Cultural perceptions:
The missing element in the implementation of ICT in developing countries

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ABSTRACT

Given the widely recognized importance of culture for the successful implementation of information and communication technology (ICT), this study explored the cultural perceptions of high school EFL (English as a Foreign Language) teachers in Syria toward ICT. Using both quantitative and qualitative research methods, the study sought to determine the teachers' overall perceptions of ICT as influenced by their national culture and school culture(s). The findings point to a notable conservatism in participants' perception of ICT in education and society at large. Teachers were mainly concerned about the morally damaging effect of ICT (particularly the Internet), its inattentiveness to their cultural and language needs, and its growing primacy at the expense of other societal needs. Hence, participants urged for the creation of local computers and software that would better serve Syrian identity and culture. The implications of the findings are discussed.

Keywords: *Syria; culture; EFL; school; education; adoption of ICT.*

INTRODUCTION

The global adoption of information and communication technology (ICT, henceforth) has been the landmark of the educational scene for the last two decades. The adoption of ICT into education has often been premised on the potential of the new technological tools to revolutionize an outmoded educational system, better prepare students for the information age, and/or accelerate national development efforts. Harvey (1983) predicts that the effectiveness of the use of the computer in education may be an important factor in determining which countries will succeed in the future. Central to this vision is the powerful metaphor of the "information age," where media, business and industry become increasingly computer-reliant.

In developing countries in particular, the metaphor of the information age has generated a whole set of wild speculations about the necessity of educational reforms that will accommodate the new tools (Pelgrum, 2001). Educational planners in most developing countries have responded to the challenge by initiating national programs to integrate new technologies (computers, educational software, the Internet, and other computer-related technologies) in education. Doing so, these governments have added to their burden of debt "even though the costs are large and the payoffs modest" (Benzie, 1995, p.38). An important reason for the frequently disappointing results in transferring electronic technology to developing countries is the inattention on the part of decision-makers to the end-users' cultural conditions or their prevailing school culture, or both (Zhuang & Thomas, 1987; Benzie, 1995). It is widely accepted that culture, within a nation or an organization, shapes individuals' perceptions of innovations that bear directly on their lives (Williams-Green, Holmes & Sherman, 1997; Chen, Mashhadi, Ang & Harkrider, 1999; Loch, Straub & Kamel, 2003).

In the field of education, it has been noticed that teachers' reactions to technological innovations are mediated by their cultural perceptions (Watson, 1998; Harper, 1987). Cultural perceptions "embody group understanding based on common beliefs and values" (Jones and Maloy, 1996: p.

25). They are influenced by not only national norms and values but school regularities and practices as well (Hofstede, 1997). A number of studies have shown that cultural perceptions toward different computer-related technologies are key factors related to both the initial acceptance of these technologies as well as future behavior regarding their usage (Al-Oteawi 2002; Chen, et. al., 1999; Loch, et. al., 2003; Straub, Keil & Brenner, 1997; Hill, Loch, Straub, & El-Sheshai, 1998). Studying teachers' cultural perceptions is particularly important in developing countries where ICT is not usually part of the culture. Due to its novel presence in society at large and in schools in particular, ICT may not be well received by developing-country teachers under various cultural influences.

One developing country that is currently pursuing the technological track in education is the Syrian Arab Republic. Recognizing the challenge of the "information age," the Syrian Ministry of Education has recently adopted a national plan to introduce computers and informatics into pre-college education. To this end, the Ministry has established computer-equipped labs within secondary schools for general, vocational and technical education. It has also connected many schools to the Internet. In addition, the Ministry created a new specialization in computer technologies in an effort to increase the number of computer experts in society. According to The National Report (2000), the introduction of ICT into the Syrian educational system aims "to keep pace with the progress and to reach efficient levels of education."

Unfortunately, the implementation of ICT into the Syrian schools has not been guided by research. The "initiation stage" (Rogers, 1995), which demands information gathering and planning, has been overlooked in the urgency to implement ICT in schools. A key element that has been left out is understanding the cultural perceptions of the end-users toward these new tools. Such inattention to the teachers' cultural perceptions may generate unforeseen repercussions for ICT diffusion in Syrian schools. Many technology experts have pointed out that the integration of ICT in education should occur in the light of the cultural conditions of the country and the prevailing school culture (Watson, 1998; Harper, 1987; Thomas, 1987). Obviously, unless teachers recognize the importance of ICT for their school and national cultures, they will not use it in their classes. This suggests that studies at the early stages of technology implementation should focus on teachers' cultural perceptions toward technology. Starting to understand these information gaps about teachers' cultural perceptions of ICT was the primary purpose for this study.

