Understanding cultural and national identity in teleworking and electronic communication

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Abstract

The goal of this research project is to study the computer mediated interactions between teams and individuals from extremely diverse cultural and linguistic backgrounds. In particular, the study aims at determining the sets of activities, behaviors and attitudes that are most conducive to positive or successful computer mediated cross cultural interactions between teams from highly diverse cultural and linguistic backgrounds. The research question is addressed by a project where representative groups from populations of Jordan and Norway interact together in computer mediated environments. The participants are second year students majoring in Computer Science from Jordan University of Science and Technology in Jordan and Bergen University in Norway. The data on which this study is based consists of two parts. The first part was collected through questionnaires measuring technology attitude, personality, and feeling of team cohesion among group members. The second part consists of records of online chatting between the members of the Jordanian and Norwegian teams on predetermined topics. The results suggest that there would appear to be some cultural differences between the subjects from Norway and Jordan. The main difference would appear to be linked with early family life and experience. Obviously this was a preliminary study but the results do suggest that online cultural differences might be linked to differences in family structures and behaviors and not necessarily to differences in education or language.

Keywords: teleworking, electronic communication, cultural diversity, computer attitudes, chatting, foreign language.

1 Introduction

Much of the existing literature on computer based interaction in online distance learning (ODL) and computer supported cooperative working (CSCW) is based on scenarios which involve individuals with a common culture or a common
language. It can be argued that even those studies which have involved cross-cultural interactions, for example the Copernicus projects within the European Union (EU), have enforced what we will call a "Single Language Single Culture" (SLSC) medium. In such SLSC environments participants are restricted to using a computer mediated system in a particular way, which is culturally biased towards the culture of the designers of the system in terms of direction of written text and icons used for actions. Furthermore, participants are usually forced to interact and "think" using a single language which may or may not be their own mother tongue. Such scenarios give native English speakers an advantage, and this is often shown in terms of higher scores and "superior" performance indicators. In comparison, very little research has been performed to investigate the factors involved when the culture and language of collaborators are dramatically different. Investigations into computer mediated interactions between dramatically diverse cultures and languages are felt to be important because as the world becomes increasingly connected by data and communication networks, the future of computer mediated human-human interaction in both education and teleworking will involve collaborations between individuals and teams from increasingly diverse cultural and linguistic backgrounds.

There has been a considerable body of research conducted on learning or acquiring cultures within the fields of psychology, sociology and anthropology. Some of the more recent studies have looked at the role of learning in relation to new technology [9]. These works propose that some of the fundamental tools for cultural indoctrination within a society are the very things found in computer systems. Things such as the use of games, textile patterns and interactive devices. Researchers have recognized that these are the very things that make computing a culture of its own [5] and make computing so addictive to many individuals [8]. Some researchers have even proposed that computing has changed our perceptions of reality and continues to do so [3]. Terms like 'Virtual reality' have now been commonly adopted into western technological cultures, where they would have been quite outside such shared 'cultural reality' only 20 years ago.

Some of the earliest work in the area of designing computer communications technology for undeveloped cultures investigated how different cultures handled technological innovation [9]. These studies found that there was no consistent way in which cultures reacted to changes to technology, but rather each reacted in a unique and unpredictable way, depending on factors such as geographical position, wealth, education, environment and culture. There are more applied suggestions for the design of computer interfaces [9], but these concentrate on rather superficial changes to the medium and do not attempt to support or respect different cultures. In a similar way, some researchers have developed some simple guidelines for the minor changes to the ergonomic design of computer systems required by these populations [11]. More recently researchers in the field of media advertising have investigated the methods of advertising to different emerging cultures. In addition to the research being conducted on how to design effective advertising campaigns, there are companies providing
expertise on the many business issues involved with these emerging cultures and their huge populations of potential customers [2]. The European Union 'Erasmus' program of funding has produced several Masters degree education programs aimed at training business executives on the cultural differences they can expect to find when doing business with emerging countries [6]. In contrast, there is currently little research being conducted into assessing the likely cultural impact of this new technology on the existing ancient cultures of native indigenous peoples. Such a study of the attitudes of indigenous people towards these new mediums and the likely impact of the new technologies would form part of this study.

All the problems that we have discussed with regard to technological change are multiplied when we consider technological introductions into less developed cultures. There are many examples where technological introductions into less advanced cultures have produced social and economic disasters for the indigenous peoples [10]. Thankfully there is now recognition, at least among academics, that when dealing with less technologically developed cultures, there is a vital need to respect the local value belief systems [8]. If this is not done then the consequences can be drastic changes to parts of the social structure. Researchers who have specialized in this area of technological introduction have reported that no aspect of the culture is immune when more advanced technology is introduced into these less technologically advanced societies. Even the political culture is influenced by technology and innovation [8]. In order for the introduction to be successful, seven components have been identified to be vital to effective future development. They are need identification, appropriate resources, correct technology, social conscience, integrity, attitude and problem solving [1]. However, we should not think that the role of new technology is all bad, technology has been shown to break cultural biases that exist in communities [4]. On a more practical level, researchers who have investigated how to change negative attitudes towards technology in less advanced cultures have found that the school teachers attitudes are vital in determining their students own attitudes towards new technology [7]. It is interesting to note that this finding is identical to that reported as the determining factor for computer phobia.

