The impact of cultural factors on technology acceptance: A technology acceptance model across Eastern and Western cultures

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Abstract: The proposed learner environment presented in this paper is based on constructive perspective (learner focus) learning according to Hadjerrouit (2007). This model offers an environment where focus is on the learner and encourages them to construct new ideas by testing theory through the solving of problems. Associated pedagogy with this model is: the provision of an interactive environment for the building of knowledge and problem solving ability, provision of activities that promote experimentation and discovery and allow evaluation and reflection. On the other hand, this model allows a teacher to maximize the pedagogy of a rich/dynamic learning environment, increase student participation, and provide back-up learning materials. This is because the theory of learning encourages a learning environment where instructions are learner centered and teachers are only facilitators. In this theory, knowledge and skills are gained by the interaction between study materials. Therefore, the research will focus on platforms which will use learning styles that encourage interaction and learner centered learning, which is referred to by Popescu (2010) as learning style-based adaptive educational systems which allow for increased integration and interaction.

1.   INTRODUCTION

Culture is a common behaviour that is learned from the society into which one is born—or in which one becomes embedded—and consists of norms, beliefs and customs (Gay 2000; Scupin 2008). Moreover, it reflects the common set of values that characterize a society in the forms of family, education and the system of social organization (Tweed & Lehman 2002; Thomas et al. 2003). Any particular society or community might accept certain values whilst rejecting others owing to the nature of any particular individual or grouping of individuals, on the one hand, and on the other hand owing to the social, intellectual, religious and political background of the wider society/community (Kennedy 2002; Thomas et al. 2003). The interplay between values based on the attitudes of an individual or distinct group, and any change that occurs in the aforesaid values, will have consequential effects on the behaviour of such an individual or group (Li 2003; Thomas et al. 2003; Gales 2008).

Several studies have emerged over the last thirty years to illustrate the relationship between cultural factors and the uptake of technology (e.g. Hofstede 1980; Del Galdo 1996; Trompenaars& Hampden-Turner 1997; Tse et al. 2004; Barton 2010). These show that cultural background plays a significantly important role in affecting the uptake and use of technology. In the case of ICT, most information systems have been developed within the Western world and thus are culturally biased in terms of those societies, and even in terms of the mainstream cultures within those societies (Hill et al. 1998; Lynch et al. 2002). As western culture has played a major role in the development of these new technologies, ICT may be presented to non-western societies in forms that are not necessarily appropriate for non-western cultures. Collis (1999) makes the argument that culture is a crucial factor that influences how humans accept, use and react to the internet. Arenas-Gaitán et al. (2011) refer to the numerous cross-cultural studies, in which the adoption and use of new technologies in different cultures are compared in terms of specific cultural dimensions and subjective norms (Van Raaij&Schepers 2008; Yuen & Ma 2008). According to Hofstede (1997), national differences may be understood in relation to the distinctive features of any particular national culture. The conceptual model employed in this regard posits that national cultures are constructed along four dimensions or continuums; these are (a) individualism/collectiveness, (b) power-distance, (c) uncertainty-avoidance, and (d) femininity/masculinity. Other scholars include additional dimensions, including the adoption of computer self-efficacy (Yuen & Ma 2008), perceived playfulness (Zhang S et al. 2008), and cognitive absorption (Zhang P et al. 2006). Moreover, system features have characteristics that are in effect cultural features and thus constitute part of the 'mix' affecting the adoption process. These features affect personal interaction with the system and arise in issues surrounding computer anxiety, gender, motivational factors, personal innovativeness, technical support, perceived credibility, and compatibility (Van Raaij&Schepers 2008).

Certain studies have examined the relationship between technology acceptance and cultural factors in developing countries, more particularly in the Arab World. Hofstede (1997) was amongst the first to investigate cultural dimensions and users' technology acceptance in Arab countries, and the findings revealed a high uncertainty-avoidance among Arab cultures, with people avoiding changes in their life—in this case, with regard to new computer technology. In addition, they tend to resist this kind of uncertainty continually, as they see it as posing new risks in an already uncertain world. In the same context, Hill et al. (1998) highlighted Arabs as displaying a particular cultural feature whereby Arabs prefer the traditional ways of communication (i.e. in real-time mode, thus including the use of telephones and radio) rather than using ICT to support their communication. Other studies have tended to corroborate these findings, although with differences in the details depending on the part or parts of the Arab World surveyed (Straub et al. 2001; Loch et al. 2003; Akour et al. 2006; Khushman et al. 2009). Overall, Arabs tend to be unwilling to change their habits, traditions, and values in their lives and interactions (Alkadi 2005; Khushman et al. 2009). Rose & Straub (1998) investigated the role of various factors as they affected the ways in which technology (specifically ICT) was adopted in five Arab countries.

For that study, Rose & Straub (1998) employed the Technology Acceptance Model (TAM) first elaborated by Davis (1986) which is described hereafter. In a subsequent journal article, Davis (1989) described how the TAM was based on a theory that relates adopted innovations to perceived ease of use and perceived usefulness. Within the TAM, perceived usefulness related to the degree to which a person believes that using a particular system will enhance their job performance (Davis 1989). Rose & Straub (1998) found that generally within the culture of the Arab World, individuals tend to be more collective and family-oriented, to the extent that they view websites and the internet as possible threats to family and social life. Following on these findings, serious attempts have been made by interested scholars to investigate how cultural factors in Arab countries might influence user acceptance and adoption of new technologies, as a specific focus in the larger issue of the importance of technology transfer into the developing countries (Fandy 2000; Khushman et al. 2009).

However, it is to be noted that worldwide the new technologies are generally being adopted by the younger sectors of the population, for social rather than formal purposes (Becta 2008). This trend was to play a pivotal role in the rise and spread of the Arab Spring that began at the end of 2010 (Stepanova 2011). The entrenched establishments in Tunisia, Libya and other countries were overwhelmed as the new technology enabled people to communicate directly with each other and to bypass official channels, when calls appeared on Facebook and Twitter pages to protest against the corruption and monopoly of power in those countries, and even to overthrow the regimes (Allagui&Kuebler 2011). These social networks were the medium through which protesters spread their discussions within and across groups, they were enabled to participate in the political process more effectively, and they were able to maintain contact with those sharing the same opinions (DeLong-Bas 2011).

Social networks and social media opened the door for forbidden political attitudes to be expressed openly over the internet and they created an immediate interaction between opposition leaders and people to revolt against the status quo, using different kinds of media and technology to broadcast their beliefs, to show their circumstances and to organize their activities (Beaumont 2011). Mobile phones, digital cameras and the internet bridged the gap between the revolutionized countries and the whole world. Millions of people were able to watch events unfolding inside those countries through the videos uploaded to You Tube and via the shared links and clips on the social networks. In other words, technology has expanded the spectrum of freedom for many of those who are deprived of it, by inventing a new cyber-world in which new opportunities are available to inform oneself and express one's opinions and attitudes regardless of affiliations (DeLong-Bas 2011). Technology is seen by the younger Arab generations as the new cyber battlefield for recreating the world (Beaumont 2011). The role of ICT in the Arab Spring since 2010 may well play a powerful part in gaining acceptance for ICT amongst those in the Arab World and elsewhere who might otherwise be less willing to accept or perhaps even be positively hostile to 'technology' and innovation.
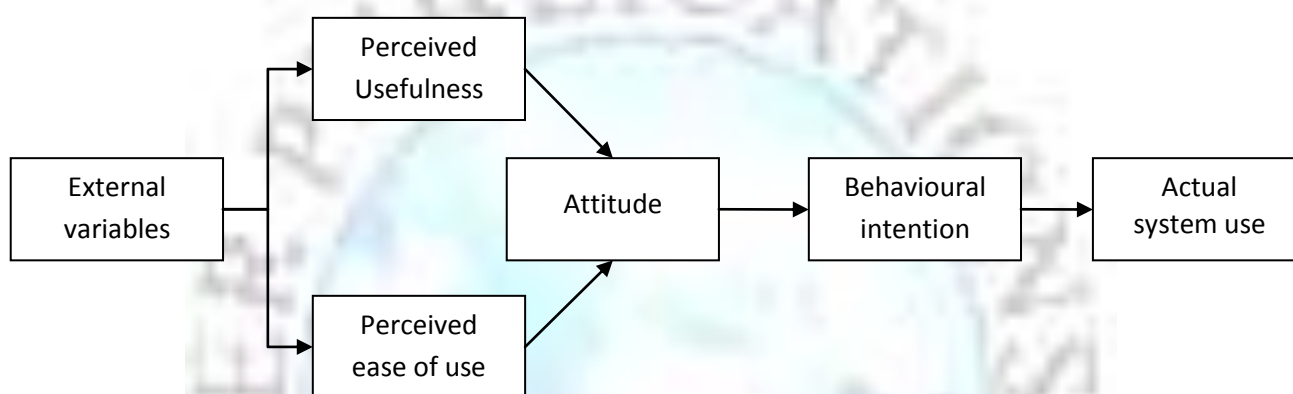
2. THE TECHNOLOGY ACCEPTANCE MODEL (TAM) AND E-LEARNING

The use of modern technology has long influenced increasing numbers of aspects of people's social and work lives. However, the case of ICT is unique, owing to the phenomenal rapidity with which it has spread around the world and is increasing its presence in the lives of populations on a global scale hitherto unseen (Cortada 2008). The impacts of this rapidity and extent of pervasiveness have driven much of the research into technology diffusion and acceptance (Wejnert 2002). This in turn has influenced the development of a variety of theoretical frameworks and models that investigate technology acceptance in general and particular, including the works of Davis (1986, 1989), Davis et al. (1989), Mathieson (1991), Chau (1996), Venkatesh& Davis (2000), Chau & Hu (2001), Pavlou (2003), Hess et al. (2010), and Cornell et al. (2011).