REVIEW OF LITERATURE

In the headlong drive to incorporate educational technology in schools, the accommodation of the new tools has often taken precedence over the end-users' cultural perceptions toward the media. Many researchers have cautioned about the current lack of attention to cultural beliefs and their impact on ICT adoption in developing countries (Loch, et. al., 2003; Hill et. al., 1998). Researchers suggest that force-fitting the culture to the technology can create an unfavorable climate for the acceptance of ICT in different organizations in the importing country. In fact, Hill et. al. (1998) asserts that, unless taken into consideration, socio-cultural factors may put ICT transfer at risk in certain developing countries.

Apparently, the changes developing countries are opting for cannot be attained by simply placing more computers in their schools. Martinez (1999) suggests that one of the major challenges facing developing countries is to make technology an essential part of the culture of the people. In fact, the reverence with which technology is held in technologically developed countries may be in contradiction to the perceptions of cultures that are relationship-oriented (Roblyer, Dozier-Henry & Burnette, 1996: p. 9). Harper (1987, p. 47) contends that cultural factors play an important role in creating negative perceptions toward computers: "One direct cultural cause is people's

apprehension that life is becoming too mechanized, so they resist contributing to a "computer culture." Another cause is the concern that there are other social problems that need to be solved before computer-education is addressed..." Intellectuals from different developing nations have been aware of the difficulty involved in accommodating "the computer culture" within their home cultures. For example, Modum (1998, p. 99), noting Nigerians' cultural conservatism toward computers, urges his people to "imbibe the values of the computer as a tool that can be used by all for problem solving, no matter their profession." Similarly, Dewachi (2002) notes that "cultural impediments" are responsible for the Arab States' slow launch into the new information and communication age and their inadequate exploitation of the Internet. Obviously, the change initiated through the diffusion of technological innovations is a complex process characterized by many obstacles, regressions and cultural challenges (Benzie, 1995). Rather than being transposed through ready-made models, change often evolves as a response to societal needs originating from the inside culture.

In his theory of Diffusion of Innovations, Rogers (1995, 1971) identifies the *Social System* as an important parameter in the innovation diffusion process. The social system denotes the social context in which the innovation diffuses. The structure of the social system affects diffusion in many ways. Rogers points specifically to the effects of the social norms on the rate of innovation adoption. Norms are the established patterns of behavior that tell members of the system what behavior is expected (Rogers, 1995, p.26). According to Rogers, social norms can be a main barrier to change. Following Rogers, Thomas (1987, p. 15) proposes that "How acceptable a new technology will be in a society depends on how well the proposed innovation fits the existing culture." Thomas refers to his hypothesis as the *cultural suitability* factor, which he places within his model of technology transfer from developed to developing countries. Both Rogers and Thomas note that, despite their indisputable importance, cultural conditions and/or social norms have not been sufficiently studied in the innovation-diffusion research. The dearth of studies examining "cultural conditions" might be attributed to the difficulty involved in capturing this construct. To be researchable, cultural perceptions was delineated in this study to mean "Syrian teachers' perceptions of the value, relevance, and impact of ICT as it relates to the cultural norms in Syrian society and schools."

The study of cultural perceptions has been found essential for accounting for teachers' overall attitude toward ICT and for anticipating their future adoption of the new tools (Thomas, 1987; Harper, 1987). In fact, Chen, et. al. (1999) considers cultural perceptions among five main factors that may determine ICT adoption by educators. Unfortunately, however, only a few studies have tried to study the impact of cultural perceptions on the reception/rejection of ICT in education. Loch, et. al. (2003) tried to find the extent to which social norms influence the acceptance of the Internet in the Arab world. They found that, although many of the participants were enthusiastic about the promoting role of the Internet for education and training, cultural barriers affected their acceptance of the Internet is so many ways. Among these are the limited number of websites with Arabic content, the "moral and religious cultural issues" (p. 53), social life and communication, and fear of the influence of other cultures. Similarly, Hill et al. (1998) found that the cultural tendency to face-to-face dealings and to family-like environments militate against technology acceptance in the Arab World. They also found that participants with "traditional religious values and conservatism" showed greater resistance to ICT transfer in its current "Westernized" form.

Al-Oteawi (2002, p. 258) found that teachers refrain from using the Internet in the classroom for fear of the ethically inappropriate material on the Internet. He also found that his participants looked at much of the material on the Internet as inappropriate for the Saudi culture. He particularly pointed to the teachers' reluctance to endorse the Internet for teaching and learning "because of concerns about the evil aspects of the Internet." Chen, et. al. (1999) created three computer-enhanced learning environments: local-institutional, trans-institutional, and global. The

first two were designed for giving student teachers the opportunity to explore the conditions of learning and teaching in Singapore primary schools. Unlike the learning environments commonly built on Western assumptions, the learning environments created by the researchers took into account different aspects of the Singaporean culture. The researchers found that the participants benefited both educationally and socially from this experience because of its incorporation of cultural issues that are important for the participants. Therefore they urged for a consideration of cultural factors in computer-based learning environments.