We have reviewed the existing literature on technology and its affects on the development and education of the individual. We have seen that technology has a huge affect on the self-image that each of us possesses and how we interact with the world around us. When our whole environment is pervaded with advanced technology, we need to work not just for communication systems which are easy to use but also communication systems which project a positive self image on users from all cultures who come into contact with them. This issue is the focus of this study, where we will investigate and determine those factors which lead to successful cross-cultural communication using these new technologies.

2 The study

The goal of this project was to study the computer mediated interactions between
teams and individuals from extremely diverse cultural and linguistic backgrounds. In particular, the study aimed to determine the sets of activities, behaviors and attitudes that are most conducive to positive or successful computer mediated cross cultural interactions between teams from highly diverse cultural and linguistic backgrounds. The research questions were to be investigated through a project where representative groups from Jordan and Norway interact together in computer mediated environments. These questions were addressed in a controlled manner which permits the systematic manipulation of the cultural differences represented among the subject populations available. This allows our experimental conditions to closely match the set of real-world situations faced by international commerce and education. First, we identified the sets of characteristics in pre-exposure surveys which we find reported as being associated with positive or successful interactions in the computer based communication. Then, we determined those sets of behaviors and attitudes which were felt by all participants to be directly involved in successful cross cultural computer based interaction.

2.1 Participants

The participants in this study were two groups of second year university students majoring in computer science. They come from two countries which are extremely different linguistically and culturally. The first group consists of 19 students from Jordan University of Science and Technology in Irbid-Jordan. Their mother tongue is Arabic, but they studied English as a foreign language for at least eight years at school. In addition, they have to take one, two, or three courses in English for science and technology at the university level depending on their score in the university English placement test given to all first year students. Moreover, most of their university courses involve a lot of English specially their computer courses in which all the programming is done in English. The second group consists of 11 students from the University of Bergen in Bergen-Norway. Their mother tongue is Norwegian, and they study English as a foreign language for at least 5 years at school. Although some of their textbooks are in English, most of the instruction they receive and all the programming they do is in Norwegian.

It should be mentioned that all the participants reported that they are familiar with using computers since they have to use them for their courses and with Microsoft Hotmail MSN Messenger since they use it for chatting in English in their own time. It is also worth mentioning that the two countries to which the participants belong; Norway and Jordan, are extremely diverse culturally. Jordan is a third world country in the Middle East with Muslim traditional population who speak Arabic, while Norway is a Scandinavian industrial country with Christian or unaffiliated liberal population who speak Norwegian. However, in both countries English is taught and used as a foreign language.

2.2 Design of the experimental method

The experimental method was designed to control observation of interactions
between teams of individuals from diverse linguistic and cultural backgrounds. The participants were given a clear idea about the study and responded to three questionnaires on personality, technology attitudes and team cohesion before they interacted with their counterparts. The interaction between the two teams took place in two computer mediated communication laboratories in which Microsoft Hotmail MSN messenger software was available, and the communication was through chatting in real time.

2.3 Pre-experimental measures

These measures include administering the following questionnaires to the Jordanian and Norwegian participants before they interact with their counterparts.

1. Technology attitudes questionnaire:
This questionnaire is divided into two parts. The first part consists of 22 questions dealing with the participants background and their feelings towards using items which involve technology e.g. computers, cars, stereos etc. The second part consists of 7 questions on early experiences with items involving technology. The items in the two parts require responses on a five-point scale.

2. Personality questionnaire (Thomas Killman’s Conflict Inventory):
This questionnaire was designed to investigate how the participants deal with conflict. It consists of 30 items each consisting of two statements from which the participant has to choose the one which best describes his feelings or behavior.

3. Team cohesion questionnaire:
This questionnaire is divided into two parts. The first part consists of 9 items dealing with the participants feelings and their personal involvement with their team. The second part of the questionnaire consists of 9 items dealing with the participants’ perception of their team as a whole. The items in the two parts require responses on a five-point scale.

It should be mentioned that all the questionnaires were in English and were piloted on 20 students from Amman University then modified according to the students’ responses. The modifications included simplifying the vocabulary used and the scale. The new versions of the questionnaires were piloted again before it was administered to the Jordanian and Norwegian participants prior to their interaction with their counterparts.