Davis (1986, 1989) first formulated the TAM based on the Theory of Reasoned Action (TRA) that had been developed by Fishbein&Ajzen (1975) from previous research on the theory of attitude, which led them to the study of attitude and

behaviour. Their theory sought to explain behaviour through the observation and analysis of subjects' attitudes, declared intended behaviour and actual behaviour (Sheppard et al. 1988). The separation of behavioural intention from actual behaviour in this theory further enabled them to offer explanations of limiting factors on attitudinal influence and thus to build a model for the prediction of behavioural intentions (Ajzen & Fishbein 1980). The approach adopted by Davis (1986, 1989) on the basis of TRA theory posits that actual behaviour is associated with the intention(s) underlying a person's behaviour, and he elaborated this into a model for studying and explaining the acceptance of new technology (Davis 1986, 1989). The TAM has been developed into subsequent versions by Davis and others (e.g. Davis et al. 1989; Bagozzi et al. 1992; Venkatesh et al. 2003; Venkatesh & Bala 2008).

Numerous studies have employed the TAM to investigate specifically the uptake of e-learning, such as those by Morris & Dillon (1997), Hu et al. (1999), Landry et al. (2006), Van Raaij & Schepers (2008), Park (2009), Al-Enezi et al. (2010), and Arenas-Gaitán et al. (2011). According to Suh & Lee (2007), two dominant factors make the TAM ideal for examining the adoption of e-learning systems: users' attitudes to ease of use and perceived usefulness. Lee (2008) identified other factors such as perceived adequacy of facilities/resources, internal versus external computing training, internal versus external computing support, and external equipment accessibility. Another factor identified by Suh & Lee (2007) is perceived enjoyment, and they showed that perceived enjoyment has an important impact on the intention of using e-learning and on actual e-learning usage. The main purpose of TAM is to predict people's attitudes, behaviours and intentions to new technology as they are formed by external variables (Lu et al. 2003) as shown in Figure 1.

Figure 1: Technology Acceptance Model [TAM] (Davis 1989)

The motivational factors perceived usefulness (PU) and perceived ease of use (PEOU) are primary factors of user acceptance of information systems (Teo et al. 2008). PU refers to people's belief that technology will help them increase their performance: if they believe that the new technology is useful, they will then have a positive attitude towards it and this in turn will lead to the successful adoption of the new technology. PEOU refers to the degree to which users believe that the system will be free of mental effort: this implies the extent to which technology will be interesting and attractive to learn and use. In addition, PEOU offers a good prediction of how easy technologies will be to use in terms of efficiency and effectiveness. In general, both these motivational factors affect technology acceptance and mould behavioural intention towards information-system acceptance (Pikkarainen et al. 2004). This model has attracted considerable criticism for not including social issues, and this has led to some modifications by the addition of social factors. Therefore, a proposed and extended model by Venkatesh & Davis (2000) included new factors such as subjective norm, image, job relevance, output quality, result demonstrability, experience, and voluntariness. These issues affect PU, PEOU and intention-to-use, but they omitted issues regarding attitude. As first predicted by Davis (1986), future technology will likely uncover issues that could affect usefulness, ease of use and user technology acceptance (Wang et al. 2008). Therefore, many studies have tested the TAM across various fields and subjects for its capacity to predict attitudes and intentions towards using any particular information system, and these studies have incorporated new issues that have been discovered in the research context (Liu et al. 2004; Huang & Liaw 2005).

3. PROPOSED TAM WITH CULTURAL FACTORS

This model comprises the TAM factors identified by Davis (1989), together with PU, PEOU, behavioural intentions and attitudes relating to accepting and using new technology. The model also incorporates three main external factors as manifested in (i) social factors, (ii) cultural factors and (iii) political factors, owing to the varied influences exerted by culture on human behaviour (McCort & Malhotra 1993). Cultural neutrality has been identified as a blind spot in previous TAMs, because culture has been demonstrated in the literature to exert a major influence on acceptance. Unfortunately, the literature shows that technology is predominantly developed for the young (Maguire & Osman 2003; Tedre et al. 2006; Rogers 2009; Ziefle & Jakobs 2010). Some studies are concerned with the investigation of how

technology acceptance cuts across national borders. Often the practice is to take the existing knowledge regarding technology acceptance in developed western nations and to relate it to other cultures based on cultural beliefs and values (Hofstede 1980). However, as Ziefle&Jakobs (2010) affirm, people use technology within a cultural and social context, and these influence how humans behave towards technology. Often a whole host of factors differ across cultures, and these factors include social taboos, political and legal constraints, together with religious, ethical and traditional values. Therefore, technology users across the globe have different perceptions, styles of thinking, cognitive and cultural values, and assumptions.

Social factors include language, qualifications/skills, and facilitating conditions. The language used in technology plays an important role in a user's attitude towards technology. When technological language is easy and understandable, the use of technology will be easy and flexible, which elicits positive attitudes towards that technology. The converse is also true, as difficult and complicated technological language generates negative attitudes towards technology. Other important social factors include qualifications and the skills required to use technology. Users need to be qualified and well trained to use technology, as a lack of training and skills will lead to negative outcomes that will in turn give rise to negative attitudes.

Facilitating conditions refer to the technical support available and the adequacy (or otherwise) of equipment and/or software. All these are indicated as important factors by the literature (Groves &Zemel 2000; Lim &Khine 2006; Teo et al. 2008). Three primary continuums drawn from the cultural dimensions theory of Hofstede (1997) are used to identify the differences in the cultural factors—individualism/collectivism, uncertainty avoidance, and power distance.

Individualism/Collectivism is the degree to which individuals are integrated within any group. In individualism the emphasis is on individual roles and rights, where individuals are expected to stand up for themselves, their own family and their own affiliations. In contrast, in collectivism, individuals behave as members of an organization or group, so that their 'family' is that group or organization to which they pay unquestioning loyalty (Srite&Karahanna 2006).

Uncertainty Avoidance is defined as the tolerance of a society for uncertainty. It measures the extent of coping with anxiety by avoiding uncertainty. High uncertainty-avoidance cultures implement rules and laws to support plans that are followed step-by-step to minimize unknown and ambiguous circumstances (Srite&Karahanna 2006). On the other hand, low uncertainty-avoidance cultures have as few rules as possible, they tolerate changes and accept a changeable environment and situations; these cultures tend to be pragmatic cultures (Hofstede 1984).

Power Distance reflects the way people accept and perceive power differences. High power-distance cultures accept autocratic power relationships, where people are not equal to each other, and their positions are classified hierarchically from superior to subordinates (Akour et al. 2006). In contrast, low power-distance cultures experience more democratic relationships, and equality is practised by all members of the society, who have the right to criticize and change the decision making of those who are in power (Teo et al. 2008).

Political factors measure the impact of the use of technology on politics and on political crisis. This has been expressed extensively in social networks (such as Facebook, Twitter, forums and blogs) and in social media (such as YouTube, e-newspapers, videos and mobiles) (Teo et al. 2008). As mentioned above in Section 1.6.1, such social networks played an important role in the Arab Spring protest movements taking place in various Arab countries. The urgency of the situation changed these facilities from being mainly social and invested them with a whole new purpose and status.
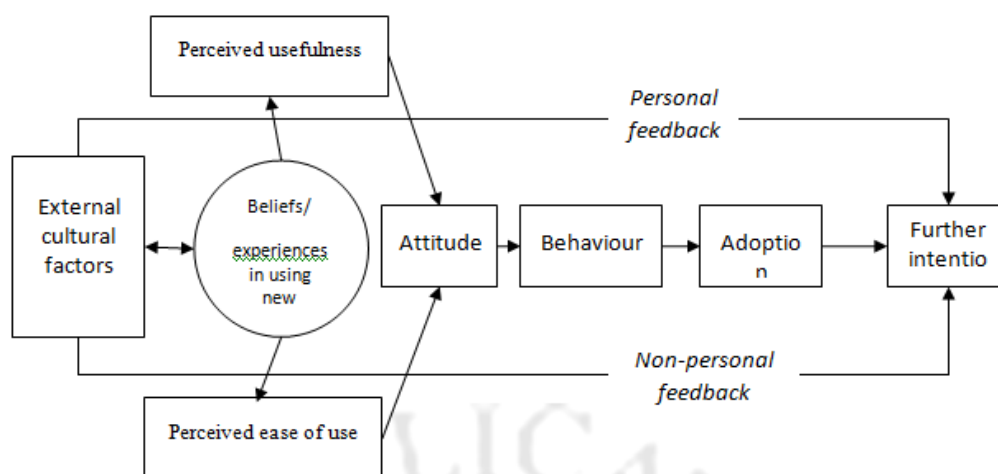
Figure 2: Proposed Technology Acceptance Model (TAM)

The TAM proposed as the model proposed in this paper is shown in Figure 1.4. In the diagram there are two special flow-lines that designate personal feedback and non-personal feedback. It might be argued that these are superfluous or redundant in this model. However, it is suggested here that the discussion of the TRA and TAM studies given in Section 1.6.2 illustrates the complexities involved in human motivation, especially where intended behaviour often gives way to actual behaviour, even against a person's better judgement, owing to factors of which the person might not be fully aware. With regard to the discrepancy between intended and actual behaviour, Ajzen (1985) first introduced the concept of planned behaviour and subsequently developed it (Ajzen 1991, 2011), whilst Bandura (1997) formulated the concept of self-efficacy (referring to an individual's confidence in his/her personal competence) and explored the tensions between this and the individual's expectation of the outcome of a course of action (Bandura et al. 1999). In other words, a person does not always implement his/her planned behaviour, and does not always exercise self-control. In Figure 1.4 the outlying arrows for personal and non-personal feedback refer to those influences that might cause an individual to modify intentions and/or behaviour even at the last instant before engaging in a certain course of action or behaviour.