Apart from the effect of the national culture on technological diffusion in schools, the micro-culture of the school itself may affect such diffusion (Hodas, 1993). Williams-Green, et. al. (1997) contends that the culture developed within an institution or within an organization can act as a barrier to change. For a new technology to be placed into an organization's culture there must be a match of organizational and technological values (Hodas, 1993). Within the school organization, if the technology is not received well by teachers, there must be a mismatch of values between the culture of schools and that of the technology. Watson (1998) found that teachers' inability to negotiate the role of the computer in their practice resulted in their resistance to its use in their classrooms. Therefore, he warned that the mismatch between the culture of technocentric mindedness and the teachers' pedagogic culture results in the alienation of the teachers from the use of technology. On the other hand, Coppola (2000) found that because the norms of school and community encouraged innovation and autonomy, teachers learned not only how to use computers in their teaching but also how to operate them within the constructivist framework. It seems that the integration of ICT in schools cannot be effective unless escorted by supplementary programs that would foster a culture of acceptance amongst teachers, students, and administrators.

One area about which the literature remains virtually silent is the cultural non-neutrality of computers, the fact that the "…characteristics of technologies are determined by the socially and culturally-based assumptions of their designers" (Damarin, 1998, p. 12). As Bowers (1998, p. 50) notes, "Right now, learning about the cultural non-neutrality of technology is a peripheral area of study, if it is studied at all." Computer technologies, like most other tools, select, amplify, and reduce aspects of experience in various ways. This aspect of the new technology may pose a threat to conservative cultures that value their own experiences. In *The Media Is the Message*, McLuhan (1964, p. 207) wrote, "The spiritual and cultural reservations that the oriental peoples may have toward *our* technology will avail them not at all. The effects of technology do not occur at the level of opinions or concepts, but alter sense ratios or patterns of perceptions steadily and without any resistance [italics added]." Undeniably, teachers' awareness of the cultural non-neutrality of ICT may have substantial influence on their attitudes toward it as well as their conception of its place in their instructional practices.

From both theoretical and empirical perspectives, cultural perceptions seem to have a significant impact on teachers' adoption of ICT. Unfortunately, much of the early research on computer uses in education has ignored teachers' cultural perceptions toward the new machines (Harper, 1987). Studies focused on the computer and its effect on students' achievement, thus overlooking the psychological and contextual factors involved in the process of educational computerization (Clark, 1983; Thompson, Simonson & Hargrave, 1992). The delicacy of this situation calls for an investigation of teachers' cultural perceptions regarding the introduction of ICT into their schools and society at large.

THE STUDY

Given the importance of teachers' cultural perceptions for the success of the integration of ICT into education, the purpose of this study was therefore to determine the high school EFL teachers' cultural perceptions toward ICT in Syrian education. More specifically, the study investigated the following two questions:

1. What are teachers' perceptions about the introduction of ICT into their society, given its own mandates and their own cultural conditions?

2. What are their perceptions about the relevance of ICT to their schools?

First of its kind in the Syrian context, this study is part of a larger study aiming to assess the recent introduction of ICT into Syrian schools from a teacher viewpoint. The study focused mainly on EFL (English as a Foreign Language) teachers because they were first to experiment with computers in the Syrian context. This is partly because of their familiarity with English as "the main computer language" and also because much of the available software and educational web content is for English language practice. Moreover, teachers with English language skills have access to a wider range of material on the Internet and are expected to be more familiar with technology discourses. More importantly, "The field of foreign language education has always been in the forefront of the use of technology to facilitate the language-acquisition process" (Lafford and Lafford, 1997, p.215).

METHODOLOGY

This was a descriptive study of an exploratory nature. Creswell (2003, p. 30) suggests that exploratory studies are most advantageous when "not much has been written about the topic or the population being studied." The target population in this study was high school EFL teachers in Hims (the largest Syrian province) during the 2003-2004 school year. Hims contains diverse Syrian communities, and might therefore be considered a "representative" Syrian province. The list of teachers was based on EFL teachers' Directory, which is maintained and updated on a quarterly basis by Hims Department of Education. The total number of high school EFL teachers in the Directory of the Department of Education was 887 (214 males, 24%; 673 females, 76%) as of the thirtieth of March, 2004.

Both quantitative and qualitative methods were used in order to collect the data on the population of EFL teachers in Hims. A questionnaire consisting of sixteen items was developed by the researcher to obtain the information needed for the study (Appendix 1). The instrument was evaluated by a panel of experts for content and face validity. The panel included three content experts (professors of educational technology and EFL), two bilingual experts, one measurement expert, and four population experts (Syrian EFL teachers). The Cronbach's alpha reliability coefficient for the scale was .76. The questionnaire was translated into Arabic and then back into English to ensure its suitability for the participants. The qualitative data was collected through in-depth phone interviews. This qualitative element was employed not only to gather more in-depth information but also to ensure the trustworthiness of the results (Gelsne, 1998). A semi-structured interview form (Gay & Airasian, 2000) was developed by the researcher and then piloted on one participant to ensure that the questions were comprehensible to the respondents (Appendix 2).

