploiting the Internet and IT in general, they have received relatively little research attention (Hasan & Ditsa, 1998). This paper's focus on Jordan not only deals with the specific experience in that country but also adds significantly to our overall knowledge of the factors underpinning student acceptance of e-learning technology.

The Arab Open University (AOU) was founded by Prince Talal bin Abdul Aziz under the umbrella of the Arab Gulf Program for United Nations Development Organizations (AGFUND) and is headquartered in Kuwait; one of its first branches was founded in Jordan in 2002. The AOU was the first Jordanian university to adopt e-learning on a widespread basis and plays a critical role in e-learning development nationally. It operates in partnership with the UK Open University (OU) and deploys a Moodle-based e-learning management system to deliver courses and support to learners.

The Technology Acceptance Model (TAM)

The TAM is an adaptation of the theory of reasoned action (Fishbein & Ajzen, 1975) specifically tailored for modelling user acceptance of information systems. Thus, the TAM is an intention-based model. According to the theory of reasoned action, beliefs influence attitudes, which lead to intentions, which then generate behaviour. The TAM adopted this belief-attitude-intention-behaviour relationship to model users' acceptance of IT (Bernadette, 1996; Di Benedetto, Calantone, & Zhang, 2003; Riemenschneider & McKinney, 2001). The TAM posits that two factors, perceived usefulness and perceived ease of use, are of primary relevance in influencing IT acceptance behaviours. Following Davis (1989), the posited relationship between perceived usefulness and perceived ease of use is that perceived usefulness mediates the effect of perceived ease of use on attitudes and intended use. In other words, while perceived usefulness has direct impacts on attitudes and intended use, perceived ease of use also influences attitude and use indirectly through perceived usefulness. These direct and indirect effects are additive. In turn, these two factors are the product of a number of variables which are exogenous to the TAM itself. Figure 1 summarises the TAM.

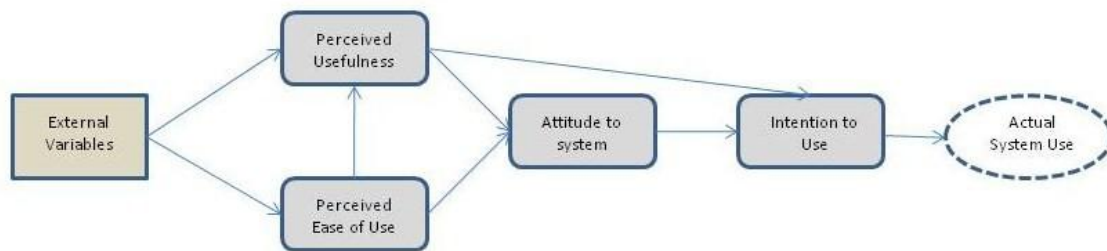


Figure 1: The Technology Acceptance Model (TAM)

Perceived ease of use is the degree to which an individual believes that learning to use a technology will require little effort. Perceived usefulness refers to the extent that a learner believes that use of the technology will improve his or her performance (see Efferson, Lalive, Richerson, Mcelreath, & Lubell, 2006).

The problem of measuring and finding the factors that determine computer usage has inspired many researchers during the past two decades. The Technology Acceptance Model (TAM) set the baseline for much future research in information and computer technology adoption and use (Davis, 1989). In the TAM, Davis proposed two determinants of computer usage: perceived usefulness and perceived ease of use. Later, other researchers expanded the TAM model to incorporate additional variables that may account for more variance in computer technology usage (see Venkatesh & Davis, 2000; Gefen & Straub, 1997). The TAM was originally developed to focus on IT system usage in the workplace. More recently, the TAM has been applied to the domain of e-learning (Carswell & Venkatesh, 2002). This paper develops an extended version of the TAM to investigate factors that influence a student's decision to use an e-learning management system.

Literature Review

Researchers have progressively developed the TAM by proposing and testing specific antecedents to its two use-belief constructs. Without considering antecedent factors, the TAM provides only very general information on users' opinions about a system and does not yield "specific information that can better guide system development" (Mathieson, 1991, p. 173). However, research on technology adoption often produces conflicting findings (Chen, Gillenson, & Sherrel, 2002) and care must be exercised in choosing potential external variables for inclusion in the study. The basis of choice proposed here is a combination of prior empirical evidence and expectations derived from the existing literature.

Subjective Norms

A subjective norm refers to a person's perception that significant others think she should or should not perform the behaviour in question (Fishbein & Ajzen, 1975). Taylor and Todd (1995) use the term "subjective norms" to refer to a person's perception of the social pressures put on him or her to perform the behaviour in question. Subjective norms have been found to have a significant direct (Ajzen, 1991; Mathieson, 1991; Taylor & Todd, 1995) and indirect (Venkatesh & Davis, 2000) effect in predicting an individual's intention to use computer technology. However, research results are variable. Some studies have found that it is not significant at all (e.g. Davis, 1986), whilst other studies have suggested that the effects of subjective norms decay over time and only remain significant in mandatory settings (Venkatesh & Davis, 2000). More recently, Lee (2006) found that subjective norms significantly influenced perceived usefulness. This study includes subjective norms as an independent variable with the expectation that they will positively influence behavioural intentions to use e-learning.

Internet Experience

Studies using the TAM have proposed that an individual's experiences with a specific technology influence perceptions of ease of use and usefulness of that technology. In addition, Kerka (1999) argued that learner success in distance learning depends on technical skills in computer operation and Internet navigation as well as the ability to cope with the substantive subject matter. Morss (1999) found empirical evidence that older students who had more experience of the technology used a learning management system (WebCT) more than younger students with less experience of IT.

System Interactivity

The key elements of learning processes are the interactions among students themselves, the interactions between faculty and students, and the collaboration in learning that results from these interactions. A major source of developments in e-learning has come via technologies that promote increased learner interaction. Interactions can be either synchronous or asynchronous. Thus, system interactivity is expected to be one of the factors that may affect students' adoption of e-learning systems. Davis, Bagozzi, and Warshaw (1989) argued that objective system characteristics have a direct impact on perceived usefulness and ease of use. In a study of the adoption of e-mail and text editors, Davis (1989) found that the TAM fully mediates the effects of system characteristics on usage behaviour.

Self-Efficacy

Self-efficacy is an important concept in social learning theory (Bandura, 1977). Self-efficacy is an individual's belief in her capability to perform certain behaviours or one's personal beliefs about her ability to perform certain tasks successfully. Several studies have found that perceptions of self-efficacy influence decisions about what behaviours to undertake, persistence in attempting certain behaviours, and the actual performance attainments of the individual with respect to those behaviours (Brown & Inouye, 1978; Wood & Bandura, 1989). In the e-learning

context, self-efficacy is interpreted as a student's self-confidence in his or her ability to perform certain learning tasks using a learning management system (LMS). A student who has a strong sense of his capability in dealing with a LMS may have a more positive perception of its ease of use and usefulness and is likely to be more willing to accept and use the system.

Technical Support

The availability of technical support is one of the important factors in determining the acceptance of technology for teaching (Williams, 2002). This is especially the case in the beginning stage of technology adoption. Venkatesh (1999) found that facilitating conditions and external control served as anchors that users employ to inform perceived ease of use about information technology. Support as a facilitating condition and external control were strong determinants of perceived ease of use. Empirical evidence shows that e-learning projects that were not successful in achieving their goals did not have access to technical advice and support (Alexander & McKenzie, 1998; Soong, Chan, Chua, & Loh, 2001). Recently, Ngai et al. (2007) extended the TAM to include technical support as an external variable in explaining use of WebCT.

Figure 2 shows our initial model. This combines the hypothesised effects drawn from the literature. Letters in brackets show the shortened names for variables that will be used in this paper.

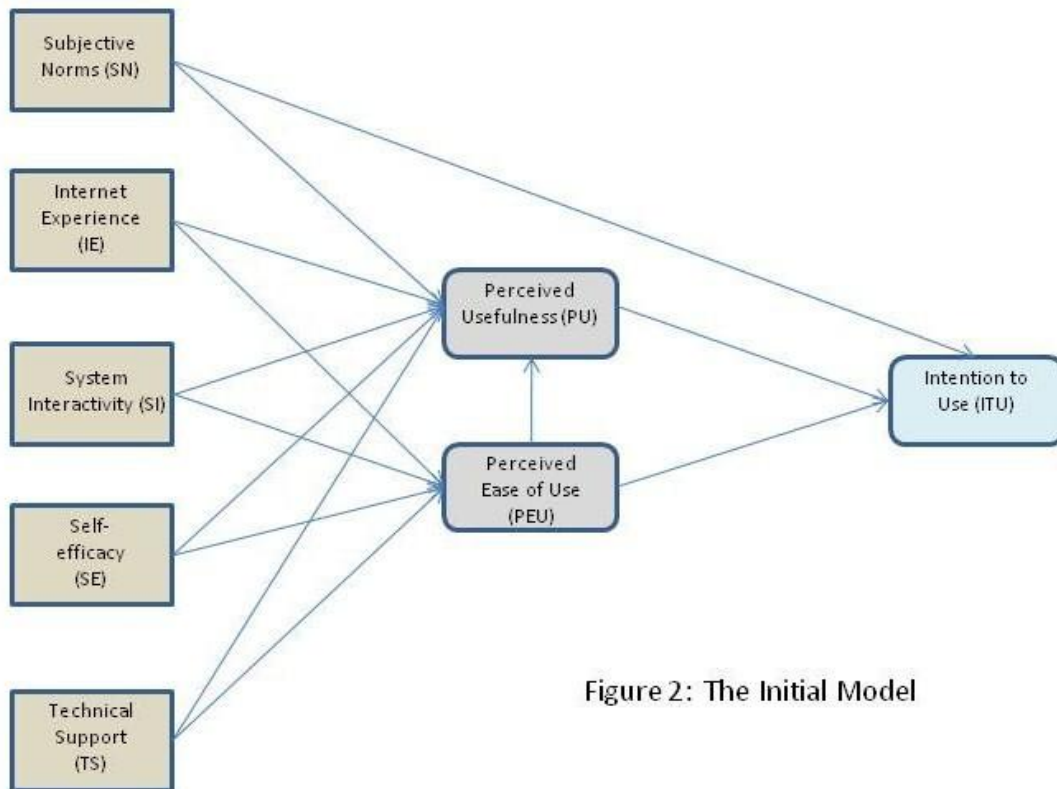


Figure 2: The Initial Model

Methodology

Participants in the Study

Participants in the study consisted of undergraduate students who were taking the last lecture of the first basic computer literacy classes at the Arab Open University (AOU) in Jordan. Participation in this study was voluntary, and 486 of 654 students (74.3%) who were enrolled in these classes agreed to take part. Sixteen questionnaires with significant levels of missing data were identified and removed from the study. Thus, 470 completed questionnaires were included in the analysis. A summary of demographic characteristics of participants is shown in Table 1.

Table 1

Summary of Demographic Characteristics of Research Participants

Variable	No. of Respondents	Percent (%)
Gender:		
Male	151	32
Female	319	68
Age:		
Under 20 years	31	6.6
20 - under 30 years	283	60.2
30 - under 40 years	133	28.3
Above 40 years	23	4.9
Faculties:		
Faculty of Language Studies	120	25.5
Faculty of Business Studies	72	15.3
Faculty of Computing Studies	60	12.8
Faculty of Educational Studies	214	45.5
Faculty of General Studies	4	0.9
Occupation:		
Not working	200	42.5
Part-time worker	54	11.5
Full-time worker	216	46
Computer at home:		
Yes	381	81
No	89	19
Internet access at home:		
Yes	210	44.7
No	260	55.3
Internet experience:		
Never	71	15.1

Less than 1 year	127	27
1 – 2 years	65	13.9
More than 2 years	207	44

The Research Instrument

A majority of studies using the TAM have relied on survey methodology for data collection. The survey method used in this study is similar to that used in previous TAM studies, thus enabling continuity and comparability with previous research. A seven-point Likert scale was used to measure students' level of agreement or disagreement with 36 items. These items were adapted and refined from previous studies (e.g., Davis, 1986; Ajzen, 1991) to make them more specifically relevant to the current research. Appendix A specifies the survey items used in the final estimation of the model. Since Arabic is the main language spoken in Jordan, the empirical study was conducted in the Arabic language. The original survey instrument was developed in English and then independently translated into Arabic by two expert bilingual speakers with a general knowledge of higher education. The two versions were compared and a final version agreed upon. The Arabic version was pilot tested using 30 Arab Open University students to ensure usability.

Research Methods

This research uses a three-stage approach. Firstly, previous studies were reviewed to help build an initial model based on the TAM approach. Secondly, a survey was constructed to provide measures of the factors identified; the measures were further developed using confirmatory factor analysis (CFA). Finally, a structural model (summarised in Figure 2) was developed and estimated using structural equation modelling (SEM) techniques. SEM is a comprehensive statistical approach to testing hypotheses about relationships among observed and latent variables (Hoyle & Panter, 1995). A major advantage of SEM is the ability to estimate a complete model incorporating both measurement and structural considerations. In SEM the measurement model shows the statistical relationship between the latent and observable (also known as measured or indicator) variables. The measurement model does not look at relationships between latent variables. Here latent variables are those shown in the boxes of Figure 2, whilst the measured variables are the sets of responses to the individual survey questions. Thus latent variables (often called factors) are not measured directly but are estimated from observed variables. Once the measurement model that best explains the relationships has been identified or "confirmed" (i.e., uses the fewest observed variables to measure the latent variables), the structural model is estimated. This estimates potential causal dependencies between the latent variables. The structural model is usually expressed as a diagram known as a path model.

SEM techniques have been widely used in measuring user acceptance of information technology (Chau, 1996; Venkatesh, Morris, Davis, & Davis, 2003). In relation to technology uptake, a number of published studies have adopted the SEM approach; examples include Moon and Kim (2001), Selim (2003), Venkatesh (1999), and Venkatesh and Davis (2000). However, it is not the

purpose of this paper to provide a full discussion of SEM techniques and a full account can be found in Bollen (1998).

Confirmatory factor analysis (CFA) was used as the first step of the two-step sequence of analysis (identifying the measurement model). Revisions to the model were made based upon the general guidelines suggested by MacCallum (1986) and Anderson and Gerbing (1988). As a general rule, modifications are made one at a time since a single change might affect other parts of the solution. CFA was conducted using AMOS 7.

In practice, several survey items are often statistically associated with (loaded on) more than one latent variable (factor). Each of these items is removed from the estimation model one at a time, and the model re-estimated. The general sequence of item deletion begins with the item having the most factors loaded. The remaining items are used in final (measurement) model estimation. Cronbach's α is usually used to assess the internal consistency of the multi-item scales.

Results

Model Estimation

Initial model estimation indicated a poor model fit. Six common model-fit measures were used to assess the model's overall goodness-of-fit: the ratio of χ^2 to degrees-of-freedom, goodness-of-fit index, adjusted goodness-of-fit index, normalized fit index, comparative fit index and root mean square error of approximation. The initial model was only acceptable on the root mean square error of approximation test. The final model was derived through the process of progressively deleting items and re-estimating the model. In terms of overall goodness-of-fit, the final model met all six of the criteria identified above. The model also met Bollen's (1998) criteria for identification. Appendix A shows the items used in the final model estimation. The α score for each of the eight factors was higher than the usually accepted threshold level of 0.7 as Table 2 shows.

Table 2

Composite Reliability

Factor	Variables	Composite Reliability α
Perceived Usefulness	PU1 PU3 PU4	0.847
Perceived Ease of Use	PEU3 PEU4 PEU6	0.874
Intention to Use	IU1	0.877

	IU2 IU3 IU4	
Subjective Norms	SN2 SN3 SN4	0.844
Internet Experiences	IE2 IE3	0.864
System Interactivity	SI1 SI2 SI3	0.846
Self-Efficacy	SE2 SE3 SE4	0.836
Technical Support	TS2 TS3	0.802

Discriminant validity is the extent to which a given statistical construct (here a latent variable) is distinct from other constructs (Hair, Black, Babin, Anderson, & Tatham, 2006). Thus, high discriminant validity provides evidence that a statistical construct is unique and captures some phenomenon that other measures do not. Discriminant validity is said to be present when cross-correlations between indicators measuring different factors are not excessively high and, therefore, correlations between the latent variables (factors) are only moderately strong (Kline, 1998). As shown in Table 3, factor correlation coefficients, ranging from 0.389 to 0.797, all indicated that the eight constructs were correlated yet distinct constructs and, therefore, provided a strong evidence of discriminant validity. Generally, a cross-factor correlation of 0.85 or higher indicates that the two factors might be measuring the same underlying constructs.

Table 3

Factor Correlations

	PEU	PU	ITU	TS	SE	SI	IE	SN
PEU	1							
PU	0.715	1						
ITU	0.797	0.791	1					
TS	0.416	0.52	0.474	1				
SE	0.727	0.64	0.691	0.452	1			
SI	0.491	0.541	0.585	0.519	0.638	1		
IE	0.598	0.441	0.516	0.438	0.6	0.477	1	
SN	0.508	0.551	0.558	0.389	0.57	0.65	0.456	1

Correlations greater than 0.3 for the sample size of 470 used in the analysis are statistically significant at the 0.01 level. An inspection of the correlation matrix reveals that all of the inter-item correlations were significant (greater than 0.3) at the 0.01 level. The correlation matrix for the survey items (as opposed to the factor correlations discussed here) is shown in Appendix C.

The Structural Model

CFA alone is limited in its ability to examine the nature of relationships between variables beyond simple correlations (Hair et al., 2006). A structural theory is a conceptual representation of the relationships between constructs. It can be expressed in terms of a structural model that represents the theory with a set of structural equations and is usually expressed in a visual form. A path analysis for the structural equation model with latent variables (see Appendix D) was performed to evaluate the hypothesized relationships that help predict students' behavioural intentions to use e-learning systems.

The commonly used measures of model fit, based on results from an analysis of the structural model, are summarized in Table 4. The results indicated an acceptable fit to the data. The model was also fully identified according to Bollen's (1998) criteria.

Table 4

SEM Statistics of Model Fit

Model goodness-fit indexes	Recommended value	Result in this study
Chi-square		504.533 *
Degrees of freedom		208
Chi-square/degree of freedom	≤ 3.0	2.426
Goodness-of-fit index	≥ 0.90	0.914
Adjusted goodness-of-fit index	≥ 0.80	0.886
Normalized fit index	≥ 0.90	0.927
Comparative fit index	≥ 0.90	0.955
Root mean square error of approximation	≤ 0.08	0.055

Note: N = 470, * p< 0.05

Table 5 shows the effects of the observed variables on the latent variables. These do not show causality in other than a statistical sense; although, of course, we have a priori reasons (discussed at the outset of this paper) to believe that causality in the wider sense is present. Direct effects are those where a change in variable x results in a change in variable y ($x \rightarrow y$). Indirect effects occur when the change in variable y contingent on a change in x operates through a third variable z ($x \rightarrow z \rightarrow y$). The total effect is the sum of the direct and indirect effects and is the correlation between the two variables. Following Cohen (1992), total effects of greater than 0.5 can be said to be of medium strength whilst those in the 0.2 to 0.5 range can be said to be small (large effects require correlations of 0.8 or more.) Effects of size greater than 0.2 are shown in bold. R^2 (the

coefficient of determination) is a measure of the proportion of the variability in a particular variable explained by the model; for example, the model explained 75% of the variability in *Intention to Use*.

Table 5

Standardized Causal Effects

Factor	Determinant	Direct Effect	Indirect Effect	Total Effect
Perceived Ease of Use (R ² = 0.580)	IE	0.233	-	0.233
	SI	0.001	-	0.001
	SE	0.567	-	0.567
	TS	0.062	-	0.062
Perceived Usefulness (R ² = 0.613)	PEU	0.495	-	0.495
	SN	0.162	-	0.162
	IE	-0.129	0.115	-0.014
	SI	0.064	0.001	0.064
	SE	0.130	0.280	0.411
	TS	0.218	0.031	0.249
Intention to Use (R ² = 0.75)	PU	0.412	-	0.412
	PEU	0.450	0.204	0.654
	SN	0.119	0.067	0.185
	IE	-	0.099	0.099
	SI	-	0.027	0.027
	SE	-	0.424	0.424
	TS	-	0.130	0.130

However the information in Table 5 is not sufficient to tell whether or not a particular path value is (statistically) significant. To test for this we need to compare the estimates of the path values with the variability in those estimates. Table 6 shows the critical ratios (t-test values) obtained by dividing the path values by their standard errors.

Table 6

Results of Path Tests

Path	Critical Ratio	Sig. Level	Comment
IE → PEU	4.199	0.001	Sig.
SI → PEU	0.019	0.985	Not Sig.
SE → PEU	7.788	0.001	Sig.
TS → PEU	1.182	0.237	Not Sig.
SN → PU	2.647	0.008	Sig.
PEU → PU	6.734	0.001	Sig.

IE → PU	-2.280	0.023	Sig.
SI → PU	0.919	0.358	Not Sig.
SE → PU	1.616	0.106	Not Sig.
TS → PU	4.096	0.001	Sig.
SN → ITU	2.742	0.006	Sig.
PEU → ITU	7.765	0.001	Sig.
PU → ITU	6.601	0.001	Sig.

The results shown in Tables 5 and 6 should be interpreted together. Note that Table 6 does not include paths with indirect-only effects. A path with a small effect can satisfy the t-test if the standard error is also very small. However, the fact remains that the effect is so small it indicates no ‘real’ effect. This occurs in three cases (SN → PU, IE → PU and SN → ITU). Similarly a path with an acceptable effect coefficient can have a large standard error and thus not be significant on a t-test. This occurs with the SE → PU path. Only paths that satisfy both tests can usefully be regarded as being statistically significant. These are shown in bold in Table 6.

Results

The final model is summarised in Figure 3. Heavier lines indicate the stronger effects; thinner lines indicate small effects. The arrows show the implied direction of causality in the relationships between factors.

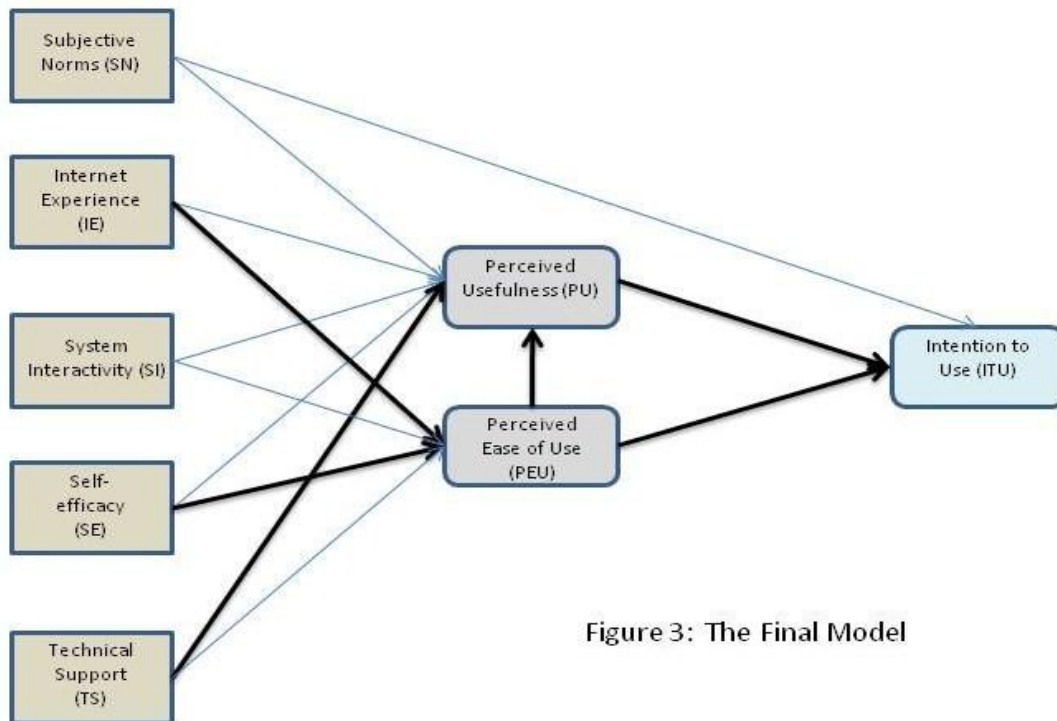


Figure 3: The Final Model

Another way of representing our results is through the estimated structural equations for the model, which are as follows:

$$\text{PU} = 0.476\text{PEU} + 0.167\text{SN} - 0.102\text{IE} + 0.146\text{SE} + 0.194\text{TS}$$
$$R^2 = 0.613$$

$$\text{PEU} = 0.191\text{IE} + 0.001\text{SI} + 0.659\text{SE} + 0.057\text{TS}$$
$$R^2 = 0.580$$

$$\text{IU} = 0.434\text{PU} + 0.456\text{PEU} + 0.129\text{SN}$$
$$R^2 = 0.75$$

The findings show that self-efficacy is an important determinant of perceived ease of use. This is consistent with the results of Venkatesh and Davis (1996). Self-efficacy showed a strong direct effect (0.567) on perceived ease of use. The result is also consistent with that of Davis (1989), who argued that computer self-efficacy and perceived ease of use are related and similar.

A student's prior Internet experience has a statistically significant influence upon perceived ease of use but not perceived usefulness. This finding is at variance with those of Igbaria, Gamers, and Davis (1995), who found that the level of computing experience had a significant direct influence on perceived usefulness and perceived ease of use.

Previous studies have demonstrated mixed results where the effects of subjective norms are concerned. Venkatesh and Davis (2000) showed a direct effect between subjective norms and both intention to use a system and perceived usefulness. Previous findings (Davis et al., 1989; Mathieson, 1991) failed to establish statistically significant relationships between these variables, as is the case here. Of course different studies refer to different times, places, technologies, and cultural contexts, and this is a potentially persuasive reason why they are not necessarily comparable.

System interactivity refers to students' perceptions of the system's ability to provide interactive communication between instructor and students and among students. This study does not provide any evidence that system interactivity affects students' adoption of e-learning systems.

Perceptions of the level of technical support available to users were found to have a direct effect on perceived usefulness and reasonable indirect effect on intention to use. This result was consistent with that of Ngai et al. (2007).

Discussion

The primary objective of this study is to analyse the factors influencing students' acceptance of e-learning. Previous findings from the field of technology acceptance research suggest that for the advantages of a technology to be attained, the technology must be accepted and used (Venkatesh

et al., 2003). The application of the TAM to e-learning is relatively new, and the power of SEM has the potential to add new insights into the factors underpinning students' acceptance of e-learning technology. The location of the study in Jordan, a developing country, is also a needed departure from the bulk of previous work.

Our results lead to four conclusions:

1. Students who are frequent and/or heavy users of the Internet are more likely to use e-learning systems.
2. Students who are confident in their ability to master an e-learning system, without help, are more likely to become users.
3. Students are reassured by the availability of back-up technical support.
4. Students believe that an e-learning system will be more useful to them if it is easy to use.

Of course we may argue that such conclusions are unsurprising and perhaps even uninspiring, but they may also point to a latent construct around the areas of confidence and path dependence from prior learning trajectories which form future areas of research, for example, de Nahlik and Morris (2008).

However the "negative" findings are also of interest. Frequent Internet users are more likely to use e-learning systems because they believe they will be easy to use rather than useful per se. This apparently contradicts the 2006 study by Efferson et al. but suggests that the payoff is of lesser importance. However, again this offers future research possibilities in that it could be explained by deconstructing perceptions of use and the nature of the payoff, to use the Efferson et al. (2006) construct. It may be that the study award is not perceived in the same way as "usefulness" but relates to perceptions of a higher order goal, which could, for example, be conceptualised by returning to Maslow (1943) and his level of "esteem" constructs.

The effects of Internet use on beliefs about LMS usefulness are an indirect product of perceptions of how easy to use a system might be. On the other hand the availability of technical support is a direct influence on perceived usefulness but not ease of use. This would seem to suggest that a well-designed e-learning system or LMS should have a reassuring and intuitive user interface, which promotes confidence among potential users.

There is no strong evidence in our work that subjective norms or system interactivity influences students' intentions to use e-learning systems. Whilst the former is of no great consequence for the design of e-learning systems, the latter would seem to run counter to our aims to develop collaborative e-learning pedagogies. The development of e-learning is in its infancy in Jordan and it may well be that students' expectations of e-learning systems did not embrace communication capabilities. Indeed the results for system interactivity and subjective norms may reinforce each other. If there is no great expectation that an e-learning system will be used for communication purposes then there will be little peer pressure to use the system.

Finally, given the subject of this special edition of IRRODL, it may also be worth considering and celebrating differences in linguistic structures and social patterns of interactions. Cultures that are more focused on oral traditions may be less engaged with e-learning (other than as a conduit to information) and may use existing social interactive structures that lie outside of any LMS to collaborate. Much e-learning material is prepared using Western pedagogic models. Are we using a less appropriate cultural lens to explore this subject?

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Appendix A

Survey Items Used in the Final Estimation of the Model

Previous Studies		Perceived usefulness
Davis, 1986	PU1	Using the e-learning system (LMS) would allow me to accomplish learning tasks more quickly
	PU3	Using the LMS would enhance my effectiveness in learning
	PU4	Using the LMS would increase my productivity in learning
		Perceived ease of use
Davis, 1986	PEU 3	My interaction with the LMS is clear and understandable
	PEU 4	Getting the information from the LMS is easy
	PEU 6	Overall, I find the LMS easy to use
		Intention to use
Davis, 1986	IU1	I intend to use the LMS to study
	IU2	I intend to study other subjects through a LMS
	IU3	I intend to increase my use of the LMS in the future
	IU4	Having used the LMS, I would recommend it to my colleagues to use it for study purposes
		Technical support
Venkatesh, 1999	TS2	A hotline is available when there is technical problem
	TS3	E-mail enquiries can be made when there is technical problem
		Internet experience
Tan and Teo, 2000	IE2	I spend many hours using the Internet
	IE3	I frequently use the Internet
		Subjective norms
Ajzen, 1991	SN2	My instructors think that I should use LMS
	SN3	People who are important to me think that I should use LMS
	SN4	People who are influence my behaviour think that I should use LMS
		System interactivity
Davis, 1989	SI1	The LMS enables interactive communications between instructor and students
	SI2	The LMS enables interactive communications among students
	SI3	The communicational tools (e-mail, chat room, forum, etc) in the LMS are effective
		Self-efficacy
Tan and Teo, 2000	SE2	I am confident of using the LMS even if there is no one around to show me how to do it

	SE3	I am confident of using the LMS even if I have never used such a system before
	SE4	I am confident of using the LMS as long as someone shows me how to do it

Appendix B

Factor Loadings

Item	Component							
	1	2	3	4	5	6	7	8
PU1	.261	.663	.191	.173	.003	.256	.143	.137
PU2	.251	.770	.065	.149	.187	.136	.125	.184
PU3	.256	.728	.179	.235	.196	.158	.158	.001
PU4	.289	.681	.179	.219	.093	.139	.102	.066
PU5	.267	.664	.366	.014	.233	.163	.055	.084
PU6	.285	.640	.398	.063	.229	.116	.086	.100
PEU1	.187	.403	.614	.086	.217	.111	.107	.189
PEU2	.304	.474	.489	.191	.151	.157	.092	.121
PEU3	.290	.238	.732	.142	.152	.145	.090	.168
PEU4	.348	.251	.620	.243	.150	.158	.117	.130
PEU5	.314	.229	.580	.356	.051	.012	.030	.316
PEU6	.327	.243	.631	.299	.091	.067	.041	.257
IU1	.592	.355	.303	.111	.092	.068	.226	.193
IU2	.628	.136	.381	.165	.081	.143	.135	.161
IU3	.664	.293	.151	.201	.188	.151	.107	.182
IU4	.614	.394	.182	.104	.188	.190	.082	.132
ATT1	.713	.275	.199	.156	.187	.126	.123	.107
ATT2	.622	.432	.147	.224	.126	.092	.163	.063
ATT3	.601	.247	.227	.313	.032	.145	.261	.038
ATT4	.692	.207	.216	.197	.201	.190	.144	.065
TS1	.234	.168	.222	.080	.270	.545	.248	-.050
TS2	.061	.204	.001	.111	.107	.782	.120	.179
TS3	.167	.198	-.009	.140	.072	.820	.094	.091
TS4	.226	.112	.344	.031	.079	.663	.202	.134
TS5	.106	.083	.359	.238	.052	.442	.440	.141
IE1	.188	.120	.262	.282	.085	.053	.245	.633
IE2	.122	.100	.212	.185	.147	.173	.092	.795
IE3	.144	.150	.156	.136	.170	.159	.129	.838
SN1	.258	.118	.130	.251	.638	.236	.119	.236
SN2	.147	.127	.214	.147	.786	.141	.091	.067
SN3	.148	.213	.107	.158	.794	.061	.206	.102
SN4	.115	.232	.026	.168	.676	.051	.372	.126
SI1	.156	.158	.091	.168	.202	.174	.782	.100
SI2	.166	.062	.024	.168	.202	.200	.789	.098
SI3	.241	.208	.099	.152	.204	.144	.670	.203
SE1	.303	.150	.278	.487	.218	.239	.330	.139
SE2	.202	.188	.275	.632	.081	.152	.213	.274

SE3	.247	.092	.250	.738	.159	.142	.150	.169
SE4	.192	.193	.089	.712	.187	.058	.271	.102
SE5	.193	.238	.111	.765	.283	.109	.036	.166

Note: Factor loadings in bold

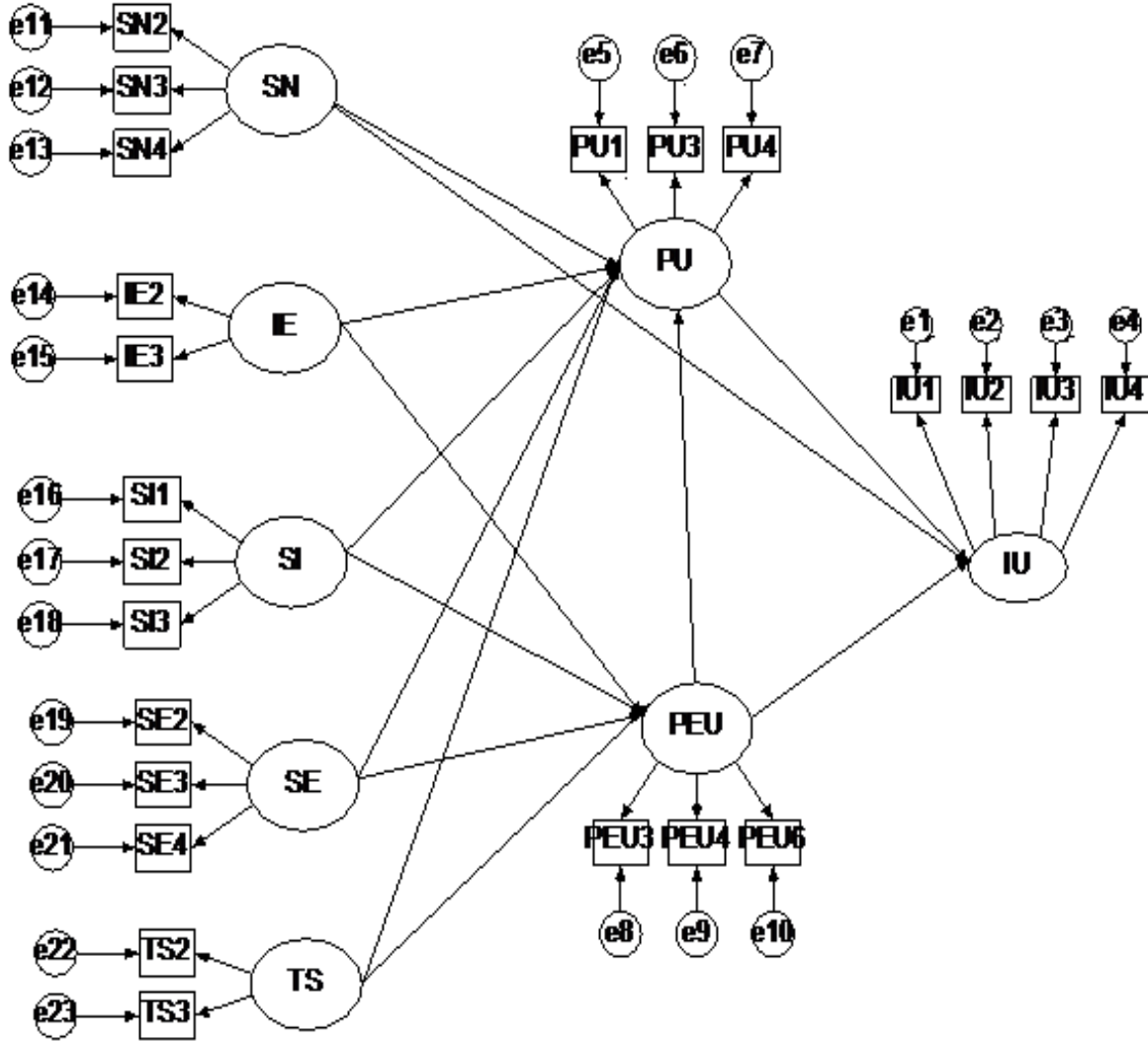
Appendix C

Survey Item Cross-Correlations

	PEU3	PEU4	PEU6	PU1	PU3	PU4	IU1	IU2	IU3	IU4	TS2	TS3	SE2	SE3	SE4	SI1	SI2	SI3	IE2	IE3	SN2	SN3	SN4	
PEU3	1																							
PEU4	0.708	1																						
PEU6	0.684	0.705	1																					
PU1	0.461	0.476	0.46	1																				
PU3	0.498	0.514	0.497	0.66	1																			
PU4	0.474	0.488	0.472	0.62	0.67	1																		
IU1	0.548	0.564	0.546	0.51	0.55	0.52	1																	
IU2	0.515	0.531	0.513	0.48	0.52	0.49	0.65	1																
IU3	0.537	0.554	0.536	0.5	0.54	0.52	0.67	0.63	1															
IU4	0.521	0.536	0.519	0.49	0.53	0.5	0.65	0.61	0.64	1														
TS2	0.279	0.287	0.278	0.33	0.35	0.34	0.32	0.3	0.31	0.3	1													
TS3	0.286	0.295	0.285	0.34	0.36	0.35	0.33	0.31	0.32	0.31	0.67	1												
SE2	0.504	0.519	0.502	0.42	0.45	0.43	0.48	0.45	0.47	0.46	0.31	0.31	1											
SE3	0.501	0.516	0.5	0.42	0.45	0.43	0.48	0.45	0.47	0.45	0.3	0.31	0.7	1										
SE4	0.432	0.445	0.431	0.36	0.39	0.37	0.41	0.39	0.4	0.39	0.26	0.27	0.6	0.6	1									
SI1	0.334	0.344	0.333	0.35	0.37	0.36	0.4	0.37	0.39	0.38	0.34	0.35	0.44	0.44	0.38	1								
SI2	0.33	0.34	0.329	0.34	0.37	0.35	0.39	0.37	0.39	0.37	0.34	0.35	0.43	0.43	0.37	0.67	1							
SI3	0.318	0.328	0.317	0.33	0.36	0.34	0.38	0.36	0.37	0.36	0.33	0.34	0.42	0.42	0.36	0.64	0.63	1						
IE2	0.429	0.442	0.428	0.3	0.32	0.31	0.37	0.35	0.36	0.35	0.31	0.32	0.43	0.43	0.37	0.34	0.34	0.32	1					
IE3	0.435	0.448	0.433	0.3	0.33	0.31	0.38	0.35	0.37	0.36	0.31	0.32	0.44	0.44	0.38	0.34	0.34	0.33	0.76	1				
SN2	0.321	0.331	0.32	0.33	0.35	0.34	0.35	0.33	0.35	0.34	0.24	0.25	0.36	0.36	0.31	0.41	0.4	0.39	0.3	0.31	1			
SN3	0.356	0.367	0.355	0.36	0.39	0.37	0.39	0.37	0.38	0.37	0.27	0.27	0.4	0.4	0.35	0.45	0.45	0.43	0.33	0.34	0.65	1		
SN4	0.337	0.347	0.336	0.34	0.37	0.35	0.37	0.35	0.36	0.35	0.25	0.26	0.38	0.38	0.33	0.43	0.42	0.41	0.32	0.32	0.61	0.68	1	

Appendix D

Structural Model



April – 2009

Regional Focus Issue: Bridge over Troubled Waters ~ Cengiz Hakan Aydin and Yoram Eshet-Alkalai, IRRODL Regional Editors for the Middle East

Exploring Open Distance Learning at a Jordanian University: A Case Study

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Abstract

This case study explores an open distance learning program offered by the Information Technology and Computing (ITC) department at AOIJ, a major university in Jordan. It provides an overview of e-learning in the Arab region and explores factors that affect ODL quality in the Arab Open University in Jordan (AOIJ). The research utilized a qualitative approach, which included five lengthy semi-structured interviews with the program director, two instructors, and three students. Three important conclusions can be drawn from the study about e-learning in the Arab region: (1) the existence of adverse conditions, (2) the presence of strong instructional practices, and (3) the need to improve administrative support.