This research thus critically recognizes that the success of using information technology in an e-learning environment will not only have to take cognizance of the individual's level of familiarity with technology, but also take into account that various other factors will have an effect on the learner's experience, perceptions, performance and (ultimately) acceptance of the e-learning process. The focus is thus laid on creating an adaptive e-learning system that factors-in user acceptance based on cultural influences. This is important since cultural influences affect each individual's responses, as well as the level of analysis. As Srite & Karahanna (2006:679) state, cultural values such as "masculinity/femininity, individualism/collectivism, power distance, and uncertainty avoidance are incorporated into an extended model of technology acceptance as moderators". Lau & Woods (2009:1059) have identified that the characteristics of a learning object influence "perceived usefulness and perceived ease of use of learning objects, therefore, individual differences appear to have no influence upon intention to use learning objects". The TAM to be applied to e-learning as proposed in this paper thus includes self-efficacy, system accessibility, subjective norms, perceived ease of use, behaviour intention, and perceived usefulness based on the TAM as proposed by Park (2009). Such a model expresses the realization that these factors determine the attitude, behaviour, adoption and further intention of the user to technology, where further intention is affected by personal feedback of the user from external factors.

4. METHODOLOGY

Using the TAM described, the author carried out a survey to evaluate the effect of cultural factors on technology acceptance in an e-learning environment. Both students and teachers were targeted, but owing to various constraints, it was not possible to target students from the UAE. So in the event, two groups of students were surveyed (one each in Oman and the UK), whilst three groups of teachers were covered (one each in Oman, the UAE and the UK). It might be objected that there arises thereby a disparity of sample size, and this is admitted. However, as the younger elements of society are more amenable to accepting innovation, it was felt that the extra data available from teachers might give a better insight into their reactions regarding innovation and e-learning.

4.1 Student survey

Target groups of students from Oman and UK were introduced to an e-learning model that took account of cultural factors. This exercise was purely experimental, since its variables (derived from schools in the UK and Oman) were all experimental variables. Suitable schools in the UK and Oman were selected on criteria that ensured general mutual comparability. Owing to various constraints at the time of the survey, a sample size of 40 participants (20 male and 20 female) was set for each country, as giving sufficient scope for data analysis and statistical analysis. The total of 80 participants presented a workable sample-size for capturing and analyzing data with a reasonable chance of representativeness. The two countries represent different cultures—western culture in a developed country (UK) and Middle Eastern/Gulf Arab culture in a rapidly developing country (Oman). This affords the opportunity to investigate whether social and cultural differences can affect the acceptance of e-learning, by comparing student responses to a standardized set of questions. It is evident from studies that educational practices—both teaching and learning processes—are tied to culture and tradition (Chang & Chin 1999; Bodycott& Walker 2000; Tweed & Lehman 2002; Zhu et al. 2008).

Consequently, during the creation of a virtual learning environment, socio-cultural factors must be taken into consideration since they may present barriers. This survey measured the differences in TAM outcomes between students who have grown in Oman and the UK. To members of the Middle Eastern and Gulf Arab communities, the challenge has been that the internet, ICT and therefore e-learning have arisen and are therefore inevitably associated with western contemporary culture, which is different from Islamic culture. In this regard it might be well to remember Hoftstede's (1991) dimension of 'uncertainty avoidance' owing to the Arab cultural feature of aversion to the unknown.

The questionnaire that was constructed contained 20 items, together with a further four regarding student profile. In order to obtain representative responses to these items, the Researcher selected different schools in different educational regions within Oman. In order to make sure that the students were aware and familiar with what was required of them in the survey, the Researcher attended the classes selected and explained the implications of the items to the students. The Researcher oversaw the distribution of the questionnaires and collected them, to reduce the margin of error in sampling. This process was also used in the UK, as permission was sought from the administration to explain the meaning of the questionnaire items to the students at Shorefields Technology College in Liverpool. Although only one institution was selected in the UK, this one is prominent in its field and had a sufficient number of students available for the survey.

The ethical issues surrounding the questionnaire were addressed by ensuring that the data were used solely for the purpose of this research, and the identity and personal details of the participants have been kept secret. The following sentence in the introduction to the questionnaire gave the undertaking of guaranteed anonymity: "All provided answers will be treated confidentially and will be used only for the purpose of this investigation. The identity of respondents will be kept anonymous". The questionnaire consisted of 20 questions and four student-profile questions. The questionnaire sought to elicit responses by offering a five-point Likert scale for each item: 1 (Strongly Disagree); 2 (Disagree); 3 (Neutral); 4 (Agree); and 5 (Strongly Agree) to measure the various e-learning technology acceptance variables. The variables that were measured in the survey covered social factors (including language, background qualifications and skills, and facilitating conditions); cultural factors (including individualism/collectivism, uncertainty avoidance, and power distance); political factors (including use of social networks and social media); and Technology Acceptance Model constructs (including perceived usefulness and perceived ease of use).

The questionnaire was divided into two sections. The first section had questions that provided a list of responses for the students to tick. These questions represented the demographic data (covering gender, age, cultural background, language, and experience with the internet). The second section measured social factors (the variables of language, qualifications, skills, and facilitating conditions). Section Three dealt with cultural factors that measured the variables of individualism/collectivism, uncertainty avoidance, and power distance. Section Four evaluated political factors, measured by the variables of use of social networks and social media. Finally, Section Five measured Technology Acceptance Model constructs, identified by the variables of perceived usefulness and perceived ease of use.

4.2 Teacher survey

Teachers may not have much scope for choosing whether to accept or reject the new technology that is being introduced into the educational services by which they are employed. In these circumstances the Technology Acceptance Model (TAM) takes on greater importance in assessing teachers' attitudes and intentions regarding how they react to adopting the new technology and how they will behave in complying with the directives of their employers. A lack of enthusiasm, or even commitment, can act as a powerful dampener on the perceptions of their students. Regarding the questionnaires designed to gather data for measuring teachers' acceptance of e-learning, both quantitative and qualitative approaches have been adopted, to give a balance between purely quantitative data and more particularly qualitative data that can be integrated into a quantitative matrix (Connolly 2007).

Specifically to highlight variations in the TAM values, the questionnaires were aimed at measuring teacher acceptance by comparing culturally influenced values of teachers from three countries, two of which were Gulf Arab countries (Oman, UAE) representing present-day developing countries of similar cultural background that nevertheless have had different trajectories of modern development, whilst the UK represented the culture of long-developed western countries. The questionnaire consisted of 30 items and to measure five main factors contained the TAM designed for this research (demographic, social, cultural, political and TAM constructs). Furthermore, all items measure responses on a five-point Likert-type scale, where respondents indicated their reactions to a given statement, ranging from 'Strongly Disagree' (1) to 'Strongly Agree' (5). The measurement items used in this research are shown in the Appendix. The data collected in the two Gulf Arab countries and in the UK came from teacher samples that in each case consisted of 40 members, split evenly 20 female and 20 male.

The two Gulf Arab countries represent variations on the Gulf Arab cultural phylum, whilst the UK represents the western cultural bloc. The three countries selected for this survey, then, have diverse cultures—and this holds true even for the two Gulf Arab countries that share a common border (Barakat 1993; Khalaf 1998; Alsharekh&Springborg 2008). This survey investigates whether and to what extent social and cultural differences can affect the acceptance of e-learning. It is evident from studies that educational practices—both teaching and learning processes—are tied to culture and tradition (Chang & Chin 1999; Bodycott& Walker 2000; Tweed & Lehman 2002; Zhu et al. 2008). Therefore, the creation of a virtual learning environment must take into consideration the socio-cultural factors since they may present barriers. Furthermore, it is to be remembered that e-learning is very much a product of western contemporary culture, different from the Islamic culture of Gulf Arabs, which might produce tensions owing to perceptions of western cultural hegemony in the globalization process (Gannon 2004). This research also takes into

consideration on Hoftstede's (1991) dimension of 'uncertainty avoidance'—the aversion to the unknown in Arab culture. Relevant schools in Oman, UAE and UK were selected for this purpose whilst, considering the importance of choosing a suitable sample size, the target group was set at 40 participants in each country in order to optimize data analysis and statistical analysis.

The questionnaire contained 30 items. In order that these items might be answered effectively, the Researcher chose different schools in the three target educational regions in Oman. In order to make sure the teachers were fully aware and familiar with what was required of them in the survey, the Researcher explained the implications of the items to them. The Researcher oversaw the distribution of the questionnaires, then collected them, to reduce the margin of error in sampling. This process was also used in the UK, as permission was sought from the administration to explain the background to the questionnaire items to the teachers at Shorefields Technology College, Liverpool. However, in the case of teachers in the UAE, the Researcher found it difficult to travel to that country, but managed to coordinate matters with the relevant officials in the chosen schools so that full clarifications were available to the respondent teachers there.