The data were collected in two stages. In stage one, the questionnaire described above was administered to a random sample of 326 EFL teachers in the Department of Education in Hims. The specific procedure used for sample selection was a "table of random numbers" (Gay & Airasian, 2000, p. 124). This procedure involved assigning each subject in the population to a

number, and then selecting 326 arbitrary numbers from the population. Since each number corresponded to a subject in the population, the selected numbers formed the sample of subjects for the study. Following Dillman's (1978) recommendations, a letter of recruitment, a letter of informed consent (which also included consent to participate in a follow-up interview), and a return envelope accompanied the questionnaire. Letters of support by the Syrian Ministry of Education and the Director of English in the Department of Education in Hims were used for accessing the schools and teachers. A total of 326 questionnaires were distributed over a period of three days from the 27th to the 29th of April. By May 17th, a total of 320 questionnaires were collected from the participants. The response rate was 98.16%. The rate was high enough to avoid further survey distribution. Six out of 320 were not usable for data analysis because they were not completed. Only 314 were analyzed, representing a valid response rate of 96.32%.

In stage two, a purposeful sample of 15 teachers out of 97 who provided their consent to participate in follow-up interviews were interviewed via phone. The selected subjects were contacted by phone twice. During the first contact, the researcher presented a cover story to re-introduce himself and his research topic, explain the purpose of the interview, request participation in the interview, and set up appointments for the interviews. The second contact was dedicated to the interviews themselves. All interviews lasted between 20-30 minutes, and all were audio-taped and then immediately coded.

The quantitative data were analyzed via SPSS. 12 statistical package. Descriptive statistics were used to describe and summarize the properties of the data collected from the respondents. Prior to conducting the analysis, the scoring of all negatively stated items was reversed. The qualitative data were analyzed using an interpretive qualitative approach (Glesne, 1998). Within this paradigm, "it is possible to understand the subjective meaning of action (grasping the actor's beliefs, desires and so on) yet do so in an objective manner" (Schwandt, 2000, p.193). Interviews were transcribed verbatim and then coded. The coding followed the procedure recommended by Glesne (1998) for data cataloging using analytic codes, categorization, and theme-searching. In developing codes, the first step was to systematically read and group the participants' transcribed responses. After this basic grouping of data, recurring words, phrases, and ways of thinking within each group were identified and then labeled into coding categories. Related codes were synthesized into broader codes. For verification purposes, a combination of manual and computer-assisted methods was employed to code the data. The particular computer program used for coding the data was NUDIST (N6). Relevant quotations were grouped with their related codes and then translated into English. To ensure the anonymity of the respondents, pseudonyms were used to identify individual respondents. Lastly, the relationships amongst codes were sought and then assembled into themes and sub-themes before final reporting.

MAIN FINDINGS

Quantitative Data

Participants were asked to respond to 16, Likert-type statements dealing with their perceptions about computers' cultural relevance to and impact on Syrian society and schools (Appendix 1). Cultural perceptions were represented by a mean score on a 5-point scale, where 5 (Strongly Agree) represents the maximum score of the scale and 1 (Strongly Disagree) represents the minimum score. Table 1 illustrates the frequency of participants' responses to the Cultural Perceptions scale.

Table 1: Frequency Percentages on the Cultural Perceptions Scale

N.	Cultural Perceptions Scale	Percent (%)				
		SD	D	N	A	SA
1	*Computers will not make any difference in our classrooms, schools, or lives	23.3	54.8	15.3	6.1	0.6
2	Students need to know how to use computers for their future jobs	0.0	3.2	9.6	60.8	26.4
3	*Students prefer learning from teachers to learning from computers	4.1	27.4	38.9	23.6	6.1
4	Knowing about computers earns one the respect of others	1.9	13.4	20.4	49.7	14.6
5	*We need computers that suit better the Arabic culture and identity	2.6	5.4	8.6	52.2	31.2
6	Computers will improve our standard of living	1.0	4.8	24.8	43.0	26.4
7	Using computers would not hinder Arab generations from learning their traditions	4.1	9.9	23.9	48.7	13.4
8	*Computers are proliferating too fast	0.3	4.5	6.7	60.8	27.7
9	People who are skilled in computers have privileges not available to others	0.0	3.8	11.5	51.6	33.1
10	*Computers will increase our dependence on foreign countries	7.0	31.2	29.3	26.1	6.4
11	*There are other social issues that need to be addressed before implementing computers in education	6.4	23.9	16.6	41.1	12.1
12	The increased proliferation of computers will make our lives easier	1.6	5.4	12.1	65.0	15.9
13	*Computers dehumanize society.	21.3	48.7	15.9	10.5	3.5
14	Working with computers does not diminish people' relationships with one other	5.7	26.4	15.9	43.3	8.6
15	*Computers encourage unethical practices	14.7	32.2	26.1	19.4	7.6
16	Computers should be a priority in education	1.9	5.4	12.4	51.0	29.3