Introduction

The field of open and distance learning (ODL) has many well-respected journals and ample documentation of institutional success stories and student learning, especially in developed countries (Allen & Seaman, 2004; Ashby, 2004). Numerous position papers from authorities are now documenting the potential of the “Read/Reflect/Write/Participate” Web (Richardson, 2006, pp. 125-133). ODL was started as an alternative and secondary form of education utilizing communication technologies within an information transmission model. It is now recognized as a ground-breaking form of teaching and learning in which technology, information, media, and interaction converge.

For several years, distance education has been used as an instructional mode in numerous countries around the world. Well-known universities, such as the University of Georgia (USA), Open University (UK), and the Open University of Japan, to name a few, have been utilizing distance education in programs to teach engineering, business, education, and arts etc. This mode of teaching, according to Knowles' theory of andragogy, helps learners take control of their education and provides them with opportunities to learn at their own pace and at times and places compatible with their life commitments (Knowles, 1984). In addition, instructional delivery methods and technologies are changing and constantly improving the effectiveness of distance education.

However, a quick review of the literature shows that distance learning programs face challenges. For example, Moiduser et al. (2000) found that many online programs do not exhibit evidence of innovative pedagogical approaches, such as using constructivist learning principles. Vygotsky's social construction theory states that learning is a social, active, and interactive process, and such theory highlights the needs for actively incorporating principles of collaborative and cooperative learning. A third challenge to distance education is students' motivation and commitment to engaging in new learning methods. Masie (2002) stated that beginning e-learners should be exposed to simple and single methods of instruction in order for them to master the online material.

In developing countries, the growth of ODL has been severely deterred due to the lack of technological infrastructure, negative perceptions of online degrees and learning, and unstable socio-political environments (Enuku & Ojogwu, 2006; Rennie & Mason, 2007). About a decade ago, Jamlan (1995) stated that higher education in the Arab region has underserved public and societal needs and duplicates work and resources between competing institutions. He also pointed out that most universities in the Arab region create their own policies and make decisions about curriculum and specialization based on the needs of the host country without cross-national or institutional comparisons. To counter this ineffectiveness, Jamlan proposed an Open University model. Despite the good intentions of governments and institutions, the growth of ODL in the region seems to have been much slower than the advancement of ODL in many other nations. With modern ODL technologies providing greater opportunities for access and sharing of quality education, it is critical to examine the contextual factors that interfere with the development and integration of ODL program models.

The literature reveals that the success of ODL in developed countries does not come without challenges. Researchers state that a successful ODL program is a result of coordinated efforts between a strong organization, instructional and program staff members, and learners (Owen & Demb, 2004; Yoon, 2003). For cross-national ODL ventures, flexible and supportive policies and institutional adjustments are viewed as additional necessities (Bailey, 1999). The quality and

success of student learning and ODL programs are affected by numerous instructional and administrative factors. Critical factors include faculty development and student assessment (see the *Journal of Asynchronous Learning Network*, volume 4, issues 2 and 3), instructional design (Garner, 2005), program business models (Vignare, Geith, & Schiffman, 2006), blended learning (Osguthorpe & Graham, 2003), and student retention (for a review, see the *Journal of Open Learning*, volume 19, issue 1), to name a few. Among these topics, proper design and implementation of interactive courses and institutional, learner, and technology support are viewed as particularly important (Phipps & Merisotis, 2000).

In view of the challenges mentioned above (i.e., multiple factors affecting the quality of ODL, less established technological infrastructure in developing countries, and less supportive cultural and socio-political environments for ODL in the Arab region), this study attempted to explore pedagogical and administrative models in the region. To do so, the Arab Open University at Jordan (AOUJ) was purposefully selected for this study. AOUJ was envisioned and initiated in the late 1990's by Prince Talal Bin Abdul Aziz, President of the Arab Gulf Program for the United Nations Development Organizations (AGFUND). The structure of the university was a collaborative effort among multiple participating Arab countries. The mission was to provide higher and continuing education to underserved populations and regions through advanced technologies. For the above reasons, AOUJ presented an appropriate context. In exploring suitable program models, we examined the selected institution's various ODL practices, which use the widely supported Instructional Systems Design model of analyzing, designing, developing, implementing, and evaluating (ADDIE) as a framework (Dick, Carey, & Carey, 2000). We explored the factors affecting ODL quality in one specific program at AOUJ. To better understand the issues of this case, we used the following research questions to guide our study: (1) What is the general condition of e-learning in the Arab region? (2) What are the factors affecting ODL in one educational program at AOUJ? (3) How does AOUJ manage the support of faculty and students as well as administration?

Method

A single case study design was used to obtain a better understanding of the setting and phenomena (Creswell, 1998). The case study was conducted between May and September 2008 and focused on an open distance learning program offered by the Information Technology and Computing (ITC) department at AOUJ, a major university in Jordan. The open learning program provides online learning modules for university students to increase their learning achievements and fulfill curriculum and personal goals. Courses offered in the program contribute to the completion of a degree certificate. A key component of this program is its emphasis on online activities in the form of blogs, Web pages, discussion boards, and other asynchronous online communications that aim to impact students' performance.

The research utilized a qualitative approach, which included conducting five lengthy, semi-structured interviews with the program director, two instructors, and three students. The first interview with the program director investigated the formal structures, processes, and background of the program. The director also had teaching and program coordination experience at AOIJ. The second interview was with the program's two senior instructors, called staff tutors, and investigated the preparation for and perceptions of the program, attitudes towards students, and opinions about some factors that affect the learning process. In addition, three students, one male and two females, were interviewed to get their perceptions of the program and whether and how it helped them learn better and develop new skills. All interviews were done by phone, and follow-up conversations were carried out through e-mail to clarify certain ideas. Guidelines for creating interview questions and triangulating multiple data sources for analysis were used (Merriam, 1998; Yin, 1994). To validate the researchers' interpretations of the interviews, member check was conducted and reviews of the program's online material and Web site were performed. An expert, a faculty member of instructional design and technology, checked all interview questions for face validity and appropriateness before the questions were sent to the contacts (Merriam, 1998).

Data Collection and Analysis

Our contacts provided us with answers and further resources to the list of questions we formulated over the course of this study. To answer the research questions guiding the study, exploratory questions based on the ADDIE model were formulated (Dick, Carey, & Carey, 2000). Additional questions were used to gather information about the administrative structure and practices of the program. The researchers also collected related information and supporting evidence from secondary sources, including the AOIJ Web site and other published articles. Once all the data were collected, the authors sought to clarify interpretations of findings, implications, and conclusions through frequent discussions and reviews. We attempted to highlight important themes that emerged from descriptions of various ODL practices. We also included data about administrative changes that were required in view of surrounding cultures and environments. In the discussion section, we drew out common and disparate themes as well as implications for practice and followed these with recommendations for further research.

Two major limitations of this study should be noted. First, the findings of this study could be affected by the observer's subjectivity. While the depth of investigation gives a thorough understanding of one single study, it is likely that it is only specific to the case at hand and thus unsuited to generalization. Results of this study should be interpreted with caution and might be compared only to highly similar settings. This study followed a case study methodology for data collection. Different quantitative research and data gathering methods, such as using a survey

instrument, can provide different information and affect the interpretation and generalizability of the results.

Case Setting and Context

Jordan is a small Arab country with limited natural resources and a population of six million. Since the mid 1990s, the Jordanian government has undertaken a program of economic reform and has a development priority of leveraging human capital through education. Over the past 10 years, education in Jordan has been stressed as a main pillar for development and was adopted at all levels. Recognizing the value of academic partnership between countries and the potential benefits of ODL, the government signed an agreement in 2002 to support the AOU's mission and to provide physical and administrative resources. Thus AOUJ was created and academic instruction began in the fall of 2002. Since then, student enrollment has been growing continuously.

According to the AOUJ Web site and the director we interviewed, AOU consists of seven branches in seven countries with five deanships centered at the University's headquarters in Kuwait. Among the participants, Jordan was the first branch to be established in 2002. Since the program's inception, AOU has been licensed as a private Arab institution of higher education of special status.

Based on the concepts of open, flexible, and accommodating learning, the AOUJ lists six program goals and objectives on its Web page: (a) promote an open system of higher education that provides wide opportunities of studies for professional development and lifelong learning, (b) adopt the highest standards of excellence in the qualification and training of its students and in the stimulation of work generated by its faculty and staff, (c) graduate students capable of embracing current and emerging technologies and competent in working in a global economy, (d) foster an environment of intellectual development and pursuit of research dedicated to the service of the Arab and human societies, and (e) instill the spirit of upholding deeply rooted social and ethical values of the Arab-Islamic heritage and an appreciation for other human cultures and heritages.

The AOUJ open learning system is a form of distance education with enhancements for quality education. In order to avoid the limitations of correspondence study, which usually lacks lectures and faculty-student interaction, AOUJ's open learning philosophy adopted a tutoring process aimed at promoting a proactive environment of teaching and learning. This philosophy is supported by course lectures presented in a programmed and progressive mode using well-prepared textbooks, supporting notes, and other forms of delivery media (audio and video cassettes, CD-ROMs, online material). A library system and other computer-based resources are also deployed at AOUJ and are augmented by a number of Learning Centers (LCs), which are

distributed around the country.

AUOJ is trying to establish itself as a leading institution of open learning and a forum for lifelong education. Currently, AOIJ offers four programs: (1) English Language and Literature, (2) Information Technology and Computing (ITC), (3) Business Administration, and (4) Bachelor of Education. In this study, the ITC program was of interest.

The four programs at AOIJ differ in exact numbers of staff members but are fairly comparable. Within the ITC program, there are five full-time and 16 part-time faculty members. The full-time faculty members include two doctorate degree holders, who are called staff tutors, and three master's degree holders, who are called tutors. The demographics of students attending the ITC program reflect those of AOIJ students. The majority come from Jordan with a few from Saudi Arabia, Syria, Iraq, the Czech Republic, and the U.S.A. The male representation is a little higher than the female, and the majority of students are within the age group of 25 – 29 years.

Findings

This section is organized in accordance with the research questions. The results begin with the general conditions of e-learning in the Arab region and are followed by an overview of ODL at AOIJ then end with an exploration of the factors affecting the program.

Overview of E-Learning in the Arab World

According to the ITC program director, e-learning in the Arab world is still new, and benefits and challenges coexist. As of this writing, AOIJ is the only university in Jordan that provides e-learning programs. When asked to identify the current status and major challenges of e-learning at AOIJ and across the region, four issues were articulated by our interviewees. The first issue mentioned by all interviewees was low public esteem for online learning. The program director, for example, pointed out the high level of skepticism the public has toward online degrees and the public perception of low job prospects afterwards. As well, our interviewees agreed that competition from well-known higher education institutions, especially from reputable and accredited Western universities, was a major challenge to attracting quality applicants. The third issue that emerged from our interviews was the failure to use online management systems fully. The interviewees indicated that most universities in the region were using course management systems (such as WebCT) as limited and supplementary tools to support courses. One staff tutor considered this issue to be similar to “driving a sports car using only the first two gears.” The fourth issue that emerged was the unsatisfactory level of Internet connectivity, which frustrates both universities and students. The program director informed us that “university Internet speed sometimes fails to be as fast as needed and this discourages students to continue to be patient

especially when things are not downloading fast enough. Also, one of the students stated that “personal Internet connections operate at a very low speed and this adds to [their] frustration.”

These challenges are major reasons for the weakness of ODL in Jordan, but based on their responses, our interviewees seemed to be aware of the need for change and for developing and improving new technologies and implementing system-wide training to enhance the quality of ODL.

Data analysis did not provide enough evidence on how external environments (e.g., language, economy, culture, and socio-political environments) affected administrative or managerial aspects of the distance learning program, or whether they constituted a major influence. Rather, one of the respondents stated that the driver for AOIJ programs “has always been the quality of students’ educational experiences.”

Instructional Approaches

Our data provided us with salient information about recommended instructional approaches. A standing policy of the ITC program and AOIJ in general is to encourage and promote various means of communication between students and their instructors or tutors and amongst students. In addition, the program provided different information technology (IT) and Internet-based resources that helped achieve this goal.

Course Design and Development

A typical e-learning process involves planning, design, development, evaluation, delivery, and maintenance (Khan, 2004). The e-learning process is iterative in nature. In the ITC program, the components of the program have been updated and redesigned frequently. At AOIJ, program plans are developed and changed in accordance with local and regional market needs. Faculty revises the programs once every two years.

The program director informed us that the general course coordinator (GCC) takes responsibility for course design and development processes. Usually, the GCC designs and develops courses based on program requirements, student needs, and instructors’ feedback. AOIJ provides several support resources for the course designers, such as the course calendar, tutorials, final examinations, homework, and quizzes (including model answers). Courses are designed based on a course enrollment of 20 students per class. This number is decided on the basis of the roster capacity for best learning outcomes, tutor load, and support equipment needed.

The ITC Department uses Moodle, an open source learning management system (LMS). The

LMS enables content to be organized and delivered in a standardized way, as a course divided into modules and lessons, supported with quizzes, tests, and discussions. As well, the LMS is integrated into the university's student information system.

The content and courseware is updated each academic year through the regular meeting schedule for departments at both the branch level (AOUJ) and the university level (AOU). Once developed, these courses are monitored by external examiners, such as the Quality Assurance Agency for higher education (QAA) and the Open University Validation Services (OUVS), to ensure the quality of the content.

Course Delivery

According to the program director, it takes four months on average (one semester) for students to complete a course and five years to fulfill the requirements of the whole program. Tutorial sessions are planned as a means of useful and effective face-to-face interaction between students and their tutors. Tutors are expected to schedule office hours and arrange other means of communication with their students including email, chat platforms, and Web-based resources. Students are, in turn, encouraged to take advantage of these resources and to keep in contact with their tutors.

Common components of distance learning courses at AOIJ include tutorials, textbooks, online forums, teacher marked assignments (TMAs), homework, quizzes, final examinations, online group work for projects, PowerPoint presentations, and summaries. Some courses have audio/video tapes and software to simulate an environment for some practical activities. In addition, group work and student collaboration are highly encouraged, especially when doing course research work. Student collaboration is supported through the utilization of different tools and technologies, such as email, chat, discussion forums, and Web-based resources.

Evaluation

The quality of teaching and the delivery of information to target students are major concerns at AOIJ, which emphasizes evaluation, whether it relates to teachers, students, courses, or technologies. Staff tutors and external examiners conduct evaluations, and evaluation questionnaires are filled in by students. Teacher evaluation results are used for personnel decisions, such as performance appraisals and year-end incentives.

Course evaluations provide important data and determine the degree of success of the courses and the program. Both staff tutors (interviewees) indicated that "course evaluations are presented via face-to-face meetings between tutors and the GCC and are also available online." In addition,

“instructors complete a special Tutors’ Form every semester and for every course.” Other evaluations include a forum that is used by course teachers and the course coordinator and a course questionnaire completed at the end of the semester.

The collected data showed that student evaluations are presented through staff tutors, TMAs, computer managed assignments (CMAs), quizzes, and final examinations. They are presented using the log file of the LMS for students. The program director indicated that future plans for enhancement include activating student self-assessment quizzes.

Respondents indicated that they assessed the technology in use at least once. These evaluations are presented in the form of user satisfaction surveys, which are performed on three levels: administration, tutors, and students. The satisfaction rates are mostly above 80%. Other technology measures that only the program director mentioned include tutors’ assessment, course delivery, quality of the program used, software cost, software support system, and software performance (measured by troubleshooting occurrences per semester).

Support for Faculty, Students, and Administration

While the former questions address instructional practices at AOIJ, this section focuses on managerial and administrative practices within the program.

Faculty recruitment and training.

When hiring new tutors, AOIJ attempts to recruit the best candidates. The search committee, usually led by the GCC, considers the candidates’ academic qualifications, research record, experience, and computer literacy, among other skills. The director of the ITC program at AOIJ informed us that preference is given to candidates who have some experience and familiarity with distance learning tools, but this is not a necessary condition since the AOIJ concept is new. Training and support is available to tutors who design and develop the online instruction. They attend course briefings at the beginning of each semester. The GCC has the greatest role in bridging technology and education.

At AOIJ, the percentage for full-time vs. part-time tutors is 50%. Usually, full-time tutors are more qualified than part-time tutors. This is reflected in the disparity in quality and management between courses taught by the two groups. As a requirement to teach an online course, new instructors, whether full-time or part-time, should finish several training workshops before leading their classes. These workshops cover various subjects. For example, one workshop introduces trainees to the open learning philosophy and distance learning concepts, goals, tools, and scope, etc. Another workshop provides trainees the skills and knowledge needed to use the

Moodle LMS. A third workshop helps tutors to manage online course assignments, to conduct online quizzes and final examinations, and to mark TMAs. In addition, training and technical support is provided to all instructors of new courses (e.g., troubleshooting).

Student support.

To assist students with their technology problems and needs, there is internal technical systems support within the ITC department at AOIJ. To complete a distance learning course, different technologies are used, such as the LMS, Web server, regular PCs, and specific software for some students. Along with the technologies provided to students, technical support is provided via a help desk that utilizes LMS forums, blended learning techniques, email, telephone, Web site links, site visits during office hours, and face-to-face tutorials. Technical support is usually available 12 hours per day.

Other support services available to online students include an online library, list of library books, list of sites, and course summaries. In addition, with each course, students receive a complete package of textbooks, CDs, equipment (e.g., calculator) and all the necessary instructions. Usually the GCC makes technology-related decisions with assistance from the tutors (e.g., purchasing, technical support methods, updates).

Data collected revealed that the students' perceptions about the effectiveness of the online courses in the ITC program were positive in general. For example, all three students interviewed agreed that the content of the courses was well prepared, and the delivery of the courses was satisfactory. They stated that their contributions to online participation were higher than within face-to-face classes. One student noted, "...I was shy in class, and it is easier for me to participate in discussions and dialogues online." A second student offered this comment:

As a student, I am usually reluctant to participate in discussions, what if I am wrong? But for some reason, I feel comfortable with online dialogues and do state my opinions even though I do not know others opinions about the topic!

These responses reflect the collectivist nature of Arab culture (Gillespie & Riddle, 2003). They also reveal the innovative pedagogy ODL offers to a region in need of educational system reform, where old learning habits such as lecturing and memorization are still heavily practiced.

The students made important suggestions to improve the program. All three students identified the use of technology as a challenge that affected their learning experiences. One student offered this observation:

It is a learning curve, it was challenging at the beginning to learn about the new medium, but I got help from my colleagues and tutors. My colleagues shared valuable information with me and my tutors were available to answer any questions, and that helped tremendously.

On the same topic, one tutor added “We [tutors] guide students to learn about the model in a relatively short period. We usually prepare them by having simple activities and discussions to introduce them to the system and to familiarize them with the content.”

One of the main concerns of distance learning is the attrition rate. Student drop-out rates in such programs far exceed those of students who enroll in traditional face-to-face programs. Yukselturk and Inan (2004) reported a 35% attrition rate for a three year period for an online program. At AOIJ, the program director indicated that about 95% of admitted students successfully complete their program of study, which is a percentage that AOIJ prides itself on accomplishing. The program director attributed this low drop-out rate to the dedication and seriousness of the AOIJ and to the quality of course content.

Discussion

ODL is a viable and legitimate form of teaching and learning (Bernard et al., 2004). It is worth noting that due to modern collaboration technologies and stable communication tools, the majority of faculty members view online education as equal or superior to onsite education (Allen & Seaman, 2006). However, the transfer of successful ODL theory and practices from the Western hemisphere will not occur instantly in the Arab region. Findings from this case study provided three important themes and conclusions: (1) the existence of adverse conditions, (2) the presence of strong instructional practices, and (3) the need to improve administrative support. Implications for practice are presented within each theme.

Existing Adverse Conditions

The penetration rate of distance learning in Arab countries is low. Several measures of economic and social development suggest that countries in the Arab region are more divergent than convergent in their e-learning practices. Although most of these countries have begun to develop an infrastructure for the Internet, these are baby steps compared to the developments in other countries, such as the USA, Korea, Japan, and countries in Europe. The insufficient Internet infrastructure experienced by our interviewees supports this conclusion. Organizational leaders are cognizant of the fact that modernization hinges upon introducing technology, and they support the incorporation of e-learning and technology into educational and training programs. Still, they have done little to widen access to e-learning technologies (UNDP, 2003). The fact that the AOIJ

was launched based on such recognition but is the only e-learning oasis in Jordan provides evidence that it will take some time to expand the concept of e-learning within the region.

Challenges to e-learning also come from educational policy makers themselves. Some educators resist change. They fear that e-learning might shift traditional education abruptly, and they will be unfamiliar with the objectives, content, and learning outcomes of a new pedagogical model (Nasser & Abouchedid, 2003). On a related note, the program director shared that the lack of familiarity with e-learning techniques and methods (know-how) were major challenges to enhancing instructional effectiveness within the ITC program at AOIJ. Our findings showed that faculty development and personnel decisions rewarded innovators and adopters of new technologies, but little was found at the policy level to encourage participation from larger faculty bodies. Professionals who do not change or who do not accept such change are left behind or may become a stumbling block and a source of frustration for those who do.

Instructional Development Practices

Instructional development practices seem to be based on established models and practices. Still, utilization of technology can be improved. Our findings showed that a variety of instructional methods and communications were welcomed and used in courses offered at AOIJ. For instance, planning courses always started with an assessment of the needs of the surrounding community, and updating courses regularly was based on the results of evaluations from multiple sources. These practices reflect AOIJ's advancement in terms of curriculum and course development. Other practices support this conclusion. AOIJ followed a team-based approach to quality assurance. For instance, the collaboration among the general course coordinator, instructors, and other personnel at the Open University is a quality assurance mechanism (Phipps & Merisotis, 2000). Determining student numbers based on the feasibility of accomplishing course objectives, tutor load, and equipment support capacity shows that priority goes to quality over quantity. The annual update of contents and the courseware through regular meetings between departments at the branch and at the university level, as well as the presence of expert external evaluators, is another quality assurance measure. Lastly, strict implementation of research-supported practices, such as tutoring, group collaborations, and homework, show that pedagogical decisions are strongly grounded in established instructional practices (Hannum, 2008).

As for the use of technology, findings showed that a variety of tools were used throughout the courses. Technology was used with tutorials, textbooks, online forums, homework, examinations, online group work, and PowerPoint presentations. But our findings showed that the use of cognition-facilitating tools, such as simulations and audiovisual content, was not consistent across courses. According to the program director, using powerful instructional tools, such as a learning management system, was mostly limited to supplementary support for existing courses at most

universities in the region.

Regarding technology for student interaction, students were trained as they went through the courses, but there was strong support from the tutors and within the student community. Still, it is critical to explore design approaches that facilitate effective and efficient learner interactions with (a) contents, peers, instructor, experts, and interface (Hirumi, 2002) and (b) virtual simulations and collaborations (Nelson et al., 2005).

Administrative Structure and Support

Findings from this study indicated that AOIJ administrative leaders work hard to make instructional and administrative practices systematic. Still, some areas of administrative practices are rather anecdotal and more systematic approaches are necessary for areas such as hiring, resource sharing, and research. AOIJ seeks qualified instructors, but due to the short history of open learning in the region, there is a lack of experienced applicants. AOIJ tries to compensate for this with mandatory systems training.

With priority given to course development and teaching, it was not certain how many staffing decisions, such as hiring and training, must be handled by each branch or by the headquarters of AOIJ. The AOIJ Web site is informative and comprehensive. Employment information is available and clear at the headquarters and at all branch campuses. However, comparing Web sites of the different AOIJ branches revealed little consistency in the organization of information and layout. In addition, little information was found regarding how resources were shared or how collaborations occurred between branches or with the headquarters. Since we could not obtain access to learning management systems, we need to be cautious about our interpretation related to the lack of sharing. Still, the observed inconsistency in the structure of information across branches and the lack of information regarding collaboration or resource sharing across branches indicate that cross-institutional collaborations can improve.

Positive signs emerged from the findings; for example, AOIJ values the benefits of strong research and evaluation and is actively using results from evaluations to inform administrative decisions. Various types of evaluation as well as student satisfaction with program services and other support services and how these services affect academic performance are important topics to be examined further (Kember, 1989; Rovai, 2003; Tinto, 1993).

It is our conclusion that the prevalent paradigm of open distance education in the Arab World, based on the case of AOIJ, falls somewhere between the “equal education” and the “new domain” beyond the “replication” paradigm (Lee, Owens, & Benson, 2002, pp. 407-410). Quality experiences emphasized throughout the program and attempts to utilize various instructional and

communication technologies to enhance educational experiences support this conclusion. It is unlikely that a single pedagogical and administrative model will dominate in the context of an open university that serves multiple countries in the region. Although our interviewees did not think that cultural and socio-political environments affected instructional and administrative practices as much as students' educational experiences, stability of political and economic conditions differ in other branches of AOU, and unique variations in national cultures, levels of development, education of the labor force, and legal-political forces should be taken into consideration when developing distance education programs in the region.

Another important finding was that the development and implementation of the program modules helped AOUJ save money on operational costs by hosting online cohorts. However, there are no financial considerations driving the shaping of program models because AOUJ is a non-profit university.

Pedagogical practices can be more consistent across countries with the utilization of familiar approaches, such as the ADDIE model, and with the integration of additional guidelines for fostering online interaction (Hirumi, 2002), virtual simulations, and collaboration (Nelson et al., 2005). On the other hand, less consistent and systematic administrative practices discovered in this study point to the need for more experimentation, support, research, and sharing of findings in this area.

Conclusion

Understanding ODL concepts and applications in the Arab region is imperative. This study focused on ODL in the Jordanian context. Measuring ODL in different countries and environments is important and is a recommendation for future research. Also, comparing differences between the Arab region and other international settings is another possible topic to be studied.

This study serves as a proposal to integrate the best practices in e-learning and ODL into the Arab region and to continue working in the best interests of the students, the communities, and the people of the region. Friedman (1999) argued that to be competitive in the global economy, individuals, organizations, and countries must be able to adapt quickly to change. One way to do this is to adapt e-learning, ODL, and modern learning and teaching concepts to the culture and educational systems of the region.

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Quality of Distance Education in Turkey: Preschool Teacher Training Case

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Abstract

Distance education is used for teacher training at different levels and fields in Turkey. Launched in the 2000-01 academic year and still applied by Anadolu University, the Preschool Teacher Training Program is one of those programs offered by distance education. This study aims to evaluate Anadolu University's Preschool Teacher Training Program in Turkey by obtaining student opinions. A total of 1,026 senior students enrolled in the Preschool Education major at the Open Education Faculty of Anadolu University participated in the survey. A questionnaire to determine the opinions of students about the program was used as a means of data collection. Means (X) and standard deviations (SD) were employed to analyze the survey data. The results showed that although the teacher candidates study at a good level, they do not have a good record of watching the television programs. The results also revealed that the opinions of teacher candidates about the textbooks, television programs, teaching practices, and academic assistance services are positive.

Keywords: Distance education; teacher training; preschool education; program evaluation

Introduction

Distance education is a new means of training teachers, but there's a limited amount of research on this practice, and most of it is performed in developed countries (Edwards, 2005). However, it has been stated that the use of distance education in teacher training has yielded positive outcomes (Uşun, 2003; Perraton, Creed, & Robinson, 2002; Moon, 1997; Evans & Nation, 1993; Prescott & Robinson, 1993; Demiray, McIsaac, & Yangın 1993; Anderson & Simpson (2005), Nielsen & Tatto, 1991). There is good evidence that the distance education programmes in the field of knowledge, general culture, educational theories, and practical dimensions of teacher training have been successful (Perraton, Creed, & Robinson, 2001). Studies concerning teacher training practices performed in such countries as Tanzania, Guyana, Zimbabwe, Sri Lanka, and Indonesia also indicate that the teachers trained through distance education might be as good as and, in some cases, better than the teachers trained through the traditional method (Yates, 2000).

In addition, it has been argued that the teachers who participate in teacher training via distance education consider distance education programmes to be equal to face-to-face programmes (Jackson, 2006; Miller, 2000.); teacher training by means of distance education programmes in comparison with traditional programmes is more effective in increasing teachers' knowledge and skills (Shrestha, 1997); and teachers participating in distance education are able to teach more effectively than those participating in traditional programmes (Brophy & Dudley, 1983; Nielsen & Tatto, 1991).

Distance education is viewed by those teachers who are willing to improve themselves and manage their time as an accessible and inexpensive approach to teacher training (Martinez, 2002). Therefore, distance education programmes are implemented today in many countries for both pre-service and in-service training of teachers (Shrestha, 1997). In their analysis, Perraton, Creed, and Robinson (2001) state that countries adopt the distance education approach for teacher training in order to achieve various aims. These aims are outlined below:

(1) Initial qualification

Some countries utilize distance education so that a large number of teachers can gain basic qualifications. This practice might occur as a way of enhancing the qualifications of beginner level or low-qualified teachers.

(2) Continuing professional development

Since face-to-face teacher training is not considered efficient in terms of scheduling, distance education is used in order to improve skills, maintain cognitive depth, and expand knowledge. Some programmes might focus on special groups.

(3) Re-orientation for teachers for curriculum reform and change

Distance education plays a significant role in programme reforms aimed at changing educational content and activities. For instance, the programmes intended to contribute to the use of educational technologies at schools are carried out with this aim.

(4) Teachers' career development

Distance education is utilized in order to support teachers' career development. When teachers study for the purpose of professional development, they aim to improve their qualifications so that they can advance to higher level positions, such as head teacher or educational inspector; in short when they need new skills, they derive benefit from distance education.

One of the fundamental problems with the use of distance education in teacher training is how to combine theory with practice (Robinson & Latchem, 2003). As most of the learning in distance education takes place independently of teachers and is based on the instructional tools prepared beforehand (Evans, 1994), practical activities have strategic significance in teacher training programmes. It is important for teacher candidates to achieve their teacher qualifications, transform theoretical knowledge into practice, and gain positive attitudes regarding the teaching profession.

Anadolu University's Preschool Teacher Education Programme

In Turkey, distance education is combined with face-to-face education for teacher training. In the 2001-02 academic years, Anadolu University offered undergraduate programmes in order to train preschool and English teachers. Unlike the programmes for primary and secondary education teachers, these two programmes are not intended for employed teachers. They were initiated due to the countrywide need, and they were conducted parallel with face-to-face education. The Open Education Faculty's Programme of Preschool Education, one of the teacher training programmes initiated in the 2001-02 academic year and still continued by Anadolu University, is a unique teacher training programme in terms of its structure and operation.

Programme Content

The undergraduate programme is designed to equip preschool education students with the knowledge, skills, and attitudes they need. It consists of courses in professional knowledge on teaching, field knowledge, and general culture. The courses in the first year focus on general culture, and those in the last year focus on field knowledge. On the other hand, the courses that focus on professional teaching knowledge are offered throughout the four-year period. The courses offered in the programme are shown in Table 1.

Table 1

OEF Preschool Education Undergraduate Programme Course List

1. Year			
<i>Code</i>	<i>Course Name and Branch(es)</i>	<i>Hour(s)</i>	<i>ECTS Credit</i>
1337	Introduction to Education	3+0	8.0
1338	Computer	3+0	10.0
1343	Principles and Methods of Preschool Education	3+0	10.0
1344	Human Anatomy and Physiology	3+0	8.0
1345	Child Developmental Psychology	3+0	8.0
1346	Mother and Child Health and Nutrition	6+0	10.0
1216	German, French, English	4+0	6.0
2. Year			
2252	Atatürk's Principles and History of Turkish Revolution	4+0	6.0
2352	Turkish Writing and Speaking Skills	4+0	6.0
2353	Planning and Evaluation in Teaching	4+0	8.0
2354	Development and Learning	3+0	8.0
2355	Teaching Music	6+0	9.0
2356	Language and Concept Development in Children	3+0	8.0
2357	Movement and Game Development in Children	6+0	9.0
2358	Speaking and Writing Education	6+0	6.0
3. Year			

3365	Classroom Management	3+0	8.0
3366	Counselling	3+0	10.0
3368	Preschool Teaching Drawing	6+0	6.0
3369	Literature for Children	6+0	5.0
3370	Teaching Computers in Preschool Education	3+0	4.0
3371	Parent Education	3+0	6.0
3372	Preschool Science and Mathematics Teaching	6+0	6.0
3374	Practice in Preschool Education	9+0	6.0
3377	Techniques of Individual Recognition	6+0	5.0
3391	Special Education	3+0	4.0
4. Year			
4375	Development of Individualized Education Programs	6+0	6.0
4389	Special Teaching Methods	6+0	6.0
4390	Creativity In Children and Drama	6+0	6.0
4392	Child Psychology and Adaptation Problems	3+0	6.0
4393	Material Development in Preschool Education	6+0	6.0
4394	Teaching Practice	5+0	10.0
4439	Training of Children with Hearing, Speaking and Visual Disabilities.	3+0	6.0
4440	Training of Children with Behavioural and Learning Problems	3+0	6.0
4450	Instructional Technology and Material Development	3+0	8.0

In addition to the theoretical courses, there are two practical courses in the Programme of Preschool Education: *Practice in Preschool Education* in the 3rd year and *Teaching Practice* in the 4th year. Practice in Preschool Education is a course based on the observations, interviews, practices, and evaluations performed in order for teacher candidates to learn about the school where the practicum will take place, the programme, and the teachers. Preschool Education Practice is taken in the third year of the major as one full-day (eight hours) a week for 24 weeks. Teaching Practice is a course aimed at allowing teacher candidates to test and improve the knowledge and skills they acquire through theoretical courses in a school environment and to gain the required professional skills. This course is taken in the fourth year of the programme as one full or two half days a week for 14 weeks.

The practices are carried out as a cooperative venture between the Open Education Faculty and the Ministry of Education. The Open Education Faculty practice coordinator represents the Faculty and the practice school coordinator and practice teacher represent the Ministry of Education, or in other words the practice school. The Directory of Education conducts the necessary administrative tasks within the Open Education Faculty practice school (Gültekin, 2004). Practical manuals designed for teacher candidates are used in conjunction with practice teachers (mentors). The structure of the teaching practices, which are conducted cooperatively

between Anadolu University and the Ministry of Education, is presented in Figure 1.

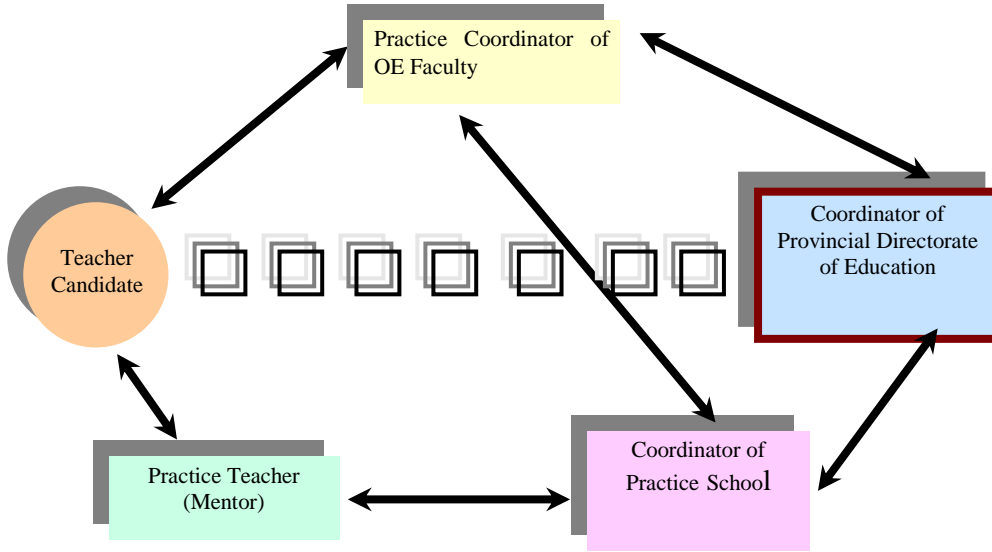


Figure 1. Open Education Faculty Practice School.