The ethical issues raised by the questionnaire were addressed by ensuring that the data were used for only the purpose of this research, and that participant details were kept secret. A guarantee of anonymity was given to all respondents in the following sentence before the first part of the questionnaire: "All provided answers will be treated confidentially and will be used only for the purpose of this investigation. The identity of respondents will be kept anonymous". The questionnaire consisted of 30 items with a further five profile questions for the teachers to complete. The questionnaire had the respondents answer the 30 main items by giving a response on a five point Likert scale in the form of 1 ('Strongly Disagree'); 2 ('Disagree'); 3 ('Neutral'); 4 ('Agree'); and 5 ('Strongly Agree') to measure the e-learning technology acceptance variables. The variables that were measured in the survey were first demographic background, and secondly social factors (language, background qualifications and skills, and facilitating conditions). Cultural factors were the third variable (including individualism/collectivism, uncertainty avoidance, and power distance). The fourth variable was political factors (use of social networks and social media). The fifth variable consisted of the Technology Acceptance Model constructs which include perceived usefulness ad perceived ease of use.

The questionnaire was divided into two sections. The first section had questions that provided a list of responses for the teachers to tick. These questions represented the demographic data (gender, age, cultural background, language, and experience with internet). The main section covered the 30 questionnaire items. Social factors were measured by the variables of language, background qualification and skills, and facilitating conditions. Cultural factors were measured by the variables individualism/collectivism, uncertainty avoidance, and power distance. Political factors were measured by the variables of use of social networks and use of social media. The Technology Acceptance Model constructs were identified by the variables perceived usefulness and perceived ease of use.

5. Experimental Design

4.3 Omani students—general
The questionnaire sample was selected from students in the tenth grade in different schools, and consisted of 20 males and 20 females (Table 1)

Table 1: Omani students' sample (in percentages)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	20	50.0	50.0	50.0
	Female	20	50.0	50.0	100.0
	Total	40	100.0	100.0	

The results showed that the average responses ranged between 4.3–2.8 of 5 (as shown in Table 2).

Table 2: Phase 3 Omani students' sample: Summary Item Means

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.677	2.875	4.300	1.425	1.496	.159	20

The students' responses reflected a high rate of acceptance of e-learning technology as seen in the items mean of 3.67, when all items contained in the questionnaire ranged between 1 (Strongly Disagree) and 5 (Strongly Agree).

Table 3: Omani students' ranking of the four main factors

Factors	Means	Percentages
Social	3.7	25%
Cultural	3.5	24%
Political	3.6	25%
TAM constructs	3.8	26%

4.4 UK students—general

The research sample consists of students from Shorefields Technology College in Liverpool. The sample of 40 students comprised 22 males and 18 females registered for the academic year 2011/2012 as shown in Table 4.

Table 4: Phase 3UK students' sample (in percentages)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	22	55.0	55.0	55.0
	Female	18	45.0	45.0	100.0
	Total	40	100.0	100.0	

Questionnaires returns showed that the average responses ranged between 4.0–4.6 of 5 as shown in Table 5.

Table 5: Phase 3UK students' sample: Summary Item Means

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.345	4.025	4.550	.525	1.130	.030	20

The students' responses reflected a high rate of acceptance of e-learning technology as seen in the much higher items mean of 4.34, when all items contained in the questionnaire ranged between 1 (Strongly Disagree) and 5 (Strongly Agree).

Table 6: UK students' ranking of the four main factors

Factors	Means	Percentages
Social	4.3	26%
Cultural	3.8	23%
Political	4.1	25%
TAM constructs	4.3	26%

4.5 Social factors

Regarding social factors, the comparison between the responses of Omani and UK students reveals a substantial discrepancy in only one aspect, that of language. Most of the relevant geography e-learning sites are presented in the English language. Others exist in a range of European and non-European languages but relatively few are in Arabic. The Basic Education programme attempts to train all Omani school-goers in English as a second language, but achieving consistently good results is a slow process (Sergon 2011). As Omani students are normally exposed to learn English before any other language (such as Spanish, French, Chinese), the particular difficulties Omani students face are in the area of non-Arabic language content. This explains the particular discrepancy in the comparative lists of means of social factors (see Table 7). In all other aspects Omani students are seen to be close to their UK counterparts.

Table 7: Students' Responses: Means of social factors across two cultures (Oman & UK)

Means of social factors		
Factors	Cultures	
	Oman	UK
Language	3.1	4.2
Qualification/Skills	4.1	4.5
Facilitating Conditions	4.0	4.4

4.5.1   Omani students

For Omani students, social factors came in second place in the ranking of the four main components of technology acceptance. As stated above, for Omani students the major problem resides in issues surrounding the language in which a particular e-learning website is presented. One useful outcome of this study, then, has been to highlight this particular problem (which exists not only in the subject-field of Geography). However, it is noteworthy that this problem has been highlighted by the voluntary responses of the Omani students themselves, when they could have allocated reasons for difficulties to other causes, to those outside their own competence or responsibility. So it is encouraging to see that these Omani students are prepared to be open and honest about their difficulties in using languages other than Arabic to search and surf e-learning websites—as is made clear in the responses to items numbers 1 and 11 (having means of 3.3 and 2.9 respectively). In addition the qualification/skills are the important aspects of the e-learning environment where students need basic skills in using technology gained by studying the information technology (IT), as is clear from items 2 and 12. Facilitating conditions constitute another important factor as indicated in items 3 and 13, pointing to the importance of providing to schools greater numbers of computers and regular maintenance services to facilitate students' (as well as teachers') performance in the e-learning environment. Table 8 gives details.

Table 8: Means of social factors according to Omani students' responses

Means of social factors		
Factors	Means	Mean of means
Language	3.1	
Qualification/Skills	4.1	3.7
Facilitating Conditions	4.0	

4.5.2   UK students

From the responses of UK students, social factors came in first place in the ranking of the four main components of technology acceptance. As social factors comprise language skills and competences besides background qualification/skills and facilitating conditions, UK students possess an advantage that exists because of historical reasons. The vast majority of relevant websites are in English, and even though the teaching of modern languages has been in serious decline across the UK (CILT 2011), students in the UK still have better opportunities for exposure to other languages (in the classroom and in real life) than do students in Oman. Accordingly, UK students have few or no problems when using and searching other-language e-learning websites, as is clear from response items numbers 1 and 11 (with means of 4.4 and 4.1).

Qualification/skills and facilitating conditions have high response-averages, indicating that the UK students agree with the importance of providing students with basic IT skills and/or IT study-courses to build their capacity in using and makes searches of e-learning websites. Furthermore, they believe that as long as the learning environment remains equipped at a suitable level for e-learning, this will help and support them in their learning. Details are shown in Table 9.

Table 9: Means of social factors according to UK students' responses

Means of social factors		
Factors	Means	Mean of means
Language	4.2	
Qualification/Skills	4.5	4.3
Facilitating Conditions	4.4	

4.6 Cultural factors

Comparison between Omani and UK students in cultural factors reveals discrepancies in all aspects, whilst consistency in Omani responses is paralleled by a noticeable internal dichotomy within the UK responses. Uncertainty avoidance and power distance are stronger amongst Omani students. However, the individualizing effect of working on a computer (which introduces an isolating tendency effect amongst students) is offset in the case of Omani students by their stronger culture of cooperation; so that in many cases uncertainty avoidance and power distance can be mitigated, as Omani students will tend to seek help from their colleagues much sooner than their UK counterparts would consider doing so. Table 10 shows the comparative details.

Table 10: Students' Responses: Means of cultural factors across two cultures (Oman & UK)

Means of cultural factors		
Factors	Cultures	
	Oman	UK
Individualism/Collectivism	3.7	3.2
Uncertainty Avoidance	3.4	4.2
Power Distance	3.5	4.2

4.6.1 Omani students

Cultural factors (individualism versus collectivism, uncertainty avoidance and power distance) came in fourth place in the Omani students' ranking of the four main components of technology acceptance of technology acceptance. Omani students tend to cooperate and work as a team, in virtue of their strong background of living in a community in which the collective spirit of cooperation and interaction is still strongly alive, even in urban areas. This is illustrated through the high level of agreement in response to the item "Using e-learning rather than traditional instruction creates an isolation atmosphere between me and my friends". They prefer to ask colleagues, friends and technicians when they encounter problems when browsing or learning from e-learning websites, as indicated in the means to response items 4 and 14. Moreover, while Omani students experience anxiety in tackling unknown and unpopular learning websites— perhaps owing to a lacking of browsing skills or through aversion to the unknown—the mean of 3.4 is indicative that they still seek to challenge themselves in the e-learning context. As for power distance, in spite of the response mean of 3.4 for the proposition that using e-learning should be not limited to certain groups (such as mangers and highly qualified individuals), item number 6 clearly shows the trend of respondents to share experiences with their friends when they learn new topics from e-learning websites (a mean of 3.7). In fact these means indicate the problems that Omani students face in relation to this factor, showing their need for guidance and help to gain more confidence in using technology applications by providing more training and to counteract the notion that using technology should be limited to certain groups such as qualified individuals. Table 11 shows details.

Table 11: The means of cultural factors according to Omani students' responses

Means of cultural factors		
Factors	Means	Mean of means
Individualism/Collectivism	3.7	
Uncertainty Avoidance	3.4	3.5
Power Distance	3.5	

4.6.2 UK students

The same cultural factors came in third place in the UK students' ranking of the four main components of technology acceptance. Unlike Omani students, UK students show a high degree of reticence. The UK students did not think that the e-learning process creates isolation between them and their friends, as is clear in their low response mean in item number 4 (a mean of 3.1). However, their response regarding readiness to ask a colleague or friend in case of problems when browsing e-learning websites (item number 14) reflects an individualistic attitude regarding technical competence (and thus a reluctance to turn immediately for help in circumstances of difficulty). Thus when technology is available it tends to foment isolationist attitudes. Additionally, their replies illustrate a lower level of uncertainty avoidance—in response to statements "I prefer to surf the unknown and unpopular learning websites" and "I like to search for and explore new e-learning websites" (items means 4.1 and 4.4 respectively). Results also reflected weaker power distance effects in responses to "I prefer to share my experience with students and colleagues when learning new topics from e-learning websites" and "Using e-learning should not be limited to certain groups such as highly qualified individuals" (items means 4.3 and 4.1 respectively). However these results support Hofstedes' observations (1980) regarding the

lower ambient levels of uncertainty avoidance and power distance in western cultures (Shafeek 2011). Table 12 shows details.