Scale: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree
*Note: * polarity reversed on these items*

From a school culture perceptive, the majority of the respondents agreed or strongly agreed that students need to know how to use computers for their future jobs (87.2%), and that computers should be a priority in education (80.3%). Also, a high percentage of the respondents disagreed or strongly disagreed with the negatively stated item 1, indicating that computers will make difference in their classrooms, schools, and lives (78.1%). However, a high percentage of them

(38.9%) were neutral about whether or not students prefer learning from teachers to learning from computers.

From a national culture viewpoint, the majority of the respondents agreed or strongly agreed that knowing about computers earns one the respect of others (70.1%), entitle people who are skilled in computers to privileges not available to others (84.7%), contribute to improving their standard of living (69.4%), and eventually make their lives easier (80.9%). Most of them indicated that computers do not diminish people' relationships with one other (51.9%), or hinder Arab generations from learning their traditions (62.1%). Also, a high percentage of the respondents disagreed or strongly disagreed with the three negatively stated items 10, 13, and 15, indicating that computers do not increase their dependence on foreign countries (38.2%), dehumanize society (70%), or encourage unethical practices (46.9%).

Participants' negative responses surfaced on three items. The majority of them indicated that there are other social issues that need to be addressed before implementing computers in education (53.2%), that computers are proliferating too fast (88.5%), and that alternative computers which better suit the Arabic culture and identity are needed (83.4%).

Table 2: Distribution of Mean Scores on the Cultural Perceptions Scale

Scale	Percent (%)					Mean	SD
	Highly negative	Negative	Neutral	Positive	Highly positive		
Cultural Perceptions	7.0	19.5	18.0	40.0	15.5	3.38	0.44

In general, teachers' perceptions of the cultural relevance of computers were somehow midway between neutral and positive (Table 2). The overall mean score on the Cultural Perceptions Scale was 3.38 with a standard deviation of 0.44.

Qualitative Data

The majority of the interviewees were aware that computers are bringing about perceptible changes in the character of the Syrian society. These changes were eyed with a mixture of hope and discomfort on the part of the participants. On one hand, participants considered ICT as a new window opened to the world. What interviewees particularly valued about this feature is getting acquainted not only with the events of the world but also with different cultures and different people. To some interviewees, this helps enhance "cultural education" with the added advantage of having a way for communicating directly with people around the world. In one of the participants' terms, cultural education indicates that "…you know what people from the rest of the world think, how they behave…these are things you cannot find in the school books."

On the other hand, some of these changes were not seen as favorably by a number of interviewees. For example, three respondents were concerned about the reduction of social exchanges that the new means of communication (chatting and email) were bringing into the lives of Syrian people. Samer hoped that computers "will not isolate us by locking us within their domain away from family kinships." Two other participants were disappointed that Arabic has limited presence on the Internet compared to the other main languages. Kareem complained, "I cannot believe that Arabic …with all the large number of people speaking it… has such shy

presence on the Internet…to me this means less advantage of this tool for Arab people in general and Arab students in particular."

More disconcerting to most of the participants was the immoralities that the Internet is bringing into the Syrian culture, even though their effect may encroach on only a limited audience. As Omar stated, "I do not think though that immoral websites affect rational people. Only corrupt people will be affected by such things." A reiterated assertion was that "if one is confident of himself, nothing like that will affect him…I myself won't care about these websites even if they were to multiply hundred times…" Most of the participants were particularly worried that the increased proliferation of immoral websites may negatively influence younger generations through the promotion of inappropriate adult material and the incitement of "loose manners" and "degenerate behavior." Hence, they urged that children should never use the Internet on their own. For example, Zahra remarked, "My deepest fear is about my children. I cannot overcome the fear that one of my children would reach one of these awful websites. This is my only complaint about the use of the Internet. One has always to be on the alert when children are using it." To some participants, allowing these culturally inappropriate websites to appear for the common Syrian people is just another way of facilitating cultural invasion. As Ali indicated, "it seems there are people who are dedicated to spreading immorality…I really do not understand what the point of this is (…)…what we can do is to forbid these websites…else we would be aiding this form of cultural invasion."