2.4 Experimental session measures

Two computer mediated communication laboratories were assigned one at the University of Science and Technology in Jordan and one at the University of Bergen in Norway. These laboratories were equipped for the use of Microsoft Hotmail MSN messenger software. The computer mediated communication using Hotmail MSN messenger in the two laboratories was tested several times.
by the researchers and their assistants before the participants used it for online communication. In fact, the researchers themselves used Hotmail MSN messenger to discuss conducting the experiment.

2.5 Conducting the experiment

The computer laboratories in which the experiment was conducted were set in both Jordan and Norway, and the Hotmail MSN messenger software was ready to use. The students in the two countries were assigned special Hotmail accounts and given a special password. The researchers in the two countries and their assistants established the connection and did the invitation for the interaction. Each participant was given a set of instructions on how to proceed in the interaction and the researchers and their assistants provided help when needed. The two teams were divided into twelve groups, eight each consisting of one Jordanian and one Norwegian, and another four each consisting of two Jordanians and two Norwegians.

2.6 Task

Which of the following things do you regard as necessary, which not? Which of them are important for people living in a foreign country? What else might be important for them? Give reasons.

Public schools
Private schools
Free language classes to enable foreigner's children to succeed in school
Right to choose one’s own education
Public libraries
Right to choose or change a job
Free radio, TV + press
Radio and TV programs in foreign languages
Free access to information
Privacy of the post
Active and passive right to vote for everyone living in the country
Right to join and found activist groups and political parties
Right to visit and found places to practice religion (churches, mosques etc.)
Subvention of public transport
Right to choose the place to live
Freedom to travel
The interaction lasted among each team members for one hour. The script of the interaction was saved on floppy disks and printed so that the interaction can be analyzed.

3 Data analysis

The data analysis involved applying both qualitative methods and quantitative statistical methods. We analyzed the responses of the Jordanian group and the Norwegian group to the questionnaires on Technology Attitudes, Early Life Experiences, Thomas Killman’s Conflict Inventory, and Team Cohesion. The responses of each group were analyzed first separately, and then the responses of the two groups were compared.

The online chats between the Jordanian and Norwegian participants were divided into chat logs each consisting of one utterance which could be a word (e.g. hi), a phrase (e.g. always on time), a sentence (e.g. what is your name?) or more than one sentence. Those chat logs were classified into six types of conversation acts, which are: initiating conversation, passive response, active response, clarification request, no response, and misunderstanding.

A Pearson correlation was performed on the study data using MiniTab Version 13.32. The Jordanian and Norwegian participants’ responses to the items used in various questionnaires were correlated with each other, then with the types of conversation acts they used in their online communication. The correlation was performed to the data obtained from the Jordanian subjects separately from that obtained from the Norwegian subjects, then the results were compared.

It should be mentioned that although 30 subjects participated in the study, not all subjects completed all aspects of the questionnaires or online recordings because the participation was voluntary.

4 Results and discussion

The following correlations were found at the 0.05 significance level or better.

4.1 Impact of childhood and family life on later technology attitudes and proficiency

The results showed that childhood experiences affect adult technology attitudes and behavior as can be seen in (Table 1).

The figures in (Table 1) provide a clear evidence of the importance of childhood experiences in forming adult technology attitudes and behavior. It is obvious that those individuals who were given encouragement to explore machines and technology when they were children were significantly more likely to be confident and positive towards technology in adult life. For example, the item (I used to help my family repair equipment when I was a child), from Early Experiences Questionnaire, correlated with (1), (2) and (3) in the table above such that subjects who helped around the home as children were more likely to
have an independent learning style, to enjoy finding out how things work, and to like working with machines in their adulthood. It also correlated with (4) and (5) such that if children were encouraged to help out around the house, they become more independent and competent with technology in their adult life. In addition, it correlated with personality score such that working with one’s family when as a child is more likely to make the person a “team player” in later life.

Table 1: Impact of early childhood and family life on later technology attitudes and proficiency.

<table>
<thead>
<tr>
<th>Technology attitudes and proficiency</th>
<th>Pearson Correlation with early childhood</th>
<th>Probability</th>
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</thead>
<tbody>
<tr>
<td>1. Independence of learning style</td>
<td>-0.559</td>
<td>0.024</td>
</tr>
<tr>
<td>2. I enjoy finding out how things work.</td>
<td>0.477</td>
<td>0.062</td>
</tr>
<tr>
<td>3. I like to work with machines.</td>
<td>0.596</td>
<td>0.015</td>
</tr>
<tr>
<td>4. I like to repair machines.</td>
<td>0.689</td>
<td>0.003</td>
</tr>
<tr>
<td>5. I prefer to use the computer myself rather than have someone else use it for me.</td>
<td>0.689</td>
<td>0.003</td>
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</table>

Other items which have to do with family encouragement to explore machines include (my family made sure that broken equipment was repaired quickly) which correlated with (4). They also include (I was encouraged to explore how machines worked) which correlated with (3) and (2) such that subjects who were encouraged as children to explore how machines worked are more likely to enjoy finding out how things work as adults.