Table12: The means of cultural factors according to UK students' responses

Means of cultural factors		
Factors	Means	Mean of means
Individualism/Collectivism	3.2	
Uncertainty Avoidance	4.2	3.8
Power Distance	4.2	

4.7 Political factors

Comparison between Omani and UK students in political factors shows internal consistency in each set of responses. Young people in the west have been developing a sub-culture within each western society such that they have become differentiated at rapidly decreasing intervals—the so-called 'Generation X' (from roughly the middle to the end of the 20th century) and Generation Y (beginning by overlap near the end of the 20th century or beginning at the opening of the 21st century)—and these generations have become increasingly differentiated in their own characteristics (Edmunds & Turner 2005; Wilson & Gerber 2008). Thus, young people in the UK (as in other western societies) have had various means of proximate and distance interacting through social facilities that have been available for a long time. Consequently, a constantly developing cultural tradition about social interaction and networking has grown up amongst youth that is passed down the generations (Urry 2003). Owing to historical background, the young generations in Oman have yet to develop a similar sub-culture within the larger society, and this is reflected in the ways in which they tend to use social networks and media, and in the patterns of use and purpose that characterize their habits.

Table 13: Students' Responses: Means of political factors across two cultures (Oman & UK)

Means of Political Factors		
Factors	Cultures	
	Oman	UK
Social Networks	3.9	4.3
Social Media	3.3	4.0

4.7.1 Omani students

Political factors (the use of social networks and social media) came in third place in the Omani students' ranking of the four main components of technology acceptance. For social networks, items numbers 7 and 17 had responses with means of 4.1 and 3.7 respectively, indicating that social networks such Facebook, Twitter, as well as various other forums and blog-sites using enhanced technology play a major role in providing and updating students with the latest news of political and other issues. In contrast, the mean of 3.3 for social media indicated the low incidence of using mobiles to follow political and other events. However, it is noted that the political factors are now playing an increasingly important role in technology acceptance, but only to a certain extent because the government has yet to encourage greater freedom of discussion on various topics such as domestic political issues. This creates a certain amount of reluctance in the take-up of new technology, and it will take time before such a take-up can be stimulated further. Table 7.30 gives details.

Table14: The means of political factors according to Omani students' responses

Means of Political Factors		
Factors	Means	Mean of means
Social Networks	3.9	
Social Media	3.3	3.6

4.7.2 UK students

Political factors (the use of social networks and social media) came in second place in the UK students' ranking of the four main components of technology acceptance. Items numbers 7 and 17 had high means (4.4 and 4.3 respectively), indicating that the respondents believe in the important roles that social networks play in exchanging, providing and updating information on political and other issues. As for social media, items numbers 8 and 18 had the same response mean of 4.0 and this confirmed that UK respondents used internet via mobiles and YouTube to follow up political

events and other issues. This usage reflects somewhat the tolerance of UK culture with regard to the discussion of political issues. Details are shown in Table 15.

Table 15: The means of political factors according to UK students' responses

Means of Political Factors		
Factors	Means	Mean of means
Social Networks	4.3	4.1
Social Media	4.0	

4.8 TAM constructs

Perceived usefulness and perceived ease of usefulness were ranked in first place by both sets of respondents, although in the case of the Omani students, the majority in favour was not as high as in the case of the UK students.

Table 16: Students' Responses: Means of TAM construct factors across two cultures (Oman & UK)

Means of TAM construct factors		
Factors	Cultures	
	Oman	UK
Perceived Usefulness	3.7	4.3
Perceived Ease of Use	3.9	4.4

4.8.1   Omani students

Technology Acceptance Model constructs (perceived usefulness and perceived ease of use) came in first place in the Omani students' ranking of the four main components of technology acceptance. This response reflected acceptance of these two factors as providing to them many advantages, such as savings in time and effort, providing them with useful learning materials, and making it easy to find information from e-learning websites. However, the majority of the Omani student who accepted these constructs was not as great as that in the case of their UK counterparts. Details are given in Table 17.

Table 17: The means of TAM constructs factors according to Omani students' responses

Means of (TAM) constructs factors		
Factors	Means	Mean of means
Perceived Usefulness	3.7	3.8
Perceived Ease of Use	3.9	

4.8.2   UK students

Technology Acceptance Model constructs (perceived usefulness and perceived ease of use) also came in first place in the UK students' ranking of the four main components of technology acceptance. The UK students reported these two factors as being very important in using e-learning websites. Thus, they agreed that the use of e-learning websites helps to save time and effort, helps to find information easily and provides useful learning materials. Table 18 gives details.

Table 18: The means of TAM construct factors according to UK students' responses

Means of (TAM) constructs factors		
Factors	Means	Mean of means
Perceived Usefulness	4.3	4.3
Perceived Ease of Use	4.4	

4.9 Discussion of results

The detailed comparisons between the responses provided by the students from Oman and the UK indicate patterns that are generally what would be expected, given the historical background to the two countries and their educational

systems. Within social factors, Omani students showed a particular disadvantage as regards ability to perform in English and other non-Arabic languages. English has become in many ways the world language for technology, and the Omani education system is acting to address this issue. Omani students are also seen as being at a disadvantage in two out of three cultural factors (uncertainty avoidance and power distance), but they are at a comparative advantage in the area of cooperation/collaboration owing to their cultural background. In political factors they are lagging behind UK students especially in their use of social media—the mobile media, especially—although as their society develops these differences are expected to decrease considerably. Given the responses regarding these three classes of factors (social, cultural, political) it should not be surprising that the majority of Omani students who accept the TAM construct factors is smaller than that among UK students. A lot of what is taken for granted by UK students is still new to students in Oman, although they are adapting rapidly to innovation. However, what might have been surprising would have been a majority of Omani students who did not view TAM construct factors favourably.

4.9.1   Teacher Questionnaires: General Comparison

In attempting to identify the specification requirements for developing an active learning environment for Geography, a field questionnaire survey was conducted before the Pilot Experiment. This questionnaire had the aim of discovering the specifications and techniques that should be used to develop a learning-environment based on e-learning, as well as other aspects of this development. Copies of the questionnaire were distributed to to supervisors and teachers of Social Studies in schools, as well as to lecturers and educators in universities for assessing and giving their feedback, in order to make appropriate adjustments as necessary. In addition, Cronbach's alpha-coefficient was used to measure tool reliability, as shown in Table 19. The Cronbach Alpha reliability statistics result for the teachers' questionnaire items shows that the degree of stability is 0.901, thus confirming the stability of the questionnaire items.

Table 19: Cronbach Alpha reliability test for Phase 1 Teacher Questionnaire returns
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	N of Items
.901	.942	14

After modifying the questionnaire statements according to the referees' comments, the Researcher identified three educational regions (Muscat, Al-Batinah South and Al-Batinah North) for this particular survey. They were purposively selected from among the seven educational regions owing to their diversity of response. Furthermore, a sample size of 70 respondents for each region was set (making a total of 210) in order to cover the largest possible number of respondents and to optimize the credibility of the answers. SPSS was used to analyze the responses from this survey and to extract the arithmetic mean and standard deviation.

Questionnaires were distributed to teachers in order to identify the specification requirements for developing a learning-environment. The teachers' questionnaire included 14 items designed based on a Likert scale while the last question was also an open question. Average responses ranged between 4.6–3.7 of 5. From the responses of the sample, it was found that all items were approved and accepted by the respondents, but the estimates showed a diversity of averages, for example, response item 1 (which refers to the importance of technology in the delivery and understanding of geographic contents in the virtual learning-environment) came in first place, which confirmed the importance of technology in supporting and enhancing the geography curriculum. However, item 4 came in second place, thus emphasizing the importance of 3D technology and multimedia for improving the understanding of geographical phenomena. In third place was the item dealing with simulations, game-based learning, virtual role-playing and virtual field-trips, thus indicating the importance of supporting and enhancing the curriculum from the respondents' points of view. The statistical summary of teacher response-items is shown in Table 20.

Table 20: Phase One Teacher Questionnaire Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.276	3.700	4.600	.900	1.243	.082	14

With regard to the open question (number 15) "For developing an effective learning-environment using technological resources, what additional features do you think should be in the programme that would help you understand the contents of the geography course in the best way?" respondents' points included:

- Engage students in cooperative activities.
- Support learners' skills and experience in using computer facilities.
- Ensure that teachers and learners have a rich interactive multimedia experience.
- There has to be an effective and exciting environment for attracting learners to the learning-content.
- Include a variety of maps and websites linked to the curriculum contents, including e-Books and e-Atlas.
- The content and programme run-time should be appropriate to the time allocated for teaching geographic content within the terms of the lesson-plan.
- Include learning-methods by using modern technology that learners can deal with and understand easily.

4.9.2   Phase Three Questionnaire

This questionnaire was designed to obtain responses relevant to e-learning technology acceptance factors which measured four main factors contained in the TAM constructed for this study (social, cultural, political, and Technology Acceptance Model constructs) and consisted of 20 items. The success of capturing relevant information required appropriately selected samples of teacher participants from three cultures, in this case comparable teachers from Oman, the UAE and the UK. Regarding sample size, it was decided to target a group of 40 students in each country, totalling 120 participants to provide a suitable number to facilitate data and statistical analysis.