When asked whether an Arab-made computer would make any difference, most of the participants indicated that an Arab-made computer would be safer insofar as morality issues and children are concerned. In addition, "an Arab-made computer would serve better Arabic customs and values," one of the interviewees commented. Nonetheless, participants were not sure as to how an Arab-made computer would look like. For example, Ali mentioned, "We have to create something that reflects our ethics and rules of conduct… I myself do not know how this would be achieved, but there should be some people who can deal with this issue." More essential to many participants was the creation of Arab-made software that reflects the needs and character of the Arab people. Added to this are "awareness programs about what is useful to our people and what is not…" These measures might alleviate, but not necessarily eliminate, the effects of the new technologies, for any new invention might be re-oriented to serve morally damaging purposes. As Kareem commented, "Intruders and saboteurs always try to ruin and destroy good things. If an Arab invented a different computer, another Arab may find a way to corrupt it."

To investigate teachers' views about the cultural non-neutrality of computers, the researcher asked participants about their reactions to the statement, "Computers are said to reflect the values and ways of thinking of those who make them." The statement provoked a variety of reactions amongst participants. Three of the participants simply disagreed with this statement and tried to avoid (or failed to provide) any further explanation for their response. Two of them contested this statement on historical grounds. For example, Kareem argued:

> *We cannot simply say that computers are developed by a certain people or for a certain people since the computer industry has evolved through the contribution of people from different ethnic backgrounds…just like we cannot say that the writing system reflects the mentality of Arabs who invented it, or that mathematics reflects the values of Indians who were the first people to use it. What counts is the user and how he uses these things according to his own purposes.*

The remaining ten participants agreed hesitantly to the statement, but indicated that it is not the computer itself that is value-laden but the applications that the user chooses. In other words, it is the user who decides how to use the computer and to infuse it with his/her own values. For

example, Hala stated "the computer as a tool is like any other machine. It can be employed in whichever manner the user wants and in accordance with his own ethics and values." Typical of Hala's assertion, most of the teachers' responses seemed to subscribe to the discourse that it is humans who manipulate computers and dictate their values depending on how they put them to use. However, this explanation is arguable given that teachers were explicit about the need for Arab-made computers, culturally appropriate software, and awareness programs. It seemed that participants had vague perceptions of this concept itself, yet they had no full awareness of its meaning or implications.

Insofar as the school culture is concerned, most of the interviewees suggested that if computers were to be used in teaching, the Department of Education should prepare programs that educate students "morally and culturally" about the improper material on the Internet. Ali remarked, "We cannot expect students to take responsibility for their own behavior. Most of them may be introduced to computers at a stage where they cannot make informed judgments about the value or dangers of what they see." Ali further explained, "I would like to have computers used on a wider scale in education provided that this step would be well calculated and planned, especially when matters of supervision and guidance for students is concerned." Other participants indicated that teachers using the computer in the classroom or even teaching about it should know how to use it effectively and wisely in accordance with Arab students. As Hala stated, "…the teacher is still important to guide students as to where to go, warning them of harmful or misleading websites… Unless the teacher herself is able to evaluate the Internet material, she cannot guide her students during their access to the Internet…she cannot make effective use of it, either." Clear as it is, Hala's account externalizes and echoes the apprehension that most of the teachers felt about the culturally improper aspects of ICT. It seems that the cross-cultural benefits of ICT were moderated in the participants' eyes by the more serious apprehension about the morally damaging effects of Internet-related material.

DISCUSSION

While the computerization of schools in developing countries is gaining more and more momentum, little attention is paid to the cultural challenges to this process or, more basically, to the cultural perceptions of the end-users toward it. The technological discourse abounds with calls for training teachers, endowing them with technological competencies, and giving them more access to different technologies. Yet, only a few studies, if any, have tried to examine the educators' cultural perceptions toward the new tools. Rockman (2000) contends:

> *If schools have access to the Internet and there are computers in reasonable numbers, we also need to know that the teachers are prepared... Further, we must also have a culture that encourages and supports the use of technology for teaching and learning (p.3).*

Zhuang & Thomas (1987) warn that importing a technology into developing countries without enough understanding of the home culture can result in an incompatibility between the technology and the culture and eventually raise resistance among the indigenous end-users to the technology. Similarly, Thomas (1987) and Rogers (1995) emphasize that potential adopters may resist a technological tool because it may not fit within their macro- or micro-cultures. Both note that, despite their indisputable importance, cultural conditions and/or social norms have not been sufficiently studied in the innovation-diffusion research. This may be related to the difficulty involved in capturing this construct. To be researchable, cultural perceptions was delineated in this study to mean Syrian teachers' perceptions of the value, relevance, and impact of ICT as it relates to the cultural norms in Syrian society and schools. Even with this focused definition, the use of both quantitative and qualitative measures was still necessary for pinpointing this construct.