Within the scope of this cooperation, teacher candidates perform teaching practices under the guidance of teacher trainers at local nursery schools run by the Ministry of Education. In the 2005-06 academic year, 7,386 senior students – 3,418 in the third year and 4,220 in the fourth year – conducted practices in 213 Ministry of Education nursery schools in 81 provinces; and 81 provincial practice coordinators, 213 practice school coordinators, and 688 practice teachers were appointed to supervise the practices.

Teaching-Learning Processes of the Programme

The programme consists of printed materials, television programmes, and academic assistance services. Printed materials (books and manuals) are written by field experts under the supervision of an editor. Printed materials are written based on the principles of distance education and in a way that makes self-learning possible. Each unit in the book is made up of aims, table of contents, instructions, the text, summary, questions for evaluation, and the reference list. Twenty-three textbooks were designed for the programme. In addition, 123 television programmes were prepared in order to support the printed materials; there are two to six 20-minute programmes for each course. These television programmes are broadcast on a national television channel twice a day, once in the morning and once in the evening, on scheduled days of the week. In addition to the printed materials and television programmes, some academic assistance services are offered. The academic assistance services are conducted on the Internet and help students with their questions or problems. To supplement the third year Practice in Preschool Education and the fourth year Teaching Practice courses, Internet-supported educational software was developed.

Evaluation of the Programme

The academic achievement levels of students are assessed through central examinations in accordance with the distance education regulations of Anadolu University. According to the regulations, students take the exams three times a year on the scheduled dates in the academic calendar. Conducted as midterm, final, or make-up exams, they are taken by students in the province where they are registered to a Bureau of Open Education Faculty. The exams are conducted in 81 provincial centres, including Lefkoşa (Northern Cyprus).

All exam questions are prepared in multiple-choice format and assessed on computer. Students are required to pass each test. Scores are marked out of 100. The achievement score of each course is determined by adding 30% of the midterm score and 70% of the final or make-up score. In order to prove successful in a course, the achievement score must be 50 out of 100 or higher. If students fail up to a maximum of two courses, they are allowed to take the courses of the following year. Those failing three or more courses repeat the courses failed in the same year and are obliged to retake the exams for these courses. These students cannot advance to the following year's courses (Anadolu University, 2004).

There are no central exams for the practical courses in the programme; rather, students prepare portfolios, and these portfolios are evaluated by the practice teachers in the schools. The portfolios evaluated by the practice teachers are sent to the Evaluation Commission of Practice Portfolio, which is part of the Open Education Faculty, and this commission evaluates the portfolios once more. In the 2005-06 offering of the Preschool Education and Teaching Practice courses, 3,353 third grade and 4,206 fourth grade (total of 7,559) practice portfolios, which were previously evaluated by the practice teacher and sent to Open Education Faculty, were evaluated by the Evaluation Commission of Practice Portfolio (Yaşar, Gültekin, & Duban, 2006).

The most important issue concerning the teacher training programmes conducted through distance education is the effectiveness of the programme, or, in other words, whether the content is learnt and the desired behaviours are acquired by teachers at the end of the training (Özer, 1993). This survey emerged from the need to determine the opinions of preschool senior students because their opinions will contribute to an assessment of the effectiveness of the preschool education programme.

Aim

The aim of this research is to evaluate student opinions of Anadolu University's Programme of Preschool Education, which trains preschool teachers through distance education. The answers to the following questions were sought:

1. What is the level at which students study for their lessons and watch the television programmes?
2. What do students think about the following: (a) the textbooks, (b) the television programmes, (c) the teaching practices, (d) the exams, and (e) the academic assistance services?

Method

Research Model

To gather data about student opinions of the Programme of Preschool Education at Anadolu University Open Education Faculty, a survey was designed according to the survey method and conducted through the quantitative research method.

Participants

The survey was conducted on 1,026 senior students studying Preschool Education at Anadolu University in the 2005-2006 academic years. The research was conducted on senior trainee teachers because they had experienced all aspects of the programme.

As it was not possible to involve all senior students in the research, a sampling was performed among 4,220 senior students conducting their teaching practice in 213 Ministry of Education nursery schools in 81 provinces during the 2005-06 academic years. With this end in mind, five trainee teachers were chosen randomly from each nursery school. Therefore 1,065 senior teacher candidates out of 4,216 were delivered questionnaires. Of these questionnaires, 39 questionnaires were not assessed as they were not properly filled in and, therefore, the research was conducted through the data collected from 1,026 students. The personal characteristics of the students participating in the survey are shown in Table 2.

Table 2

The Personal Characteristics of the Teacher Candidates Participating in the Survey

Characteristic	f	%
Employment		
Unemployed	588	57.3
Employed	438	42.7
Age		
22 and younger	141	13.7
23-27	583	56.8
28-32	194	18.9
33-37 and older	95	9.3
38 and older	13	1.3
Total	1026	100.0

As seen in Table 2, 57.3% of the participant teacher candidates are unemployed and 42.7% of them are employed; 13.7% are 22 years old or younger; 56.8% of them are 23-27 years old; 18.9% of them are 28-32; 9.3% of them are 33-37; and 1.3% of them are 38 years old or older. It

is clear that more than half the teacher candidates are unemployed and again more than half of them are between 23 and 27 years of age.

Data Collection Tool

A questionnaire was prepared in order to collect the data within the scope of the research. The questionnaire is made up of two parts. In the first part, there are questions intended to determine the personal characteristics of the participating teacher candidates. In the second part, there are questions intended to determine the opinions of teacher candidates about the textbooks, television programmes, teaching practices, exams, and academic assistance services of the programme studied.

The questionnaire was shown to pre-school education experts. The experts reviewed the questionnaire in terms of content and scope, and they provided their suggestions. Then the questionnaire was redesigned by the researcher according to the experts' suggestions. Afterwards, the questionnaire was taken by 50 students as a pilot study. In order to test the questionnaire's reliability, Cronbach's Alpha was checked and it was found to be .87.

After the validity and reliability studies were completed, the questionnaires were delivered to the teacher trainees in their nursery schools by mail in May, 2006, and the teacher trainees returned the questionnaires by mail.

Data Analysis

In order to determine the opinions of teacher candidates concerning the programme studied, the arithmetic means of the points given by trainee teachers to the questionnaire items and standard deviations of the point distributions were calculated. The gained results were interpreted based on the following intervals: 4.21 - 5.00, I strongly agree; 3.41 - 4.20, I agree; 2.61 - 3.40, I neither agree nor disagree; 1.81 - 2.60, I disagree; and 1.00 - 1.80, I strongly disagree.

Findings and Interpretation

The findings gained in the research are presented in the order they are mentioned in the objectives.

The Levels at which Preschool Teacher Candidates Study for their Lessons and Watch the Television Programmes

The levels at which preschool teacher candidates study for their lessons and watch the television programmes are presented in Table 3.

Table 3

The Levels at which Preschool Teacher Candidates Study for their Lessons and Watch the Television Programmes

Levels	f	%
Study		
I don't study every day	442	43.1
Less than an hour per day	73	7.1
1-2 hours per day	342	33.3
I study 3 hours or more per day	169	16.5
Watch the television programmes		
I watch all of them	10	1.0
I watch most of them	60	5.8
I watch a few of them	245	23.9
I watch very few of them	224	21.8
I never watch	487	47.5
Total	1026	100.00

As seen in Table 3, 43.1% of participant teacher candidates say they don't study every day; 7.1% of them say they study less than an hour a day; 33.3% of them say they study one to two hours a day; and 16.5% of them say they study three or more hours a day. Regarding the television programmes, 1% of the teacher candidates participating in the survey say they watch all the programmes; 5.8% of them say they watch most of them; 23.9% of them say they watch a few of them; and 21.8% of them say they watch very few of them, while 47.5% of the teacher candidates say they never watch. These data indicate that the level at which preschool teacher candidates study for their lessons is good; whereas, the level at which they watch the television programmes is poor.

The Opinions of Preschool Teacher Candidates on the Programme

Textbooks.

The opinions of preschool teacher candidates concerning the textbooks are presented in Table 4.

Table 4

The Opinions of Preschool Teacher Candidates concerning the Textbooks

Textbooks	N	\bar{X}	SS
<i>Physical Quality</i>			
The dimensions of textbooks are ergonomic	1026	3.98	0.98
The cover cardboard of textbooks is of good quality and	1026	3.88	1.01

durable			
The bindings of textbooks are durable	1026	3.87	0.99
The covers of textbooks are aesthetically appealing to students	1026	3.46	1.12
The paper of textbooks (pattern of the paper) is of good quality	1026	3.26	1.20
The publishing quality of the textbooks is sufficient	1026	3.63	1.05
<i>Content</i>			
The knowledge presented in the textbooks is sufficient to explain the subject	1026	3.79	0.94
The knowledge presented in the textbooks is useful for the aim of the preschool education field, its principles, methods, operations, and concepts	1026	3.96	0.88
When presenting new knowledge in the textbooks, its relationship to previous knowledge is provided	1026	4.20	0.68
The examples provided to support the knowledge in the textbooks are sufficient	1026	4.18	0.72
The knowledge presented in the textbooks is valid and up-to-date	1026	3.93	0.94
The knowledge presented in the textbooks encourages students to do research, take examinations, make observations and to think critically and the like	1026	4.14	0.72
The knowledge presented in the textbooks is sequenced from the concrete to the abstract, from the simple to the complex, and from the known to the unknown	1026	3.90	0.90
The objectives, suggestions for further study, summary, and assessment questions facilitate comprehension of the unit	1026	4.08	0.78
<i>Language and Narrative Features</i>			
The punctuation marks are used correctly when presenting the subjects in the textbooks	1026	4.06	0.87
The lengths of words are convenient for reading skills	1026	4.16	0.68
Foreign words are avoided as much as possible	1026	3.95	0.92
Sentences are written in a short, clear, and grammatically correct way	1026	4.07	0.84
The connections among the paragraphs in a text are well-established	1026	3.91	0.95
Paragraphs are written in a fluent, clear, and comprehensible way.	1026	4.10	0.75
<i>Visual Arrangement</i>			
The font of letters in the textbooks is convenient for reading	1026	4.00	0.86
The font of letters is compatible with the content and other components	1026	4.27	0.69
The space between lines is convenient for reading	1026	4.26	0.65
The arrangement of the titles facilitates comprehension	1026	4.23	0.69
Page set up facilitates reading and comprehension	1026	4.17	0.73

Pictures, photographs, figures, schemas and graphics are explanatory and facilitate learning	1026	3.97	0.94
General	1026	3.99	0.57

Preschool teacher candidates state that they strongly agree with the following items concerning the physical quality of the textbooks: the dimensions of textbooks are ergonomic ($X = 3.98$), the cover cardboard of textbooks is of good quality and durable ($X = 3.88$), the bindings of textbooks are durable ($X = 3.87$), the publishing quality of the textbooks is sufficient ($X = 3.63$), and the covers of textbooks are aesthetically appealing to students ($X = 3.46$). On the other hand, they state that they neither agree nor disagree with the item that the paper of textbooks (pattern of the paper) is of good quality ($X = 3.26$). Considered from a general perspective, it is evident that teacher candidates find the physical quality of the textbooks appropriate.

Preschool teacher candidates state that they agree with all of the items concerning the content aspect of the textbooks. Accordingly, they state that they agree with the following items: when presenting new knowledge in the textbooks, the relationship to previous knowledge is provided ($X = 4.20$); the examples provided to support the knowledge in the textbooks are sufficient ($X = 4.18$); the knowledge presented in the textbooks encourages students to do research, to take exams, to make observations and to think critically and the like ($X = 4.14$); the objectives, suggestions for further study, summary, and assessment questions facilitate comprehension of the unit ($X = 4.08$); the knowledge presented in the textbooks is useful for the aim of the preschool education field, its principles, methods, operations, and concepts ($X = 3.96$); the knowledge presented in the textbooks is valid and up-to-date ($X = 3.93$); the knowledge presented in the textbooks is sequenced from the concrete to the abstract, from the simple to the complex, and from the known to the unknown ($X = 3.90$); and the knowledge presented in the textbooks is sufficient to explain the subject ($X = 3.79$). These findings indicate that teacher candidates find the content of the textbooks appropriate.

Preschool teacher candidates state that they agree with the following items concerning the language and narrative features of the textbooks: the lengths of words are convenient for reading skills ($X = 4.16$); paragraphs are written in a fluent, clear, and comprehensible way ($X = 4.10$); sentences are written in a short, clear, and grammatically correct way ($X = 4.07$); the punctuation marks are used correctly when presenting the subjects in the textbooks ($X = 4.06$); foreign words are avoided as much as possible ($X = 3.95$); and the connections among the paragraphs in a text are well-established ($X = 3.91$). Generally speaking, it can be concluded that teacher candidates find the content of the textbooks appropriate.

Preschool teacher candidates state that they also agree with the following items concerning the visual arrangement of the textbooks: the font of letters is compatible with the content and other components ($X = 4.27$); the space between lines is convenient for reading ($X = 4.26$); the arrangement of the titles facilitates comprehension ($X = 4.23$); page set-up facilitates reading and comprehension ($X = 4.17$); the font of letters in the textbooks is convenient for reading ($X = 4.00$); and pictures, photographs, figures, schemas, and graphics are explanatory and facilitate

learning ($X = 3.97$). Generally speaking, it can be concluded that teacher candidates find the visual arrangement of the textbooks appropriate.

Television programmes.

The opinions of preschool teacher candidates on the television programmes are presented in Table 5.

Table 5

The Opinions of Preschool Teacher Candidates on the Television Programmes

Television programmes	N	\bar{X}	SS
The image of television broadcasts is of sufficient quality	539	3.71	0.91
Television programmes support the units they are related to	539	3.75	0.87
The number of the television programmes is sufficient	539	3.18	1.05
The broadcasting duration of television programmes is sufficient	539	3.03	1.07
The broadcasting times of television programmes are convenient	539	3.01	1.11
Television programmes are interesting, motivating, and didactic	539	3.48	1.03
Television programmes contribute to academic achievement	539	3.43	0.80
Television programmes facilitate comprehension of the relevant unit	539	3.77	0.90
Television programmes provide students with new knowledge	539	3.81	0.86
Television programmes aid in transforming what is learnt into practice	539	3.84	0.86
Television programmes help students acquire attitudes and skills in addition to knowledge	539	3.81	0.88
Television programmes allow for performing perception, comprehension, evaluation and interpretation	539	3.85	0.84
Television programmes activate students for new learning	5396	3.78	0.88
General	539	3.60	0.79

Preschool teacher candidates state that they agree with the following items concerning the television programmes: television programmes allow for performing, perception, comprehension, evaluation, and interpretation ($X = 3.85$); television programmes aid in transforming what is learnt into practice ($X = 3.84$); television programmes provide students with new knowledge ($X = 3.81$); television programmes help students acquire attitudes and skills in addition to knowledge ($X = 3.81$); television programmes activate students for new learning ($X = 3.78$); television programmes facilitate comprehension of the relevant unit ($X = 3.77$); television programmes

support the units they are related to ($X = 3.75$); the image of television broadcasts is of sufficient quality ($X = 3.71$); television programmes are interesting, motivating, and didactic ($X = 3.48$); television programmes contribute to academic achievement ($X = 3.43$). On the other hand, they state that they neither agree nor disagree with the following items: The number of the television programmes is sufficient ($X = 3.18$); the broadcasting duration of television programmes is sufficient ($X=3.03$); the broadcasting times of television programmes are convenient ($X = 3.01$). Generally considered, it can be concluded that teacher candidates find the television programmes appropriate ($X = 3.60$).

Teaching practices.

The opinions of preschool teacher candidates on the teaching practices are presented in Table 6.

Table 6

The Opinions of Preschool Teacher Candidates on Teaching Practices

Teaching Practices	N	\bar{X}	SS
Teaching practices are professionally educative and beneficial	1026	4.44	0.68
The number and duration of the teacher practices are sufficient	1026	4.14	0.98
The scheduled time and place of the teaching practices during the year are convenient	1026	4.11	0.98
Teaching practices make it possible to transform theoretically gained knowledge into practice	1026	4.35	0.73
Organization (structure) of the teaching practices is good	1026	4.21	1.49
Teaching practice manuals sufficiently guide through planning, observing, and implementing the activities	1026	4.05	0.98
The practice schools possess the convenient conditions in order for the practices to be realized properly	1026	4.35	1.80
General	1026	4.24	0.70

Preschool teacher candidates state that they strongly agree with the following items concerning the teaching practices: teaching practices are professionally educative and beneficial ($X = 4.44$); teaching practices make it possible to transform theoretically gained knowledge into practice ($X = 4.35$); the practice schools possess convenient conditions in order for the practices to be realized properly ($X = 4.35$); and organization (structure) of the teaching practices is good ($X = 4.21$). On the other hand, they state that they disagree with the following items: the number and duration of the teacher practices are sufficient ($X = 4.14$); the scheduled time and place of the teaching practices during the year are convenient ($X = 4.11$); and teaching practice manuals sufficiently guide through planning, observing, and implementing the activities ($X = 4.05$). When the opinions of preschool teacher candidates concerning the teaching practices are broadly evaluated

($X = 4.24$), it can be concluded that the teacher candidates find the teaching practices to be very positive.

Examinations.

The opinions of preschool teacher candidates on the examinations are presented in Table 7.

Table 7

The Opinions of Preschool Teacher Candidates on the Examinations

Exams	N	\bar{X}	SS
The exam duration allocated for each course is sufficient to answer the questions	1026	4.18	0.91
The number of exam questions is sufficient	1026	4.33	0.74
Multiple-choice exam type is an appropriate measurement technique	1026	4.35	0.74
The questions measure what is learned	1026	4.14	1.84
Exam dates are convenient	1026	3.87	1.13
Exam questions are practical	1026	3.73	1.06
Exam questions are comprehensive	1026	3.82	1.06
Exam questions are distributed reasonably among the subjects learned	1026	3.80	1.07
General	1026	4.03	0.73

Preschool teacher candidates state that they strongly agree with the following items concerning the examinations: the multiple-choice exam type is an appropriate measurement technique ($X = 4.35$); the number of exam questions is sufficient ($X = 4.33$); the exam duration allocated for each course is sufficient to answer the questions ($X = 4.18$); and the questions measure what is learned ($X = 4.14$). Also, they state that they agree with the following items: exam dates are convenient ($X = 3.87$); exam questions are comprehensive ($X = 3.82$); exam questions are distributed reasonably among the subjects learned ($X = 3.80$); and exam questions are practical ($X = 3.73$). When the opinions of preschool teacher candidates concerning the examinations are evaluated in a general sense ($X = 4.03$), it can be concluded that the teacher candidates have positive views of the exams.

Academic assistance services.

The opinions of preschool teacher candidates on academic assistance services are presented in Table 8.

Table 8

The Opinions of Preschool Teacher Candidates on Academic Assistance Services

Academic Assistance	N	\bar{X}	SS
Communication with Open Education Faculty can be established easily	1026	3.72	1.13
There is immediate effort to solve the problems emerging	1026	3.62	1.06
Any question is answered sufficiently	1026	3.67	1.04
The Web page of the Programme of Preschool Education provides guidance	1026	3.89	0.92
Providing communication and interaction promote institutional loyalty	1026	4.00	0.90
General	1026	3.78	0.86

Preschool teacher candidates state that they agree with all the following items concerning the academic assistance services: providing communication and interaction promote institutional loyalty ($X = 4.00$); the Web page of the Programme of Preschool Education provides guidance ($X = 3.89$); communication with Open Education Faculty can be established easily ($X = 3.72$); any question is answered sufficiently ($X = 3.67$) and there is immediate effort to solve emerging problems ($X = 3.62$). When the opinions of preschool teacher candidates concerning the academic assistance services are examined carefully ($X = 4.03$), it can be concluded that the teacher candidates view the academic assistance services very positively.

Conclusion and Discussion

Anadolu University's Preschool Education Programme, which trains preschool teacher candidates through distance and face-to-face education, is a unique undergraduate programme. In this respect, the programme is implemented with an aim different from that of other distance teacher training practices that are carried out in order to increase the qualifications of teachers working within the system or to provide career development. This model completely matches what Miller (2000) states about the distance teacher training models in Jamaica: "distance education is a feasible, practical, and appropriate modality for delivering formal teacher education and supporting changes in teaching strategies related to reforms in education system" (p. 147). The books and television programmes produced within the scope of the programme contribute significantly to teacher training. Moreover, the television programmes broadcast around the country support not only the teacher candidates studying the major but also the adults who study child development and education issues.

Aimed at determining the opinions of the preschool teacher candidates who are trained via the distance education approach, this research study indicates that the programme was found to be positive by students. The findings of this research study match those of many others, which state that teacher training through distance education can be implemented efficiently and effectively and

that it yields positive outcomes. Teacher candidates believe that the program equips them “satisfactorily” with the necessary knowledge, skills, and attitudes. A small number of the candidates think the program provides them with the necessary knowledge, skills, and attitudes “in the best way.” Also, this fundamental finding of the research is in harmony with Yaşar and Gültekin’s (2006) research, which found that the candidates in the Open Education Faculty think the program enables them to gain the knowledge, skills, and attitudes relevant to the teaching profession at a “moderate level,” and they are capable of using these knowledge, skills, and attitudes at a “moderate level.” The study revealed that the attitudes of teacher candidates towards the teaching profession are quite positive, and their perception levels of their teaching competency are very good. Moreover, the teacher candidates consider the program they enrolled in beneficial in terms of gaining teaching competencies. Similarly, in another study conducted by Gültekin (2006b), teacher candidates in the same program believe that their attitudes regarding the teaching profession are positive and their teaching competencies are good.

Also, the research completely agrees with Carr, Fung, and Chan’s finding (2002) that most students meet the requirements of the programme, they feel pleased to participate in the programme, and the programme has a positive influence on them; Phillion, Johnson, and Lehman’s finding (2004) that the experiences in the distance teacher training programme are beneficial in terms of teaching, reflect real life, increase the technological competency of teachers, prepare preschool-service teachers better in terms of teaching, and encourage the use of technology for teaching; Anderson and Simpson’s finding (2005) that the distance teacher training programme has some positive impacts on the teaching practices performed by teachers; and Pham’s finding (2002) that the programme is considered to be efficient by students as its fundamental objectives are clear and comprehensible. In addition, this study’s results are supported by Cooper and Keefe’s finding (2001), indicating that trainee teachers are content with the programme in general and Kim’s finding (1999) showing that the programme is found to be successful by teachers and also Kim’s finding (2000) showing that the Web-based in-service training program is deemed satisfactory by students. Furthermore, this study’s findings are supported by Chivore’s finding (1992), which points out that the distance education programme is effective in terms of the introduction to the lessons, lesson development, teacher-student interaction, techniques for asking questions, classroom control, and classroom management involving student participation.

According to this study, nearly two of every five preschool teacher candidates participating in the survey do not study for their lessons systematically, but the remainder study for their lessons every day. Almost half the preschool teacher candidates involved in the survey do not watch the television programmes at all, but most of the remaining students watch them more or less. This finding of the research agrees with another research study performed by Hakan, Özgür, Kara, Kürüm, and Özkanal (2004), which found that students believe television programs are an important part of the system; however, this finding is not consistent with another finding revealing that teacher candidates cannot use television programs efficiently. There may be many reasons for these low levels of television watching by students. In addition to the personal characteristics of the teacher candidates, competing television programs’ broadcast on state channels and unfavourable broadcast times may cause the problem. Similarly, in another study

conducted by Bir (1996), it was found that students' television watching levels are low and the main reason (49.6%) for that is the inappropriate broadcast time of the programs.

The tendency of teacher candidates regarding the television programmes agrees with the finding of Kim (1999) showing that teachers do not watch the cable television broadcasts and the findings of Candemir (2002), Özer (1989), Uşun (2003), Yüksel (1987) and Yüksel (1990), pointing out that teachers watch the programmes rarely.

Concerning the textbooks, the teacher candidates find the physical features, content, language, narrative qualities, and visual design of the textbooks positive. This finding of the study agrees with the findings of Hakan, Özgür, Kara, Kürüm, and Özkanal (2004), which discovered that Open Education Faculty students believe that optimization of page layouts and print makes their reading easy, and the goals, warnings, abstracts, and assessment questions make it easy to learn. The findings of the survey also agree with Fung's finding (2005), indicating that course materials are very efficient in order for teachers to achieve their aims. Also, this finding of the survey completely agrees with Sakar's finding (2002) that students are satisfied with the print quality of the textbooks and Hakan's finding (1991) that the textbooks designed in accordance with distance teaching techniques facilitate learning and are comprehended easily.

Although the opinions of the preschool teacher candidates on the television programmes are positive in general, it was determined that the level of watching the programmes is not high. Considering that the tendency of teacher candidates to watch the television programmes is not high, it is evident that the television programmes need to be improved.

When the data concerning the opinions of teacher candidates on the teaching practices are examined, it is revealed that teacher candidates find the teaching practice activities quite positive and supportive. Teaching practices have a significant place in this program because they include the activities whereby students transform the knowledge and skills they have gained through theoretical courses into practice. The fact that the program is in use with a great number of students across the country shows that the applications are conducted in a planned and appropriate way. This finding of the survey agrees with Lea's finding (2000) that the practice experiences of students' enrich teaching; Pham's finding (2002) that the programme improved students' skills in planning and teaching; and Stobart and Chau's finding (2002), which is stated as the following: "There was again a general feeling amongst the students that the SOLE environment was such a good learning experience that it made the students more productive, allowing them to learn at an increased speed." In addition, the findings by Fung (2005), Anderson and Simpson (2005), Russell (1996), Stubbs and Burnham (1990), Schlosser and Anderson (1994), Özer (1989), and Burnham and Seamons (1987), which point out that distance teacher training programmes provide students with effective learning experiences, support this finding of the survey.

Preschool teacher candidates generally have positive opinions regarding examinations. Teacher candidates have favourable views of the duration of the exams, number of questions in the exams, the exam dates, content of the exams, and the quality of the questions. The exam-related findings

of the study agree with Hakan, Özgür, Kara, Kürüm, and Özkanal's (2004) study, which revealed that open education students believe the number of questions on the exams is sufficient and multiple-choice is the most appropriate question type. In particular, the positive finding of the survey that "Multiple-choice exam type is an appropriate measurement technique," completely agrees with Fung's finding (2005) that the vast majority of teacher candidates use test activities when reading the unit; Hakan's finding (1991) that the multiple-choice question type is the best way to measure achievement and knowledge; and Şakar's finding (2002) that the way the exam questions are asked, the time given for answering, and the comprehensibility of the questions are considered to be satisfactory by students. However, this finding of the survey does not agree with Kim (1999) and also Kim (2000), who stated that the evaluation was done through multiple-choice type questions, which might be inappropriate in terms of the nature of open education.

When the data concerning the opinions of teacher candidates on the academic assistance services are analyzed, it is found that teacher candidates consider the academic support services to be positive. The teacher candidates could easily get in touch with the faculty and find solutions for their problems. This finding of the survey is similar to Jackson's (2006) and Carr, Fung, and Chan's (2002) finding that the vast majority of students studying through distance education find the technical support, seminar, and academic assistance satisfactory and to the findings by Greer, Hudson, and Paugh (1998), Buckley (1993), Gruenhagen, McCracken, and True (1999), Kim (2000), and Perraton, Creed, and Robinson (2002) that distance education programmes are successful in academic assistance.

In conclusion, the teacher candidates in the Programme of Preschool Education of Anadolu University have a good level of studying but not a good level of watching the television programmes. As well, it can be concluded that the opinions of teacher candidates about the aims of the programme, the courses offered in the programme, textbooks, television programmes, teaching practices, exams and academic assistance facilities are positive.

The following can be recommended in light of the research results:

1. The reasons why preschool teacher candidates trained through the distance education approach do not watch the television programmes should be researched.
2. The Programme of Preschool Education should be evaluated continuously and then be improved based on these evaluation results. In particular, the television programmes should be improved and academic assistance services should be rendered more efficient.
3. Web-based interactive teaching opportunities should be utilized more in the Programme of Preschool Education.
4. The Open Education Faculty Programme of Preschool Education should also be evaluated based on the opinions of other officials, namely provincial coordinators from the Ministry of Education, coordinators at practice schools, practice teachers, and students.

5. The Programme of Preschool Education should also be evaluated by means of qualitative studies

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Research Insights from a Decade of Campus-Wide Implementation of Web-Supported Academic Instruction at Tel Aviv University

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Abstract

This paper describes the scope and outcomes of Virtual TAU, a campus-wide project that aims to integrate information and communication technologies into the academic instruction at Tel Aviv University (TAU). It provides data, insights, and conclusions drawn from various research and evaluation studies that were conducted at the university during the last decade. The paper presents its material on three main levels: (a) the institutional level, in which we describe the scope and pace of the process of diffusing the Web as an innovation into the university's instruction, and how this diffusion compares to classical diffusion models; (b) the pedagogical level, in which we present some of the innovative pedagogical practices developed and implemented as well as the current state of Web usage among both the university's teachers and students; and (c) the costs and benefits of the integration of Web-supported academic instruction, where we apply a newly-developed cost-effectiveness model to Virtual TAU courses.

Keywords: Web-supported academic instruction; empirical research; diffusion of innovation; Web pedagogy; cost-effectiveness model

Introduction

Online learning has become widely popular in academic institutions in the last decade. University leaders and administrators are aware of the pedagogical and economical potential of using advanced technologies and of their possible role in changing the structure of academic instruction. They believe that Web-supported instruction should be included as part of a university's long-term strategy (Bates, 2000; Allen & Seaman, 2005, 2006, 2007). Many lecturers who are now in the process of integrating the Internet in their instruction are using various Web-supported learning environments that facilitate more flexible and effective instruction. Tel Aviv University was amongst the pioneers in this trend about a decade ago, accompanying the implementation with ongoing research and evaluation (Nachmias, 2002). Lecturers first started to use the Internet in their instruction in 1998, and in the academic year 2000-01, a campus-wide project was launched in order to facilitate the integration of information and communication technologies into the academic instruction of the entire university. This paper describes the project's scope and outcomes and provides some data and insights from the

various research and evaluation studies conducted in recent years. The paper relates to three main levels: the institutional level, in which we present the scope and pace of the process whereby the Web as an innovation was diffused into the university's instruction; the pedagogical level, in which we present the innovative pedagogical practices developed and implemented by some instructors as well as the current state of Web usage in all instruction at TAU; and, finally, the level of the costs and the benefits of the integration of Web-supported academic instruction.

The Virtual TAU Project

Tel Aviv University (TAU) is one of the largest research-oriented universities in Israel. Located in the center of the country, it serves some 26,000 students. These students are enrolled in about 6,000 courses annually, which are taught by about 2,000 instructors in almost every academic discipline. The Virtual TAU project (see <http://virtual.tau.ac.il>) was launched in the academic year 2000-01, following a government initiative to advance the implementation of learning technologies in Israeli higher education. The project aimed to initiate and stimulate a process by which more faculty members would gradually come to use the Internet to enrich prevailing learning processes and to make traditional instruction more efficient and flexible. The learning management system (LMS) used by Virtual TAU is Highlearn, a multilingual Internet course management system developed by Britannica Knowledge Systems. Highlearn, similar to other LMSs (e.g., Blackboard, Moodle), allows the easy creation of an information base for the course's content and didactic activities and supplies asynchronous communication tools (e.g., forums) for students and instructors. In addition, it provides tools that assist instructors in administrating courses (e.g., course scheduler, test builder, address book).

One fundamental principle of Virtual TAU is that the instructors, most of them TAU faculty members, maintain full responsibility for their course Web sites. Their views regarding the objectives, syllabus, and instructional methods lead to both development and implementation of the course Web site. No pre-designed pedagogical solution was imposed; rather, each instructor acts according to his or her own pedagogical approach. Most of the projects' activities aim to empower the instructors and to help them realize their pedagogical vision (Bates, 2000; Nachmias, Ram, & Mioduser, 2006).

One of the conditions for accepting government funding was to create and maintain a central support center at the university as it was clear that the success of the process would depend on intensive support for the instructors. The center provides conceptual, pedagogical, and technical support for the instructors, via workshops, online tutorials, one-to-one meetings, and a helpdesk (serving both instructors and students). Technological aspects, such as server maintenance, integrating the Virtual TAU Web shell with the university's computation services and data bases, and video recording of lectures, are the responsibility of the university's Information Technology and Computing Division.

A major objective of Virtual TAU is to investigate and evaluate the learning potential embedded in typical Web-supported courses and to examine the conditions for realizing this potential. A research framework for the study of campus-wide academic instruction using the Web was described in detail by Nachmias (2002). This framework consists of three levels: (a) the macro level, which focuses on the diffusion process of the Internet in university instruction from the institutional perspective; (b) the mezzo level, which focuses on the emergence of new pedagogies and learning paradigms in courses that integrate the Web into traditional instruction; and (c) the micro level, which concerns the actual use of the Web in the teaching and learning process of specific courses. Graduate students from the

School of Education at TAU at both the MA and PhD levels are involved in this research agenda. This paper is an attempt to highlight some of the findings and insights, mainly on the macro and mezzo levels.

The Integration of Web-Supported Instruction in TAU: The Institutional Level

A first descriptive measure of the process on the institutional level is the number of courses and lecturers that joined the project during the last eight years. This does not reveal the whole picture but one important part of it. Figure 1 presents the number of academic courses that were a part of the Virtual TAU project during the years 2000-01 – 2007-08. The graph indicates that the number of such courses increased more than tenfold over the eight year period: from 346 courses in 2000-01 to 4,395 courses in 2007-08. It should be noted that at the start of the academic year 2000, only ninety instructors showed an interest in the project and submitted proposals for developing Web sites for about 100 courses. Soon after the opening of the support center it became clear that the demand for Virtual TAU's services was way beyond expectations. Consequently, it was decided to enable all instructors to join the project and to receive the center's support as needed. As a result, many more instructors joined the project and by the end of the first year there were about 350 course Web sites. This number almost tripled in the second year (1,036 courses), doubled in the third year (2,138 courses), and once again in the consecutive three years (4,038 courses); and since then, the number of courses has been growing slowly to the current number of 4,395 courses, of the about 6,000 courses offered by Tel Aviv University annually. Moreover, in the 2007-8 academic year, the log counter shows over 8,000,000 entries for over 155,000 Web learning items by about 24,000 students (almost all TAU students) and 193,000 course enrollments.

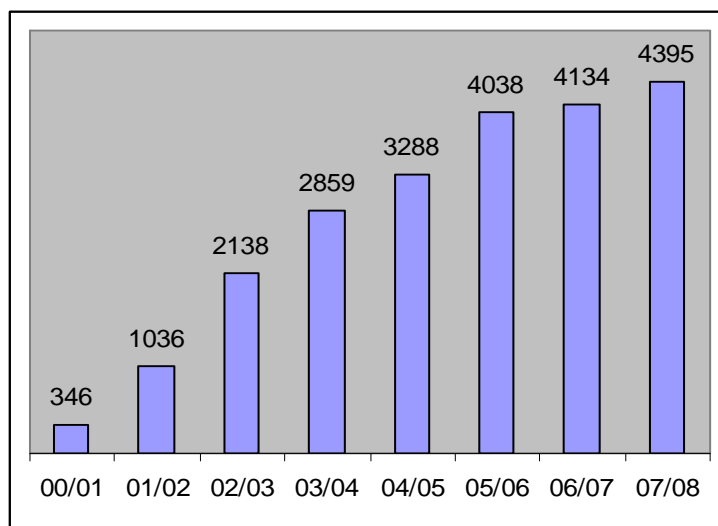


Figure 1. Number of courses using Virtual TAU in the academic years 2000-01 – 2007-08.

This phenomenon raised questions about the characteristics of the diffusion process of Web-supported instruction at TAU from the instructors' points of view: Does the diffusion process match existing diffusion models of technological innovation, e.g., Rogers (1995) and Bass (1969)? And when does the process reach the compensation level? These questions (among others) were asked and answered in a PhD thesis (Soffer, 2006) and will be described here briefly.

Rogers, in his book *Diffusion of Innovation* (1995), defines innovation as an idea, object, or practice that is perceived as new by the individual or organization. The innovation may be perceived differently among individuals, and the time it takes for individuals to adopt the innovation may be different. Diffusion, furthermore, is defined as the process by which an innovation is communicated through certain channels among the members of a social system over time. Rogers claims that innovations tend to spread through society in an S-shaped curve, with early adopters selecting the technology first, followed by the majority, until a technology or innovation is considered common. He explains that innovations are initially perceived as uncertain and even risky. To reduce the uncertainty, most people look for others like themselves who have already adopted the new idea and gained some experience. Rogers (in the latest edition of his book *Diffusion of Innovation*, 2003) argues that the penetration of the Internet into our daily life has sped up the diffusion of Web-supported learning. Rogers (1995) presented a classification scheme of potential adopters of innovation based on their receptivity: *innovators* (2.5%), who are the risk takers willing to take the initiative and time to try something new; *early adopters* (13.5%), who tend to be respected group leaders and are essential to adoption by the whole group; *early majority* (34%), who are the careful, safe, deliberate individuals unwilling to risk time or other resources; *late majority* (34%), who are those suspicious of or resistant to change. Finally there are those who are hard to move without significant influence and *laggards* (16%), who are consistent or even adamant in resisting change.