The ethical issue of the questionnaire was addressed by ensuring that the data was used for only the purpose of this research and that all personal details of the participants would be kept secret. The following declaration at the beginning of the questionnaire gave the guarantee: "All answers provided will be treated confidentially and will be used only for the purpose of this investigation. The identity of respondents will be kept anonymous". The aim of the questionnaires was to measure the teachers' acceptance of e-learning in conjunction with their cultural background and values that help to identify the extent of acceptance of new technologies in different cultures.

The e-learning Technology Acceptance Model contained 30 questions and 5 further questions to ascertain the profile of participants. A list of classified questions relating to the main factors in the TAM model meant that some questions were similar to each other, and therefore the questions appeared in random order so as to reduce prejudice and bias in the answers. Participants gave their responses to each question on a five-point Likert scale ranging from 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) to 5 (Strongly Agree) to measure respondent reaction to the e-learning technology acceptance variables.

4.9.3   Phase Three Teacher Questionnaires: General Comparison

Oman

The research sample consisted of teachers chosen randomly from different educational regions in Oman. The sample of 40 teachers was divided equally between 20 males and 20 females, all of whom were registered with the Ministry of Education for the academic year 2010/2011, details shown in Table 21.

Table 21: Omani teachers' sample (in percentages)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	20	50.0	50.0	50.0
	Female	20	50.0	50.0	100.0
	Total	40	100.0	100.0	

Questionnaires were distributed and the results showed that the average responses ranged between 2.4–4.5 of 5. Details are shown in Table 22.

Table 22: Omani teachers' sample: Summary item means

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.845	2.400	4.550	2.150	1.896	.405	30

The teachers' responses reflected a strong rate of acceptance of e-learning technology as seen in the items mean of 3.84, when all items contained in the questionnaire ranged between 1 (Strongly Disagree) and 5 (Strongly Agree).
Table 23 below shows the relative importance of the four main classes of factors according to cumulative scores of the Omani teacher's responses. TAM construct factors had the highest percentage at 28 percent.

Table 23: Omani teachers' ranking of the four main factors

Factors	Means	Percentages
Social	3.7	25%
Cultural	3.9	26%
Political	3.2	21%
TAM construct	4.1	28%

United Arab Emirates (UAE)

The survey sample consisted of teachers chosen randomly from different educational institutions in the UAE (ABC School, Al-Manhal School, New Horizon School, Al-Khawarizmi International College). The sample size was 35 (including 15 males and 20 females, five questionnaires were returned blank) and all were registered with the Ministry of Education for the academic year 2010/2011. Details are shown in Table 24.

Table 24: UAE teachers' sample (in percentages)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	15	42.9	42.9	42.9
	Female	20	57.1	57.1	100.0
	Total	35	100.0	100.0	

Questionnaires were distributed and the results showed that the average responses ranged between 4.6–2.2 of 5. Details are shown in Table 25 below.

Table 25: UAE teachers' sample: Summary item means

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.032	2.257	4.600	2.343	2.038	.265	30

The UAE teachers' responses reflected a very high rate of acceptance of e-learning technology as seen in the items mean of 4.03, when all items contained in the questionnaire ranged between 1 (Strongly Disagree) and 5 (Strongly Agree). Table 26 shows the relative importance of the four main classes of factors according to cumulative scores of the UAE teacher's responses. TAM construct factors had the highest percentage at 26 percent.

Table 26: UAE teachers' ranking of the four main factors

Factors	Means	Percentages
Social	4.0	26%
Cultural	3.8	24%
Political	3.7	24%
TAM constructs	4.1	26%

United Kingdom (UK)

The research sample consists of teachers from Shorefields Technology College in Liverpool. There were 35 teachers (13 male and 22 female, with five questionnaires returned blank) and they were registered for the academic year 2011/2012. Details are shown in Table 27.

Table 27: UK teachers' sample (in percentages)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	15	42.9	42.9	42.9
	Female	20	57.1	57.1	100.0
	Total	35	100.0	100.0	

Questionnaires were distributed and the results showed that the average responses ranged between 4.6–3.3 of 5. Details are shown in Table 28 below.

Table 28: UK teachers' sample: Summary item means

	Mean	**Minimum**	**Maximum**	**Range**	**Maximum / Minimum**	**Variance**	**N of Items**
Item Means	4.211	3.371	4.571	1.200	1.356	.112	30

The UK teachers' responses showed an extremely high rate of acceptance of e-learning technology as seen in the items mean of 4.21, when all items contained in the questionnaire ranged between 1 (Strongly Disagree) and 5 (Strongly Agree).

Table 29 below shows the relative importance of the four main classes of factors according to cumulative scores of the UK teacher's responses. TAM construct factors and social factors jointly had the highest percentage at 26 percent.

Table 29: The UK teachers' ranking of the four main factors

Factors	**Means**	**Percentages**
Social	4.2	26%
Cultural	3.8	24%
Political	3.9	24%
TAM constructs	4.2	26%

4.9.4 Phase 3 Teacher Questionnaire Results: Detailed Comparisons

4.9.4.1 (Social factors)

Table 30: Teachers' Responses: Means of social factors across three cultures (Oman & UAE and UK)

Means of Social Factors			
Factors	Cultures		
	Oman	UAE	UK
Language	2.6	3.7	3.9
Qualification/Skills	4.3	4.1	4.4
Facilitating Conditions	4.3	4.2	4.3

Omani teachers
Social factors came in third place in the Omani teachers' ranking of the four main components of technology acceptance of technology acceptance. It is noted that, the language issue formed a problem for Omani teachers (with a mean of 2.6) in browsing and surfing e-learning websites in languages other than Arabic. In addition they experienced difficulties in explaining and interpreting learning materials downloaded from non-Arabic-language e-learning websites. Regarding background qualifications and skills, results illustrated the need of respondents for qualifications and training to use e-learning; this is clear from their acceptance of the questionnaire statements relating to

qualification requirements such as basic skills in using technology and attending e-learning workshops to provide multiple skills to use e-learning websites. Facilitating conditions formed another important factor from these respondents' view, as their responses reached 4.3 in terms of facilitating the e-learning context by administrative support, regular maintenance and technicians to help and solve computer problems. Details are shown in Table 31.

Table 31: The means of social factors according to Omani teachers' responses

Means of social factors		
Factors	Means	Mean of means
Language	2.6	
Qualification/Skills	4.3	3.7
Facilitating Conditions	4.3	

UAE teachers

Social factors came in second place in the UAE teachers' ranking of the four main components of technology acceptance of technology acceptance, where the language factor (with a mean of 3.7) is considered to be important by UAE teachers' in terms of web-browsing and accessing e-learning websites sources in other languages, thus increasing the teachers' surfing of such web-sites easily. In addition the qualification/skills and facilitating conditions have high response means, reflecting the respondents' firm belief in the necessity of training qualified teachers and facilitating the environment for e-learning requirements. Table 32 below gives details.

Table 32: The means of social factors according to UAE teachers' responses

Means of social factors		
Factors	Means	Mean of means
Language	3.7	
Qualification/Skills	4.1	4.0
Facilitating Conditions	4.2	

UK teachers

Social factors came in first place in the UK teachers' ranking of the four main components of technology acceptance, whilst respondents gave second-highest rating (mean of 4.3) to facilitating conditions, i.e. the availability of computers in the learning environment and of technicians to solve computer problems, but put more emphasis on the proper training and qualifications of teachers to take part in and run e-learning programmes. UK teachers did not have report any problem with social factors. Seeing that their native language is English, they are able to use and browse the e-learning websites much more easily than their counterparts in Oman and the UAE. Qualification/skills and facilitating conditions both have high means ratings as the UK education system has been in existence for the longest period of time and should, therefore, have established systems to manage innovation and the rise of new needs in such areas as procurement and training programmes.

Table 33: The means of social factors according to UK teachers' responses

Means of social factors		
Factors	Means	Mean of means
Language	3.9	
Qualification/Skills	4.4	4.2
Facilitating Conditions	4.3	

4.9.4.2   Cultural factors

Table 34: Teachers' Responses: Means of cultural factors across three cultures (Oman & UAE and UK)

Means of cultural factors			
Factors	Cultures		
	Oman	UAE	UK
Individualism/Collectivism	3.7	3.8	3.5
Uncertainty Avoidance	3.8	3.8	4.0
Power Distance	4.2	4.0	4.1

Omani teachers

Cultural factors (individualism/collectivism, uncertainty avoidance and power distance) came in second place in the Omani teachers' ranking of the four main components of technology acceptance. Omani teachers tend to cooperate and to work as a team; this is a reflection of the collective spirit in the wider social community in Oman. This is illustrated through the moderate response rate to the item "E-learning creates an isolative atmosphere between teachers and students". They prefer to ask colleagues, friends and technicians if they have problems when browsing or learning from e-learning websites, as can be seen in their high response means in items 30 and 8 (with means of 4.0 and 3.0 respectively). Teachers did not admit to anxiety from the unknown—perhaps because the respondents have sufficient skills to browse the internet or because they actually enjoy exploring new e-learning websites. Although their response mean for this factor was 3.8, but it is still appropriate to say that they ought to challenge themselves in the e-learning context. Power distance is reflected in the high response mean of 4.2, despite the high response mean of 4.1 for the item that refers to the sharing of new experiences between teachers and their colleagues and students, when learning new topics from e-learning websites. On the other hand the high response mean of 4.4 of the sample is noted for power distance, indicating that using e-learning should be limited to certain groups such as mangers and highly qualified individuals. The sample reflects their desire to receive for more training so that they can progress in the use of e-learning applications, so as to acquire greater skills and confidence, which has the corollary of counteracting the limitation of technology use to particular groups or individuals. Table 35 gives details.