Findings from the current study suggest that teachers have positive perceptions about the relative importance of ICT within their school culture(s). Thus, the majority of survey participants perceived that computers should be a priority in education given that students need to know how to use computers for their future jobs. This rationale seems to resonate with the common rhetoric behind the entry of ICT into the field of education: "Schools must prepare students with the new skills and ideas that are needed for living and working in a digital society." (Resnick, 2002: p.5). A report from the North Central Regional Educational Laboratory states that "Technology is transforming society, and schools do not have a choice as to whether they will incorporate technology but rather how well they use it to enhance learning." Obviously, the participants' support of ICT presence in their schools does not go along with the common conception of teachers as antagonists to change in their practice (Watson, 1998). Nonetheless, participants were emphatic about the importance of equipping potential technology users among teachers and students with the basic skills to ensure the success of their ICT experience.

The survey data showed that, although most of the participants saw ICT as appropriate for the Syrian society, many of them indicated that computers are proliferating too fast and that there are more important social issues to be addressed before implementing ICT in education. It seems that balancing resource allocation among the competing areas of need in developing countries is a critical issue. The discrepancy in developing countries lies in that, while lacking in financial and human resources to invest in computer technologies, they still need to face the greater demand of keeping pace with the technologically developed countries. According to Harvey (1983, p. 266), "there is a rapid extension of information and data dissemination processes in the industrialized nations that threatens to push Third World countries even further behind their more developed sister states…" This dilemma threatens of a digital-divide on a national scale that would further polarize the world on a technology have/have not basis.

The interviews showed that while participants were slightly positive about the cross-cultural and cultural effects of ICT, they were apprehensive about the morally and culturally inappropriate aspects of ICT, and particularly the Internet. In fact, participants were concerned mainly about websites that spread immorality among children and "some corrupt people." Hence, some of them saw that children and students in particular should never use the Internet unattended. This last concern has been voiced in different parts of the world as well (e.g., Armstrong & Casement, 2000; Al-Oteawi, 2002; Alliance for Childhood, 2000). According to a statement made by the Alliance for Childhood (2000), "Too often, what computers actually connect children to are trivial games, inappropriate adult material, and aggressive advertising." It was for the above reason that most of the respondents were hoping for the creation of "cultural and ethical" awareness programs. This type of programs might make less the effect of the immoral and culturally inappropriate material on the Internet. The alarmist outlook through which a few respondents saw the effects of such websites was expressed in a fear of cultural invasion. Undoubtedly, cultural invasion is made easier and more effective through the new telecommunication channels opened up by various modern technologies, and teachers' apprehension may reflect this fact. Freire (1972, pp. 121-22) warns of the consequences of cultural invasion: "Cultural conquest leads to the cultural inauthenticity of those who are invaded; they begin to respond to the values, the standards, and the goals of the invaders." This concern has been reported by researchers from other parts of the Arab World (e.g., Al-Oteawi, 2002).

A less frequently voiced concern was about the under-representation of the Arabic language on the Web, which lowered the value that the Arab people can obtain from this tool. Many researchers have pointed to the shortage of Arabic Internet applications and web content, and warned of their limiting effects on the expansion of Internet usage in the Arab region (Gary, 2001; Loch, et. al, 2003). Though categorized among the five most widely spoken languages in the

world, Arabic ranks 20th in terms of web content with less than 1% of the world's overall Internet users coming from the Arab World (Dewachi, 2001). In view of the above inadequacies, "the major questions for educators with respect to technology would be whether the technologies are so thoroughly saturated with cultural biases that they must be changed or resisted more energetically and fully than other aspects of education" (Damarin,1998, p.12).

In both the surveys and the interviews, most of the teachers responded that they would prefer Arab-made computers that reflect the Arab customs and values. It has often been noted that people who have not been quite influential in the design and development of ICT would prefer a localized version of these technologies (Damarin, 1998). This is quite explicable since the current computer technologies fall short of serving the cultural and learning needs of "other nondominant cultures" (Roblyer et. al., 1996: p. 9). In fact, participants in this study were less concerned about the computer itself and more about its related programs and software. They were particularly emphatic about the need for Arab-made software that integrates the values, ethics and way of thinking of Arab people. This demand seems to resonate with Fodje's (1999) argument in the International Conference for Technology in Education:

> *What the world needs today is not talent in producing new technologies but talent in understanding the impact of technology on the society and individuals…Educational programs in the third world heretofore have been designed around the Western ideals. These need to be reworked to reflect the indigenous cultures and promote human values while at the same time producing the talent for 'controlled' technological advancement.*

Obviously, the creation of local computer applications and software may help in the initial cultural acceptance of ICT as well as future behavior regarding its usage.