An analysis of TAU's diffusion process among instructors each semester during the years 2000-01 – 2004-05 is presented in Figure 2. The rate of diffusion of Virtual TAU among instructors was rapid, starting from 70 instructors during the first semester of the first academic year (2000-01) and rising to 1,296 instructors at the end of the second semester of the fifth academic year (2004-05). The percentage of instructors using Virtual TAU from the total number of senior and junior instructors at the university (1,558 to 1,735 during these years) increased from 5% at the beginning to 75% at the end of the fifth academic year (2004-05). In terms of Roger's model, the innovators were there before the project started, initiating it in 2000-01. The early adopters joined the process as early as the second year, the early majority in the third year, and the late majority during the fourth and fifth years. This represents a very rapid adoption process of Web-supported instruction among TAU instructors.

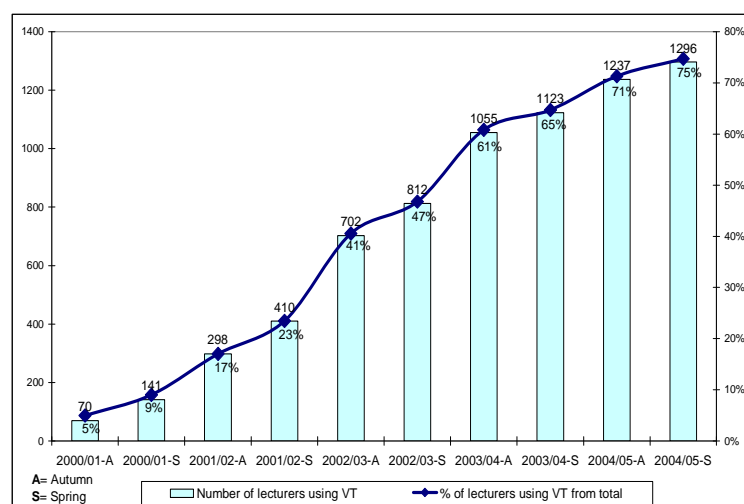


Figure 2. Growth rate in the number of instructors using Virtual TAU.

It seems that the number of instructors using the Internet reached its compensation level in the fifth year of the project. About 20% of the potential population of instructors does not “join the

bandwagon,” as proposed in another study (Elstein, 2004), either because of the time investment required and their doubts concerning the added value of the Internet or because they are using other methods of publishing their course contents on the Web. Significant differences were found in the Virtual TAU diffusion process among instructors in different academic units. Further discussion of these differences is beyond the scope of this paper and can be found elsewhere (Soffer & Nachmias, 2008).

Bass’s (1969) *Diffusion Model* is one of the best known models in the field of marketing. It allows us to estimate the number of potential Virtual TAU adopters in the university by providing a mathematical formula. The model assumes that potential adopters of an innovation are influenced by two types of communication channels: the mass media and interpersonal channels. As for the diffusion process, more weight is given to interpersonal communications. Bass assumes that the diffusion process will be S-shaped, whereby the rate of adoption during the first half of the diffusion process is symmetrical with that in the second half. His model consists of three key elements: (1) p = the *innovators*, adopters who have been influenced by the media; (2) q = *imitators*, adopters who have been influenced by interpersonal communication and (3) m = the *market potential* for the innovation. When these three parameters are known we can forecast the potential innovation over time. If the curve is S-shaped, it means that q is higher than p , and the product is innovative. If the curve takes a J-shape, q is smaller than p , and the product is less innovative and does not involve high risk. The values of the parameters p and q affect the speed of the diffusion process.

Figure 3 presents the results of Bass’s diffusion model of Virtual TAU among instructors at the university between the academic years 2000-01 – 2006-07. The results of the analysis show that $m = 0.75$, $p = 0.032$ and $q = 0.558$. A possible way to understand these figures is to compare them to the same analysis done for cellular telephone diffusion over a period of ten years in which $m = 0.45$, $p = 0.008$ and $q = 0.427$. These figures suggest that the percentage of instructors at the university who will use Virtual TAU may reach up to 75%. It also means that Virtual TAU is perceived as an innovative product among instructors at TAU. Looking at the values p and q , we could say that the diffusion process developed fast initially and then slowed down. These results show that the diffusion process was mainly affected by the imitators, who were influenced by interpersonal communication (mostly peers and/or colleagues). The innovators had a much smaller effect on the diffusion process of Virtual TAU.

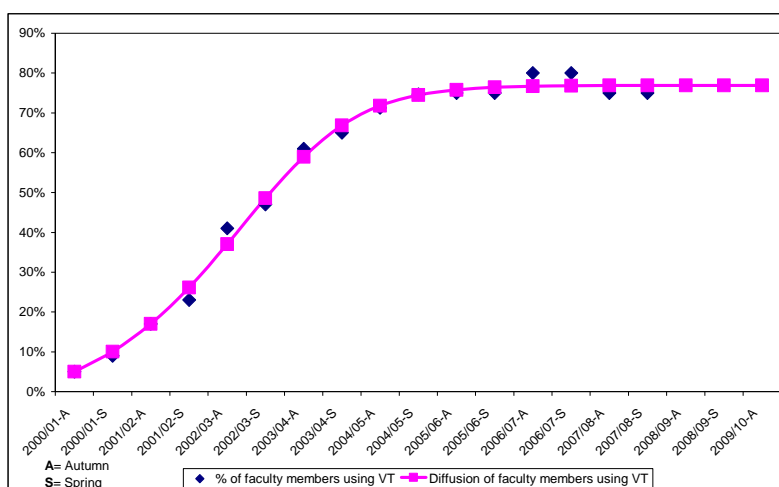


Figure 3. Virtual TAU diffusion model among instructors according to Bass’s diffusion model.

In sum, we learn from this study that the diffusion process of Web-supported academic instruction at TAU is very similar to the classical models of innovation diffusion, representing very fast adoption.

Pedagogical Aspects

The integration of Web-supported learning at TAU was clearly rapid. However, it is even more interesting to educators to understand the pedagogical aspects of this usage and whether, as a result, novel pedagogical models and approaches are emerging. Our understanding of the emergent Web pedagogy is twofold: on one hand, we seek illustrations of the feasibility of using the Web in such a way that its potential benefits and promises are fulfilled. Our questions from this perspective are as follows: Can we really increase instructional flexibility, improve learning efficiency, and augment the quality and richness of academic instruction? If the answer is yes then the question is in what ways? On the other hand, we know that not all lecturers are using the Web equally, in terms both of exploiting its innovativeness and of time investment. Given this situation, the questions are these: What are the lecturers using the Web for and to what extent?

In order to address these pedagogical issues we undertook two different types of studies: the first was a series of case studies of specific, Web-based, innovative pedagogical practices at TAU and the second included another series of studies mapping and analyzing the use of the Web by all TAU instructors and students.

The series of case studies of campus-wide, Web-based, innovative pedagogical practices was conducted in the years 2005-2007. The study was funded by the Israeli Council for Higher Education with the aim to develop and assess innovative pedagogical models and to prove the feasibility of fulfilling the Web's potential. Instructors throughout the campus were encouraged to submit a proposal to develop, implement, and assess a Web-based pedagogical innovation in their course. Thirteen of the submitted courses were chosen, and they were mainly large courses or special learning objects that could be transferred and reused in other similar units or other academic institutions. A hidden concern of the study was to check the possibility of reducing expenses in the long run. Each one of the 13 lecturers received a small grant for two years (ranging from \$15,000 - \$85,000). Altogether, the cost for the project was \$450,000. Table 1 presents the 13 courses with a short description of the pedagogical models that were developed and experimented with.

Table 1

Case Studies of Campus-Wide, Web-Based, Innovative Pedagogical Practices

THE MODEL	COURSE NAME	DEPARTMENT	NO. OF STUDENTS
Fully Online Courses - Fully online courses have almost no face-to-face interaction and the course content, assignments, and communications are dealt with on the Internet.	Principles of Marketing Management	Management	200
	Statistics for Economists	Social Sciences	400
	Statistics for Psychologists	Social Sciences	300
Online Exercise Repositories -	Introduction to Cell Biology	Life Sciences	520

The course Web sites serve as online exercise repositories and contain interactive self testing and assessment with immediate feedback, which enables individual learning at a personal pace.	Physiological Psychology	Social Sciences	300
	Introduction to Ottoman Empire	Humanities	120
Case Studies - The course Web sites contain case studies, which are discussed and analyzed by the students on the Web.	Assessment and Rehabilitation of Driving Skills	School of health professions	20
	Clerkship in Family Medicine	Medicine	100
Distant Laboratory Use - The course Web site gives students Web access to hardware and software components physically installed in the real lab.	Computer Integrated Manufacturing Lab	Engineering	120
Databases - the course Web site is a structured collection of textual and graphical data accompanied by metadata.	Plants Anatomy Laboratory	Life Sciences	250
	Introduction to Technology in Occupational Therapy	School of Health Professions	100
Online Assignment Submission System - Web-based module that allows students to submit their work through the Web and to receive the instructor's feedback.	Programming	Exact Sciences	275
Simulations - The course Web site is an interactive learning environment based on simulations. The simulations are interactive software, which assists the student in understanding complex processes.	Introduction to Geoinformatics	Humanities	130

In each of these 13 courses the pedagogical concept and materials were developed over a period of one to two years, and they were implemented at least once (during one semester or one year). The case studies were conducted during this experimental implementation, and they included computer usage log analysis, student attitude assessments via questionnaire, and long interviews with the instructors and some students. A detailed description of these case studies is naturally not in the scope of this paper. However, we can conclude that pedagogical models developed by teams headed by the instructors were impressive, and each one of them provided a useful example of how the Web's potential may be fulfilled. We also found that the students were highly satisfied with the new technological developments, especially with the fully online courses and the models that increase the flexibility of the learning process. Major problems encountered were the sustainability and transferability of these innovative models. Since the instructors were not paid and hardly rewarded for their efforts, they tended to invest a good deal of time to begin with but then did not sustain the effort

needed to update their developments. Transfer of these innovations to other lecturers and universities was barely achieved. A central effort of TAU or even at the nationwide level is needed in order to realize the potential for cooperation among departments in Tel Aviv University and other universities in the country that are teaching the same subjects and in some cases might even develop similar projects.

A series of studies conducted at TAU during 2002-2007 assessed the current state of all instructors' implementation of their Web sites and students' consumption and usage of these Web sites. Six of these studies are described here briefly.

Shemla (2008) provides a comprehensive view of the current state of instructors' usage of the Web. The research was implemented at TAU in order to investigate the purposes and extent of Internet integration into teaching and learning processes (e.g., content delivery, learning activities, and course management) by all instructors. Courses examined included all course Web sites that were created and implemented by faculty within the Virtual TAU framework upon completion of the autumn semester of the 2002-03 academic year. A total of 202 Web sites were randomly selected as research subjects, representing all TAU academic units. Each Web site was analyzed according to the course Web site characterization scheme that was developed for this study (Shemla & Nachmias, 2007). This tool consists of four instructional dimensions, *content delivery*, *learning activities*, *course management*, and *learning flexibility*, and it characterizes the Web sites' pedagogical usage. During this procedure, 6,507 valid Web items were categorized and analyzed, and data were collected on the Web site structure and navigation tools. In addition, each Web site was graded, indicating the extent of the realization of its pedagogical potential, i.e., to what extent does the Web site exploit the media's advantages?

The purpose and extent of usage in all analyzed course Web sites, with reference to content delivery, learning activities, and management are presented in Table 2. The second column presents the number of items found in each category and column 3 presents their percentage in relation to all items ($N = 6,507$). The fourth column presents the percentage of Web sites at which these items were found ($N = 202$). These data reveal that 73% of all items were aimed at content delivery, e.g., syllabus, digital articles, and presentations; 22% of all items included learning activities, and only 5% were instructor's messages regarding course management. While 100% of the courses had at least one content item, learning activities were found in only 60% of the courses, and course management items were found in 70% of the courses.

Table 2

Purpose and Extent of Web Usage (N = 202 Course Web Sites /N = 6,507 items)

PURPOSE OF USE	NUMBER OF ITEMS	PERCENTAGE OF ALL ITEMS <i>N = 6507</i>	PERCENTAGE OF COURSE WEBSITES <i>N = 202</i>
Content delivery	4,738	73	100
Learning activity	1,440	22	60
Management	329	5	70

Total	6,507	100	
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Another finding of this study was that the most common Web use was not for distance learning but for augmenting traditional instruction with supporting course Web sites. None of the sampled instructors chose to deliver their courses in an exclusively online version without face-to-face interaction. Only three of the courses reviewed (1.5%) replaced face-to-face meetings with an equivalent number of virtual ones (blended learning as defined by Bonk & Graham, 2006), and only in six courses were Web activities considered part of the final course grade.

Considering the types of learning modes supported, the results show that while all course Web sites support students' individual work, only 19% of them contain activities that support whole-class interaction (e.g., via an online discussion forum), and only 1.5% of the Web sites implement collaborative learning in small work groups.

The results of assessing the use of non-textual representation on the course Web site (e.g., still or dynamic image, animation, simulation, sound, and video) are represented in Table 3. The table reveals the minor use of non-textual representation. Furthermore, the use of video or sound files was rare. We assume that this situation is subject to change due to increased bandwidth and to Web 2.0 applications that facilitate user-developed content and knowledge sharing (e.g., YouTube, Flickr).

Table 3

Representational Means Frequency (N = 202 Course Web sites)

EXTENT OF USE	IMAGE (%)	SIMULATION (%)	SKETCH (%)	GRAPH (%)	VIDEO (%)	SOUND (%)
Not at all	87.1	96.0	83.7	85.6	99.0	98.5
Seldom (1-10 items)	4.0	0.5	2.5	1.5	1.0	1.5
Medium (11-25 items)	1.5	-	6.9	7.4	-	-
Frequent (25+ items)	7.4	3.5	6.9	5.5	-	-

Use of interactivity was another focus of this research. Each of the 1,440 activity items was placed in one of four interaction categories: student-software, student-content, student-student and student-instructor. The most frequent interaction was between student and software, e.g., simulations or online exercises with immediate feedback (42.6% of the items). Interaction between the student and the learning materials (e.g., written assignments) occurred in 38.3% of the items. Surprisingly, interaction between student and instructor appeared in 12.2% of the items and between students (e.g., via an asynchronous forum) in only 7.0% of them.

From this study we can conclude that realization of the Web's potential was limited as well. Maximum flexibility (Collis & Moonen, 2001) in learning time and space was hardly achieved. None of the instructors (in our sample) created fully online courses and very few replaced face-to-face meetings in classes with virtual ones. In the vast majority of the courses, Web activities came as an addition to the classes and in some cases increased the workload of both students and instructors.

Other as yet unrealized potentials are related to the representational means. Sophisticated, high-level media is perhaps one of the defining characteristics of Web sites today. However, instructors refrained from taking the pedagogical advantage of enriching the learning materials in a multi-sensory way. Similarly, our research showed poor results concerning Web site interactivity. Although the research literature has high expectations regarding the growth of interaction between participants, this study shows that in our case most interaction occurred between students and software and/or learning materials. Collaboration and peer interaction were rare.

Use of the course Web sites was the subject of several studies. The first one, conducted in 2002, aimed to understand TAU students' use of content in Web-supported academic courses and analyzed students' logs in 117 Web-supported courses (Nachmias & Segev, 2003). It was found that about half of the courses had items which none of the students viewed. In addition, results showed that each item was viewed by an average of only 28% of the enrolled students. Moreover, 55% of the items were visited by less than a quarter of the students, and only 16% of the items gained the attention of over half of the students. No content item was found to have been accessed by all students. This means that though the Web site hypothetically exposes the students to a variety of contents, the students may not view them. Three other studies exploring students' participation patterns in Web-supported academic forums at TAU (Acrich, 2005; Tikochinsky, 2002; Steimberg, Ram, Nachmias, & Eshel, 2006) show that it is not obvious that students will participate in forums unless participation is obligatory or perceived by the students as beneficial to their success in the final examination.

The last study reported here was a controlled experiment aimed at evaluating the effectiveness of a redesigned fully online course, *Introduction to Statistics for Economists*, by comparing it to blended learning (face-to-face lectures and online exercise sessions) and face-to-face versions of the same course ($N = 151$) (Steimberg, Ram, Nachmias, & Israeli, 2008). It also aimed to evaluate the usefulness of Web-based technological applications when they were integrated into the redesigned fully online course. The findings indicate that student achievements, attitudes, and satisfaction in the redesigned fully online course were similar to those in the face-to-face course. As regards the usefulness of the technological components, the study reveals that students make extensive use of some mandatory components, which they assume might help them succeed in the final examination; they do not take as much advantage of other components, such as applets, which support in-depth understanding of statistical concepts.

Cost and Benefit Analysis

The third issue highlighted in this paper is the cost and benefit of Web-supported learning from both the economical and educational perspectives. More and more universities and educational institutions are considering the integration of new information technologies in their instruction. However, not many of them are fully aware of the complexity of this process, nor do they recognize what their decision-making really involves. The relevant considerations are twofold: the long-term policy level and the level of the online instructor. This mission is even more difficult and confusing considering the wide variety of distance and online learning models and strategies implemented in diverse settings, from Web-supported academic instruction through blended learning and up to a fully online model. Therefore, economic planning, costing, decision-making management, cost effectiveness, and cost-benefit analysis are essential components in this process.

In light of these issues, a comprehensive model was developed, validated, and implemented at TAU in the year 2007-08. This study is part of a PhD research project (Cohen, 2009) and a few of its highlights will be provided here.

The model consists of the following: (a) a cost effectiveness framework that defines cost and benefit components of Web-supported academic instruction and (b) a computational analyzer that provides a translation of the components into quantitative values (full details in Cohen & Nachmias, 2006). For this purpose a different measure for each of the components was developed enabling calculation and quantification in relation to each of the three main actors involved in the learning-teaching process: students, instructors, and the university. The model validation was conducted with reference to theoretical and experimental literature, experts in Web-supported academic instruction, and instructors using Web-supported instruction.

The model includes 44 benefit components and 23 cost components in six dimensions:

1. *Increasing efficiency of teaching and learning processes*
This dimension includes cost reduction through time saving as a result of implementing the Internet (e.g., reducing students' library time, saving classroom costs).
2. *Improving instruction quality*
This dimension refers to improving the effectiveness of pedagogical aspects by enriching the learning environment (e.g., using simulations, asynchronous communication among students).
3. *Improving affective aspects*
This dimension includes increasing students' and instructors' motivation, interest, self-confidence, and satisfaction.
4. *Knowledge management improvement*
Management system allows effective knowledge organization as well as greater collaboration, information exchange, and sharing of resources and instructional materials (e.g., using the course Web site over the years or sharing it with other instructors).
5. *Infrastructure costs*
Technological infrastructure costs, such as central infrastructure and equipment costs (e.g., servers, software, and communication) and operational infrastructure costs, such as institute support centre, training, workshops, and continuous technological and pedagogical support (i.e., preliminary and ongoing support for faculty and students and implementation costs).
6. *Instruction costs*
Course development and preparation, costs of curriculum development and course production – these costs are reflected in the amount of instructional materials embedded in the Web site and instruction/learning costs, including assessment time and interaction time with students.

A computational analyzer was developed in order to translate the 67 cost and benefit components of the model into quantitative values. For each one of the components, computational functions ($Y=f(X)*M$) are defined. These functions calculate quantitative values for each of the three main actors involved in the learning process: students, instructors, and the academic institution's policymakers. The indicators ($X\{x_1...x_{93}\}$) are extracted from the sites' Web-logs; they are independent variables that characterize the course, the course Web site, the Web-supported teaching processes, and their use by students. The cost effectiveness parameters ($M = \{m_1...m_{82}\}$) translate the costs and benefits derived from the independent variables into a quantitative measure in terms of four different "coins" on a cost effectiveness scale. The computational mechanism is the collection of all functions. The indicators (X) and parameters (M) constitute the input of this mechanism; the

computational mechanism (through the functions) processes the data to produce the desired output. The output consists of the cost effectiveness values for each of the three actors in terms of four different *coins*: *efficiency coins* for money (\$) and time (hours), *quality coins* (Q) for improving instruction and learning quality, *affective coins* (A) for improving affective aspects, and *knowledge management coins* (KM) for facilitating knowledge management.

Although the development process is tedious and includes a very large number of definitions (67 components, 93 indicators, 82 parameters, and 108 functions), activating the analyzer is rather simple. The indicators and parameters are represented in two spreadsheet input files; all the definitions of the functions are represented in a third file; and the fourth file represents the cost effectiveness values yielded by the calculations. The amount of coins received in these dimensions indicates the effectiveness level found. Anyone who uses the analyzer can insert the input data manually or produce them from the Web-supported shell. He or she can also define the parameters for each measurement according to case-sensitive predispositions. Then the computational analyzer is activated and the computational mechanism processes the data to produce the output.

The cost effectiveness analyzer was implemented in 3,453 Virtual TAU courses during the academic year 2006-7 in order to estimate the cost effectiveness of large-scale, campus-wide, Web-supported instruction processes. Course enrollment was comprised of 23,352 students and 1,850 instructors. Table 4 presents a summary of the cost and benefit analysis (more details are available in Cohen, 2009).

Table 4

Summary of the Cost and Benefit Analysis

Costs and Benefits	Coins	Students N = 23,352	Instructors N = 1,850	University
Infrastructure costs	\$	---	---	\$240,000
Instruction costs	\$	\$60,000	\$1,050,000	---
Efficiency increase	\$	\$10,740,000	\$500,000	\$20,000
Quality improvement	Quality Coins (Q)	35,000,000 Q	4,100,000 Q	---
Affective aspects	Affective Coins (A)	27,000,000 A	2,300,000 A	29,300,000 A
Knowledge management	KM Coins	120,000 KM	650,000 KM	115,000 KM

1\$= 3.6 New Israeli Shekel (NIS)

From these data we can glean the following observations concerning TAU:

- The total direct cost of integrating Web sites in academic instruction was about \$1,350,000. About 78% of this sum went into the development and implementation of the online instruction by the instructors, including the time invested in interaction with students and assessment (instructor time was converted to money, $1_{\text{hour}} = \$30$). About 18% of the costs were invested by the university in the technological and operational infrastructure, and about 4% was spent by the students mostly for printing the electronic learning materials, rather than obtaining handouts from

their instructors. It is not surprising that the instructors and the university are the main investors while the students reap most benefits.

- Increased efficiency of teaching and learning processes was measured by means of 28 computational functions. About \$10,740,000 was saved by students and a further \$500,000 by instructors. About 95% of the total saving belongs to the students as a result of electronic content consumption efficiency, getting/delivering electronic announcements, performing exercises online, posting papers and assignments on the Web, and saving copying/printing costs.
- Improved instruction quality was measured by means of 24 computational functions. Quality coins (Q) were calculated for various pedagogical activities (e.g., one viewing of online paper = 2 Q; activating a simulation = 5 Q; viewing lesson recordings = 4 Q; one forum posting = 1 Q, etc.). In the year 2006-07, about 35,000,000 Q were awarded for student learning as a result of activity based on interpersonal communication and various content knowledge representations, in particular for self-exercises accompanied by immediate feedback that enables individual learning at a personal pace. The fact that the instructor received over 4,000,000 Q of quality coins (e.g., one posting of a reply message to a student in a forum = 0.5 Q), suggested improved instruction as a result of intensive Web site use, interpersonal communication, and production of student activity reports, which made it possible to supervise students' learning.
- Improved affective aspects, e.g., satisfaction, were measured through 15 computational functions. Students and instructors received a very high value of affective coins (A) (27,000,000 A for students and 2,300,000 A for instructors), reflecting satisfaction as a result of simplicity of use; interactivity; immediate feedback; flexible learning; and interaction between lecturer and students. The university scored a very high affective benefit (29,300,000 A) for the prestige gain that was the result of offering technology-based instruction.
- Knowledge management improvement was measured through five computational functions. The students and the university got knowledge management benefits from working with the course Web site (about 120,000 KM knowledge management coins for students and 115,000 KM for the university). But the great winners were the instructors, who received 650,000 KM for effective knowledge organization (e.g., greater collaboration and sharing among instructors and reusing materials over the years).

Our cost effectiveness model demonstrates that quantifying the cost and benefit components of Web-supported instruction is possible. It uses empirical data taken from students' and instructors' Web-logs and provides quantitative analysis of the pedagogical benefits of Internet use. Finally, it enables decision-makers to quantify cost and benefit on both the single course and the campus-wide level. This model and analyzer addresses the need for assessing Web-supported academic instruction and blended learning (rather than distance learning only).

Conclusions

This paper described some of the institutional and the pedagogical aspects of Virtual TAU, a campus-wide project aimed at integrating the Internet into the academic instruction in Tel-Aviv University. Two main preliminary and apparently contrasting conclusions can be drawn. The first is related to the impressive pace at which the Internet has been introduced in the university's academic instruction.

Beyond any expectation, many instructors adopted the technology in a relatively short time, triggering the comprehensive diffusion of Web-supported academic instruction throughout the campus and at all academic levels. Some instructors, although not many, demonstrate impressive use of the Web by implementing newly emerging pedagogies. The other contrasting conclusion relates to the still limited pedagogical range of the activities the rest of the instructors used. Most of these activities are content-rather than communication-oriented. Instructors largely vary in the extent and ways they exploit the Web for instruction; however, overwhelmingly, it is still being used at the trivial content-based level.

The data from the research presented in this study as well as from the design and empirical implementation of our cost-effectiveness model on TAU courses suggest that the process of integrating Web-supported academic instruction campus-wide is extremely complex. Nevertheless, we are seeing the first signs of how the Web is being used and of its potential: it is heavily dependent on the initiative and input of TAU instructors but provides many benefits in terms of students' learning processes, instruction, and the university's prestige. It is clear that we are only at the beginning of a process which, with more effort, will significantly change and improve instruction at the university.

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Regional Focus Issue: Bridge over Troubled Waters ~ Cengiz Hakan Aydin and Yoram Eshet-Alkalai, IRRODL Regional Editors for the Middle East

Gender Dependency and Cultural Independency of Science Interest in an Open and Distant Science Learning Environment

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Abstract

This study aims to describe the similarities and differences in the science interests of males and females from Israeli and Arab Middle Eastern countries, as derived from over 1,000 science questions sent to an international ask-a-scientist site. Our findings indicate that while the stereotypical gender gap in interest persists, and significant differences were found between the age groups, no significant differences were found between science questions that were sent by Israelis and Arabs. Furthermore, no correlation was found between female participation and the state of gender equity in the country, and only 1% of the questions made any reference to country-specific, local, or religious aspects. One may conclude that science interests are gender- and age-dependent but culturally independent in this asynchronous, open and distant science learning environment. Further research is needed in order to determine if this is a genuine attribute of science interest in ODL environments or an outcome of the digital divide in the region.

Keywords: gender; cross-cultural; informal science education; questions; ask-a-scientist; Middle East

Introduction

The declining interest of students in pursuing higher science education and science-related careers is a major concern in many countries (e.g. The High Level Expert Group on Human Resources for Science and Technology in Europe, 2004; The National Commission on Mathematics and Science Teaching for the 21st Century, 2000). One of the reasons for this disinterest is the lack of relevance of formal science education to the lives, needs, and interests of many students, especially females. This concern is even more relevant for many students in developing countries who feel that school science is like a foreign culture because of the fundamental differences between the culture of Western science and their indigenous cultures (Aikenhead & Jegede, 1999).

Interest refers to a differential likelihood of investing energy in one set of stimuli rather than another (Csikszentmihalyi & Hermanson, 1995). It is a form of intrinsic motivation, which involves doing something because it is inherently interesting or enjoyable (Ryan & Deci, 2000). Interest is a powerful motivator that differs from other motivational concepts by its content specificity (Krapp, 2002). Teaching students what they want to know can be a very beneficial pedagogical strategy. Positive relationships have been reported between interest and a wide range of learning indicators (Pintrich & Schunk, 2002; Schiefele, 1998; Seiler, 2006). Interest plays a role in learning through its contribution to students' connection with the content (affective response) and maintaining that connection for sufficient time to be able to learn (persistence) (Ainley, Hidi, & Berndorff, 2002). Interest has also been found to influence future educational training and career choices (Kahle, Parker, Rennie, & Riley, 1993; Krapp, 2000; Levy, 2003; Lindahl, 2007). The issue of students' interests may also be viewed in the context of the "pupil's voice in education" movement, in which involving students in decisions about their life in school is an important moral and educational principle (Davie & Galloway, 1996). For all these reasons, the ability to identify students' interests in science plays an important role in improving existing curricula to meet their needs.

The wealth of data regarding boys' and girls' interest in science indicates that boys in general are more interested in science than are girls (Gardner, 1975, 1998; Miller, Slawinski Blessing, & Schwartz, 2006) and hold more positive attitudes towards studying and having a career in science (Kahle & Lakes, 1983; Kelly, 1978; Miller, Slawinski Blessing, & Schwartz, 2006; Weinburgh, 1995). However, a recent study which used an open distant science learning environment as a data source instead of the traditional school science setting describes a different picture. The study drew upon almost 79,000 questions sent over the course of a decade to an international ask-a-scientist site, in order to learn about the scientific interests of boys and girls of different age groups from various countries in an online, free-choice, science learning environment (Baram-Tsabari, Sethi, Bry, & Yarden, 2009). The sample demonstrated a decade-long dominance of female interest in science among K-12 students.

Another finding that emerged from the analysis was the absence of correlation between the Gender-Related Development Indexⁱ [GDI] of the UN and the level of female participation, i.e., countries that emphasize equity in their education policy and legislation did not have a higher percentage of K-12 female students sending questions to this science site than countries that do not promote gender equity.

In many Muslim countries, gender-based discrimination coupled with social and cultural barriers limit women's access to, and participation in, higher education; furthermore, career opportunities for female science graduates are more limited than for their male counterparts (Hassan, 2000). Nevertheless, Egypt, Iran, and Indonesia (ranked 119, 99, and 110, respectively, in the UN's GDI) displayed a female majority among contributors of science questions on the site, while Sweden, Denmark, and the Netherlands (ranked 6, 14, and 12, respectively, in the GDI) had among the lowest percentage of female contributors in the research. Israel, ranked 21 in the GDI, showed an average female participation rate. The relationship between the GDI and female

participation in this site is neither linear nor inverted – it simply does not exist (Baram-Tsabari, Sethi, Bry, & Yarden, 2009).

This finding can be viewed in light of the results from the international project, Science and Scientists (Sjøberg, 2000), which found that in most developed countries boys are more interested in learning science than girls, while in most developing countries, the opposite is true. Sjøberg and Schreiner (2005) tentatively explained this pattern with the idea that obtaining an education is a luxury in developing countries, especially for girls, while it is perceived as a burden by many students in developed countries. Another study that explored gender differences in high school mathematics achievements in the United Arab Emirates found that females outperformed their male peers. The author suggested that in Arab society female students spend more time in indoor activities, and, therefore, females might spend more time on school work than males (Alkhateeb, 2001).

We can further hypothesize that females in developed countries have a wider range of educational and occupational possibilities and therefore do not view science as a unique escape route from their traditional gender roles. It is also possible that females' interest in science is a product of their wish to impact society (Schreiner & Sjøberg, 2007) or even a form of rebellion against a limiting society (Baram-Tsabari, Sethi, Bry, & Yarden, 2009).

The Internet has tremendous potential to achieve greater social equity and empowerment (Mehra, Merkel, & Bishop, 2004), and open educational resources have helped to level the distribution of knowledge across developing and developed countries (Smith, 2009). It is widely suggested that online technologies can help address issues of educational equity and social exclusion and open up democratic and accessible educational opportunities (Gulati, 2008). Therefore, the finding regarding the female majority among research participants may indicate that the Internet has a potentially empowering and democratic role, which is especially relevant to populations that are deprived of equal opportunities to learn formal science. In this sense open and distant science learning environments may provide valuable hints regarding the genuine interests and information needs of marginalized groups in scientific fields.

This study focuses on how people from Middle Eastern countries use available media to fulfill their science information needs, using the perspective of the uses and gratifications theory. In this sense we are trying to tie people's motivations for using an ask-a-scientist site to their membership in cultural groups. The study aims to describe the similarities and differences of the science interests of male and female students from Israel and other countries in the Middle East, as mirrored by the questions sent to an ask-a-scientist site, in order to unveil the role played by gender and culture on science interest in this open, Web-based ODL environment.

Methodology

Research Approach

Interest in science has been traditionally identified using written questionnaires (e.g. Dawson, 2000; Qualter, 1993; Sjøberg, 2000; Sjøberg & Schreiner, 2002; Stark & Gray, 1999) that rely on adult-centric views of what subjects should be meaningful to students (and the public in general). It is our assumption that using spontaneous ideas and questions may be a better measure of interest than using responses to a questionnaire written by a researcher. Responses to a questionnaire are externally regulated, while asking a question is a self-regulated action (Deci, Vallerand, Pelletier, & Ryan, 1991) and therefore should be a stronger measure of interest.

Students' questions are an important part of the ongoing scientific research process and have an important educational role (Biddulph, Symington, & Osborne, 1986; Brill & Yarden, 2003; Scardamalia & Bereiter, 1992). Despite the capacity of students' questions for enhancing learning, much of this potential remains untapped (Chin & Osborne, 2008). It is hard to use children's questions for research in a classroom setting since they are so rare and seldom give evidence of genuine intellectual curiosity (Dillon, 1988). Researchers attribute this situation to a classroom atmosphere in which revealing a misunderstanding may render the student vulnerable and open to embarrassment, censure, or ridicule (Pedrosa de Jesus, Teixeira-Dias, & Watts, 2003; Rop, 2003). However, students do pose science questions in free-choice, science learning environments. Therefore, we chose to use self-generated, science-related questions submitted to an open and distant science learning environment as a data source to probe the scientific interests and needs of Middle Eastern students.

The Data Source

When people are using the Internet to research their interests, some of their complex questions are better answered by experts than by a list of directories or sites. This type of service is offered on the Web by human-mediated question-and-answer sites, which are sometimes referred to as "expert services" (Janes, Hill, & Rolfe, 2001) or "ask-a" services (Lankes, 1999). Such sites usually maintain searchable public archives in which previously answered questions are returned as search results, thus making this archive a resource for their users (Pomerantz, Nicholson, Belanger, & Lankes, 2004).

Ask-a-scientist sites exist both in Hebrewⁱⁱ and Arabicⁱⁱⁱ. However, these sites could not serve as the data source for this cross-cultural comparison for various reasons, such as focusing on medical issues, addressing mostly teachers' questions, and not recording background information. Therefore we chose to use the massive archives of the international Web site *MadSci Network* as a data source, noting the limitations its language demands cast on the nature of our sample.

MadSci Network is an independent, award-winning, nonprofit organization operating from a server in Scottsdale, AZ (see www.madsci.org). It receives 90 to 150 questions daily, most of which are answered automatically by the site's search engine. Fewer than 20% of the questions are answered by nearly 800 globally distributed volunteer scientists, usually within two weeks. Unlike most ask-a-scientist services, MadSci Network covers all branches of science and stores key demographic information as metadata, making it easier to mine the information from its archives.

The Sample

Over 146,000 questions were sent to MadSci Network between 1996 and the first half of 2006. Almost 79,000 of the surfers disclosed their grade level and country of origin and filled in the name and question's subject fields. Of these, 1,289 questions were submitted by people who indicated their country of origin as one of the following: Afghanistan, Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Palestine National Authority, Qatar, Saudi Arabia, Oman, Syria, Tunisia, Turkey, and United Arab Emirates. Afghanistan, Iran, and Turkey are not Arab countries, but they were included as Middle Eastern for geographical and cultural reasons. These questions were used in our analysis, after removing duplications, non-scientific, and ambiguous questions, which resulted in a sample size of 1,102 questions. For an age and gender split of the sample, see Table 1. Throughout this paper, Israel is compared to all other countries in the region. The rationale behind this grouping is the cultural differences with regard to religion, language, and political situation.

Table 1

Demographic Characteristics of the Sample

	Israel			Middle Eastern countries ¹			Full Sample
	Males	Females	Unknown	Males	Females	Unknown	
K-3rd graders	2	0	0	11	1	1	15
4th-6th graders	1	1	0	7	3	5	17
Middle school	2	7	2	24	33	8	76
High school	17	8	8	113	100	31	277
Undergraduates	58	8	4	97	46	17	230
Graduates	57	32	6	153	74	59	381
Teachers	9	9	2	54	16	16	106
Sum	146	65	22	459	273	137	1102

¹The list includes the following Middle Eastern, Arab and Muslim countries: Iran, Turkey, Egypt, United Arab Emirates, Lebanon, Oman, Saudi Arabia, Qatar, Palestinian National Authority, Kuwait, Iraq, Jordan, Bahrain, Morocco, Syria, Libya, Afghanistan, Algeria and Tunisia

Gender Identification

Gender identification was based on the research participant's first name. Initial classification was done semi-automatically using an English name gender finder. Next, the names that were not automatically classified were analyzed manually. Some names that could be associated either with a male or a female (e.g., the Israeli name "Tal" and the Arab name "Nur") were classified as "unknown" and accounted for 14% of the sample.

Question Classification

Textual analysis of the questions was performed with coding schemes that were previously used for students' science question classification (Baram-Tsabari, Sethi, Bry, & Yarden, 2006; Baram-Tsabari & Yarden, 2005, In Press).

Topic of the question: Subject and sub-subject.

Questions in this coding scheme were placed in one of the following categories: biology, physics, chemistry, earth sciences, astrophysics, nature of science (NOS) inquiry, and technology. NOS inquiries were general questions about how scientists develop and use scientific knowledge (Ryder, Leach, & Driver, 1999) without reference to a specific scientific context. Technology questions were categorized by defining technology as the development, production, and maintenance of artifacts in a social context, as well as the artifacts themselves (Gardner, Penna, & Brass, 1996). Questions in the field of mathematics and questions that did not have a science topic were not included in our sample. Each of the categories (except for NOS) was further divided into sub-subject, resulting in a total of 65 sub-subjects: 20 in biology, 6 in physics, 13 in chemistry, 8 in earth sciences, 6 in astrophysics, 1 in NOS, and 11 in technology. An effort was made to classify the questions using the research participant's perspective. For example, the question "Plz Tell me about problems made by Masturbation in male and females," sent from Iran, was classified as "Sickness, disorders, and medicine" since this is the way the issue was framed and categorized when originally submitted to the Web site's system. For examples of the application of the categories in this coding scheme, see Table 2.