On the other hand, negative experiences with machines as children are likely to increase negative attitudes towards technology in later life and reduce overall technical ability when the person reaches adulthood. For example the item (I was at least mildly hurt by a machine in my childhood), from Early Experiences Questionnaire, correlated with (I dislike hobbies or activities which involve working with tools or equipment), (I dislike repairing machines) and (computers are too complicated for me to understand), from Technology Attitudes Questionnaire. It is clear that although it is a positive trait to encourage children to explore how machines and technology work it is extremely important that they do not have any negative experiences.

### 4.2 Self confidence and behavior using new technology

The analysis of the online communication between the Jordanian participants and the Norwegian participants provided a strong evidence that real world personality traits and behaviors were carried over into computer based communications. Although this could be expected, very little work has been done previously to empirically demonstrate that. For example, (Initiating conversations), from the chat logs, correlated with (independence of learning style), (I enjoy finding out how things work) and (I enjoy hobbies or activities which involve doing things in a specific order), from Technology Attitude Questionnaire. It is clear that subjects who initiated most conversations in online communications were also significantly more likely to have more independent learning styles, more interested in finding out how things work and enjoy
hobbies or activities which involve doing things in a specific order. Also (I think computers can help me work better) correlated with (I want to be good at whatever I do). These correlations show that there was good internal consistency (reliability) within the data set. This is a positive indication that the subjects responded honestly and reliably throughout the surveys.

As for the scores from Thomas Killman’s Conflict Inventory, it was found that a compromise score correlated with (Technology Attitudes Questionnaire) such that people who take a compromising communication style from the Thomas Killman’s Conflict Inventory do not take a computer subject because it will improve their work performance, and further they do not want to be good at whatever they do. This could be indicating that these subjects do not want to be exceptional and, instead, wish to blend into the group. This behavior would match the “compromise” score from the Thomas Killman’s Conflict Inventory.

It was also found subjects with a “Competitive” score from the Thomas Killman Conflict Inventory were in the category of “initiating conversation” in their online chats. This would match closely with what would be expected from competitive communicators. On the other hand, subjects with the most passive communication style received the most requests for clarification during online chat communications.

All of these correlations give strong indications that we have a good quality data set with reliable and valid answers.

4.3 Cross cultural differences

The comparison between Jordanian and Norwegian participants’ responses to the various questionnaires and the correlations of these responses with their online communications revealed the following cross-cultural differences.

Table 2: Aspects of Norway-Jordan cross-cultural differences in online communications.

<table>
<thead>
<tr>
<th>Aspects of Norway-Jordan differences</th>
<th>Pearson Correlation</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Independent learning styles.</td>
<td>0.332</td>
<td>0.073</td>
</tr>
<tr>
<td>2. Taking computing subject because it lead to a better job.</td>
<td>-0.712</td>
<td>0.000</td>
</tr>
<tr>
<td>3. Being concerned with damaging the computer.</td>
<td>-0.337</td>
<td>0.069</td>
</tr>
<tr>
<td>4. Preferring humans to computers.</td>
<td>-0.622</td>
<td>0.000</td>
</tr>
<tr>
<td>5. Being concerned about looking silly when making a mistake while using the computer.</td>
<td>-0.560</td>
<td>0.001</td>
</tr>
<tr>
<td>6. Being concerned about looking silly if seen not knowing how to use the computer.</td>
<td>-0.416</td>
<td>0.022</td>
</tr>
<tr>
<td>7. Being encouraged to explore how machines worked as a child</td>
<td>-0.561</td>
<td>0.024</td>
</tr>
<tr>
<td>8. Initiating conversations in computer based chats.</td>
<td>-0.256</td>
<td>0.263</td>
</tr>
</tbody>
</table>

The data indicates that Jordanian participants had more independent learning styles. It also indicates that Norwegians are more likely to be taking a computing subject because they felt it leads to a better job, they are less concerned with damaging the computer and prefer humans to computers. However, they seem to be more concerned about looking silly if they make a mistake while using the computer or if they were seen not knowing how to use the computer. In addition,
the data indicates that Norwegians were less likely to have been encouraged to explore how machines worked when they were children and were less likely to initiate conversations in computer based chats.

5 Conclusion

From these results there would appear to be some cultural differences between the subjects from Norway and Jordan. The main difference would appear to be linked with early family life and experience such that subjects in the Jordan group received more parental encouragement to explore technology and machines in their childhood. This has resulted in more positive attitudes towards technology in later life and more independent behavior in using online communication. Obviously, this was a preliminary study but the results do suggest that online cultural differences might be linked to differences in family structures and behaviors and not necessarily to differences in education or language.

References