Table 35: The means of cultural factors according to Omani teachers' responses

Means of cultural factors		
Factors	Means	Mean of means
Individualism/Collectivism	3.7	
Uncertainty Avoidance	3.8	3.9
Power Distance	4.2	

UAE teachers

Cultural factors (individualism/collectivism, uncertainty avoidance and power distance) came in third place in the Omani teachers' ranking of the four main components of technology acceptance. The responses of the UAE teachers indicate that they have a level of sociability similar to that of the Omani teachers. This becomes clear from their moderate response mean to the item proposing that using e-learning will create an isolative atmosphere between teachers and students, whilst they agree with collaborating with their colleagues and friends when they have any problem in using e-learning applications. The UAE teachers gave a 3.8 response mean to uncertainty avoidance, whilst in contrast to this their responses to items 14 and 7 indicated that they have the confidence to search unfamiliar e-learning websites and to explore new e-learning websites. Their response means to power distance was high, reaching 4.0.

Table 36: The means of cultural factors according to UAE teachers' responses

Means of cultural factors		
Factors	Means	Mean of means
Individualism/Collectivism	3.8	
Uncertainty Avoidance	3.8	3.8
Power Distance	4.0	

UK teachers

Cultural factors (individualism/collectivism, uncertainty avoidance and power distance) came in second place in the UK teachers' ranking of the four main components of technology acceptance. In contrast with Omani and UAE teachers, the individualism/collectivism factor has a response mean of 3.8 from UK teachers, which illustrates the looser ties existing in UK society, as is clear from the low response means of respondents in items 21 and 30. UK teachers showed a far greater willingness to search and explore new e-learning websites and to surf unknown/unpopular learning websites, indicating that they are subject to far less uncertainty avoidance because the UK culture's tolerance of change and its acceptance of changeable environments and situations. Moreover, the availability of high-speed internet services in UK, as well the fact that individuals do not usually face restrictions when surfing websites (unlike in Oman and the UAE) tend to mitigate uncertainty avoidance within UK culture. As for power distance, the UK response mean reached 4.1. In item 11 teachers indicated that they prefer to share experiences with students and colleagues when learning from e-learning websites, but their responses to item 6 came very unexpectedly, as they agree with the proposition "Using e-learning should be limited to certain groups such as managers and highly qualified

individuals", which reached 3.8. These results are not compatible to some extent with Hofstedes' study (1980) that proved the weaker effect of power distance in western cultures (Shafeek 2011).

Table 37: The means of cultural factors according to UK teachers' responses

Means of cultural factors		
Factors	Means	Mean of means
Individualism/Collectivism	3.5	
Uncertainty Avoidance	4.0	3.8
Power Distance	4.1	

4.9.4.3   Political factors

Table 38: Teachers' Responses: Means of political factors across three cultures (Oman & UAE and UK)

Means of political factors			
Factors	Cultures		
	Oman	UAE	UK
Social Networks	3.3	3.4	4.1
Social Media	3.2	4.1	3.7

Omani teachers

Political factors (use of social networks and social media) came in fourth place in the Omani teachers' ranking of the four main components of technology acceptance. This indicates that the political factors do not play a particularly important role because of the stability of the political situation in the country and the regime's programme of reform. On the other hand, item number 15 had responses with a mean of 4.0 indicating that the social networks using enhanced technology do indeed act as a conduit for political issues, whilst item number 13 indicates the sample's behave habit of reading about political news and events via electronic news-sites. However, their response regarding the use of chat-rooms to discuss political issues was low (a mean of 2.5) because the government does not allow in-depth discussion of political issues. Details are shown in Table 39

.

Table 39: The means of political factors according to Omani teachers' responses

Means of political factors		
Factors	Means	Mean of means
Social Networks	3.2	3.2
Social Media	3.2	

UAE teachers

Political factors (use of social networks and social media) came in fourth place also in the USE teachers' ranking of the four main components of technology acceptance. This indicates that likewise in the UAE the political factors do not play a particularly important role because of the stability of the political situation and the regime's seek to reform, and additionally owing to the absence of political parties and organizations that might generate different effects in that country. However, it is to be noted that the UAE and Qatar have been ranked by a non-Gulf scholar (one of Egyptian nationality, writing about the effects of the so-called 'Arab Spring') as the most stable countries in terms of political aspects among the Gulf countries (Salama 2011). Regarding social networks the UAE teachers have confirmed that they use them for updates on the latest news of political issues (a mean of 4.0) whilst on the other hand they did not respond highly to the item that refers to the use of chat-rooms to discuss political issues (mean of 2.2). In social media teachers promote their acceptance in using technology applications for political issues. Details showed in Table 40.

Table 40: The means of political factors according to UAE teachers' responses

Means of political factors		
Factors	Means	Mean of means
Social Networks	3.4	3.7
Social Media	4.1	

UK teachers

Political factors (use of social networks and social media) came in second place in the UK teachers' ranking of the four main components of technology acceptance. UK teachers noted that the social networks updated them with the latest news of political issues especially with regard to Facebook, Twitter, forums and blogs. Unlike Oman and UAE teachers, they gave high responses to item 22 indicating their orientation to using chat-rooms with others to discuss political issues, because British culture does not impose strict penalties on those who publicize or discuss political issues (unlike Arab societies which prosecute those who criticize the political situation). Thus, the internet in the UK is allowed for airing political issues whilst in Arab cultures such chat-rooms are normally closed down. As for social media UK teachers confirmed that they used them to follow political events.

Table 41: The means of political factors according to UK teachers' responses

Means of political factors		
Factors	Means	Mean of means
Social Networks	4.1	3.9
Social Media	3.7	

4.9.4.4   TAM construct factors

Table 42: Teachers' Responses: Means of TAM construct factors across three cultures (Oman & UAE and UK)

Means of (TAM) construct factors			
Factors	Cultures		
	Oman	UAE	UK
Perceived Usefulness	4.2	4.0	4.3
Perceived Ease of Use	4.0	4.2	4.2

Omani teachers

Technology Acceptance Model constructs (perceived usefulness and perceived ease of use) came in first place in the Omani teachers' ranking of the four main components of technology acceptance. Omani teachers have faced a new experience in learning and teaching and have found many advantages when teaching students in terms of employing useful learning materials, saving time and effort, increasing search skills, appreciating the usefulness of using e-learning websites, and finding it easy to locate information from e-learning websites. This is shown in the results that confirm the high average of teachers' response in the TAM construct factors, in Table 43.

Table 43: The means of political factors according to Omani teachers' responses

Means of (TAM) constructs factors		
Factors	Means	Mean of means
Perceived Usefulness	4.2	4.1
Perceived Ease of Use	4.0	

UAE teachers

Technology Acceptance Model constructs (perceived usefulness and perceived ease of use) also came in first place in the UAE teachers' ranking of the four main components of technology acceptance, where the items means are ranked between 3.8–4.6. As for the Omani teachers, the UAE teachers appreciated the importance of factors in using technology such as usefulness and ease of use, as appears in their high responses for TAM construct issues such as developing search skills, saving time and effort, gaining useful learning materials, finding information easily from e-learning websites, and making recommendation to colleagues and friends to surf e-learning websites. Details are shown in Table 44.

Table 44: The means of political factors according to UAE teachers' responses

Means of (TAM) constructs factors		
Factors	Means	Mean of means
Perceived Usefulness	4.0	4.1
Perceived Ease of Use	4.2	

UK teachers

Technology Acceptance Model constructs (perceived usefulness and perceived ease of use) also came in first place in the UK teachers' ranking of the four main components of technology acceptance, for whom this factor was considered to be the main determinant to any experience in terms of the perceived usefulness and ease of use. These high responses reflected the UK teachers' acceptance of these two factors as the basis for e-learning should be to focus on the usefulness and ease of use of any e-learning applications. Details are shown in Table 45 below.

Table 45: The means of political factors according to UK teachers' responses

Means of (TAM) constructs factors		
Factors	Means	Mean of means
Perceived Usefulness	4.3	4.2
Perceived Ease of Use	4.2	

4.10 Discussion of results

The detailed comparisons between the responses provided by the teachers from Oman, the UAE and the UK indicate patterns that reflect very closely the actual background in which they live and work. Especially in the area of political factors, the teachers from the Arab countries are reticent in their use of electronic networks and media for anything but professional purposes. This might have an impact on their ongoing development of capacity in keeping pace with technology and gaining greater familiarity with what is available. However, what cannot be denied is their commitment to taking advantage of the pedagogical and knowledge-building opportunities that the new technology offers. In terms of their responses to social and cultural factors, it can be seen that although the Omani and UAE teachers are subject to at several disadvantages (particularly in the area of language) they are in no way deterred from meeting the challenge posed by the new technology. In the case of the teachers from the Arab countries, it can be seen that they have similar levels of commitment to using educational technology, even though the environments in which they live continue to impose restrictions on their scope for action. These restrictions are of a physical nature (in the way of the availability of electronic resources and facilities), personal (especially in the way of language acquisition), besides those that are political/societal, that have already been mentioned. The close paralleling of the Arab teachers' responses in nature (if not in scale) with those of their UK counterparts shows that educational technology has taken hold on the imaginations of these teachers, and the item mean ratings show that whatever reluctance there might be among some teachers to use the new technology, it is a minority trend.

4.11 Evaluation of feedback from learners and teachers

4.11.1   Learners' feedback

This study sought to develop an adaptive learning environment which is appropriate to the requirements of e-learning, in which the interaction between teachers and students and the positive results that have been achieved are all reflected in the learning outcomes and the survey responses. The study was conducted though three experimental procedures, which obtained results that reflected positive attitudes among teachers and students towards using e-learning applications in terms of effectiveness and efficiency, and also gave different indications about the role of cultural factors in influencing the acceptance of e-learning.