What should not go unnoticed is that the majority of the interviewees expressed little concern about the cultural non-neutrality of computers; they thought it is the user who ultimately determines how these tools are used. Although it seems attractive to suggest that teachers endorse the instrumentalist argument (that it is humans who decide how to put technology to use, for good or ill), the interviews showed that teachers were not aware of the non-neutral aspect of technology. This affirms Bowers' (1998) apprehension over the global unawareness about the cultural non-neutrality of ICT. As Bowers puts it, "…neither the computer industry nor educational policy makers understand the cultural mediating characteristics of computers" (p. 49). Unfortunately, people from different countries have often accepted technological innovations as neutral tools (De Castell et al., 2002). De Castell et al. cite Penley and Ross (1991) arguing:

> *We fully recognize that cultural technologies are far from neutral and that they are the result of social processes and power relations. Like all technologies, they are ultimately developed in the interests of industrial and corporate profits, and seldom in the name of greater community participation or creative autonomy (p. 10)*

The sensitivity of this issue suggests that teachers need to be informed about the value-laden aspect of ICT and how to adjust its functionality in accordance with their cultural character. Harvey (1983) warns that "computerization cannot be allowed to become a new form of cultural imposition — neocolonialism is not acceptable even in an automated package" (p. 269). Apparently, the non-neutrality aspect of ICT requires special awareness on the part of educational planners in developing countries, who might need to find local solutions to this problem.

Overall, the participants' reservations about the above aspects of ICT might be interpreted within Hofstede's general cultural communication model (1997), which suggests that the values and practices of a certain culture or organization provide the lenses though which a person perceives, discerns, and constructs meaning. As members of an educational system embedded in a larger

cultural context, teachers approach ICT through this cultural framework. The findings of this study go along with Rogers' premise about the decisive role of social norms in the diffusion of innovations, and also with Thomas's "Cultural Suitability" hypothesis, which posits that the acceptance of a new technology depends to a large extent on its compatibility with the existing culture. The fact that the participants acknowledged the importance of ICT for their educational system and society, yet simultaneously aspired to modify its functionality in accordance with their cultural values, reflects the influence of their cultural norms on their perception of ICT.

CONCLUSION

While the study of teachers' cultural perceptions is a global need, it is more so in developing countries, being at the receiving end of the computerization process. Researchers have pointed to teachers' cultural perceptions as one of the main factors influencing ICT adoption (Chen, et. al, 1999; Loch, et. al; 2003; Straub, et. al., 1997). Findings from the current study support this conclusion. The participants' enthusiasm about the advent of ICT into their schools seems to be conditional; different cultural issues have to be resolved before the new tools are fully accepted. Although teachers supported the entry of ICT into the school system, viewing it in the light of the global demands for technologically capable generations, they simultaneously expected a careful plan that would take into account preparing teachers and students for this innovation. Likewise, the advent of ICT into Syrian society was welcomed by participants, who were nonetheless cognizant of other social needs that might be overlooked in favor of computerization, and were additionally apprehensive about the immoralities that the Internet might bring into the Syrian culture (through the promotion of improper adult material as well as the incitement of "loose manners" and "degenerate behavior"). Besides, teachers urged for the creation of Arab-made computers and software that would reflect Syrian values and better serve Syrian culture.

Teachers' apprehension about the culturally inappropriate materials on the web and their unwelcome effects on Syrian children and students should receive its due attention on the part of the Ministry of Education. The Ministry might need to employ Internet content blocking systems, apply strict rules about Internet use, and/or implement awareness programs in schools. Such steps might alleviate the teachers' concerns and simultaneously motivate them to use ICT in their classrooms with the least amount of anxiety. It is also incumbent upon teachers themselves to increase their awareness of this issue in order to be able to guide students during their access to the Internet. Another important step toward assuaging teachers' cultural concerns is the creation of software and programs that are congruent with the Syrian character, values, and customs. Such software may depart from the common ideals promoted explicitly or implicitly in common Western software (such as individualism, materialism, competition, ownership, etc.) and focus more on indigenous values, such as kinship relationships, spirituality, cooperation, empathy, and sharing. Such undertaking should attract future researchers, who might explore teachers' cultural perceptions in the light of these changes.

While the findings shed some light on teachers' cultural perceptions of ICT in one developing country, their implications are significant to other educators in similar educational contexts. The findings bring to light the main concerns voiced by many technology experts about the current cultural challenges to the implementation of educational technology in developing countries (Bowers, 1998; Loch, et. al., 2003; Chen et al., 1997; Straub, et. al., 1997). At the same time, they raise questions about the potential direction of educational technology in developing countries, given that most of these countries are not technically capable of producing local technologies that would better serve their own needs, purposes and circumstances: How can technology be implemented with maximum educational value and minimal negative effects on the indigenous cultures? What measures are needed for developing countries to "indigenize" these

tools? And how can teachers be culturally and educationally prepared to put these tools to ends commensurate with their national and school cultures? These and similar questions should be taken into account by those involved in ICT implementation in developing countries.

Note:

The word "computer/computers" in Arabic often refers not only to computers but their related technologies (software, Internet, etc.). Therefore the word "computers" in the questionnaire refers to ICT in general.

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