Table 2

Examples of the Questions Analyzed According to their Topic and their Frequency within Various Subjects

Subject	Sub-subject	Example¹ (gender², age group, country)
Biology (36.6%, 405) ³	Physiology and anatomy (3.5% , 39) ³	What is the mechanism which produces the sensation of thirst? (f, high school, United Arab Emirate)
Chemistry (20.8%, 230)	Phases of matter (1.1% , 12)	What form of matter does fire come under? Is it solid, liquid or gas? (f, middle school, Kuwait)

Physics (14.5%, 161)	Modern physics (1.3% , 14)	Let's say we find a way to accelerate matter to the speed of light, and let's say a bus is driving at the speed of light, with someone sitting at the back of it. Then, while the bus is at the speed of light this person gets up and walks forward in the bus. Isn't he going faster than the speed of light? (m, high school, Israel)
Technology (12.5% , 139)	Aeronautics (1%, 11)	Can a helicopter fly freely in a tunnel? (m, graduate, Israel)
Astrophysics (5.6% , 62)	The solar system (2.3% , 26)	How many days does it take for the moon to make one revolution? (m, middle school, Egypt)
Earth science (3.2% , 36)	Atmosphere (1% , 10)	How would Earth look like from space if it didn't have an atmosphere? (m, high school, Israel)
Nature of Science (1.2% , 13)	–	What are the characteristics of a scientist? (m, high school, Lebanon)

¹ These are verbatim quotes. In some cases only a part of the question is shown.

² Where data is available, m = male; f = female; NA = not available.

³ Percentage of questions in this subject or sub-subject out of the total sample, followed by the absolute number of questions.

Magnitude.

The order of magnitude of the object in question was noted. This scheme was inspired by the concept of “level of organization,” which is abundantly used in biology education research (e.g. Knippels, 2002; Songer & Mintzes, 1994; Verhoeff, 2003). The levels chosen for this scheme were population, macroscopic, microscopic, molecular, and nano-metric scale. This classification was relevant to only 79% of the questions, mostly in the fields of biology, chemistry, and physics. For examples of the application of the categories in this coding scheme, see Table 3.

Object of interest.

Many questions were embedded in the context of human biology, zoology of non-humans, botany, or unicellular entities. This classification was relevant to only 36% of the questions, mostly biology questions. For examples of the application of the categories in this coding scheme, see Table 3.

Table 3

Examples of the Questions Analyzed According to the Object of Interest and its Magnitude and their Frequency

Magnitude: organization level	Object of interest	Example¹ (gender², age group, country)
Population (11.1% , 123) ³	Zoology (4.8% , 53) ³	How can birds find their way home? Do they have a magnetic compass? (m, teacher, Turkey)
Macroscopic (25.6% , 283)	Human (25.3% , 280)	My baby 8 months old when crying no tears are coming out till now why? (f, NA, Kuwait)
Microscopic (4.6% , 51)	Not mentioned (64% , 707)	Can you tell me why are the nervous system cells non-compensate? (NA, high school, Saudi Arabia)
Molecular (13.6% , 151)	Human	Does DNA get updated as a person grows up? (m, high school, Israel)
Nanometric scale (14% , 155)	Not mentioned	How does light travel through vacuum? (NA, undergraduate, Lebanon)

¹ These are verbatim quotes. In some cases only a part of the question is shown.

² Where data is available, m = male; f = female; NA = not available

³ Percentage of the questions in this subject or sub-subject out of the total sample, followed by the absolute number of questions. Percentages do not add up to 100% since not all categories are represented in the table.

Psychological distance.

Bar-Ana, Liberman, and Trope (2006) describe four dimensions of psychological distance: (a) spatial – how distal in space is the target from the perceiver? (b) temporal – how much time (past or future) separates the perceiver’s present time and the time of the target event? (c) social – how distinct is the social target from the perceiver’s self (e.g., self vs. others, friend vs. stranger)? (d) hypothetical – how likely is the target event to happen, or how close is it to reality, as construed by the perceiver? The zero-anchoring point of all four dimensions is the perceiver’s direct experience, the stimuli sensed in the here and now, whereas psychologically distal entities are objects and events that are not part of the perceiver’s direct experience. We added another dimension to the psychological distance, which is scale. Objects that are too small or big to be experienced with our senses can be considered as psychologically distal. The questions were coded into three levels according to the psychological distance of the research participant from the object of the question:

1. Myself. Example: How does caffeine affect us?
2. Direct environment. Refers to objects that the research participant may observe and interact with. Example: How can I detonate a hydrogen balloon safely?
3. Distant environment. Refers to objects that the research participant may not observe and interact with. Example: Is there more chance for life in galaxies that are in a non crowded space?

Country-specific and religious aspects.

Particular attention was given to questions with a local, national, or religious emphasis. The number and nature of such questions serves as an indication of the cultural dependence of the science and technology-related interests of people from Middle-Eastern countries, as mirrored by their questions.

Reliability

In order to establish reliability, 120 questions were classified independently by two researchers in order to establish an acceptable level of reliability. For the first preliminary trial, 20 questions were coded independently. Problematic issues were then discussed and refined. For the second trial, another 40 questions were coded; disagreements were resolved by discussion among the researchers, and the coding system was adjusted as necessary. In the third trial, the remaining 60 questions were coded and compared. Agreement between the researchers for the third trial was as follows: gender identification, 100%; subject, 96%; sub-subject, 95%; magnitude, 83%; object of interest, 100%; psychological distance, 90%; local/religious aspects, 100%.

Statistical Analysis

Significant differences were determined according to a cell chi-square test. Pearson correlation index was used for finding linear correlations. All p-values reported are two-sided.

Results

In order to investigate the role played by gender and culture in an open and distant science learning environment, 1,102 questions submitted to an international ask-a-scientist site by students and teachers from Middle Eastern countries were analyzed.

Grade Level, Gender, and Geographical Distribution of Participants

Most of the questions (80%) in the sample were sent by high school, undergraduate, and graduate students (Table 1). The questions that originated in Israel represented 21% of the sample, and the rest were sent from Arab countries in the region. Of the 943 gender identifiable questions, only 36% (338) were sent by females. However, among the questions sent by K-12 students, 46% (153) of the gender identifiable questions were sent by female students (Table 1). The greater participation of females among K-12 age groups compared with older age groups mirrors trends found in other regions in the world, such as the US and Western Europe (Baram-Tsabari, Sethi, Bry, & Yarden, 2009).

Interactions between Scientific Interests, Grade Level, and Gender

Overall, the questions in the sample referred to the following scientific disciplines, appearing here in their order of popularity (Table 2): biology (36.6%), chemistry (20.8%), physics (14.5%), technology (12.5%), astrophysics (5.6%), earth science (3.2%), and nature of science (1.2%). The

most popular sub-subjects for questions were sickness, disorders, and medicine; electricity and magnetism; biochemistry; light, heat, sound (radiation); sex, genetics, and reproduction; computers and Internet; botany; chemical reactions; cell biology; mechanics; and neurobiology and the mind.

A significant difference ($p < 0.001$) was found between boys and girls in the distribution of question topics: Boys were more interested than girls in learning about physics and technology, while girls were more interested than boys in biology. This was true for Israelis ($p < 0.001$) and for Arabs ($p < 0.001$) as well as for the whole sample. This stereotypic gap in gender interest has been described previously in many countries, both in formal and informal learning environments (e.g. Baram-Tsabari & Yarden, 2008; Dawson, 2000; Jenkins & Nelson, 2005; Jones, Howe, & Rua, 2000; Murphy & Whitelegg, 2006; Yerdelen-Damar & Eryilmaz, 2009). A significant difference ($p < 0.001$) was also found between the age groups as far as the distribution of question topics: interest in biology decreases with age while interest in technology increases.

Many of the questions that were coded for order of magnitude ($n = 759$, Table 3) asked about macroscopic entities ($n = 283$). Many other questions referred to population, molecular, and nano-metric organization levels. With students' increasing age, the order of magnitude of the objects in question deviated from macroscopic scale to organization levels that are not obvious to the naked eye ($p < 0.01$).

Of the questions that were classified for object of interest ($n = 395$, table 3), most dealt with human biology ($n = 280$), and a few concerned zoology, botany, and microbiology. On the other hand, over two thirds of the questions (67.6%) related to objects that are not experienced directly by the research participant but are found in his/her distant environment; 25.5% of the questions dealt with objects found in the research participant's immediate environment; and 6.9% concerned themselves. A significant difference ($p < 0.01$) was found in the likelihood of males and females to ask about objects that cannot be directly experienced: females asked more about their direct environment, while males asked more about the distant environment. A significant difference ($p < 0.01$) was also found with regard to age: interest shifts from the direct to the indirect environment of the participants with age.

Interactions between Scientific Interests and Country of Origin

Questions submitted from Israel and from other Middle Eastern countries displayed no significant differences with regard to subject, order of magnitude, object of interest, or psychological distance (Table 4).

Table 4

Significance of Interactions between Characteristics of Science Questions and Characteristics of the Research Participants

	<i>Gender</i>	<i>Grade level</i>	<i>Country of origin</i>
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Subject	p < 0.001	***	p < 0.001	***	p = 0.1	NS
Magnitude	p = 0.28	NS	p < 0.01	**	p = 0.2	NS
Object of interest	p = 0.41	NS	p = 0.07	NS	p = 0.08	NS
Psychological distance	p < 0.01	**	p < 0.01	**	p = 0.06	NS

NS = not significant

The same cultural independence of science interests was observed using the *Country-specific and Religious Aspects* coding scheme. Only 11 questions out of 1,102 (1%) referred to local or religious aspects (Note: gender, grade level, and country of origin are in brackets):

1. What about nuclear future in Egypt? (m, high school, Egypt)
2. What is the probability of a B+ blood type person to be an Arab or African? (m, graduate, Qatar)
3. [Looking for] References/Web sites on Nile pollution (f, teacher, Egypt)
4. What is the name of the dye which is present in mehndi (henna) leaf? (f, high school, Saudi Arabia)
5. What are the activities recommended for a future taxonomist living in Kuwait? (f, middle school, Kuwait)
6. Was Isaac Newton a Jew? (m, undergraduate, Israel)
7. How [...] present is the possibility of the earth quake in Tehran? (f, high school, Iran)
8. At what time will the eclipse occur in Israel, how much will we see? (m, graduate, Israel)
9. Formula to convert between calendars [Hebrew and Christian]. (m, graduate, Israel)
10. Is it possible that a Kuwaiti can be an astronaut with average grades? (m, middle school, Kuwait)
11. The definite causes of the Egyptian great pyramid effects and mysteries? (m, graduate, Egypt).

These exceptional examples demonstrate the general and global, rather than local, nature of the science-related interests of people from Middle-Eastern countries, as mirrored by the majority of questions submitted to MadSci Network.

Interactions between Gender and Country of Origin

The percentage of female contributors varied greatly between countries, from 25% in Turkey to 85% in Jordan. The countries with the greatest ratio of posts made by women were Jordan, Kuwait, and Lebanon. Saudi Arabia and Egypt also demonstrated a higher number of female than male contributions among K-12 students (Table 5). Some of the results reported by Baram-Tsabari, Sethi, Bry, and Yarden (2009), notably the higher number of female participants observed in Iran (52%), were not reproduced here, probably due to methodological differences. The former study used an automatic classification, while here almost 200 questions were eliminated because a textual analysis found them to be unscientific or ambiguous with regard to their subject.

However, the absence of correlation between the percentage of submissions by females and the UN's gender-related developmental index that was described earlier, using an international sample dominated by English speaking countries (Baram-Tsabari, Sethi, Bry, & Yarden, 2009), was repeated in this Middle Eastern sample. No correlation was found between the percentage of submissions by females, either K-12 students or all age groups, and the GDI of the specific country (Table 5). Further, no correlation was found between any of the indicators for digital access and the overall number of questions submitted from any specific country (Table 5).

Table 5

Country Characteristics with Regard to General and Female Participation, Gender Equity, and Digital Divide

Country ¹	Number of questions	% of female submissions ²	% of K-12 females submissions ²	Gender-related development index ³	Internet users per 100 inhabitants ⁴	Digital access index ⁵	Networked readiness ⁶
Israel	233	31% (65)	38% (16)	21 (0.927)	27.7	0.70	18 (5.18)
Iran	222	29% (55)	44% (24)	83 (0.750)	25.5	0.43	-----
Turkey	168	25% (30)	30% (13)	78 (0.763)	16.6	0.48	55 (3.96)
United Arab Emirates	111	40% (36)	44% (21)	43 (0.855)	36.7	0.64	29 (4.55)
Egypt	93	35% (32)	55% (17)	-----	8.0	0.40	63 (3.74)
Saudi Arabia	71	48% (26)	67% (18)	69 (0.783)	18.6	0.44	48 (4.07)
Kuwait	46	66% (29)	73% (24)	32 (0.884)	29.5	0.51	52 (4.01)
Lebanon	42	54% (21)	62% (8)	80 (0.759)	26.3	0.48	-----
Oman	22	45% (9)	40% (4)	66 (0.788)	12.2	0.43	53 (3.97)
Jordan	18	85% (11)	75% (3)	79 (0.760)	13.7	0.45	47 (4.08)
Iraq	16	31% (4)	0% (0)	-----	0.16	-----	-----
All sample ¹	1102	36% (338)	46% (153)	-----	-----	-----	-----

¹ Only countries with 15 submissions or more are listed.

² Percentages calculated of the total of gender identifiable questions.

³ <http://hdrstats.undp.org/indicators/268.html>

⁴ United Nations Statistics Division. <http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=608>

⁵ The Digital Access Index (DAI) measures the overall ability of individuals in a country to access and use new ICTs, built around four fundamental vectors: infrastructure, affordability, knowledge and quality, and actual usage of ICTs. Issued by the International Telecommunication Union on 2003. www.itu.int/ITU-D/ict/dai

⁶ Networked Readiness Index 2007–2008 rankings are issued by the World Economic Forum as part of The Global Information Technology Report. www.weforum.org/pdf/gitr/2008/Rankings.pdf

Discussion

When studying science, students move between the culture of their everyday life-world and the culture of Western science (Aikenhead & Jegede, 1999). An open and distant science learning environment, such as an ask-a-scientist site, might be viewed as a mechanism of cultural border crossing. This is especially true for traditionally marginalized groups in Western science, such as

females and non-Westerners (of all genders). Such an ODL environment allows an investigation of one's own interests and genuine needs in the context of science. Thus, ask-a-scientist sites may serve as a data-source about children's science interests, which could ultimately inform classroom science teaching and enhance the attractiveness and relevance of science curricula and informal science learning environments (Baram-Tsabari, Sethi, Bry, & Yarden, 2006; Baram-Tsabari & Yarden, 2005).

The sample used in this study, which originates from the culturally, economically, and politically diverse Middle East region, did not demonstrate correlation between the percentage of science questions sent by females and the gender equity of specific countries. Contrary to expectation, gender differences with regard to interest in science are not smaller in technologically advanced countries, which foster mass education and equity legislation (Steinkamp & Maehr, 1984). It is an example of cultured technology, in which communities reshape a technology and make it a part of their culture, while at the same time changing their customary ways of life and unwritten laws to adapt to it (Barzilai-Nahon & Barzilai, 2005). In this case study, the Internet serves as a potential bypass for traditional gender inequities by allowing girls to pursue their science interests through an open and distant science learning environment even when their direct environment does not necessarily encourage such interests.

This is a specific example of the more general notion of the Internet as a facilitator of free thought. Rinnawi (2002) expressed this idea with regard to political issues in Arab countries:

Arabs have and continue to use the Internet, for reshaping the public sphere through expanding the margins of freedom of expression. In the circumstances of very narrow margins of freedom of expression and regime controlled mass media, as in the Arab World, the Internet is proving its ability to increase opportunities for individuals and groups to discuss and make political and socio-cultural issues more renowned. (Page 1)

Our results also show that the stereotypical gap in male and female science interests crosses borders and cultures: boys' greater interest in physics and technology and girls' greater interest in biology was evident for both Israelis and Arabs. This finding is mirrored by an analysis of questions submitted to a Turkish ask-a-scientist site, which found that only 15% of the physics questions were submitted by females compared with 52% of the biology questions (Yerdelen-Damar & Eryılmaz, 2009). The Science and Scientists (SAS) project, too, found strong similarities between the lists of Norwegian and Japanese science topics favored by boys and girls, despite the strong cultural differences between these two countries (Sjøberg, 2000). In addition, significant shifts in interest related to age were found, from biological to technological questions as well as diversification of the organization level of objects to the psychological distance of the object of interest from the research participant.

However, no significant differences were observed between the science interests of Israeli and Arabs, as inferred from their questions. One might have expected such differences, due to culture-related indigenous knowledge, beliefs, and values. Semali (2004), for example, pointed to the

importance of cultural identity at a time of economic and educational globalization. Another reason to expect a difference is that culture-specific beliefs (such as sense of time or preference for face-to-face versus electronic meetings) are thought to have a downstream effect on the use of the Internet (Loch, Straub, & Kamel, 2003). A survey among computer-savvy Arabs, for example, listed culture conflict among the discouraging factors for the acceptance of the Internet in the Arab world (Loch, Straub, & Kamel, 2003). A culture conflict may emerge, for example, because in the virtual realm interaction patterns between male and female students cannot be controlled and religious barriers collapse (Al-Hunaiyyan, Al-Huwail, & Al-Sharhan, 2008). An empirical examination of ultra-Orthodox Jewish communities in Israel found them to conceptualize the Internet as a threat (Barzilai-Nahon & Barzilai, 2005).

Nevertheless, our findings indicate that while the stereotypical gender gap persisted, and an age related shift in science interest was also observed, no significant differences were found with regard to country of origin (Table 4); no correlation was found between female participation and the UN's gender-related developmental index (Table 5); and only 1% of the questions made any reference to country-specific, local, or religious aspects. One may conclude that science interests are gender- and age-dependent but culturally independent in this asynchronous open and distant science learning environment.

This finding might be a genuine attribute of science interest in ODL environments, but also it might be an outcome of the great digital divide in the region, which spans from 0.2% penetration in Iraq to 52% in Israel (Internet World Stats, 2008 and Table 5). Caswell, Henson, Jensen, and Wiley (2008) crown new distance education technologies as enablers to achieving the universal right to education and as social transformers. However, this social transformation depends on access to adequate technology, which is still more ideal than real (Huijser, Bedford, & Bull, 2008). E-learning does have the potential to meet the educational needs of masses of poor people in developing countries; however, the present IT provisions in developing countries are limited to the elite (Gulati, 2008). Notwithstanding the widely expanding access to the Internet, the research sample might have been far less heterogeneous than the general population in the region because the sample is characterized by access to the Internet and reasonable fluency in English.

There are a variety of barriers that make it difficult for many Arabs to freely access the Internet, including language and the cost of equipment, software, and Internet connections (Rinnawi, 2002). Many Arab countries also lack the infrastructure required to enable wide-scale data transmission over their phone lines. Government prohibitions have resulted in the Internet not being available to the public in Iraq and Syria, for example. In other countries, such as Tunisia, state monitoring may also turn away potential users. In Bahrain, UAE, and Saudi Arabia, all Internet traffic passes through a single government-controlled gateway (Rinnawi, 2002). Therefore, the cultural differences observed might have been smaller than among the general population in the region.

Additionally, *country of origin* was used as a single indicator for cultural affiliation, although a large minority of Arabs live in Israel, and they use the Internet in different ways (Avidar, 2009). In order to address these problems, future research on the interplay of culture and ODL in the

context of science interest should identify comparable ask-a-scientist applications in Hebrew, Arabic, and Farsi.

Another drawback of this study is the limited sample size, which made it impossible to control for age and gender while comparing results according to country of origin. Future research should take advantage of bigger samples in order to control these variables. Furthermore, as in the case of other ODL environments, the sample is self-selected and constituted of students who are initially more interested in learning (in this case, science) than the general population.

Conclusion

This attempt to unveil the role played by gender and culture in pursuing scientific interests in an open, Web-based ODL environment found that an interest in science is gender- and age-dependent but culturally independent. It seems that the Israeli and Arab contributors to our sample were quite similar with regard to their interests, curiosities, and needs. It is tempting to say that common interest in science provides scaffolding for an educational bridge over the troubled Middle Eastern water. However, further research is needed in order to determine if this is a genuine attribute of science interest in ODL environments or an outcome of the digital divide in the region.

Smith (2009) notes two challenges to open educational resources: the extent of use in the developed and developing worlds and the question of effectiveness. This study makes a contribution to the first challenge. Knowing more about the cultural and gender characteristics of users of open and distant science learning environments will help make them a more reliable data source, a better research tool, and a more relevant and effective learning environment for different groups of learners.

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Endnotes

ⁱ Human development reports, Technical Note 1: The gender-related development index (GDI) adjusts the average achievement of a country to reflect the *inequalities* between men and women using three basic dimensions of human development: (1) A long and healthy life, as measured by life expectancy at birth, (2) Knowledge, as measured by the adult literacy rate (with two-thirds weight) and the combined primary, secondary and tertiary gross enrollment ratio (with one-third weight), (3) A decent standard of living, as measured by GDP per capita.

ⁱⁱ e.g. www.bashaar.org.il ; www.weizmann.ac.il/zemed/net_activities.php?cat=1639&incat=1412

ⁱⁱⁱ e.g. www.panmedsa.com ; www.6abib.com ; www.hawahome.com ; www.md4a.net ; www.raneem.net



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Regional Focus Issue: Bridge over Troubled Waters ~ Cengiz Hakan Aydin and Yoram Eshet-Alkalai, IRRODL Regional Editors for the Middle East

Psychosocial Well-Being of Israeli Students and Attitudes toward Open and Distance Learning

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Abstract

This article reports on a study conducted in Israel at an academic institution. The study investigates the correlation between students' attitudes toward open and distance learning (ODL) and their perceived self-esteem and loneliness at the last stage of their online learning experience. For this study, 120 students were asked to complete a questionnaire. The students were enrolled in three fully online academic courses, which were similar in their instructional design approach although different in content. Findings reveal that there is a positive correlation between self-esteem and attitudes toward e-learning in general and toward online interaction with the instructor in particular. The findings further suggest that there is no correlation between loneliness and student attitudes toward e-learning. Some explanations for these results are raised as are recommendations for further research.

Keywords: attitudes toward ODL; perceived well-being; UCLA Loneliness Scale; fully online courses

Introduction

The use of the Internet is becoming increasingly influential in our daily life. Internet technology is developing at an astounding rate. The pace and scale of these changes for the whole of society are such that this phenomenon has been compared to the "Industrial Revolution" of the nineteenth century and dubbed the "Internet Revolution" (Amichai-Hamburger, 2002).

The educational arena is no exception. The open and distance learning (ODL) revolution, which can be aptly described using the terms e-learning (electronic learning) and online learning to refer to the implementation of the Internet in the learning process, is here and now (Moore & Kearsley, 2005). Based on Kurtz et al. (2003), we define ODL as an interactive teaching-learning process, in which at least part of it is done online by means of text/audio/video.

With the growth of online courses, it is critical to ensure the success of students in the online environment. Much research has been done on online students' perceptions, satisfactions, motivation, and cognitive and learning styles, and how these factors influence student achievement in online courses (Fahy & Ally, 2005; Young, 2006; Bates & Khasawneh, 2007; Offir, Bezalel, & Barth, 2007).

A particularly relevant variable for understanding people's behavior on the Internet is personality. Hamburger and Ben-Artzi (2003) pointed out that personality can serve as a leading explanation for differential behavior of surfers on the Internet. Many personality characteristics, such as introversion and extroversion (Hamburger & Ben-Artzi, 2003), need for closure (Amichai-Hamburger, Fine, & Goldstein, 2004), need for cognition (Amichai-Hamburger & Kinar, 2007), locus of control (Hoffman, Novak, & Schlosser, 2003), and sensation seeking (Alonzo, & Aiken, 2004), have been suggested as reasons to explain Internet behavior. Based on the research cited in this section, personality traits seem to constitute relevant variables in understanding people's behavior on the Internet and we can assume also in the e-learning environment.

This research investigates the correlation between students' attitudes toward ODL and their perceived self-esteem and loneliness at the last stage of their online and face-to-face learning experience. The analysis focuses on three undergraduate online courses similar in their instructional design approach but different in content: two courses are on the topic of quantitative research and one is on the state and government in Israel.

The courses were designed to be self-paced so that students would study independently within a timeframe that was set by the instructor. The courses' content and educational activities (including assignments) were carried out through an asynchronous learning management system (LMS).

Theoretical Background

The Internet in its Psychological Context

The Internet creates a unique psychological environment for the online user. McKenna, Green, and Gleason (2002) suggest four major factors that differentiate Internet interactions from face-to-face interactions:

(1) Greater anonymity

On the Internet, people can easily maintain their anonymity. Internet sites differ as to the degree of anonymity they allow the user to maintain. However, even when users provide their real names

or disclose other personal details or private information, they still feel relatively anonymous (McKenna & Bargh, 2000). This feeling of anonymity frees people from social norms and encourages them to express themselves and behave more freely and sincerely than they would normally in face-to-face interactions.

(2) Diminution of the importance of physical appearance

Physical appearance is one of the focal determinants of how we are perceived by others (Fiske & Taylor, 1991). Cialdini (1984) suggested that attractive people have enormous social advantages, they are seen as possessing superior personality traits and intellectual capabilities, and they are better liked and more frequently helped. These benefits are bestowed due to what is termed as the halo effect. This occurs when one positive characteristic of a person, such as attractiveness, leads the perceiver to believe that other positive characteristics are present, e.g. an attractive male may be perceived as honest and caring. Just as the halo effect plays in favor of the physically attractive, conversely people who are physically unappealing will frequently find that they are judged unfavorably on any number of unrelated aspects. In an online environment, people are freed from being appraised by others based on physical characteristics.

Since a major part of Internet interaction is text-based, the physical characteristics of the participants remain undisclosed. This factor will be particularly significant for people with unsightly or unattractive physical characteristics, who are very likely to suffer from discrimination in a face-to-face interaction. On the Internet such people have an opportunity to present themselves in any way they choose. They may hope that if and when the interaction will move on to become face-to-face, any negative physical features will not be relevant.

This freedom may help them form a new basis for their interaction with others and help strengthen their self-image and self-confidence. Whilst offline, such people may have internalized a negative social perception of themselves, but interaction over the Internet may give them opportunities to reframe their self perception.

(3) Greater control over the time and pace of interactions

One of the unique facets of Internet communication is that for the participant the whole encounter is taking place in an environment of his or her choosing, and this may be a source of security and comfort. The Internet user is able to go out to meet the world from his/her living room (Mandell & Muncer, 2007). Another source of security comes from the opportunity Internet users have to review their statements before sending them. This type of thought and review process does not exist in face-to-face encounters because they take place in real-time. This progression of writing and then reviewing on the screen creates a higher self-awareness since the writer observes him/herself as an object (Duval & Wicklund, 1972).

(4) Finding similar others

The need to belong is listed as one of the significant needs in Maslo's (1971) *Hierarchy of Needs*. Being a member of a group that shares your goals and interests is likely to enhance self-esteem (Tajfel & Turner, 1986), which is believed to be very important for well-being (Branden, 1969).

The Internet is visited every day by millions of surfers, all of whom have varied interests. It is easy to find details about the different interest groups on the Internet, which facilitates the discovery of like-minded others who are visiting the same site. This is often particularly relevant to people who belong to stigmatized groups or to very small groups since they are likely to find it difficult to get together with others in non-Internet environments. It was found that on the Internet people sometimes develop group identifications even faster than offline groups (McKenna, Green, & Gleason, 2002).

Interaction in an online learning event is a crucial component of the education process (Anderson, 2003). Anderson and Garrison (1998) described the three most common types of interaction involving students, which are discussed in the distance education literature: student-student, student-teacher, and student-content. All three types of interaction share similarities with the online interaction characteristics described above: students can maintain some anonymity within the learning activities; they are freed from being appraised by others based on physical characteristics; and they can study unconstrained by time and place. By sharing common learning goals with their classmates they can develop what Anderson (2008) calls “a community-centered context.” It seems that lonely people will derive greater enjoyment than their non-lonely counterparts from participating in the e-learning environment since the opportunities it provides for significant social interaction compensates them for their previously unsatisfied social needs.

Self-Esteem

Self-esteem is defined as an individual’s overall negative or positive attitude towards himself or herself (Rosenberg & Simmons, 1975) or as one’s belief regarding how well one is living up to the standards of value prescribed by one’s society (Harmon-Jones et al. 1997). Baumeister et al. (2003) pointed out that one of the components necessary to achieve a true rise in self-esteem is successful performance in a learning task. Moreover, since modern society places a value on the mastery of technology, it would appear that taking an e-learning course would enhance self-esteem.

Research Hypotheses

In conducting the research presented in this paper, two hypotheses were proposed:

1. Students with high self-esteem will be associated with positive attitudes toward online learning and a greater preference for online learning when compared to students with low self-esteem.
2. Lonely students, when compared to students who are less lonely, will express positive attitudes toward online learning and will choose online learning as their preferred mode of learning over the face-to-face mode.

Research Method

The sample comprised 120 students who completed questionnaires while attending a face-to-face meeting a few days before the final exam in summer, 2007. The students were enrolled in three fully online undergraduate courses. The students were not required to attend this face-to-face meeting. This fact explains the relatively small sample of students, which was 19% of all students enrolled in the three courses. Statistical analysis revealed no significant differences between the students in the three courses in regards to personal traits or attitudes toward e-learning. The 'no significant difference' result led us to the decision to refer to the 120 students as a unified group.

Student loneliness was measured using the revised UCLA Loneliness Scale from Russell, Peplau, and Cutrona (1980). The UCLA scale contains 20 positive and negative statements about one's social relations. Participants rated each statement according to applicability, using a 4-point scale from not at all (1) to very much (4).

Self-esteem was measured using Heatherton and Polivy's (1991) State Self-Esteem Scale (SSES). This scale consists of 20 positive and negative statements about one's self-concept, ranking from 1-lowest (negative) to 5-highest (positive).

The attitude toward Online Learning Scale (OLS) was adapted from research by Kurtz, Sagee, and Getz-Lengerman (2003). The OLS consists of 14 items that examine aspects of beliefs, preferences, and satisfaction, all related to online learning and ranking from 1-lowest (negative) to 5-highest (positive). In addition, students were asked to state their preferred mode of learning: (1) only face-to-face; (2) only online; (3) blended (i.e., face-to-face and online), or (4) no preference. This question served as a concluding question that summarized the OLS items.

Results

Students' Background Variables

Most respondents to the questionnaire were female (72.8%); 62.5% were married, and 35.7% were single; more than 60% of the students stated that their family income is average compared to the general or above; about 50% were under the age of 30, ranging in ages from 21 to 57 ($M = 32.8$, $SD = 8.88$); and for half the students, the course was their first online course.

Hypothesis 1: State Self-Esteem and Attitudes toward E-Learning

The mean score of the SSES was 3.8 ($SD = 0.49$) and the mean score of the OLS was 3.2 ($SD = 0.68$). Pearson correlations conducted between SSES and OLS revealed a positive relationship between the scales ($r = +.33$, $p = 0.00$, $n = 110$). This result indicates that students with high self-esteem are more likely to express positive attitudes about online learning.

To further examine the correlation between the two indices, we divided both indices into factors. Based on Kurtz, Sagee, and Getz-Lengerman (2003), we divided the OLS into two factors. The first factor was attitudes toward *online learning in general factor* (accounted variance = 43.1%,

M = 3.4, SD = 0.76). The second factor was attitudes toward the course in regard to the *interaction with the instructor factor* (accounted variance = 13.4%, M = 2.5, SD = 0.93).

Although Heatherton and Polivy (1991) identified three factors within the SSES, we found only one significant factor, which was the *performance self-esteem factor* (coefficient alpha of .69). The mean score of the performance self-esteem factor was 4.2 (SD = 0.60).

Pearson correlation shows that the performance self-esteem factor is highly and positively correlated with the attitudes toward online learning in general factor ($r = +0.38$, $p < 0.01$, $n = 113$), but that there is no significant correlation with the interaction with the instructor factor. These results provide additional empirical support for the tendency that students with high self-esteem are more likely to express positive attitudes toward online learning.

The association between the SSES with the preferred mode of learning reveals a significant correlation between the variables (chi-square = 112.73, $df = 118$, $p < 0.04$). There was also a significant correlation of the SSES with the students who prefer an online mode of learning ($n = 11$) and with fewer students who prefer face-to-face learning ($n = 25$) ($t = -1.638$, $df = 31$, $p < 0.01$).

These results indicate that the first hypothesis was confirmed. Students who prefer an online mode of learning are likely to rate themselves as having a higher self-esteem than those students who prefer learning face-to-face. Katz and Offir (1990) add an additional support for the first hypothesis. They found that positive computer-oriented attitudes are related to self-esteem and school motivation and satisfaction. Pupils with positive self-esteem prefer study through the medium of computer assisted learning.

Hypothesis 2: Loneliness and Attitudes toward E-Learning

Pearson correlation between loneliness and the OLS did not reveal a significant relationship between the variables. Also, the chi-square test between the UCLA Loneliness Scale and the students' preferred mode of learning did not reveal a significant correlation between the variables.

Overall, the second hypothesis was not substantiated, i.e., no correlation was found between student loneliness and student attitudes toward e-learning and preferred mode of learning.

Conclusion

The current paper investigated the correlation of the psychosocial well-being of students in the last stage of their learning in online courses with their attitudes toward e-learning. The analysis focuses on three undergraduate online courses similar in their instructional design approach but different in content.

Two hypotheses were proposed: the first was confirmed; the second was not. The results for the first hypothesis confirmed the hypothesis and suggested a correlation in accordance with our

prediction. Students' self-esteem was positively related to attitudes toward online learning and to a greater preference for online learning. As for the second hypothesis, no statistically significant relationship between student loneliness and attitudes toward e-learning and preferred mode of learning was found.

There are a number of possible explanations for our failure to confirm the second hypothesis. It could be that the instructional design of the online courses did not allow much student control over the learning process, nor did it allow students to maintain their anonymity within the learning process. The instructional design of all three courses was not student-centered. A student-centered approach places the focus and the control of learning into the hands of the learner (Barr & Tagg, 1995), while emphasizing the development of a sense of learning community that binds learners and teachers through shared values, ideals, and goals (Sergiovanni, 1994). In our research study, the courses were delivered using an object-based approach to learning in an LMS that organizes and standardizes learning content, dividing the course into modules and lessons and supported with quizzes, tests, and discussions (Downes, 2005).

Students were required to participate in class discussions/assignments within specific dates, and the instructor could track their activities in class at any time. This requirement did not follow the first principle of good teaching practice that encourages contact between students and faculty. Frequent student-faculty contact in and out of class is an important factor in student motivation and involvement (The American Association of Higher Education's *Seven Principles for Good Practice in Undergraduate Education*, cited in Caplan & Graham, 2008). By putting in place a more indirect opportunity for guidance using distance technologies, faculty interactions with all students (especially with shy students who are reluctant to ask questions or challenge the teacher directly) can be strengthened. It is often easier to discuss values and personal concerns in writing than orally since inadvertent or ambiguous nonverbal signals are not so dominant (Chickering & Gamson, 1987, as cited in Caplan & Graham, 2008). These explanations can help us better understand why the second hypothesis was not substantiated.

Recommendations for Future Research

We do not intend to generalize these results to a wider population. However, our participants offered us food for thought, providing interesting correlations that need to be explored further. In our opinion, it would be important to extend the research to a comparative study with a control group that would study the same content but in the traditional face-to-face method. It would also be useful to extend the research to include representative groups of students who differ in their psychological traits and Internet experience. Also, longitudinal research that samples the same students at different points in time is needed to identify trends and changes in psychosocial well-being and attitudes toward e-learning. It would also be important to extend this research to courses with a different instructional design to the one presented here. For example, research could be conducted on online courses that allow greater control over the learning process and emphasize collaborative work and personal contribution while at the same time offering students the possibility to maintain their anonymity. Finally it is important to study e-learning environments that include significant social interactions. In such a case, one would be able to

examine if the face-to-face environment that it is substituting might make it a more favorable place for people with social inhibitions.

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Turkish University Students' Perceptions of the World Wide Web as a Learning Tool: An Investigation Based on Gender, Socio-Economic Background, and Web Experience

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Abstract

The main purpose of the study is to investigate Turkish undergraduate students' perceptions of the Web as a learning tool and to analyze whether their perceptions differ significantly based on gender, socio-economic background, and Web experience. Data obtained from 722 undergraduate students (331 males and 391 females) were used in the analyses. The findings indicated significant differences based on gender, socio-economic background, and Web experience. The students from higher socio-economic backgrounds indicated significantly higher attitude scores on the self-efficacy subscale of the Web attitude scale. Similarly, the male students indicated significantly higher scores on the self-efficacy subscale than the females. Also, the students with higher Web experience in terms of usage frequency indicated higher scores on all subscales (i.e., self-efficacy, affective, usefulness, Web-based learning). Moreover, the two-way ANOVA results indicated that the student's PC ownership has significant main effects on their Web attitudes and on the usefulness, self-efficacy, and affective subscales.

Keywords: Web usage pattern; Web attitudes; gender; socio-economic background; Web experience

Introduction

In many societies, information and communication technologies have become progressively more widespread in education (Keller & Cernerud, 2002). In particular, the role of the Internet continues to expand for both the delivery and support of courses in higher education. For instance, Internet usage in higher education spans a wide range from providing online support for traditional classroom-based courses through the placing of syllabi or readings on the Web to Internet-based delivery of entire courses (Brinkerhoff, Koroghlanian, 2005).

The first Internet connection in Turkey, which has the demographics of a developing country with a GDP per capita of around US\$5,000 (Business Monitor International, 2008), was established in 1990 (Usun, 2003). Presently, the Internet penetration in Turkey is about 23%, which is notably lower than the penetration rate (50%) in developed European Union countries. However, the Internet penetration in Turkey is increasing rapidly with the introduction of a number of campaigns to boost Internet penetration in education and other sectors (Business Monitor International, 2008). Although several universities (i.e., Middle East Technical University, Ege University) were the dominant users of the Internet in the first six years, since 1996 the Internet in Turkey has entered many sectors, including banking, health, and all levels of education (Usun, 2003). Nevertheless, there have been more attempts to integrate the Internet into Turkish higher education than primary and secondary education. For instance, some Turkish universities, such as Anadolu University and Sakarya University, have begun to offer Web-based online degrees (Usun, 2003).