The proposed TAM has four main factors to measure students' trend to use e-learning technologies and websites. Responses' mean of Omani students illustrated the place of cultural/social factors as TAM constructs, Social, Political and Cultural factors respectively. TAM constructs like usefulness and ease of use are represented the importance factors because the respondents used new experience and the interface and facilities of website are important to understand and used the technology components (Saadé&Bahli 2005) therefore, this factor came at the first rank. Social factors came in second place in terms of the respondents' awareness that the facilitating conditions and qualification/skills are important factors to develop the effective learning environment where it seen to facilitating conditions as the recognition of the existence environment elements such as knowledge, time, financial resources, equipments, and access to hardware/soft ware and these consider to be the initial requirements for any learning environment (Mathieson et al. 2001). In other side language is presented the problem with respondents as they found difficulties to search and surf in e-learning websites using other language. Political factors came in third place in terms of social media and social networks and their role to provide and update students for latest news of political issues. Cultural factors came in last place as students reflected a collective community and they have an anxiety from unknown and unpopular learning websites because they do not have enough skills to browse in internet or because they do not like to explore new e-learning websites. In addition, they have another problem regarding to their believe of using technology should be limited in certain groups such as qualified individuals and this illustrated their needs to be more confidence in using technology applications and to solve this problem they should provide them with more training to get necessary skills and abilities. UK students' responses mean in terms of the four main factors are ranked as TAM

constructs/ Social, Cultural and Political factors respectively. UK and Omani students agree on the importance of TAM constructs factors which consist of ease of use and usefulness in terms of using e-learning websites. In contrast, unlike Omani students, UK students have not faced any problem with language when they search in English because it is their mother tongue. Moreover, unlike Omani students, UK students represented the individual community in using technology because of the availability of technologies networks, speed and services contrast to Oman culture. Results as well showed the less uncertainty avoidance and power distance within UK culture which support Hofsted's study (1980) that approved the less effect of uncertainty avoidance and power distance in western cultures (Shafeek 2011). Political factors presented the last place which means social media and social networks have played main role in exchanging, providing and updating the political issues according to UK respondents and this is reflected the tolerance of UK culture with respect to political issues following and discussing unlike Omani culture.

4.11.2   Teachers' feedback

The results that obtained showed the differences between three cultures (Oman, UAE and UK) in terms of the Technology Acceptance. Proposed TAM has four main factors to measure teachers' trend to use e-learning technologies and websites. Responses' mean of Omani teachers illustrated the place of cultural/social factors as TAM constructs, Cultural, Social and Political factors respectively. TAM constructs like usefulness and ease of use are represented the importance factors because they found many advantages when they teaching students in terms of using useful learning materials, save time and effort, increase search skills, the usefulness to use e-learning websites and they found easy to find information from e-learning websites, however TAM constructs factors have high average of teachers' responses reflect the importance of these factors in terms of acceptance of any new technologies (Shen et al. 2010). Cultural factors came in second place as teachers' responses reflected the collective Omani culture and that what recent study by Klassen et al. (2011) was confirmed, Moreover, they have not an anxiety from unknown and unpopular learning websites because they have enough skills to browse in internet or because they like to explore new e-learning websites. In addition, they have problem regarding to their believe of using technology should be limited in certain groups such as qualified individuals and this illustrated their needs to be more confidence in using technology applications and to solve this problem they should provide them with more training to get necessary skills and abilities. Social factors came in third place where Omani teachers have problem in browsing and surfing in other language likewise Omani students while they have high responses in qualification/skills and facilitating conditions which reflects teachers' awareness of the important to qualify and prepare teachers for e-learning environment and accommodate e-learning context with computers, administrative supporting, regular maintenance and technicians to solve any problems in computers. Political factors came in the last place in terms of social media and social networks and their role in providing teachers with latest political issues. Results referring to the lack of importance of the political factor because of the stability of the political situation and the regime's seek to reform but in other side the government does not allow discussion in some specific political issues.

UAE teachers' responses mean in terms of the four main factors are ranked as TAM constructs, Social, Cultural and Political factors respectively. Like Omani teachers, UAE teachers found that usefulness and ease of use are consider to be the importance factors in using new technology and searching from e-learning websites. In somewhat UAE teachers unlike Omani teachers did not find any problem to browse and access e-learning websites using other language might be because the UAE government was allowed people to access the internet from 1995 to be the first country among gulf countries represented this service then Saudi Arabia (Mirza& Al-Abdulkareem 2011) as well they have high means towards qualification/skills and facilitating conditions which reflect their believe that the necessity to qualify teachers to have basic skills for using technology within e-learning environment, and facilitate environment to be suitable to apply e-learning experiences (Zitter et al. 2009; Cheng & Wang 2011). Cultural factors in terms of individualism/collectivism, results reflected collectivist cultures like Omani students, while in uncertainty avoidance the results indicated to the confidence of respondents to search unfamiliar e-learning websites and explore new e-learning websites. Power distance in some extant high therefore, they need to have more experiences in e-learning to be more familiar with technology applications. Political factors have effected in some extent the acceptance of technology in terms of their high responses in item that refer to their using of social networks to update them for the latest news of political issues, in contrast they refused the item that refer to their using to chat room (chatting) to discuss political issues. Political situation in UAE and Oman has described as stable situation because of the regimes seek to reform and the absence of political parties in both countries, however UAE and Qatar are ranked as most stable countries in terms of political aspects among the Gulf countries (Salama 2011).

UK teachers' responses means in terms of the four main factors are ranked as TAM constructs/ Social, Cultural and Political factors respectively. TAM constructs factors have high responses means with Omani, UAE and UK teachers because of the importance of these factors to understand and use new technologies experiences. Unlike Omani and UAE teachers, UK teachers have not any problems with language in terms of social factors because English is their native language and they can browse and use e-learning websites and applications easily. Qualification/ skills and facilitating conditions have high responses means which reflected the respondents' aware that the teachers who have high qualify and skills in e-learning will be able to achieve the obvious competence in learning environment (Law

2010) also the environment which facilitate with suitable equipments will support the success in e-learning context. However, UK education system is existence for the longest period time, it was first organized in the late of nineteenth century and it was extended nationwide at the end of the nineteenth century and the beginning of the twentieth century therefore, according to (DfES 2004) the British schools are equipped to embrace the e-learning system and teachers are qualified and have enough skills to engage in such system.

In contrast with Omani and UAE teachers, UK teachers in individualism/ collectivism cultural factors have high responses means which illustrated the weakness of social relations in British society, in addition UK teachers have less uncertainty avoidance because the UK culture tolerates changes and accept a changeable environment and the available high speed internet services as well as the individuals have not faced any restrictions when they surfing websites unlike Oman and UAE, all of these aspects are supported less uncertainty avoidance. In power distance teachers have unexpected responses in terms of high power distance however, these results are not met the results of Hofsted's study (1980) which approved the less affect of power distance in western cultures (Shafeek 2011) .In political factors, UK teachers noted that the social networks updated them with the latest news of political issues, unlike Omani and UAE teachers, UK teachers have high responses in this factor because the British culture dose not impose strict penalties on those who talk and discuss the political issues unlike Arab societies which punish those who criticize the political situation.

Technology and the internet have entered into countless aspects of daily life for teachers, students and ordinary people alike. It is therefore necessary for educational authorities to keep close track of such developments and to prepare programmes to enable present and future citizens to function in the resulting environment (Castells 1999; Kellner 2000). Teachers thus need to become familiar with all relevant technological applications, and to transfer their knowledge and skills to their students (Mishra & Koehler 2006). In developed and developing countries alike, the education system is now placed to be the key player in preparing citizens to function in the modern economic climate (Dahlmann 2007) and to engage in the increasingly necessary activity of lifelong learning (Longworth & Davies 1997; Chapman & Aspin 2000; World Bank 2003). Additionally, the role of eLearning in lifelong learning is steadily increasing (Gray 1999; Sharples 2000; Friesen & Anderson 2004). Thus, this research can offer relevant findings for the condition of eLearning and lifelong learning in Oman (and other Gulf Arab states). It supports previous studies regarding the relationship between culture and technology acceptance. It also highlights aspects of the importance of optimizing the use of learning technology to improve students' achievements and (consequentially) to enhance their attitudes towards technology within the learning environment, particularly with regard to the BE tenth-grade. The great majority of the Omani students who took part in the eLearning experiments reported higher performance levels and expressed generally positive attitudes towards the eLearning experience. In addition this study's findings illustrate the obstacles that can affect teachers and learners in respect of using technology, and their responses have highlighted suggestions to solve these problems.

Conclusion

This study has described the construction of an adaptive learning framework for a specific environment in the Omani state education system, and has discussed the arguments regarding the introduction of a hybrid pedagogical approach suitable for use in the new environment (Mirza& Al-Abdulkareem 2011), irrespective of whether the constituent approaches happen to be currently fashionable or otherwise. A review of the literature has revealed that a broad variation in views on pedagogic method is to be found in scholars who research eLearning. This study adopted a pragmatic mixed approach in the design of the experimental eLearning framework, with a view to facilitating active interaction between all the components and actors within the system. These interactions enable the framework to be highly productive in terms of knowledge acquisition and exchange, as well as helping students to build skills in reasoning and critical thinking. This framework seeks to deliver the sort of pedagogy that is required for the present-day world, in which whilst it is important to acquire and retain knowledge, it is more important to gain a proper understanding of such knowledge and even more important to be able to make effective use of such knowledge (Lankshear&Knobel 2003).

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