The World Wide Web, which is an Internet-based network of information resources, combines text and multimedia. The Web started to become a popular resource after 1993 when the first widely distributed browser provided a convenient way to access a variety of information on the Internet (Microsoft Encarta Online Encyclopedia, 2007). Today, most Turkish universities have proper Internet connections, and a variety of educational information is provided to students on their Web sites. According to Liaw (2002b), understanding learners' perceptions of information technology is useful and necessary before or during their use of it as an assisted learning tool. The term perception in this study is considered to be the attitudes and feelings the students have toward the Web as a learning tool. However, Turkish university students' perceptions of the Web as a learning tool have not been sufficiently investigated, although some studies are emerging. Therefore, this study focuses on Turkish undergraduate students' perceptions of the Web as a learning tool.

Purpose of the Study

The main purpose of the study is to investigate Turkish undergraduate students' perceptions of the Web as a learning tool and to analyze whether their perceptions differ based on gender, socio-economic background, and Web experience. Moreover, this study also investigates whether there are any differences in the Web usage pattern of Turkish students based on gender, socio-economic background, and perceptions of the Web as a learning tool. Specifically, this study investigates the following research questions:

1. What is the Internet or Web usage pattern of Turkish undergraduate students?
2. Are there any differences in the Web usage pattern based on gender, socio-economic background, and perceptions or attitudes toward the Web as a learning tool?
3. Are there any differences in perceptions of the Web as a learning tool based on gender and socio-economic background?
4. Are there any differences in perceptions of the Web as a learning tool based on personal computer (PC) ownership?

5. Are there any differences in perceptions of the Web as a learning tool based on Web-usage frequency?
6. Are there any main or interaction effects of socio-economic background, PC ownership, and gender on the students' perceptions of the Web as a learning tool?

Literature Review

In regard to gender issues, some prior studies (e.g., Sam, et al., 2005; Carswell et al., 2000) revealed that the attitudes of male and female students toward Internet use in educational environments do not differ significantly. However, some other studies (i.e., Durndell & Haag, 2002; Schumacher & Morahan-Martin, 2001) indicated that male students tend to reflect more positive attitudes toward Internet use. Thus, there is no consistency among the findings of prior studies about the relationship between gender and Internet attitudes.

Moreover, most prior studies (e.g., Liaw, 2002b; Durndell & Haag, 2002; Luan, et al., 2005; Anderson & Reed, 1998) that investigated the relationship between Web experience and Web attitude found that students with higher Web experience indicate more positive attitudes toward the Web as a learning tool.

Furthermore, prior literature (e.g., Bozionellos, 2004; Haseloff, 2005) suggests that socio-economic background has a strong positive relationship with computer or Internet experience. For instance, Haseloff's (2005) study in India indicated that Internet usage drastically decreases in the lower socio-economic and income classes.

Methodology

Participants

The questionnaire was distributed to 741 Turkish undergraduate university students at Abant Izzet Baysal University in the 2008 spring semester, but the data obtained from 19 students were excluded from the analyses since the students' responses on the questionnaire were incomplete. The data obtained from 722 students (331 males and 391 females) in different faculties or schools, such as the Faculty of Literature and Science ($n = 145$), the Faculty of Education ($n = 260$), the Faculty of Management and Business Administration ($n = 224$) and the School of Physical Education and Sport ($n = 93$), were used in the analyses.

Research Instrument

A questionnaire consisting of two sections was used to collect data. The first section was used to collect data for demographical characteristics (e.g., gender, socio-economic background) and computer and Web experience (e.g., PC ownership, Web-usage frequency, Web-usage activities). The second section of the questionnaire contains a Likert-type Web attitude scale with 21 items. The first 16 items of the scale were adapted from a Web attitude scale (WAS) developed by Liaw

(2002a). The rationale for the use of WAS in this study is that it has high internal consistency, stability, and validity (Liaw, 2002a), and it has been used in other studies (e.g., Akpınar & Bayramoğlu, 2008; Yang & Lester, 2003). Moreover, before obtaining the data from the Turkish students, the original WAS with 16 items in English was translated to Turkish by the researcher, and the translation was validated by a linguist who is proficient in English and Turkish. The last five items of the scale were adapted from an attitude scale toward Internet-based learning developed by Tekinarslan (2008) in Turkish to measure more specifically the students' attitudes toward Web-based learning.

Validity and Reliability of the Attitude Scale

After collecting the data from the 722 students through the 21-item Web attitude scale, both the Barlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were performed to examine whether the data set was appropriate for a factor analysis. The KMO measure of sampling adequacy was high (0.933) and significant ($P = 0.000$). Barlett's Test of Sphericity was also notably high and significant (chi-square = 9155.720 with 210 degree of freedom at $P = 0.000$). Then an explanatory factor analysis (principle components, varimax rotation with Kaiser Normalization) was applied to analyze the items and to clarify the structure of the Web attitude scale. The analysis identified four factors with eigenvalues > 1 . The items and responding factors (subscales) in the scale are represented in Table 1.

Table 1

Rotated Factor Loadings and Cronbach's α Coefficients for the Four Factors (Subscales) of the Web Attitude Scale

Items	Factor 1: Usability $\alpha = 0.90$	Factor 2: Web-based Learning $\alpha = 0.89$	Factor 3: Self-efficacy $\alpha = 0.85$	Factor 4: Affective $\alpha = 0.72$
10	.778			
15	.763			
12	.741			
13	.720			
9	.643			.431
16	.633	.373		
11	.630			
21	.619	.470		
14	.554	.452		
19		.843		
20		.826		
18		.745		

17	.475	.637		
3			.850	
1			.833	
2			.746	
4			.736	
6		.332		.716
5				.613
7		.363		.608
8	.401			.553
Eigenvalue	9.183	2.105	1.417	1.092
% of variance	23.913	16.501	14.098	11.190

Overall $\alpha = 0.93$. total variance explained is 65.701

As expected, the items adapted from the WAS (Liaw, 2002a) and the Internet-based learning attitude scale (IBLAS) (Tekinarslan, 2008) generally loaded under different factors, although an item (item 21) adapted from the IBLAS loaded higher under one of the factors structured with the items of WAS. However, in the following analyses, item 21 was used under a factor that covers the items from the IBLAS since it was more related to contents of other relevant items under the factor. Moreover, the items adapted from the WAS loaded under three different factors and they were named as *self-efficacy*, *affective*, and *usefulness* by considering the characteristics of the WAS described by Liaw (2002a) and the contents of the relevant items. Additionally, the factor which covers the items from the IBLAS was named as *Web-based learning* based on the contents of the relevant items.

As indicated in Table 1, the factor loadings of the relevant items differ between 0.778 – 0.554, 0.637 – 0.470, 0.850 – 0.736 and 0.716 – 0.553 respectively for usability, learning, self-efficacy, and affective factors or subscales. The factor loadings of the items can be considered as sufficient and they reflect evidence for the factorial validity and construct validity of the scale (Thompson & Daniel, 1996).

Table 2

The Items and the Factors (Subscales) on the Attitude Scale toward the Web

Item No*	Subscale	Question
10	Usability	The Internet/Web helps me to find information. ^a
15	Usability	I believe that learning how to use the Internet/Web is worthwhile. ^a
12	Usability	The multimedia environment of Web (e.g. text, image) is helpful to understand online information. ^a
13	Usability	I believe the Internet/Web has potential as a learning tool. ^a
9	Usability	I believe using the Internet/Web is worthwhile. ^a
16	Usability	Learning the Internet/Web skills can enhance my academic

		performance. ^a
11	Usability	I believe the Internet/Web makes communication easier. ^a
14	Usability	I believe that the Internet/Web is able to offer online learning activities. ^a
21	Web-based learning	I believe the Web contributes greatly to life-long learning. ^b
19	Web-based learning	I suppose that taking a course in the Web environment must be enjoyable. ^b
20	Web-based learning	I would like to take a course in the Web environment if I have chance to. ^b
18	Web-based learning	The idea of Web-based learning is exciting. ^b
17	Web-based learning	I like to learn in the Web environment. ^b
3	Self-efficacy	I feel confident using Web browsers (e.g. Internet Explorer, Netscape Communicator). ^a
1	Self-efficacy	I feel confident using the Internet/Web. ^a
2	Self-efficacy	I feel confident using e-mail. ^a
4	Self-efficacy	I feel confident using search engines (e.g. Yahoo, Excite, and Lycos). ^a
6	Affective	I enjoy talking with others about the Internet. ^a
5	Affective	I like to use e-mail to communicate with others. ^a
7	Affective	I like to work with the Internet/Web. ^a
8	Affective	I like to use the Internet from home. ^a

NOTE: * The item number indicates the item order in the initial version of the scale (a total of 21 items)

^a Adapted from the WAS (Liaw, 2002a).

^b Adapted from the IBLAS (Tekinarslan, 2005).

Furthermore, as indicated in Table 1, the internal reliability coefficients are high ($\alpha = 0.90$, $\alpha = 0.89$, $\alpha = 0.85$) and sufficient ($\alpha = 0.72$) respectively for usability, learning, self-efficacy, and affective subscales and for the entire scale ($\alpha = 0.93$). According to these findings, the scale has a high reliability in general.

Moreover, the items and responding factors (subscales) in the Web attitude scale are represented in Table 2. The descriptive results for the students' scores on the subscales are indicated in Table 3. The higher mean scores of the participants on the subscales indicate better attitudes toward the Web as a learning tool.

Table 3

The Students' Scores on the Subscales of the Web Attitude Scale

Factors	N	Items	Possible	Range	Mean	Std.	Dev.
---------	---	-------	----------	-------	------	------	------

			range		(\bar{X})	(sd)
Usability	722	8	8-40	32	33.73	5.52
Web-based learning	722	5	5-25	20	19.44	4.37
Self-efficacy	722	4	4-20	16	14.72	3.57
Affective	722	4	4-20	16	15.17	3.17

Data Collection and Data Analysis Procedures

The data analyses were carried out with the Statistical Packages for Social Sciences (SPSS). After the explanatory factor analysis, descriptive statistics, chi-square tests, t-tests, and one-way and two-way ANOVAs were used to analyze the data.

Results

Web Use Pattern

The Turkish undergraduate students ($N = 722$) responded that they mostly use the Internet or Web for the following activities: research through search engines (86.3%, $n = 623$); e-mail services (76.3%, $n = 551$); news reading (69.5%, $n = 502$); entertainment (e.g., games, music, etc.) (69.1%, $n = 499$); education (e.g., reading electronic papers, etc.) (64 %, $n = 462$); software downloading (62.2%, $n = 449$); and chat (60.1%, $n = 434$). On the other hand, a notably lower number of students responded that they use the Internet for participation in discussion groups and forums (23.8%, $n = 172$) and for shopping (18.3%, $n = 132$).

Differences in the Web Use Pattern Based on Gender

The gender differences in the Web use pattern for the common Web activities are shown in Table 4. Significantly, more Turkish male students in comparison to female students have used the Web for shopping ($\chi^2 = 18.87$, $df = 1$, $p = .000$), software downloading ($\chi^2 = 36.37$, $df = 1$, $p = .000$), news reading ($\chi^2 = 26.72$, $df = 1$, $p = .000$), participation in discussion groups and forums ($\chi^2 = 21.01$, $df = 1$, $p = .000$), and entertainment activities ($\chi^2 = 14.10$, $df = 1$, $p = .000$).

Table 4

Differences in Using the Web for Common Web Activities Based on Gender

	Male (N=331)		Female (N=391)		χ^2	P
	Yes	No	Yes	No		
Web activities	N	N	N	N		

Shopping	83	248	49	342	18.87	.000*
Software downloading	245	86	204	187	36.37	.000*
E-mail	261	70	290	101	2.17	.140
Chat	205	126	229	162	.847	.357
Entertainment	252	79	247	144	14.10	.000*
Research	270	61	353	38	11.49	.001*
Education (e.g., reading electronic papers)	200	131	262	129	3.37	.066
News reading	262	69	240	151	26.72	.000*
Discussion groups and forums	105	226	67	324	21.01	.000*

*P<.05

However, significantly more Turkish female students have used the Web for research purposes as compared to male students ($\chi^2 = 11.49$, $df = 1$, $p = .001$). Furthermore, the gender difference in the use of the Web for educational purposes was close to significance level ($\chi^2 = 3.37$, $df = 1$, $p = .066$) in favor of the females. However, there were no gender differences in the Web usage for e-mail and chat purposes.

Table 5

Differences in Using the Web for the Common Web Activities Based on Monthly Family Incomes in New Turkish Lira (NTL)

Web activities	<750 NTL (N=116)		750-1500 NTL (N=353)		1501-2250 NTL (N=353)		2251-3000 NTL (N=59)		>3000 NTL (N=28)		χ^2	P
	Yes N	No N	Yes N	No N	Yes N	No N	Yes N	No N	Yes N	No N		
Shopping	15	101	51	302	32	134	22	37	12	16	31.391	.000*
Software downloading	59	57	208	145	120	46	42	17	20	8	18.179	.001*
E-mail	75	41	270	83	134	32	51	8	21	7	13.889	.008*
Chat	63	53	201	152	111	55	40	19	19	9	8.422	.077
Entertainment	76	40	234	119	117	49	52	7	20	8	12.239	.016*
Research	102	14	302	51	147	19	50	9	22	6	2.674	.614
Education	73	43	217	136	112	54	42	17	18	10	3.226	.521

News reading	74	42	237	116	124	42	47	12	20	8	7.754	.101
Discussion groups and forums	22	94	88	265	38	128	16	43	8	20	2.527	.640

*P<.05

Differences in the Web Use Pattern Based on Socio-economic Background

The socio-economic backgrounds of the students were categorized depending on their families' monthly incomes in New Turkish Liras (NTL) (1 US\$ \cong 1.6 NTL): less than 750 NTL, between 750 and 1500 NTL, between 1501 and 2250 NTL, between 2251 and 3000 NTL, and over 3000 NTL.

As displayed in Table 5, there were significant differences in the Web use pattern for four Web activities, namely shopping ($\chi^2 = 31.39$, $df = 4$, $p = .000$), software downloading ($\chi^2 = 18.17$, $df = 4$, $p = .001$), e-mail ($\chi^2 = 13.88$, $df = 1$, $p = .008$), and entertainment ($\chi^2 = 12.23$, $df = 4$, $p = .016$), in favor of the students from higher socio-economic backgrounds. In general, notably fewer students with a monthly family income of less than 750 NTL have used the Web for these activities (i.e., shopping, software downloading, e-mail, entertainment) as compared to the numbers of students with higher monthly family incomes (i.e., 1501 – 2250 NTL, 2251 – 3000 NTL, and over 3000 NTL). Moreover, the socio-economic background difference in the Web usage for chat activities was close to significance level ($\chi^2 = 8.42$, $df = 4$, $p = .077$) in favor of students from the higher socio-economic backgrounds. However, there were no socio-economic background differences in Web usage for activities such as research, education, news reading, and discussion groups and forums.

Differences in the Web Use Pattern Based on Perceptions toward the Web

As displayed in Table 6, the t-test results showed that students who have used the Web for the seven common activities (i.e., shopping, software downloading, news reading, e-mail, chat, entertainment, discussion groups and forums) indicated significantly more positive attitudes or perceptions toward the Web on all of the subscales (i.e., self-efficacy, affective, usefulness, Web-based learning) at .05 level. In addition, the students who have used the Web for educational activities (e.g., reading electronic papers) showed significantly higher attitudes toward the Web on self-efficacy and affective subscales than the students who have not. Furthermore, the students who have used the Web for research activities indicated significantly higher attitudes on the affective subscale than the students who have not.

On the other hand, the mean scores of the students who have and have not used the Web for educational activities did not differ significantly on the usefulness and Web-based learning subscales. Similarly, attitudes of the students who have and have not used the Web for research activities did not differ significantly on the usefulness, Web-based learning, and self-efficacy subscales. These findings revealed that the Turkish undergraduates ($n = 462$ out of 722) have

used the Web for educational activities regardless of their attitudes on the usefulness and Web-based learning subscales. Similarly, regardless of their levels of Web attitude on the usefulness, Web-based learning, and self-efficacy subscales, most of them ($n = 623$ out of 722) have used the Web mainly for research activities.

Table 6

Differences in Using the Web for Common Web Activities Based on Attitudes toward the Web

	Subscales																	
			Usefulness				Web-based learning				Self-efficacy				Affective			
	Yes	No	Yes	No	t	p	Yes	No	t	p	Yes	No	t	p	Yes	No	t	p
Common Web activities	N	N	\bar{X}	\bar{X}	t	p	\bar{X}	\bar{X}	t	p	\bar{X}	\bar{X}	t	p	\bar{X}	\bar{X}	t	p
Shopping	132	590	34.93	33.46	2.77	.006*	20.47	19.21	3.01	.003*	16.03	14.93	4.70	.000*	16.04	14.98	3.50	.000*
Downloading software	449	273	34.22	32.92	3.08	.002*	19.83	18.80	3.11	.002*	15.66	13.18	9.58	.000*	15.62	14.43	4.97	.000*
E-mail	551	171	34.12	32.45	3.48	.001*	19.80	18.29	3.97	.000*	15.31	12.81	8.37	.000*	15.58	13.85	6.40	.000*
Chat	434	288	34.26	32.92	3.21	.001*	19.73	19.01	2.15	.031*	15.03	14.25	2.90	.004*	15.65	14.45	5.06	.000*
Entertainment	499	223	34.35	32.34	4.55	.000*	19.85	18.54	3.75	.000*	15.31	13.41	6.79	.000*	15.68	14.04	6.61	.000*
Research	623	99	33.88	32.78	1.83	.067	19.56	18.69	1.84	.066	14.77	14.39	.993	.321	15.27	14.54	2.13	.033*
Education	462	260	33.89	33.43	1.07	.283	19.50	19.35	.449	.654	15.01	14.21	2.86	.004*	15.51	14.58	3.79	.000*
News reading	502	220	34.04	33.01	2.23	.020*	19.75	18.73	2.90	.004*	15.17	13.70	5.16	.000*	15.42	14.61	3.15	.002*
Discussion groups and forum	172	550	34.69	33.43	2.63	.009*	20.47	19.12	3.56	.000*	16.19	14.26	6.34	.000*	16.20	14.85	4.93	.000*

* $P < 0.05$

Differences in Perceptions toward the Web Based on Gender

The t-test results indicated that mean attitude scores (\bar{X}) of the male ($N = 331$, $\bar{X} = 15.25$) and female students ($N = 391$, $\bar{X} = 14.27$) on self-efficacy subscale differ significantly in favor of the male students ($t = -3.679$, $df = 720$, $p = .000$). However, there were no significant differences at 0.05 level in the mean attitude scores of the male and female students on the affective ($t = .392$, $df = 720$, $p = .695$), usefulness ($t = 1.021$, $df = 720$, $p = .307$), and Web-based learning ($t = -.033$, $df = 720$, $p = .974$) subscales.

Differences in Perceptions toward the Web Based on Socio-economic Background

As displayed in Table 7, the one-way ANOVA results on differences based on the socio-economic backgrounds in terms of monthly family incomes indicated that there were significant

differences in the mean scores of the students on the self-efficacy subscale ($F = 4.306$, $df = 4/717$, $p = 0.002$). Specifically, post-hoc analysis (Tukey HSD) revealed that the students whose families have less than 750 NTL monthly income had significantly lower attitude mean scores than the students whose families have higher monthly incomes (i.e., 1501 – 2250 NTL, and 2251 – 3000 NTL) on the self-efficacy subscale.

Table 7

Differences in Perceptions toward the Web Based on Socio-Economic Background

Monthly family income	N	Web-based			
		Usefulness	learning	Self-efficacy	Affective
		\bar{X} (sd)	\bar{X} (sd)	\bar{X} (sd)	\bar{X} (sd)
(1) <750 NTL	116	33.77 (5.41)	19.24 (4.77)	13.81 (4.15)	14.87 (3.48)
(2) 750-1500 NTL	353	33.44 (5.45)	19.36 (4.30)	14.60 (3.49)	15.15 (2.96)
(3) 1501-2250 NTL	166	33.63 (6.14)	19.67 (4.27)	15.10 (3.34)	15.32 (3.41)
(4) 2251-3000 NTL	59	35.23 (3.07)	19.52 (4.23)	15.83 (2.90)	15.35 (2.91)
(5) >3000 NTL	28	34.60 (6.59)	19.78 (4.52)	15.53 (3.85)	15.46 (3.61)
F (ANOVA)		1.533 ($P=.191$)	.251 ($P=.909$)	4.306 ($P=.002$)*	.467 ($P=.760$)
Tukey HSD				(3)>(1)* (4)>(1)*	

* $P < 0.05$

However, the one-way ANOVA results on differences based on the socio-economic backgrounds also indicated that the differences in the mean scores of the students on the affective ($F = .467$, $df = 4/717$, $p = 0.760$), usefulness ($F = 1.533$, $df = 4/717$, $p = 0.191$), and Web-based learning ($F = .251$, $df = 4/717$, $p = 0.909$) subscales were not significant at .05 level.

Differences in Perceptions toward the Web Based on PC Ownership

The t-test results in Table 8 indicated that mean attitude scores (\bar{X}) of the PC-owner students ($N = 445$) and the non-PC-owners ($N = 277$) on three subscales (usefulness, self-efficacy, affective) differ significantly at .05 level in favor of the PC-owner students. However, there were no significant differences in the mean attitude scores of the PC-owner and non-PC-owner students on the Web-based learning subscale.

Table 8

Differences in Perceptions toward the Web Based on PC Ownership

PC ownership	Usefulness				Web-based learning			Self-efficacy			Affective		
	N	\bar{X}	t	p	\bar{X}	t	p	\bar{X}	t	p	\bar{X}	t	p
PC owners	445	34.36			19.66			15.55			15.60		
Non-PC owners	277	32.71	3.960	.000*	19.10	1.682	.093	13.38	8.275	.000*	14.49	4.595	.000*

*Degree of freedom (df) = 720 in all cases.

*P<.05

Differences in Perceptions toward the Web Based on Frequency of Web Use

The students reported their Web use frequencies as the following: never ($n = 4$, 0.6%); between 1 and 5 hours a month ($n = 86$, 11.9%); between 1 and 5 hours a week ($n = 291$, 40.3%); and everyday ($n = 341$, 47.2%). The *never* users were excluded from the analysis in this section since their numbers were insufficient. Also, crosstab results indicated that significantly more PC owner students use the Web *everyday* ($n = 279$, 63%) in comparison to the non-PC-owners ($n = 62$, 22.5%) ($\chi^2 = 128.40$, $df = 2$, $p = .000$). These findings reflect that the PC-owner students use the Web more frequently than the non-PC-owners.

As displayed in Table 9, the one-way ANOVA results on differences based on the Web use frequencies indicated that there were significant differences in the mean scores of the students on all subscales: usefulness ($F = 12.561$, $df = 2/715$, $p = .000$); Web-based learning ($F = 5.579$, $df = 2/715$, $p = .004$); self-efficacy ($F = 64.898$, $df = 2/715$, $p = .000$); and affective ($F = 34.972$, $df = 2/715$, $p = .000$). Specifically, the post hoc tests showed that *everyday users* had significantly higher mean scores on the usefulness, Web-based learning, self-efficacy, and affective subscales than the Web users with lower frequency (i.e., 1 – 5 hours in a week, 1 – 5 hours in a month). Moreover, the students who use the Web between one and five hours a week had significantly higher attitude mean scores on the usefulness, self-efficacy, and affective subscales than those students who use the Web between one and five hours in a month.

Table 9

Differences in Perceptions toward the Web Based on Web-Usage Frequency

	N	Usefulness		Web-based learning		Self-efficacy		Affective	
		\bar{X}	(sd)	\bar{X}	sd	\bar{X}	sd	\bar{X}	sd
Web-usage frequency									
(1) 1-5 hours in a month	86	31.74	(5.65)	18.25	4.46	12.26	3.86	13.30	2.90
(2) 1-5 hours in a week	291	33.19	(5.80)	19.27	4.24	13.88	3.42	14.72	3.13
(3) Everyday	341	34.70	(5.07)	19.92	4.36	16.12	2.97	16.07	2.93
F (ANOVA)		12.561		5.579		64.898		34.972	
		(P=.000)*		(P=.004)*		(P=.000)*		(P=.000)*	
Tukey HSD		(3)>(1)*		(3)>(1)*		(3)>(2)>(1)*		(3)>(2)>(1)*	
		(3)>(2)*							

*P<0.05

Main and Interaction Effects of Socio-Economic Background, Gender, and PC Ownership on Web Attitude

The descriptive results in Table 10 showed that PC-owner students ($N = 445$) had notably higher mean scores on most subscales than the non-PC-owner students ($N = 277$) within the same monthly income groups except for in the 1501 – 2250 NTL and 2251 – 3000 NTL income groups on the Web-based learning subscale. The two-way ANOVA results in Table 11 showed that PC ownership (PCO) had significant main effects on the Web attitudes of the students on the usefulness, self-efficacy, and affective subscales. However, the monthly family income (MFI) did not have any notable main effect on the attitudes of students on any of the subscales.

Table 10

Descriptive Statistics for the Attitudes on the Subscales depending on Monthly Family Income and PC Ownership

Monthly family income	PC ownership		Usefulness	Web-based learning	Self-efficacy	Affective
	N	%	\bar{X}	\bar{X}	\bar{X}	\bar{X}
<750 NTL	Yes	42 (36,2%)	35.33	20.04	15.59	16.61
	No	74 (63,8%)	32.89	18.78	12.79	13.87
	Total	116	33.77	19.24	13.81	14.87
750-1500 NTL	Yes	196 (55,5%)	33.79	19.59	15.28	15.35
	No	157 (44,5%)	33.00	19.08	13.74	14.91
	Total	353	33.44	19.36	14.60	15.15
1501-2250 NTL	Yes	132 (79,5%)	34.16	19.59	15.63	15.56
	No	34 (20,5%)	31.58	20.00	13.02	14.38

	Total	166	33.63	19.67	15.10	15.32
2251-3000 NTL	Yes	52 (88,1%)	35.51	19.51	15.88	15.48
	No	7 (11,9%)	33.14	19.57	15.42	14.42
	Total	59	35.23	19.52	15.83	15.35
> 3000 NTL	Yes	23 (82,1%)	36.08	20.26	16.60	16.30
	No	5 (17,9%)	27.80	17.60	10.60	11.60
	Total	28	34.60	19.78	15.53	15.46

As indicated in Table 10, numbers and percentages (%) of the PC-owner students increase notably as their socio-economical levels in terms of monthly family income increase. According to these findings, the students with higher socio-economical levels (e.g., 2251 – 3000 NTL) are more likely to own a PC than the students with lower socio-economical levels (e.g., < 750 NTL).

Table 11

The Two-Way ANOVA Results on the Web Attitude depending on Monthly Family Income and PC Ownership

Source	df	Usefulness			Web-based learning			Self-efficacy			Affective		
		Mean Square	F	P	Mean Square	F	P	Mean Square	F	P	Mean Square	F	P
MFI	4	34.91	1.17	.319	5.431	2.83	.889	14.388	1.23	.293	6.60	.682	.605
PCO	1	551.91	18.62	.000*	32.199	1.67	.196	365.99	31.51	.000*	208.61	21.51	.000*
MFI x PCO	4	72.38	2.44	.045*	14.75	.769	.546	31.49	2.71	.029*	40.86	4.21	.002*

*P<.05

As indicated in Table 11, monthly family income and PC ownership had significant interaction effects on the Web attitudes of the students on the usefulness, self-efficacy, and affective subscales. The findings revealed that the effects of the students' monthly family incomes on the attitudes on the usefulness, self-efficacy, and affective subscales differ significantly depending on their PC ownership.

In addition, the descriptive statistics indicated that the PC-ownership rate among the male students (63.7%, $n = 211$ out of 331) is higher than that among the female students (59.8%, $n = 234$ out of 391). According to these results, the male students are more likely to own a PC than the female students although the difference in the rates (3.9%) is not very large.

Moreover, the two-way ANOVA results in Table 12 indicated that PC ownership had significant main effects on the Web attitudes of the students on the usefulness, self-efficacy, and affective subscales. Additionally, the results indicated that gender had a significant main effect on the

attitudes of the students on the self-efficacy subscale; males had a notably higher mean ($\bar{X} = 15.25$) than that of females ($\bar{X} = 14.27$).

Furthermore, the interaction effect between gender and PC ownership was significant on the attitudes of the students only on the affective subscale on which PC-owner males ($\bar{X} = 15.76$) and females ($\bar{X} = 15.44$) had notably higher means than those of non-PC-owner males ($\bar{X} = 14.00$) and females ($\bar{X} = 14.87$).

Table 12

The Two-Way ANOVA Results on the Web Attitude Depending on Gender and PC Ownership

Source	df	Usefulness			Web-based learning			Self-efficacy			Affective		
		Mean Square	F	P	Mean Square	F	P	Mean Square	F	P	Mean Square	F	P
Gender	1	29.62	.991	.320	.279	.015	.904	112.48	9.76	.002*	13.22	1.35	.245
PCO	1	458.30	15.32	.000*	55.74	2.917	.088	789.13	68.47	.000*	230.39	23.61	.000*
Gender x PC-O	1	13.38	.448	.504	2.54	.133	.715	16.59	1.44	.231	60.52	6.20	.013*

*P<.05

Discussion

The findings of the study regarding the Web use pattern of Turkish undergraduate students indicated that research (86.3%, $n = 623$) was the highest activity, followed by e-mail (76.3%, $n = 551$), while shopping (18.3%, $n = 132$) was the lowest activity, which is similar to the findings of prior studies conducted in Malaysia (Sam et al., 2005; Luan, et al., 2005).

In regard to the gender issue, the findings of this study revealed that significantly more Turkish male students have used the Web for shopping, software downloading, news reading, participation in discussion groups and forums, and entertainment activities in comparison to the female students. However, significantly more Turkish female students have used the Web for research purposes as compared to the male students. These findings suggest that there are notable variations in the Internet activities between males and females although the gender differences in some Internet activities (i.e., e-mail, chat, education) are negligible, which is similar to the findings of Durndell and Haag (2002). Also, the Turkish male students reflected significantly higher attitudes on the self-efficacy subscale than the females, although no significant gender differences were found on the usefulness, Web-based learning, and affective subscales. The finding of this study about the gender difference on the self-efficacy subscale supports prior

studies (Torkzadeh & Koufteros, 1994; Durndell, & Haag, 2002), which revealed that males tend to report greater computer self-efficacy.

Moreover, the findings of the study indicated that the students from lower socio-economic backgrounds in terms of monthly family incomes reflected significantly lower attitudes on the self-efficacy subscale. Furthermore, notably fewer students in the lower monthly family income group (i.e., <750 NTL) have used the Web for shopping, software downloading, e-mail, and entertainment activities as compared to the numbers of the students in the higher monthly family income groups, similar to the findings of a prior study in India (Haseloff, 2005).

Furthermore, the results of the present study revealed that the students who have used the Web for the nine common Web activities indicated significantly more positive attitudes toward the Web on most subscales. Moreover, the students with higher Web experience in terms of frequency of Web use had higher attitudes on all subscales. Also, the findings indicated that the PC-owner students, who are more likely to use the Internet more frequently (i.e., everyday), had significantly higher attitudes on the usefulness, self-efficacy, and affective subscales than the non-PC-owners. These findings suggest that increased Web experience is closely associated with more positive attitudes toward the Web, similar to the findings of prior studies (e.g., Liaw, 2002b; Durndell & Haag, 2002; Luan et al., 2005; Anderson & Reed, 1998).

Furthermore, the two-way ANOVA results indicated that PC-ownership had significant main effects on the Web attitudes of the students on the usefulness, self-efficacy, and affective subscales. Moreover, monthly family income and PC-ownership had significant interaction effects on the Web attitudes of students on the usefulness, self-efficacy, and affective subscales. The interaction effect between gender and PC-ownership was significant on the attitudes of the students only on the affective subscale on which PC-owner males and females had notably higher mean scores than those of non-PC-owner males and females. The findings revealed that the effects of the students' monthly family incomes on the attitudes on the usefulness, self-efficacy and affective subscales, and the effect of gender on the affective subscale vary depending on the students' PC-ownership. According to these findings, it can be stated that Turkish students' attitudes or perceptions toward the Web as a learning tool are mostly related to their computer and Web experience rather than gender and socio-economic background. The findings of this study regarding the effect of Web or computer experience on the Web attitudes of the students support the findings of prior studies (Hong et al, 2003; Luan et al., 2005), which indicate that computer and Internet experience promotes positive attitudes or perceptions toward the Web as a learning tool.

Conclusion

The main purpose of the study was to investigate Turkish undergraduate students' perceptions of the Web as a learning tool and to analyze whether their perceptions differ based on gender, socio-economic background, and computer (e.g., PC ownership) and Web experience (e.g., Web use frequency). The findings of the study and prior studies in other societies (e.g., Hong et al, 2003;

Luan et al., 2005; Liaw, 2002b) suggest that the students' perceptions or attitudes toward the Web as a learning tool are highly related to their computer and Web experience. The students with more computer and Web experience are more likely to have more positive perceptions or attitudes toward the Web as a learning tool. As a result, although differences based on gender and socio-economic backgrounds were found on the self-efficacy subscale, the findings of this study suggest that perceptions of students toward the Web as a learning tool are mostly associated with their computer and Web experience.

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Regional Focus Issue: Bridge over Troubled Waters ~ Cengiz Hakan Aydin and Yoram Eshet-Alkalai, IRRODL Regional Editors for the Middle East

Information and Communication Technology (ICT) in the Service of Multiculturalism

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Abstract

This paper presents an online inter-group contact hypothesis (OICH) model, developed within the Israel education system, whereby online and distance learning (ODL) is used in the service of multiculturalism. The goal is to build bridges among secular and religious Arabs and Jews in Israel based on small multicultural groups and collaborative learning through effective use of the Internet and other cutting-edge information technologies. The model expands the contact hypothesis (which holds that under the right conditions contact could reduce bias between groups) to a model for online collaboration. It adds the gradual development of contact between the groups by progressing from individual asynchronous textual communication to individual synchronous audio communication combined with collaborative asynchronous communication to collaborative synchronous communication and finally to face-to-face communication.

Keywords: Multiculturalism; online learning; ICT; Contact Hypothesis; teacher education; collaboration; technology; team teaching and learning; CMC; OICH; ODL

Introduction

In our global reality, living together and accepting differences while building on commonalities has become crucial to everyday life. Yet in many places in the world, galloping globalization is accompanied by a growing trend toward cultural, national, and religious individuation and separatism.

In Israel, which is beset by inter-cultural tensions and political enmities, differences, rather than similarities, are often in the forefront of public discourse and in the minds of many Israelis. Moreover, Israelis of diverse religions and backgrounds, who live in the same area or neighborhoods in mixed cities, often experience great difficulty in communicating with each other or have little or no notion as to who their neighbors are. They are separated not geographically but most often psychologically by prejudices and a host of stereotypical beliefs (Ghanem, 2001; Ganayem, 2005). Thus, inter-cultural dialogue is essential in a country like Israel, which comprises a broad range of ethnic groups and religions, all of which share a small patch of land. It is vital that groups living in such close proximity meet, identify, and build on commonalities, rather than dwell on differences and areas of potential conflict (Smootha, 1989).

Mirroring the diverse religious and cultural streams, most sectors in Israel have their own school curriculum and often their own teacher training institutes, for example, the Jewish sector, which is divided into secular and religious streams, and the Arab sector, which includes Moslem Arabs, Christian Arabs, Druze and Bedouins, both religious and secular. Consequently, in the normal course of things, students from different educational streams seldom have the occasion to meet or interact. As a result, in this conflict-ridden society, in which daily occurrences and events often serve to further divide rather than to unite, mutual stereotypes are reinforced.

Indeed, the protracted Israeli-Palestinian conflict, most particularly since the second Intifadah (2000), has exacerbated mutual fears, suspicions, and hatred within Israel itself. Among religious Arabs and orthodox Jews, the wall of preconceived notions, mistrust, and lack of readiness to even listen to the other side appears to be even greater. Both sides tend to ascribe demonic characteristics to each other, viewed as God-given, i.e., absolute and immutable; and therefore, they are often opposed to attempts to engage in dialogue as if the very exchange might be misinterpreted or used by the other side as a sign of legitimization of its positions.

Teacher education colleges are potentially major agents of social change and dialogue among cultures in that they are charged with the important task of training future teachers, who in turn have an impact on future generations of students. Yet students in teacher colleges are, on the whole, not exposed to courses on multiculturalism or to exchanges with sectors and groups other than their own. This is true not only between Jews and Arabs but also between secular and religious Jews. As a result, when these students become teachers, they (wittingly or unwittingly) tend to reflect, and thereby perpetuate, their own stereotypical views of the “other” among the children with whose education they are entrusted.

The technological reality of the 21st century provides the tools to combat the perpetuation of these stereotypes. It allows for in-depth acquaintance with other cultures based on common universal values in addition to the unique values of each culture, thus developing a more open, understanding, and respectful dialogue.

In this environment, the Center for Multiculturalism and Technology was established in early 2005 by the writers, who are the heads of the respective IT departments of the Jewish secular Kibbutz College of Education, the orthodox Jewish Talpiot College of Education, and the Arab-

Islamic Al-Qasemi College of Education, with the support of the principals of these three colleges. The aim of the Center is to develop and implement an innovative learning and teaching model that connects cultures and ethnic groups through IT while enhancing IT skills and their creative application to teaching and learning. The model used for this aim, entitled the *online inter-group contact hypothesis (OICH) model* (see Figure 1), enables faculty, pre-service teachers, in-service teachers, and ultimately students to teach and learn advanced Internet technologies while facilitating first-hand acquaintance with various cultures based on shared universal values that complement the unique values of each culture.

Applying this model in the classroom, the first online course from the three participating teaching colleges opened in the 2005/6 academic year with a total of 45 participants and three lecturers. In each subsequent year, three additional colleges joined, one per sector, bringing the number of participating colleges in 2007 to nine and tripling the annual number of participating students. All participating students received a special certificate that will enable them to teach in school projects.

This article describes the OICH model, where ICT is used in the service of multiculturalism to build bridges, based on small multicultural groups and collaborative learning, among secular and religious Arabs and Jews in Israel through effective use of the Internet and other cutting-edge information technologies.

Theoretical Background

Much of the research on connecting among different cultures is based on the *contact hypothesis* (Allport, 1954), which lays down the conditions for successful contact between two or more groups. Allport claims that knowledge of differences between groups is not in itself enough to stop prejudice. In order to reduce prejudice and bias, it is necessary to become directly acquainted with people of the other culture/sect, etc., and his hypothesis stipulates a number of conditions that need to be fulfilled in order to reach this goal: equal-group status within the situation; common goals; intergroup cooperation; and institutional support. Under these conditions, participants in information exchange and intergroup interaction “increase their knowledge of the outgroup and reduce intergroup anxiety, which in turn broadens the perceptual field to allow impressions of outgroups to become more accurate and more favorable” (Stephan & Stephan, 1984). Thus, previous stereotyping and prejudice towards the other culture is reduced. In fact, although studies claim that indeed there is a change in how an individual relates to another individual from a different cultural group, this change in attitude does not always lead to a change in the individual’s bias against the entire group. In order for there to be a change in global attitudes, there must be carefully controlled conditions (Brown & Wade, 1987; Hewstone & Brown, 1986; Riordan & Ruggiero, 1980; Scarberry, Ratcliff, Lord, Lanicek, & Desforges, 1997).

Pettigrew and Tropp (2000) stipulate that one of the basic requirements for successful contact between cultures is cooperation and collaboration. In addition, they claim that bias can be reduced without applying all of Allport’s conditions. They claim that the contact itself in some cases could be sufficient for lasting bias reduction and that it generalizes beyond the individual to the larger

group. However, they show that the more conditions applied, the more the bias is reduced, and with a lasting effect. In Pettigrew and Tropp (2004), they refine their conditions and require that contact should be cooperative rather than competitive, between partners of equal status, between groups rather than individuals, long-term rather than short-term, supported by the institution, and capable of leading to the development of a “super-ordinate identity,” i.e., one that transcends local, regional, or national identity.

There are many problems involved with applying the contact hypothesis through face-to-face contact (Amichai-Hamburger & McKenna, 2006; Shonfeld, Ganayam, & Hoter, 2006). They include the logistics of group meetings, the need to meet with another group from a nearby or easily accessible geographical location, and growing transportation costs. It is difficult to meet the condition of equality of status in a face-to-face meeting where people are sensitive to dress codes and subtle cues of status (Hogg, 1993). Another issue that appears in the research is one of anxiety at the prospect of a face-to-face meeting (Stephan & Stephan, 2001). These problems can be overcome by using online communication among the groups.

Interaction, which can progress from written correspondence to aural/oral contact to video and finally to face-to-face meetings, has been put forward to build up the trust among groups through collaboration and cooperation in joint tasks (Amichai-Hamburger & McKenna, 2006; Shonfeld, Ganayam, & Hoter, 2006; Shonfeld et al., 2008).

Research on adapting the contact hypothesis to virtual rather than real contact began in the mid-1990s. Sundberg (2001) suggests that geographical distance lessens feelings of threat and anxiety. Postmes, Spears, and Lea (1998, 2002) show that group interaction raises participants’ understanding of the outgroup, i.e., the group outside of their own culture, thus reducing previous bias.

A number of computer-mediated communication (CMC) projects have been carried out among diverse populations, specifically populations in conflict, based on the contact hypothesis. Probably the best documented one is *Dissolving Boundaries*, carried out from 1999 to 2008 between Northern Ireland and the Republic of Ireland (Austin, 2006). This project brings together online students and pupils from the different religious sectors of Northern Ireland and the Republic of Ireland for joint study projects. The research concludes that sustained curricular and social interaction has an effect on childrens’ perceptions of each other and that the effect is most marked between two schools, one on each side of the border.

In Israel, efforts to use CMC between Arab and Jewish populations have met with inconsistent results. Mollov and Lavie (2001) and Mollov (2006) examined discussions that focused specifically on Jewish and Islamic religious practices through email exchanges between Israelis and Palestinians. They concluded that a one-to-one religious dialogue was a means for building Israeli-Palestinian understanding. However, group encounters that focused on political concerns did not result in reducing biases (Ellis & Maoz, 2007; Maoz & Ellis, 2001).

For CMC interaction to be successful, it is important to incorporate different learning models in collaborative learning. According to Ligorio and Veermans (2005), research data confirm that international Web-based interaction can work effectively only “when meaningful pedagogical models are implemented.” Austin and Anderson (2008) claim that a new paradigm is emerging that can bring together insights from both social learning theories in education and insights from social psychology. Additional research shows that asynchronous instruction has to be carefully structured to assist student learning: discussion topics should be well-designed, and there should be frequent e-moderator or instructor input and feedback (Salmon, 2004; Ellis & Hafner, 2003).

Concerning the issue of how important it is to initially see (or not see) the other group members, Lea, Spears, and de Groot (2001) claim that that it is advantageous not to see the other group members. They claim that the lack of visually individuating cues in CMC diverts individuals’ attention from distinctive characteristics of group members. This depersonalizes perceptions and allows for identification with the prominent group.

The *social identity model of deindividuation effects* (SIDE) (Reicher, Spears, & Postmes, 1995) applies social identity theory to CMC by focusing on the consequences of visual anonymity for identification processes online. Social identity theory claims that people see themselves more as part of a group than as individuals; also, they view their partners to be equivalent and interchangeable with other in-group members. Intergroup identification exaggerates perceptions of similarity between oneself and other in-group members and magnifies perceived differences between self and out-groups (Tajfel & Turner, 1986)

The building of trust is a crucial component in a multicultural CMC course (Walther & Bunz, 2005; Walther, 2008). Krebs, Hobman, and Bordia (2006) demonstrated that the use of CMC lowered the lack of trust among people of different ages relative to face-to-face groups. Using experimental groups with a variety of diverse characteristics among their members, they found a positive association between birthplace dissimilarity and trust in CMC groups, but not in face-to-face groups. Smith (2008) uses a psychodynamic, constructivist perspective to analyze online collaborative groups, showing how past conscious and unconscious trust experiences can greatly influence current trust issues. According to Salmons (2008), the development of trust is gradual and moves through different stages of interaction and collaboration, starting from dialogue to peer review to parallel collaboration to sequential collaboration and finally to synergistic collaboration.

The OICH Model

The online inter-group contact hypothesis (OICH) model is based on an extension of the contact hypothesis (Allport, 1954). Its aim is to adapt the original contact hypothesis for online connections between groups in conflict. The model is applicable to various levels of professional/project-oriented collaboration among culturally diverse groups: academic staff at teaching colleges; trainees in the teaching colleges; teachers in schools, who are program graduates; and pupils in schools who collaborate on educational projects.

The components of the model are illustrated in Figure 1.

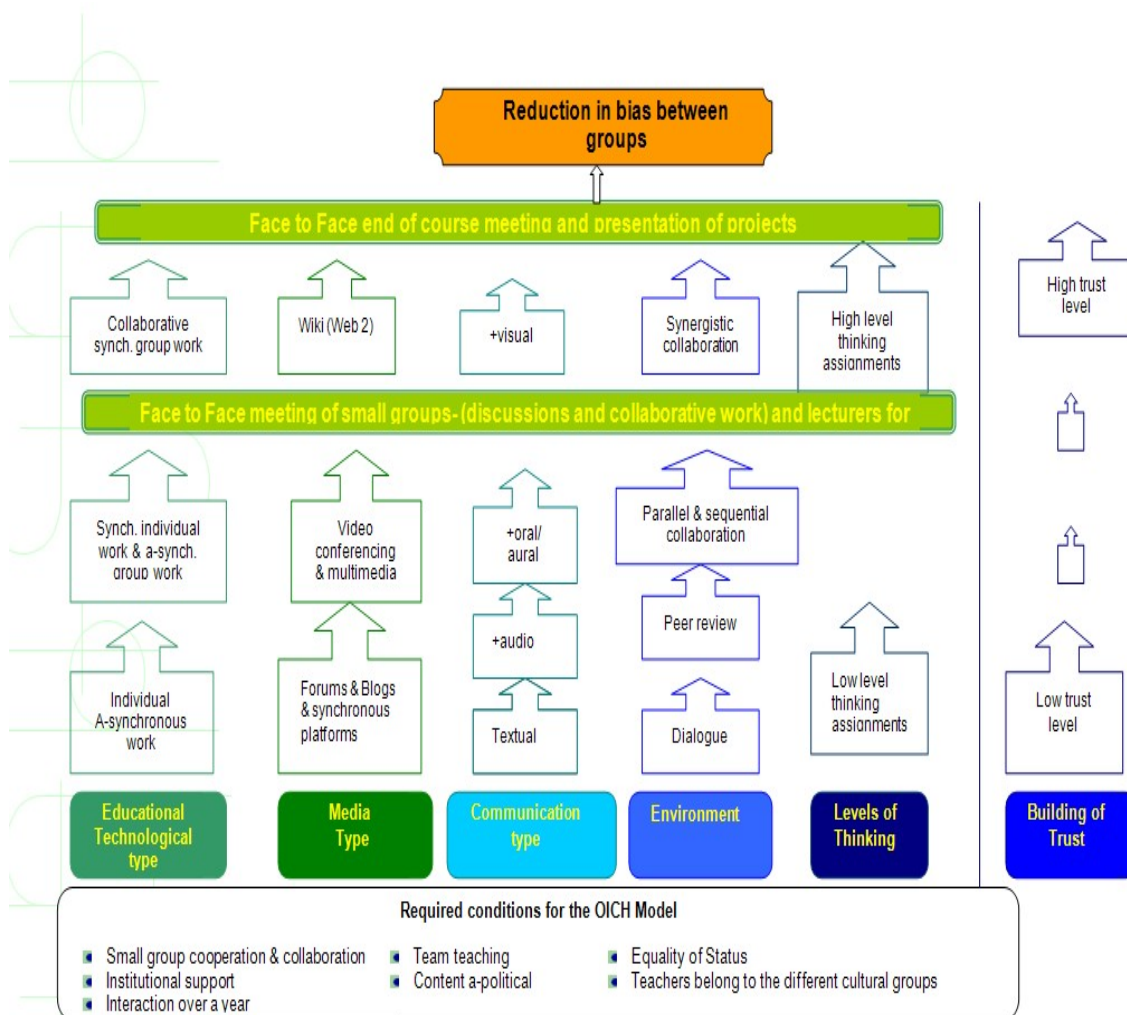


Figure 1. The OICH Model: online inter-group contact hypothesis

In order for the model to work, the project must meet a number of conditions, which are outlined below:

- be fully supported by each participating institution,
- involve collaboration among groups rather than among individuals,
- deal with general subjects and not with conflicts,
- be based on a need for participant collaboration rather than competition,
- ensure participants have equal status,
- progress gradually over a period of at least one year, beginning with exchanges via the Internet followed by text and voice exchange and finally, after a positive online experience, by face-to-face encounters among the partners, and

- employ teachers who themselves come from the different cultural groups and who “team teach” the course in a collegial environment.

The multi-collegial IT course offered by the Center annually since 2005 uses this model in a unique course that offers Israelis from diverse religions and backgrounds an advanced Internet learning environment, which focuses on computerized tools and online teaching methods (including forums, blogs, wikis, film editing programs, and more). Teacher trainees learn about applications of technology in teaching, and they practice these within the framework of a given topic or discipline of their choice.

As shown in Figure 1, courses based on this model are delivered online synchronously and asynchronously based on team teaching and group projects. The teams and the groups include participants from the three different cultures in a cooperative, non-competitive environment. The communication among the groups begins with text-based forums, but as the course progresses, the online educational platforms enable audio communication. Initially, there is a lecture with two-way communication between the lecturer and the trainees. Later, the groups begin to communicate directly through audio programs. After a few months of meetings through the Internet almost every week, the students meet either through a video conference or face-to-face. At the end of the academic year, the students meet to socialize and present their group project exhibitions. By this point, the groups’ interests have become paramount and the cultural differences have become irrelevant.

Teamwork is part of the ideology and is modeled through team teaching by the culturally diverse course instructors. The participants work in small multicultural groups; each participant comes from a different college; and each group includes two trainees from each of the participating sectors (i.e., secular Jewish, orthodox Jewish, and Arab). Their lecturers also become partners in the projects. The participants receive an individual as well as a group grade in which both cooperation and collaboration are taken into consideration. This is explained for each assignment in the rubric for the activity. Thus, participants understand the importance of collaborating and cooperating with their partners in order to achieve the maximum grade. The collaborative Internet teaching and learning includes reading an article, the collaborative creation of online and multimedia educational materials, management of and participation in discussions, and, finally, online instruction.

Course content areas reflect subjects taught within the formal education system, for example, science, the environment, special education, nutrition and health, mathematics, current events, drama, music, etc. In all these areas, trainees collaborate in creating an online unit that includes materials they have developed throughout the course. The tasks are relevant to teacher education and to students’ needs, and most require high-level thinking. In each of the chosen areas, students receive a list of assignments calling for the use of different media and skills. To assess the trainees’ work, a clear structured rubric for each assignment is created. Examples of assigned tasks include the following:

- development of an educational game,

- creation of a video clip,
- involvement in Internet research, including use of various databanks,
- searching for relevant articles and discussing these articles and other resources in the field,
- participation in activities incorporating understanding and the implications of safe and secure Internet use,
- reflection via personal blogs,
- building of treasure hunts and Web quests,
- working and collaborating on a wiki.

The course is based on online units where part of the work is asynchronous, coupled with synchronous lessons that take place every two to three weeks. Its unique format allows trainees to learn and interact at their convenience in a Learning Management System (HighLearn), which includes learning materials, tasks, and discussion forums. The communication component provides a virtual café, where participants can get help and support on group assignments from their peers.

Small multicultural groups of trainees use an online forum to discuss their work developing learning units on a specific educational subject of their choice, and they provide each other with formative evaluation.

Course Satisfaction

In 2007-8, such a course was held among nine different colleges. At the end of the course, a short questionnaire was administered to find out the level of satisfaction with the course. Seventy-one students completed the questionnaire and wrote a short reflection in the blog they had created during the course. In addition, in the face-to-face meeting at the end of the course, they were videotaped while speaking about the course and their work in a multicultural environment.

Some results from the questionnaire are presented in Table 1.

Table 1

Course Satisfaction

Question	On a scale of 1-5 (5 is high)	SD
Satisfaction with the method of learning and its effectiveness	3.17	SD=1.2
Satisfaction with the tasks	3.79	SD=0.95
Interest in learning about other cultures and religions	4	SD=0.97

Satisfaction from studying in a multicultural environment

3.76

SD=1.18

In their reflections, many students noted that one of the reasons for the success of the course was the extensive collaboration among the instructors. S. explained the modeling she viewed and experienced:

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The excellent team teaching encouraged the collaborative learning in the groups between the students and this is the reason for the success of the course.

At the year-end, face-to-face meeting of the project participants, students spoke about their mutual exposure to the other cultures and the changes in attitudes this elicited. One Arab student illustrated the empathy generated among women in her group:

It became apparent that our relations had become 'normal', when last night, after completing our joint project on the phone, we complained to each other about our husbands' lack of consideration.

An orthodox Jewish student from one of the settlements added this remark:

This coming year, I will begin teaching...and when I use the word 'Arab' in my class, it will sound different than it would have before the course.

Another student offered this comment:

My hope is that this is the start of something new...that we will succeed in showing everyone that little by little we can move ahead toward constructive dialogue.

As the course progressed, many participants emphasized the importance of initial contact through the Internet, rather than face-to-face meetings, as this allowed them to feel less threatened, imbued them with a sense of equal status, and enabled them to be more open and frank with each other:

There is almost no subject that can't be dealt with online...and because the subject is a loaded one, the geographic barrier enables a measure of emotional restraint, allowing us to approach difficult emotional issues in a rational manner.

It is precisely because of the enmity between Jews and Arabs...that the Internet can serve as an effective means for multi-cultural exchange...it obviates face-to-face friction... barriers fall away, enabling a productive discussion.

I don't think I'd be able to say what I've just said at a face-to-face conference...the screen made it easier for me to express my thoughts and feelings.

The formal questionnaires yielded numerous remarks and insights in response to the question, "What did you learn about different cultures?" These included students' feelings that they had more in common with each other than anticipated and observations by Arab students that they were pleasantly surprised to be treated as equals:

I learnt that there is no discrimination in this course. Everyone has an equal opportunity to express themselves and to participate. The lecturer relates to each student's forum posting in an equal manner.

Program participants had to overcome a number of cultural differences and obstacles, such as problems of language, differing study habits, inter-cultural competitiveness, and ideological and psychological barriers. For example, it was difficult for some in the initial group of orthodox Jewish male students to accept women in their group. Some, because of their beliefs, did not attend the face-to-face meeting, as it included both men and women. Secular Jews were anxious about collaborating with both orthodox Jewish students and Arab students, who look different and espouse different religious beliefs. For the Arab students, the barrier was one of language and fear of facing inequality in the group. When questioned about the difficulties they encountered in the course, responses ranged from insufficient knowledge of the Hebrew language to technological backgrounds of varying levels to the learning pace and style of the diverse student group members.

Lessons Learned

The issue of the language of instruction is important in this type of course, where not all students' first language is identical. Pre-course questionnaires showed that the Arab-Israeli students preferred Hebrew as the language of the course rather than English. However, the proficiency level among the populations is diverse. While the Arab-Israeli students wrote the same number of messages in the forums as the native-speaking Jewish-Israeli, they differed in length, in complexity of language, and in complexity of content. To combat this problem, a new course rule was set up whereby no attention would be given to spelling or grammar errors by other participants. This, we believed, would allow the Arab-Israeli students to be less inhibited and more willing to write freely.

Collaborative learning needs a long process of gradual group work. And, in the end, not all groups manage to work collaboratively. In order to improve the groups' chances for collaborative learning, we held training sessions for the teaching staff on collaborative learning and eventually added more stages for the assignments in the program.

Some subjects chosen by the groups proved to be too provocative and led to heated discussions on political issues. One such topic was history, where, of course, each culture came with a

different narrative. We decided to eliminate this topic from the list. Another seemingly apolitical subject, sports, proved to be very political. In these situations, where subjects became provocative, it was left to the teacher responsible for each group to veto problematic sub-topics.

Another issue which proved to be problematic concerned one of the groups chosen to represent the Jewish religious colleges. The group was made up of male students studying religious and Biblical studies. This group refused to attend the face-to-face meetings because of the dress code of the non-religious female participants. We decided in the future to work with only mixed or female groups from the religious Jewish sectors because we see the face-to-face meetings as an integral and important component in our model.

Conclusion

The model developed and the results presented from the course based on the model show that structured ICT intervention can reduce bias, stigmas, and ethnic prejudice among prospective teachers. The OICH model not only builds bridges among cultures but also promotes advanced uses of technology and the Internet for trainees' self-improvement and pedagogical goals. The model is unique in the way it promotes the gradual use of educational technology and types of communication while at the same time creating a collaborative environment, a high level of trust, and high-level thinking through the use of such tools as blogs and wikis.

The initial evaluation of the course reveals a high level of satisfaction on the part of participating students. More research is needed to understand how the use of various technologies can not only improve the ICT abilities of the participants but also improve the relationship among participants by reducing bias and stereotyping of other groups.

The next immediate step is the implementation of the model in the school system, so the project can have a significant, societal ripple effect. In this way, future teachers will apply their newly-acquired technological skills to their teaching, while introducing their newly developed multicultural worldview to their pupils, who are from diverse backgrounds, religions, and geographic locations, and thus impact the broad Israeli pupil population.

The model can also be adapted to countries facing multicultural challenges. As well, it is suitable for students from elementary school to colleges in addition to adult learners.

Finally, project feedback indicates that attractive content of intrinsic interest and relevance to teachers' and students' needs motivates participants to open their minds to new technologies and integrate them into their teaching while opening their hearts to colleagues from other cultural groups.

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Regional Focus Issue: Bridge over Troubled Waters ~ Cengiz Hakan Aydin and Yoram Eshet-Alkalai, IRRODL Regional Editors for the Middle East

Pedagogical and Design Aspects of a Blended Learning Course

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Abstract

Based on recent research reports, the blended learning model, which combines face-to-face and online learning, is now the preferred model for online course design. Its superiority over online learning, which lacks face-to-face interaction, is evident from studies that examined both student achievement and satisfaction. Nevertheless, there is ambiguity in the literature and in the field regarding the proper implementation of blended learning and the optimal proportions between online and F2F components in various learning scenarios. The range of contradictory reports in recent literature on the potential of different blended learning models shows the need for more research on specific blended learning courses in order to establish proper standards for effective course design and implementation. The present evaluation study focuses on students' perceptions of pedagogical and design issues related to a new model for blended learning used in a graduate-level course at the Open University of Israel. Fifty-eight of the course's 91 students participated in the study and completed a questionnaire regarding three major aspects of the course design: (1) pedagogy, (2) textbook format (print vs. digital), and (3) learning environment usability. The results illustrate the importance of completing the pedagogical and visual design of online learning in advance. Also, the course model suggests ways to bridge the gaps between students and instructors and students and their peers, which are typical of online learning in general and of open universities in particular.

Keywords: Online learning; blended learning model; usability; pedagogical design

Introduction

In the past decade, pervasive communication technologies and effective learning management tools have led to the proliferation of online learning for both academic and training purposes (Harasim, 1999; Stephenson, 2001; Herrington, Oliver, & Reeves, 2003; Bonk, 2004a; b). However, recent studies report that the integration of online learning environments in academia faces a wide range of problems, and the effect of online technologies on the institutes' teaching

and learning culture is limited (Bonk, Wisher, & Lee, 2003; Cuban, Kirkpatrick, & Peck, 2001). According to some studies, the following can explain the limited success of online learning:

Reading from a digital display

Reading academic text in a digital format is problematic for most learners because of disorientation problems and the low level of ownership that readers have in digital text (Armitage, Wilson, & Sharp, 2004; Spencer, 2006; Eshet-Alkalai & Geri, 2007; 2009). Consequently, students' achievements when reading digital text are reported to be lower than their achievements when reading printed text (Ackerman & Goldsmith, 2008; Ackerman, 2009)

Loneliness

Students report feelings of loneliness and social detachment when learning online because the physical reinforcement of the F2F learning environment is lacking. These feelings have a negative effect on their learning achievements (Lazenby, 2003; Coates, 2006; Bates & Khasawneh, 2007; Kurtz & Amichai-Hamburger, 2008). In most of these reports, learners express the need to bridge the gap with their online instructor and peers.

Digital skills

Teachers and students lack the necessary cognitive skills for making effective use of online technologies (Eshet, 2004; Eshet-Alkalai & Amichai-Hamburger, 2004; Eshet, 2007). As pointed out by Shemla and Nachmias (2006), this lack of skills leads to an uneducated use of instructional technologies.

Pedagogic design

Most academic online learning is perceived as complementary to lecture-based courses, and therefore pedagogical approaches are adopted that fit the traditional, frontal teaching and learning process (Bonk, 2004a; b; Bonk, Graham, & Moore, 2005; Shemla & Nachmias, 2006). Consequently, online courses do not usually employ pedagogical approaches that fit online learning (Andrews & Haythornthwaite, 2007; Bonk & Graham, 2006; Graham, 2006; Eshet, 2007).

The blended learning model emerged from the above-cited problems (Osguthorpe & Graham, 2003; Garrison & Kanuka, 2004; Bonk et al., 2005). Typically, blended learning makes extensive use of learning technologies through the "blend" of physical and virtual environments in order to supplement traditional F2F learning (Singh, 2003; Bersin, 2004; Bonk, 2004a; Rovai & Jordan, 2004). A wide variety of blended learning models are described in the literature (e.g. Singh, 2003; Thorne, 2003; Bonk et al., 2005), ranging from supplementing the F2F learning process with online materials, as in most traditional universities (Shemla & Nachmias, 2006), to conducting the learning via a learning management system (LMS) supplemented by a few F2F orientation meetings, which is common in most open or distance universities (Guri-Rosenblit, 2005). Most of the papers on blended learning indicate that there is no ultimate formula for blending the online and F2F learning components and emphasize the challenges faced by designers of blended learning to achieve the best proportion in every learning situation (e.g. Rossett, Douglass, &

Fraze, 2003; Bersin, 2004; Denti & Motsching-Pitrik, 2005; Rossett, Douglass, & Fraze, 2003). Garrison and Kanuka (2004) indicate that the transition from traditional F2F to blended learning is not trivial, and they describe the challenges for both students and instructors; nevertheless, they emphasize the great potential of this learning model. In their comparative study of F2F and blended learning, Rovai and Jordan (2004) illustrate the advantages of the latter over the former method in creating a better sense of community without sacrificing high academic standards.

Despite the problems that are involved in the blended learning model, e.g., the need to master a range of digital cognitive skills (Eshet, 2004; Bonk et al., 2006), as of today, it is considered the most effective model for online learning (Osguthorpe & Graham, 2003; Bonk et al., 2006; Andrews & Haythornthwaite, 2007). However, although numerous studies have investigated the implementation of the blended learning model, much ambiguity exists regarding its utilization in real-life situations and the optimal proportion of its components in different instructional situations (Bonk, Wisner, & Lee, 2003; Thorne, 2003; Bersin, 2004; Singh, 2004).

The common model for course design, development, and instruction in most open universities worldwide (e.g., Israel and the UK) contains paradoxes (Guri-Rosenblit, 2005), the most central of which is the fact that courses are developed and written by experts who do not teach them and that the actual instructors of the courses are not involved in writing the textbooks and the learning guides. As pointed out by various scholars (e.g. Guri-Rosenblit, 2005; Lazenby, 2003), this kind of course-delivery model creates a gap between the course developer, the course instructor, and the students and has a negative effect on the learning process and on student satisfaction (Swan, 2001; Bates & Khasawneh, 2007). Guri-Rosenblit (2005) and Stephenson (2001) emphasize the importance of making special efforts to close this gap in the design of online courses in open universities.

The present evaluation study focused on a graduate-level blended online course at the Open University of Israel in which online learning technologies were used to create an effective and satisfactory online learning environment. This paper presents results from a survey of students regarding the interface and the pedagogic design of the course.

Course Pedagogical Model

In most of the courses offered at the Open University of Israel, the use of online components in the learning process is relatively limited, consisting mainly of a course homepage, instructor's announcements, syllabus, assignments, occasional online resources, and a forum for online discussions. In most of the courses, the online elements are added to the course after it is developed; they are considered "nice to have," but they are not mandatory or a central element in the learning process. As a result, the online technologies are regarded by students and instructors as add-ons, and they don't affect the learning in the course significantly.

The course investigated in the present study is a graduate-level online course titled *Design Principles of Computer-Based Learning Environments*. The course focuses on the major aspects of designing technology-based learning environments. Unlike most online courses at the Open

University, this course is designed as fully online, which means that all learning materials (e.g., lectures, readings, textbook, timetable, assignments, and exercises) are available online, and a major portion of the learning takes place in a specially-designed online learning environment.

The course design and development was based on knowledge of the major problems that underlie online teaching and learning in universities, particularly in open universities (Guri-Rosenblit, 2005). In light of present-day research reports regarding problems that most users face in reading academic texts from digital displays (Eshet & Geri, 2007), the course textbook is made available to students in both digital and print formats. This allows students to choose their favorite mode of learning for each section in the course and to navigate freely between the text and the online environment. The numerous video lectures by the course writer, which are included in the online course environment, are meant to bridge the above-noted gap between the course writer and the students (Guri-Rosenblit, 2005). The pedagogical design of the course emphasizes a constructivist approach (Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990), in which the learning process focuses on the students' ability to solve real-life problems in an academic context. Accordingly, the course assignments require students to analyze Internet-based learning environments, design user interfaces, and suggest educational simulations to solve real-life learning problems. The course's computerized learning environment (CLE) emphasizes usability standards, navigational flexibility, and design principles for hypertextual learning environments (Balcytiene, 1999).

The course's instruction follows the blended learning model (Bonk et al., 2003; Osguthorpe & Graham, 2003). It consists of six optional face-to-face orientation meetings, and the remainder of the learning is done online. According to blended learning principles (Bonk et al., 2003), online learning is widely used for topics that emphasize practical issues (e.g., interface design, databases, or simulation design), for which authentic tasks are assigned. On the other hand, for the more theoretical topics (e.g., learning theories), face-to-face learning is dominant.

The course deals with the major aspects of designing computer-based learning environments and their underlying learning processes. The course consists of five learning units: theoretical aspects of learning with technology, hypertext and hypermedia learning environments, user-interface design, designing databases, and educational simulations. Each unit combines a discussion of the theoretical and the practical aspects of the topic. The theoretical background is provided by the assigned articles for each unit and by the course textbook. The course tasks and assignments are designed to help students implement their theoretical knowledge in authentic situations. As noted above, designed as a "virtual classroom," the course's Web site serves as the major learning environment in which discussions take place, the face-to-face meeting summaries are posted, and assignments and tasks are submitted, making the content and the online learning processes inseparable.

Goals of the Study

As discussed above, knowledge of the major problems associated with online and blended learning (i.e., reading from digital displays, detachment from peers and course instructor,

mastering digital skills, and inappropriate pedagogical course design) was taken into consideration in designing the blended learning course. Accordingly, the main goals of the present evaluation study were to examine students' perceptions of the following topics:

1. Course pedagogy, including the pedagogical aspects of the online and printed textbook design,
2. Textbook format (print versus digital), and
3. Usability of the course learning environment.

Method

Participants

Data were collected anonymously from 58 of the course's 91 students during a period of three semesters in the years 2006-2007 (Table 1). The following demographic information relates to all 91 students: 79% were females ($n = 72$) and 21% were males ($n = 19$); their mean age was 39 (Stdv 8.2); 47% ($n = 43$) were from central Israel; 45% ($n = 41$) were from northern Israel; 7% ($n = 6$) were from southern Israel; and one was unknown.

Table 1

Distribution of the Study's Participants according to Semester

Semester	Number of participants
Fall 2006	21
Fall 2007	14
Spring 2007	23

Tools

A structured questionnaire was developed in order to examine students' attitudes about the following issues: the course's instructional pedagogy, the technological tools and the learning materials, and the influence of the learning environment design and its contents on learning processes. The questionnaire consists of 78 questions that refer to the students' use of the various learning components, their usability (i.e., friendliness, ease of use, and orientation), and their perceived contribution to learning. Ratings are made on a 1-4 or 1-5 Likert scale for each question, depending on the subject. In some questions, ratings refer to the number of students that used components of the learning management system (LMS) or the frequency of use. The questionnaire, which was distributed during the fall and spring 2007 semesters, was updated to include questions that were absent in the fall 2006 semester.

Procedure

Data was collected during three semesters in 2006-2007. The questionnaire was administered in the last F2F meeting or via electronic mail. Students completed the questionnaire either during the meeting, or they completed it online and submitted it via electronic mail. The questionnaire was not part of the course requirements and it was not obligatory to complete it.

Results

Results are presented in respect to the study's three major goals: (1) course pedagogy (pedagogical aspects of the online textbook's design, online video lectures, and online discussion groups), (2) issues that relate to reading print versus digital text, and (3) usability of the course learning environment (i.e. the online textbook and the course Web site).

Course Pedagogy

Results relate to three aspects of the course pedagogy: (1) contribution of the overall course components to learning, (2) pedagogical aspects of the textbook and the video lecture design, and (3) the video lectures and discussion groups.

Contribution of course components to learning.

Students' perceptions of the pedagogical value of various instructional and learning components in the course were examined in the current study. As can be seen in Table 2, the instructional components that were perceived as contributing most to learning were the course tasks (mean = 4.72), the printed textbook (mean = 4.54), the meeting presentations (mean = 4.42), and the F2F meetings (mean = 4.15). The online video lectures were not found to contribute highly to learning (mean = 3.83); however, 47 out of the 58 participants who answered this question indicated that they would not give them up. The personal notebook (a component in which students can mark selected sections from the online textbook) was the most unused component and was perceived as insignificant to learning (only 7.3% used it frequently; mean of contribution to learning = 1.6). The online textbook was considered to be an average contributor to learning (mean = 3.32). However, almost half the participants (46.5%) indicated that they used it frequently.

Table 2

Students' Attitudes toward the Pedagogical Value of Various Instructional and Learning Components

Learning components	No. of participants	Contribution to learning		Frequency of use (%)	
		Mean*	Stdv	High**	Low**
Online textbook	56	3.32	1.42	46.5	53.5

Printed textbook	37	4.54	0.87	83.8	16.2
Video lectures	54	3.83	1.24	73.7	26.3
Online timetable	55	3.45	1.26	63.2	35.1
Personal notebook	48	1.60	1.11	7.3	92.7
Discussion groups	53	3.51	1.12	56.1	43.9
Meeting presentations	55	4.42	0.94	86.2	13.8
List of links in the textbook	55	3.93	1.09	82.5	17.5
Tasks***	29	4.72	0.8		
F2F meetings***	26	4.15	1.26		

*The answer's scale was 1 = no contribution – 5 = high contribution

** High frequency – continuously, frequently; Low frequency – seldom, never

***Items that were not included in the Fall 2006 questionnaire

Textbook and video lecture design.

The course instruction and the computerized learning environment are based largely on constructivist principles. According to the constructivist approach, knowledge is constructed by engaging students in real-life problem-solving situations (Bransford et al., 1990). Accordingly, the online textbook contains links to brainwork exercises, performance tasks, articles, and authentic examples on the Internet. In the study, students' attitudes to the above components were examined. As Table 3 shows, items 1-3 assessed the extent to which students dwelled upon the brainwork exercises, looked over the recommended examples, or performed the tasks. It was found that the more demanding the tasks, the less students favored them, e.g., a high preference for examples (mean = 3.94) and a medium preference for performance tasks (mean = 3.17). Nevertheless, the contribution of these components to students' understanding and motivation was found to be high (mean = 4.2). Note that the *components' contribution to learning* measure was calculated as a mean of the scores of items 4-9 (Table 3). These items measure the contribution of knowledge construction, relevance to the learning themes, dynamic learning, understanding and internalization of the learning material, gratification from the learning, and the level of interest in the texts. These six items were found to have high internal validity (Cronbach Alpha = 0.91). Note that in Table 3, the number of respondents for question 3 was smaller than the other questions. This resulted from the fact that Q. 13 was added to the research during the second semester of the data collection.

Video lectures and discussion groups.

In order to bridge the gaps between the course developer and the course instructor, between the course instructor and the students, and between the students and their peers, video lectures given by the course developer as well as discussion groups led by the course instructor were included in the computerized learning environment. Most respondents (87%) indicated that the video lectures were necessary, and more than 90% reported that they observed at least one lecture. As for the lectures' contribution to learning, the possibility to listen to the lectures combined with the presentation and the examples was found to contribute the most (mean = 4.4, Table 3).

Almost all respondents (98.2%) visited the discussion groups. Most of them (67.9%) reported that they followed the activity continuously in the discussion groups while others visited them occasionally. Of all the respondents, 28.6% reported active involvement in the discussion groups. The students' satisfaction with the discussions was found to be higher than average (mean = 3.59).

Table 3

Students' Attitudes toward the Pedagogy of the Course Instruction and the Influence of the Learning Environment Design and Content on Learning Processes

	Number of respondents	Mean *	Stdv
Exercise components in the textbook			
1. Perform the exercises in the textbook	48	3.17	0.97
2. Stop and think about the questions and issues raised	47	3.40	0.90
3. Stop and examine the examples the text refers to	48	3.94	0.81
Components' contribution to the learning process			
4. Knowledge construction	47	4.15	0.81
5. Relevance to the learning themes	46	4.33	0.70
6. Dynamic learning	46	4.22	0.81
7. The level of interest in the text	48	4.23	0.81
8. Gratification from learning	48	4.21	0.82
9. Understanding and internalizing the learning material	47	4.15	0.81
Total components' contribution to learning measure**	448	4.21	0.67
10. The online textbook's functional design leads you to refer to, think of, or understand the course content	45	3.67	1.13
Video lectures			
11. The acquaintanceship with the course developer contributed to the learning experience	50	3.78	1.18
12. The lectures contributed to learning focalization in each unit	50	4.00	1.16
13. Listening to the lectures combined with the presentation and examples contributed to understanding the learning material	32	4.40	0.80
Discussion groups (DG)			
14. The satisfaction from the level of discussions	49	3.59	0.84
15. Organizing the discussion groups according to units contributed to focalization of discussions in the DG	49	3.96	0.96
16. Organizing the discussion groups according to	49	3.86	1.10

units contributed to receiving assistance when needed			
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*The answer's scale was 1 = not at all – 5 = very much

**The measure was calculated as mean of items 4-9 (internal validity, Cronbach Alpha = 0.91)

Course Textbook: Print versus Digital

The dilemma over the optimal format for presenting the course learning materials – in a printed or digital textbook – was examined in relation to three different learning assignments: reading, task implementation, and preparation for the final exam (Table 4). As can be seen from Table 4, the general preference of more than half the respondents (57.9%) was for combining the printed and the digital textbook. Of all the respondents, 36.84% preferred the printed textbook only, while few students (5.26%) preferred the digital textbook only. Table 5 shows that for most of the respondents (more than 60%), the most influential factors in choosing the printed textbook were the convenience of the printed book, accessibility, and the ease in finding information. The major reasons for choosing the digital textbook were the fast access to online examples of computer-based learning environments and the easy access to links embedded in the text.

Table 4

Students' Preferences Regarding the Textbook Format (printed, digital, or combination) in relation to Various Learning Assignments

	Digital textbook %	Printed textbook %	Combination %
How do you usually read the course textbook?	10.3	50	39.7
Which book do you usually use to prepare the course tasks?	15.8	57.9	26.3
Which book do you prefer to use prior to the final exam?	14	59.7	26.3
General preference*	5.26	36.84	57.9

* This measure integrates the respondents' preferences of the three learning assignments into one measure in the following way: students who preferred the digital textbook in all assignments = Digital textbook; students who preferred the printed textbook in all assignments = Printed textbook; all other preferences = Combination

Table 5

Print versus Digital – Reasons that Influence the Respondents' Preferences

	High/large influence %	Little influence %	No influence %	Number of respondents
It is hard to read long texts from the computer screen	56.8	35.1	8.1	37
I'm used to reading and studying	59.5	24.3	16.2	37

from printed textbooks				
The digital textbook enables easy access to examples of computerized learning environments and other references	62.9	22.9	14.2	35
The printed textbook can be read everywhere	64.9	24.3	10.8	37
It is easy to navigate in the digital textbook	47.1	32.3	20.6	34
You can't mark or write notes in the digital textbook	55.9	32.3	11.8	34
The digital textbook contains interesting information that cannot be found in the printed version	20.0	34.3	45.7	35
In the printed textbook you can find what you want easily	62.2	29.7	8.1	37
The reading in the digital textbook requires time investment	32.4	50.0	17.6	34

*The answer's scale was 1 = no influence – 5 = high/large influence

Usability

Results indicate the students' high satisfaction with various usability aspects of the CLE (i.e., the ease of use and its friendliness) and the digital textbook. Results in Table 6 show that the organization of the course's digital contents facilitated navigation by leafing through and reading the text (mean = 4.28). High scores were given to specific design elements, such as the font type and size (mean = 3.41 for both), text organization (mean = 3.46), the integration of tasks and examples in the CLE (mean = 3.64), and the ease of navigation through the text and the CLE (mean = 3.39). The general usability measure, as calculated from items 1-6 in Table 6, was high (mean = 3.5). In addition, the navigation in the CLE, which offers the students flexibility in reaching the course content "from everywhere," was found to be highly usable, and the students used this flexibility wisely and in various ways. For example, half the respondents reached the course readings via the Articles button in the CLE homepage, while 20% of the respondents reached it via links in the digital textbook or the timetable area in the CLE.

Table 6

Students' Attitudes toward the Design of the Digital Textbook and the Video Lectures

	Number of respondents	Mean *	Stdv
The digital textbook			
1. Text design – chosen font	46	3.41	0.62
2. Text design – font size	46	3.41	0.62

3. Text organization in layers	46	3.46	0.69
4. Task integration	45	3.74	0.63
5. Links and examples' integration	45	3.64	0.53
6. Navigation	44	3.39	0.75
<i>Total usability measure**</i>	46	3.50	0.50
The video lectures			
7. Functional design of the video lecture interface	49	3.45	0.68
8. Time length of the video lectures	48	3.25	0.86

*The answer's scale was 1 = is not suitable for learning – 4 = very suitable for learning

**The measure was calculated as mean of items 1-6

Discussion and Conclusions

Results of the current evaluation study make a meaningful contribution to our understanding of the perceived value of learning and instruction in online environments, especially in light of the numerous studies that indicate the need to refine our understanding of the usability and pedagogical aspects of blended learning (Thorne, 2003; Bersin, 2004; Bonk et al., 2005). The high rating in the study of the course's pedagogical and design elements illustrates the great importance of "designing in advance," which takes into account the problems of online learning, contrary to "designing in retrospect," which characterizes the majority of present-day online academic courses (Shemla & Nachmias, 2006).

The finding that students' strongly preferred the blended learning model is in agreement with reports from most current studies on online learning models (e.g. Throne, 2003, Singh, 2004, Bersin, 2004, Bonk et al., 2005). Our findings illustrate the need to adjust the instructional model to the content and the learning objectives, as discussed by Guri-Rossenblit (2005) and Bonk and Graham (2006). Findings of the current study indicate students' high evaluation of the interactive learning components, such as discussion groups and constructivist tasks, which is in agreement with other studies that explored the value of students' engagement and interactivity in the online process (Herrington et al., 2003; Bonk, 2004a; b; Coates, 2006; Allen & Seaman, 2007).

Results of the current study reinforce the widely-reported student preference for reading academic texts in print over reading them in a digital display (Spencer, 2006; Eshet-Alkalai & Geri, 2007; 2009) due to its ease of navigation and high availability. Only a few students preferred the digital over the printed textbook, mainly because of the accessibility it provides to the online examples. It should be noted that other studies (e.g. Eshet-Alkalai & Geri, 2007) indicate that the capability of readers of various age groups to deal with critical reading of digital texts in various knowledge domains is yet unclear, emphasizing the need for solid research data in order to reach conclusions regarding the preferred format in reading academic texts.

The current study found high satisfaction with the usability components of the CLE, which is exceptional compared to the general low satisfaction with LMS sites reported in many studies (e.g. Swan, 2001; Bonk, 2004a; b; Shemla & Nachmias, 2006). Extremely high satisfaction (mean = 4.7 on a 1-5 scale) with the CLE was also found in the course instruction surveys that

were given to students at the end of each semester. We believe that this high satisfaction rate is an outcome of the major investment in designing the pedagogical and usability elements of the course “in advance,” as suggested by Guri-Rosenblit (2005). Nevertheless, the usability of some components (i.e., the personal notebook) was evaluated as low. Therefore, further research is needed to clarify the reasons for these evaluations and adapt the course design accordingly.

The current study has some limitations: (1) the sample was small, (2) participants were MA students in an educational technology graduate program, and many of them have higher computer skills than the average student, so the high level of satisfaction found in the research might not represent students from other disciplines, and (3) even though the questionnaire used in the study was modified from the Open University’s standard instruction satisfaction questionnaire, it did not undergo a large-scale validation process.

In future studies, after validating the questionnaire, special emphasis should be placed on testing a larger group, comparing students’ attitudes from various disciplines and proficiency levels, and comparing online courses that are based on different pedagogical models. Notwithstanding, results of the current study shed new light on our understanding of the proper design of a blended online academic course by highlighting the need for in-advance pedagogical and visual design. In addition, results indicate the potential of the current model to bridge the gaps between students and instructors and students and their peers, which are typical of online learning, and to create meaningful learning by employing online pedagogical consideration in the course design.

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Are We There Yet? A Progress Report from Three Turkish University Pioneers in Distance Education and E-Learning

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Abstract

The international literature provides little in-depth analysis of distance education and e-learning activities, achievements, and challenges in Turkish higher education other than the country's mega-university, Anadolu. This paper examines the development of, and lessons to be learned from, such undertakings by three pioneers – two regular state universities, Ankara University and Sakarya University, and the private, non-profit Turkish-Kazakhstan Ahmet Yesevi University. Drawing on the collective experience of the authors, the paper reaches some overall conclusions about embarking on distance education and e-learning, which may apply in other Turkish universities and similar economies.

Introduction

Turkey is a democratic secular developing nation of about 70,600,000 people¹. Bridging two continents, it has a blend of Eastern and Western cultures. It links with the West through its membership of such organizations as the Council of Europe, the North Atlantic Treaty

¹ <http://turkeyeconomy.blogspot.com/2008/01/turkey-population-statistics.html>

Organization (NATO), and the Organisation for Economic Co-operation and Development (OECD) and associate membership and candidature for full membership of the European Union (EU). As a Muslim-majority country, it also fosters close cultural, political, and economic ties with the Middle East and Central Asia. Its economy was originally agricultural; today, it is increasingly dominated by the industrial and service sectors.

Turkey's higher education system comprises 94 state and 35 private universities, plus a number of police and military academies and vocational colleges. The universities' faculties and four-year schools offer bachelor and graduate programs, and their two-year vocational schools offer pre-bachelor (associate) degree programs.

Turkey also has one of the world's mega-universities, Anadolu University, in the city of Eskişehir in central Anatolia. In 1981, when the Higher Education Council (YÖK) first authorized regular universities to move into distance education, the only institution to do so was Anadolu (Latchem, Özkul, Aydın, & Mutlu, 2001). In 2008, Anadolu's Open Education Faculty had a total enrolment of 1.5 million students, about 40% of all university students and 99% of all distance education students in Turkey. Apart from some teacher training programs, Anadolu exercises no quotas in its courses and programs. Entry to Anadolu's two- and four-year programs is open to all Turkish and North Cyprus high school and vocational and technical high school leavers achieving a score of at least 160 in the Student Selection Examination (ÖSS), as opposed to the minimum of 185 required by the regular universities. As in the regular universities, examination requirements are waived for vocational and technical high school graduates continuing in their same fields of study.

In 2007, the Higher Education Council (YÖK) aimed for a 25% increase in the number of places in the regular universities. In the event, with just over 1.5 million school leavers applying for university places, 2008 saw a 27% increase, from 433,150 to 552,392. About one third of these students entered the regular universities' four-year degree programs, 29% enrolled in the two-year programs, and almost 40% signed up for the two- and four-year programs offered by Anadolu University.

YÖK is keen to achieve greater access, equity, quality, and cost-effectiveness in higher education. Over 26% of the population is in the 0-14 age group, most of the universities are in the wealthier west of the country, and the private universities have only a 5.7% share of the market. Former Vice-Rector of Anadolu University and now Member of YÖK, Ali Ekrem Özkul (2001) suggests that distance education provides a rational means of increasing capacity, maximizing resources, and realizing the nation's human resource potential. However, because of the conservative institutional cultures, cumbersome bureaucracy, under-funding, and high level of government control over expenditures, the regular universities have been slow to adapt to the changing demands and to the need to be more competitive (Mizikaci, 2006).

Distance education is still in its infancy in the Turkish higher education system (Usun, 2003). In 1956, Ankara University's Faculty of Law offered the country's first university correspondence course, designed for bank employees (Şimşek, 2005). During the 1990s, Fırat University, Selçuk

University, and a few other institutions began operating their own local television channels, and the Middle East Technical University, Bilkent University, Istanbul Bilgi University, and some other universities began teaching by videoconferencing. A number of universities are now introducing e-learning into their on-campus and off-campus programs, but there is a lack of instructional design expertise (Aydin, Mutlu, & McIsaac, 2006), and the universities mostly produce digital versions of existing teaching materials rather than new and effective e-learning environments (Cebeci, 2004).

There is a lingering suspicion that technology-based mass education compromises educational quality, and YÖK has exercised caution towards distance education, requiring any university wishing to open, change, or close a distance or e-learning program to first seek its approval (Torkul, Sezer, & Över, 2005; Karakuzu & Karaman, 2006). However, YÖK is now more actively encouraging the universities to enter this field.

The international literature provides little in-depth analysis of distance education activities, achievements, and challenges in Turkish universities other than Anadolu. It is therefore considered timely to describe and analyse the work of three of the pioneering universities – Ankara University, Sakarya University, and Ahmet Yesevi University – to see how their experiences might serve to inform universities in Turkey and similar economies contemplating moves into distance education.

Ankara University

Turkey's first state university, Ankara University, was founded in 1946. It has Faculties of Agriculture, Communication, Dental Medicine, Divinity, Educational Sciences, Engineering, Forestry, Health Sciences, Medicine, Pharmacy, Political Sciences, Science and Veterinary Medicine, as well as 13 technical training and vocational schools and 8 institutes. Also, it operates over 9 campuses.

Ankara University's Distance Education Centre, the Turkish acronym for which is ANKUZEM (see <http://www.ankuzem.ankara.edu.tr>), resulted from the Rectorate and a few academics and educational technologists recognizing the need to respond to student and employer demand for alternative forms of provision, to improve access and equity, and to apply new and more cost-effective teaching measures across the various campuses. Following a pilot project, ANKUZEM was established in 2002 and a year later it began delivering distance and e-learning programs.

ANKUZEM's vision is to provide learner-centered blended learning enriched by the use of multimedia and individual or collaborative enquiry. It has employed a range of strategies – reports, displays, seminars, examples of best practice, and research findings – to help change the institutional policies and culture and staff attitudes towards new forms of provision. It also provides staff training and support in instructional design, multimedia, and Web-based teaching and learning.

ANKUKEM's director reports directly to the rector and is also answerable to an Academic Board and Board of Management. There are two assistant directors, one responsible for administration, finance, service delivery, and student affairs, and the other for design, production, and application. The other 11 employees are responsible for developing, maintaining, and updating courses and courseware as well as conducting research and managing the learning management system (LMS), staff development, enrolments, learner support, assignments, and examinations. The centre's main strength lies in the knowledge and experience of these staff members. Its main problem is the size of the staff relative to the ever-growing number of students and courses. ANKUKEM currently serves 1,190 distance education students, 940 at undergraduate level and 250 at certificate level. New programs planned for 2009-10 include associate degree programs in insurance studies and tourism and hotel management and master's programs in business studies and education, each with a target enrolment of 500, and a master's program in distance education with a target of 250 students.

ANKUZEM's 350 m² studio, LMS, six servers, and state-of-the-art technologies are heavily employed in providing online teaching and learning, videoconferencing, interactive IP multicast via Turkey's National Research and Education Network, high-definition broadband-delivered streamed video, and interactive virtual classrooms for on- and off-campus students. ANKUZEM also uses videoconferencing and WebTV to link with other universities in Turkey, Japan, and South Korea.

ANKUZEM's first venture in distance learning was an off-campus version of the on-campus undergraduate theology program (İLİTAM) relating Islamic cultural heritage to contemporary life. Using a mix of online content and chat, interactive video, and face-to-face methods, this program attracts male and female students in Turkey and 14 other countries. ANKUZEM now also provides a Conservation in Museums (ÖKOP) program for museum researchers, which currently has 21 enrollees, a Synchronous Medicine Education (STIP) associate degree program with an enrolment of 50, the European Computer Driving Licence (ECDL) program, which currently has 775 students, and a synchronously-delivered course on Korean economics for 30 students in the Faculty of Agriculture.

As with the on-campus programs, the students are selected on the basis of their high school achievement and Student Selection and Placement System (ÖSYM) grades. In 2008, about 25% of the off-campus students were 25 years or younger, just under 50% were in the 26-35 age group, about 25% were in the 36-45 age group, and a few were 46 or over. In the same year, 42% of the on-campus students were 25 and under, 42% were in the 26-35 age group, 15% were in the 36-45 age group, and again only a few were 46 or over. The distance students are predominately male and live in urban areas. About 75% have access, albeit sometimes restricted, to computers and the Internet. Fewer than 20% describe themselves as highly skilled in the technology (Şimşek, 2006).

Upon enrolling, the students are issued with ID numbers, which enable them to access the online materials and support services, CDs, videos, study guides, etc. Orientation, instruction, tutoring, assessment, and feedback are provided through a mix of online and face-to-face methods. The

students can join virtual academic and technical forums and coffee shops and exchange ideas with their tutors and peers by email. They can also attend face-to-face classes at centres in İstanbul, Bursa, Ankara, Erzurum, Sivas, Adana, İzmir, Isparta, Sanliurfa, Samsun, or, in the case of Turkish citizens, in Cologne, Germany. The courses, examinations, and awards are identical to the on-campus programs. There is no indication of the mode of study on the awards but even if they do find this out, employers appear happy to accept graduates who studied at a distance.

In 2005-2008, the pass rates for the two-year distance education programs were 85-90% and the drop-out rate was 0.4%. These figures may be exceptional – the time-frame is limited and the number of graduates is small – but they certainly compare well with the experience of US, European, Asian, and Turkish distance teaching universities (Şimşek, 2006; Şimşek & Parlak, 2005). The Centre's staff members feel that their careful planning, concern for students' needs, and training and support for staff are paying off.

One of ANKUZEM's aims is cost-effectiveness. It has been found that the fees from the two-year İLİTAM program are sufficient to meet all the program development, delivery, and teaching costs, that the cost of the program is significantly lower than the on-campus version, and that the overall cost benefit to the university is 298%.

ANKUZEM offers services to other Turkish universities. It is a member of the 45-institution National Open Course Materials Consortium founded by the Turkish Academy of Sciences (TÜBA), having earlier pioneered the sharing of courseware with the Middle East Technical University. Such work is strongly supported by the Senate because it makes the faculties and their courses better known and demonstrates the university's willingness to share its knowledge and resources with less well-resourced institutions and the general public.

ANKUZEM is also involved in a number of international open and distance learning projects. It is a member of the European Distance Education Network (EDEN) and has bilateral agreements with the UK Open University, Bemidji State University in the US, and Modern University for the Humanities in Russia.

As well as increasing the range of programs on offer, ANKUZEM's future plans include achieving the status of a university institute in acknowledgement of its research and its developmental and service role.

Sakarya University

After opening in 1970 as the School (later State Academy) of Engineering and Architecture and operating between 1982 and 1992 as a faculty of Istanbul Technical University, Sakarya University finally became a university in its own right in 1992. It has Faculties of Education, Arts and Humanities, Fine Arts, Economics and Administrative Sciences, Theology, Engineering, and Technical Education; Schools of Healthcare and Physical Education and Sports; Graduate Schools of Natural Sciences and Social Sciences; and 10 Vocational Schools including the Distance Education Vocational School of Adapazarı. In 2009, the university had 45,576 students

– 25,273 in its undergraduate, master's, and doctoral programs and 20,303 in its two-year vocational school programs.

In 2005, the Department of Informatics established the Distance Learning Research and Development Centre (see <http://www.uzem.sakarya.edu.tr>) with the aim of providing online programs for the university and other public and private organizations and conducting research and development in this field. A number of factors have contributed to this initiative. Sakarya University has made considerable investments in, and contributes significantly to, the development and application of information and communications technology (ICT) in Turkey. In 2001, it collaborated with the Ministry of Education in mounting Turkey's first International Educational Technology Conference and Fair, and it also hosted this event in 2002, 2003, and 2004. The editor of the *Turkish Online Journal of Educational Technology* (see <http://www.tojet.net/>) is the coordinator of the Faculty of Education and the journal operates from this base. Senior management and some of the academic departments have been strongly supportive of the university's moves into distance education and e-learning, recognizing the potential to increase participation rates, provide lifelong learning, and improve the quality, scope, and cost-effectiveness of on- and off-campus teaching and learning.

The Centre offers four-year degree programs, two-year vocational school degree programs, and postgraduate degree programs through distance education. In 2009, 50 students were enrolled in each of the four-year degree programs in computer engineering, industrial engineering, and human resource management; 460 postgraduate students were taking the e-MBA program; 27 were in the information technology master's program; and 14 were in the engineering management master's program. Online enrolments in the vocational high school courses were very much higher, with 1,557 studying computer technologies and programming, 1,052 information management, 1,367 mechatronics, 1,262 industrial electronics, and 1,133 business studies. Most of the vocational students are aged between 17 and 20, but these courses also attract some older students who are already in jobs.

The Centre collaborates with the Ministry of Health in a Family Doctor Distance Learning Project in which the Ministry's educational materials are being converted into multimedia courseware for Internet delivery to over 25,000 doctors nationwide. The Centre also runs online certificate programs in ICT for the University and the Ministry of National Education. It is a test centre for the ECDL programs. It develops and provides Internet-based or blended learning courses in ICT for on-campus students in social sciences and natural sciences. It also runs online and face-to-face summer schools in ICT, the most recent attracting just under 5,000 students.

The University's Academic Committee and Accreditation Committee determine which programs the Centre may provide through distance and e-learning and which lecturers should participate in these. The Centre's staff comprises a director, an assistant director, 18 academic staff, 4 technical staff, and 12 administrative and clerical staff. It is organized into five operational units: Content Development, System and Database Management, Organizational Planning, Standards and Procedures, and Research and Development.

Course and courseware development follows the Analysis-Design-Development-Implementation and-Evaluation (ADDIE) model (Torkul, Över, Göksu, & Selvi, 2005). The course content is developed by the teaching staff, the courseware is digitized then converted into multimedia form and transferred to the Internet environment by the Centre's instructional/Web designers, and the outcomes are monitored by the Centre's research and evaluation personnel. The Centre is also responsible for the provision of technical and learner support, marketing the distance education programs, and training and supporting academic staff in instructional design and distance and online teaching and learning.

The courses and programs are delivered through various combinations of online videoconferencing, asynchronous Web-based learning and face-to-face interaction, according to the level of study. The certificate programs are wholly Web-based. Ninety percent of the vocational school programs are asynchronously online supplemented by face-to-face tutorials and practical work. The four-year programs are taught through blended learning, 70% being online and 30% classroom-based. The postgraduate programs are entirely ICT-based, 80% via the Web and 20% by videoconferencing.

Assessment and examinations are conducted through a mix of multiple-choice testing, essay-type answers, and practical work. The final awards indicate the mode of study but there is no evidence to suggest that employers think any less of these graduates.

The Centre's staff research and act as advocates for e-learning (Torkul, Över, Göksu, & Selvi, 2004; Torkul, Sezer, & Över, 2005). One recent research project, the Sakarya University-Advancity Academic LMS Project, enabled the University's faculties, graduate schools, and vocational schools to engage more cost-effectively in distance education and e-learning delivery, tracking, and evaluation. This work grew out of the Centre's earlier SAUIDO Server Optimization and Exam Module Project for the State Planning Organization, which investigated the infrastructure, operations, performance, and effects of LMSs, and the Server University Project in which Sakarya acted as a server university for other Turkish universities. Lessons learned in on- and off-campus applications of the Internet and multimedia, development of AICC and SCORM compliant courseware, and LMS operation are shared with public and private organizations.

The Centre is involved in planning the Sakarya Technology Park, which will research the potential of technology for agricultural and industrial development, e-commerce, and e-education and training. Other projects have included the Internet-based SAULMS Education Management System Software Project, the Sakarya University-IBM Content Development Project, which provided blended training in e-learning design and development for staff at Yildiz Technical University in Istanbul, and a Global English IDO Certification Pilot Project run in collaboration with the Ministry of Education, which used online methods to teach, test, and examine teachers in Ankara and Sakarya in English as a Second Language.

The Centre's operational, program development, and delivery costs are partly met by the students' fees and partly through projects undertaken for the public and private sectors. Some of

the academic departments still show little interest in distance and technology-based learning and some of the teaching staff are still concerned that large-scale technology-delivered education may compromise quality. However, the Centre's experience and influence is growing and, as at Ankara University, the main challenge is maintaining quality while serving the growing number of students.

Ahmet Yesevi University

Ahmet Yesevi University (see [http:// www.yesevi.edu.tr](http://www.yesevi.edu.tr)) is a very different kind of institution. Named for the 12th century Sufi mystic and poet famed throughout the Turkic-speaking world, this partner university was established in 1992 by the Turkish and Kazakhstan Republics with the aim of connecting the Turkish speaking countries, including some former Soviet states. Its constitution stipulates that the rector must be Kazakh, its vice-rector Turkish, and the Board of Trustees comprise four Kazakh and four Turkish members.

The University's main campus in the city of Türkistan in southern Kazakhstan houses the Faculties of Economics, History and Education, Foreign Languages, Law, Information Technology and Engineering, Medicine, Science, and Sports and Arts. Its other campus in Kazakhstan is in Kentav, with Faculties of Education and Engineering. Students may apply from any Turkish speaking country and Ahmet Yesevi University diplomas and degrees have the same status and confer the same rights as those of other universities in Kazakhstan or Turkey.

The University's first use of videoconferencing was for conducting meetings between Türkistan and the Ankara office in the 1990s. Its first educational application of the technology was teaching graduate programs in business and tourism programs between Türkistan and Gazi University in Ankara and Selçuk University in Konya.

In 2001, the Board of Trustees decided to establish the Internet-based Distance Education Department or TÜRTEP (Distance Education Program Using Turkish Language). It was envisaged that using Internet technologies would help to achieve the university's ideals of connecting Turkish-speaking countries and, by capitalizing on the knowledge and skills of Turkish and Kazakh academics, attract mature-aged learners already in jobs and enable the university to collaborate with other universities, nationally and internationally.

The decision was taken to base TÜRTEP in İstanbul because the infrastructure in Kazakhstan was judged to be inadequate to the task. Those who now form TÜRTEP's senior management team established the technological feasibility of the scheme with ICT experts. However, because they were still largely unfamiliar with the educational applications of the technology, TÜRTEP was not officially recognized by YÖK, and distance education was regarded with some suspicion by academe and the wider community, the outcomes were somewhat unpredictable. Despite these concerns, TÜRTEP went ahead and in 2002, it enrolled its first students, most of whom were in Turkey and Kazakhstan, but a few of whom were in Azerbaijan, Bulgaria, Bosnia-Herzegovnia, Uzbekistan, Kyrgyzstan, Turkmenistan, Iraq, and Ukraine.

Unlike the Sakarya and Ankara distance education centres, TÜRTEP may be classified as a virtual institution. It is physically separated from its parent institution, it has no on-campus facilities, and no students cross the threshold of what is essentially a suburban office block. And unlike the main university in Kazakhstan, which is a state institution, TÜRTEP is private and non-profit.

The personnel in TÜRTEP's Istanbul offices comprise a chair, a vice-chair academic, a vice-chair technical, a number of part-time departmental chairs, 6 part-time online content developers and instructional designers, three educational support staff, three technical support staff, two student affairs officers, three examinations office personnel, one driver, and a factotum. The administrative personnel at the Ankara office also provide occasional support for TÜRTEP.

In 2008, TÜRTEP had 2,210 enrollees in its vocational school computer programming program, undergraduate programs in computer engineering, industrial engineering, management information systems, hospital management, educational management, and regional management, and master's programs in computer engineering, management information systems, and business administration, all of which have their on-campus counterparts in Kazakhstan. The majority of the students are mature-aged with 37% in the 20-30 age group, 50% in the 30-40 group, and about 12% in the 40 or over age group.

Like Ankara and Sakarya Universities, TÜRTEP requires its students to have satisfactory high school and ÖSS scores. The course fees are slightly higher than in the state universities but slightly lower than in the other private universities. Most of the students have daytime jobs. Some opt for study through TÜRTEP because they cannot gain entry to the regular universities but most do so for reasons of work or family circumstances.

The course content is commissioned from outside academics, who are paid for the Internet usage rights of their material as well as their teaching. These lecturers are recruited for their computer skills as well as their subject expertise, so most of them are quite capable of creating their own PowerPoint presentations. They are given training in using the LMS and managing virtual classes but they lack experience in instructional design, so the courseware is improved through instructional design and enriched with animations, multimedia, simulations, and virtual labs by the course developers and instructional designers. Before their release to the students, the courses and courseware must then be approved by the department chairs and Academic Evaluation Committee. The online teaching of the 120 online lecturers, who are recruited from 30 universities and the private sector, is also subject to monitoring by the Academic Evaluation Committee, departmental chairs, and educational and technical support personnel.

TÜRTEP's programs are wholly online. To allow for the fact that the students have day jobs, the online classes start at 6:00 pm on weekdays and run for six hours. They begin with 45 minutes' synchronous instruction with the lecturers teaching from their homes using Adobe Acrobat Connect, webcams, PowerPoint, electronic whiteboards and digital tablets. The students, who are usually also home-based, interact by means of webcams, microphones, digital tablets, and chat. The remaining five and one-quarter hours of class time are asynchronous and largely postings-

based. The students can access the courseware 24/7 but it is found that they attach more importance to the live, synchronous elements of these courses than LMS-served content because they feel that these are more up-to-date and motivational.

Assessment is based upon course work, examination, practical work, and participation and performance in the virtual classes. Out of a maximum of 100 points in the semester grading, performance in the mid-semester online exams accounts for 60 points, course content visits and virtual class attendance and performance 25 points, and assignment work 15 points (students are required to complete at least two assignments per semester). These 100 points represent 30 percent of the semester grading. The other 70% is based upon the end-of-semester examinations, which students sit at centres in Ankara, Istanbul, and Türkistan. Assessment is rigorous and upon graduating, the awards make no mention of the students having studied at a distance.

Providing support for the learners requires real commitment from the staff. Because the classes are run in the evenings, like the students, the educational and technical support personnel operate from home. Being on call at any time between 6:00 p.m. and midnight, they can put in many more hours than they are actually paid for. The student affairs officers also come under pressure at the start of semesters because they are so few. The examinations personnel can also be pressured at exam times.

Under the previous YÖK administration, despite the lecturers being from accredited institutions and the courses and programs being based upon those recognized in the parent organization, TÜRTEP experienced some problems in program accreditation. However, these are now being resolved.

TÜRTEP plans to enrol an additional 1,000 students in new vocational and master's programs in mechatronics, industrial electronics, industrial automation, and TV and radio broadcasting. It also plans not only to offer these programs in Turkish but through RUSDEP or Internet Based Education in Russian Language and KAZTEP or Internet Based Education in Kazakh Language. The ultimate aim is to achieve an enrolment of 20,000 students.

It has taken 5-6 years to recoup the costs of establishing TÜRTEP. But now the fees from the vocational school, undergraduate, and graduate courses are sufficient not only to meet the costs of the building, services, staff, Internet courseware usage rights, and the part-time online lecturers (who are paid a fixed rate per semester plus an extra payment for every additional 20 students) but also to continually upgrade technology and services and recently to acquire new premises.

TÜRTEP's distance education programs are based upon the recognized programs of the parent institution; the curricula are reviewed every three years by the academic departments in Kazakhstan and TÜRTEP's departmental chairs; the qualifications gained have the same status as the equivalent on-campus programs; and employers express satisfaction with the courses and graduates. TÜRTEP is able to plan, budget, and operate more freely than the regular universities with their limited budgets and many demands on their resources and, unlike the for-profit private universities, does not need to be profit-driven. It can hire its lecturers from any university or the

private sector on a semester basis and terminate contracts in the event of any decrease in student demand or unsatisfactory performance.

The challenges to be faced are the lecturers and support staff being largely self-taught, the heavy workloads, and the fact that while Turkish students have access to broadband, most of the students in the other countries are limited to dial-up.

Conclusions

Drawing on the collective experience of the authors, it is possible to arrive at some conclusions about distance education in the Ankara, Sakarya, and Ahmet Yesevi Universities, which may help others embarking on similar journeys.

The three universities' distance education provision, instructional design, staff development, research, and sharing of experience and resources are having an impact both in the institutions and the higher education system. They are shown to be responsive to changing stakeholder expectations and are willing to take risks and operate in different roles and spheres. Also, they compensate for the shortage of on-campus places, make existing courses more widely and cost-effectively available, provide new courses in innovative ways, and provide courses and programs of the same quality as those on campus.

The majority of the distance education students are aged 26-45, with around 50% in the 26-35 age group, indicating a strong demand from employees and older learners keen to improve their qualifications.

As the World Bank cautions, the problem of acute competition for university entrance in Turkey cannot be solved by simple expansion. Attempting too much too quickly will result in poor quality programs and services and over-stretched staff and resources. Ensuring the quality and reputation of institutions must take precedence over hasty and unlimited expansion (Hatakenaka, 2006).

Quality distance education and e-learning depends upon support from senior management, cultural change in institutions, careful planning and budgeting, quality in the LMSs and ICT, adequate training, support and time-release for teaching staff, and experienced instructional design and ICT support personnel.

Applications of ICT must take account of the distance learners' needs and circumstances, for example, their competence with ICT and access to broadband or dial-up. Age, gender, and educational ability also influence students' attitudes towards distance and e-learning. Researching 800 distance learners at the Vocational School of Adapazari of Sakarya University, Tekinarslan (2008) found that male students were significantly more positively inclined towards online learning than females, that mature-aged learners with family and work responsibilities were more appreciative of online learning, and that learners with lower grades were more negative towards distance education.

Usun (2004) suggests that cultural factors can lead Turkish distance learners to experience difficulties with independent learning and unstructured learning environments. The roots of Turkish education lie in an oral tradition, the use of rote learning, and the sacredness of the text. Turkey's traditional value systems include loyalty, respect for authority, community understanding, close interpersonal relationships, and uncertainty avoidance. Turkish people tend to express themselves in practical terms rather than abstractions and, as Sever (2009) observes, like all Mediterranean peoples, they enjoy conversational flow. Inquiring into Turkish high school pupils' awareness and expectations of distance and e-learning, Inal, Karakus, and Cagiltay (2008) found that, despite their familiarity with ICT, the majority would not opt for wholly distance education programs because they would miss the face-to-face instruction and social climate of the classroom and would rather experience the university lifestyle at first-hand. These factors need to be accommodated in the instructional design, teaching, and uses of technology. The off-campus students need to be helped to feel that they are part of a university and members of a learning community. This explains why all three universities make far greater use of videoconferencing than most Western universities and why Ankara University and Sakarya University combine face-to-face and online methods in their undergraduate programs. These approaches ensure a high level of teacher presence and social presence.

So, are we there yet? No, the journey is long. But the way ahead is clear.

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Book Review - Evaluation in Distance Education and E-Learning: The Unfolding Model

Authors: Ruhe, V. & Zumbo, B. D. (2009). *Evaluation in Distance Education and E-Learning: The Unfolding Model*. New York: The Guilford Press (306 pages). \$34.00

Reviewer: Mary F. Kennedy, Program Evaluation Consultants. Contractual Faculty Member, Athabasca University.

In the preface of this book we are informed that there is a substantive link between Messick's four-facet framework for validity in standardized testing and the use of mixed methods to evaluate distance education courses at UBC. The authors make a case, upfront, for a professional approach to evaluation of distance education courses and programs, one that is rooted in the history of program evaluation theory. Certainly, there can be no argument with their stance on this issue.

As we move into the text proper, the authors claim the following as unique features of this text: the need for comprehensive evaluation in light of increasing use of innovative technologies in distance education and e-learning, the explication of a model that can be adapted to local needs, the inclusion of practice tools and strategies for conducting evaluations, and the results of piloting their model in a distance education and an e-learning course.

The authors differentiate between distance education and e-learning. However, today's distance educator, at least in the developed world, lives in one amalgamated world of distance/online learning, which is inclusive of blended learning, Web 1.0, and Web 2.0 technologies. I don't think such a distinction is justified.

The rapid expansion of distance education and the rapid structural, technological, and organizational changes that accompany it are provided as the rationale for increased emphasis on evaluation. The authors conclude Chapter One by presenting their unfolding model, which incorporates scientific evidence and relevance/cost-benefit data within underlying values and unintended consequences.

Chapter Two presents key existing evaluation models. Program evaluation is identified as a transdiscipline. The authors use Messick's framework, along with that of Atkins and Christie, to categorize existing program evaluation models according to their predominant focus on methods, values, or consequences. Most major models are discussed briefly, although Stake's Responsive Model seems to be ignored in favour of his earlier Countenance Model. There is evidence that all

models presented, despite having one major focus, incorporate the other foci as well. However, the authors make a case that Messick's framework is the most comprehensive in that it incorporates methods issues, values issues, and consequences issues equally. They made a statement earlier which has application here: "In our review of evaluation models in distance education, we found almost no models that focus on bringing forward underlying values into the foreground" (p.13). My observation is that Stake's Responsive Model (ignored by the authors) does exactly that.

In Chapter Three, the authors claim to review twelve evaluation models, which they see as specific to distance education, although they stretch their own framework by including Kirkpatrick's training evaluation model, a model with no distance education focus at all. Also, this chapter actually presents seventeen evaluation models, not the twelve indicated earlier by the authors, which leads to some confusion for the reader.

They once again group these seventeen models in accordance with their earlier foci of scientific evidence, values, and consequences. The analysis of each of these models is sound, pointing to both strengths and weaknesses in terms of their application. Table 3.1 rates the seventeen models against Messick's framework, demonstrating that the dimensions of his framework recur in many of the distance education evaluation models.

In Chapter Four, the authors present Messick's validity framework. At the core is the assumption that test validity and program evaluation overlap, and the overlap area consists of Messick's framework. The authors see their unfolding model as "a program evaluation model grounded in the science of test assessment and educational measurement" (p.75). The unified concept of validity incorporates evidential, values, and consequential realms, and construct validity is seen as the unifying force that links the various realms together. The authors conclude that comprehensive program evaluation requires collection and analysis of multiple types and sources of data, from multiple value perspectives.

Chapter Five moves into the action phase of planning the evaluation. The authors make reference to the timing of an evaluation study in relation to the program's stage of development. Inclusion of Owen and Rogers (2007) five evaluation forms (each related to a specific program development stage) would have strengthened this section. They present a series of sections on ethical review processes, which are aimed solely at university faculty research and/or evaluation studies. These sections confirm my opinion that the authors see program evaluation mostly as an academic research pursuit. That view denies the large number of evaluators and evaluation studies that are carried out in all kinds of educational and training environments on a paid, contractual basis. In fact, I would estimate that more program evaluation is done by external, contractual evaluators than within academic communities.

They then present their unfolding model as a road map in developing a workable evaluation plan across five dimensions: scientific evidence, relevance, cost-benefit, values, and unintended consequences. Their overview deals with issues of blending quantitative and qualitative methods

into a mixed method approach, the delineation of potential data sources, data access, sampling, and generalizability versus particularization.

The next two chapters present considerable depth of information on the gathering of scientific evidence and on the search for values and consequences. These chapters provide an overview of data collection methods and analysis, such as is found in any evaluation or research text. Chapter Six deals with scientific evidence, and it provides guidelines for the choice and development or use of many data collection approaches, including surveys, focus groups, interviews, test scores, document analysis, and cost-benefit analysis. Despite the superiority claim of a mixed method approach, I detected, I think, a slight bias in terms of lack of rigor of qualitative data, which is not surprising given the authors' leaning toward quantitative research and indeed their use of Messick's framework. Nonetheless, this stance is irritating to truly qualitative researchers/evaluators.

Chapter Seven deals with value-laden data and with unintended consequences. Values are integrated with distance education benchmarks and standards, and possible data sources are identified. Sample survey/interview questions and data analysis methods are presented in relation to underlying values. Unintended consequences, too, are enumerated, and sample survey/interview questions and data analysis methods are included briefly. Short sections on enhancing validity of findings, reporting results, and making recommendations follow.

Chapter Eight presents findings from the evaluation of two post-secondary distance education courses. Data collection methods for both evaluations were similar, as were data analysis procedures. The summary of evaluation findings in each example demonstrates the integration of scientific evidence with values and unintended consequences. The authors claim these applications of their unfolding model result in measures of merit and worth, despite the diversity of needs of stakeholders and inherent differences in the design and implementation of the courses.

Chapter Nine brings it all together. It reviews yet again Messick's framework and its potential for guiding program evaluation studies, providing a conceptual bridge between assessment and program evaluation. However, as an evaluator, I am not quite sure why there is any need for such a bridge. The authors emphasize the adaptability of their unfolding model to any distance/e-learning course or context.

My summary thoughts? The book is interesting and could serve as a beginners guide to program evaluation. However, it emphasizes course evaluation over program evaluation throughout; and it views evaluation too much from an academic perspective. Furthermore, though their unfolding model is interesting from a theoretical and an application perspective, as an evaluator with many years experience using a great variety of evaluation models, I see no real reason to embrace this model as the primary one for evaluation of distance education and e-learning.

