

# An Evaluation of Sociocultural Data for Predicting Attitudinal Tendencies

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**Abstract.** Cultural profiling involves a complex interplay of multiple dimensions that are virtually impossible to wholly address. This paper explores several cultural (nationality and its associated Hofstede dimensions, religious beliefs), and demographic (gender, age) variables to evaluate if each of these are good candidates for predicting behavioural as well as cognitive attitudes related to computer use and learning activities. Results indicate that each variable taken individually will lead to limited success in attitudinal predictions. Several combinations of variables however could allow an interesting degree of prediction.

**Keywords.** Cultural Adaptation, Human Factors, Learner Modelling.

## Introduction

Culture has just recently begun to be addressed by the AIED and HCI communities [2, 7, 17]. It is recognized that culture strongly affects many elements related to research on human-centred systems. For instance, Mesquita and her colleagues [13] have noticed that in the literature on affect and culture, affective antecedents (events or objects that trigger an affective phenomenon), subjective experience, appraisals, behavioural responses, and even physiological changes related to an affective experience are reported to differ across cultures. Some affective phenomena also appear to occur more frequently in some cultures than in others. Such findings as well as results of several ethnographic studies led Mesquita et al. to conclude that it has been “*convincingly demonstrated that there are cultural differences in the ecology of emotions*”.

Regarding pedagogical issues, it has been shown that locally-tailored teaching practices frequently result in greater learner motivation and achievement than western-based paradigms [1]. Using culturally inadequate methods can even lead some learners to reject or prematurely quit a learning session [19]. Attitudes toward testing [4], reward allocation [6], and management of intrinsic interest for a learning task [5] are also known to be culturally-sensitive.

Two approaches considering the development of Culturally-Aware Tutoring Systems have recently emerged, one focusing on teaching intercultural skills to learners [10, 12, 16] and a second approach discussing ways to develop cultural adaptation [3, 18]. This paper discusses one of the most crucial issues faced by the latter case i.e. , addressing the socio-cultural identity of learners.

Since so many elements could be related to this issue, using a holistic approach appears to be hopeless. Rather, researchers in many disciplines have used easy-to-assess features such as nationality or religion, or discreet models of culture such as the “systems of values” approach [8, 9]. Because cultural focus is a recent issue in AIED, few studies have discussed whether these elements are effective predictors for AIED-related behaviours, preferences and attitudes. The present study describes results of an evaluation to address this question.

In section 1, we introduce Hofstede’s framework [8, 20] and its related dimensions, one of the cultural features we chose to evaluate. In section 2, we describe the evaluation as well as the method of data collection and analysis. Results are presented in section 3 and discussed in section 4.

## 1. Overview of Hofstede’s National Values Framework

National Systems of values [8, 9, 20] refer to the idea that national cultures could be modelled in terms of a limited number of basic dimensions. It is aimed mainly at describing tendencies that are likely to be endorsed by members of a given nation. Several such systems exist, Hofstede’s work being the most frequently referred to over the last 30 years [11]. The following bipolar dimensions are mentioned in Hofstede’s framework:

- **Power Distance (PDI):** *“the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally”* [20].
- **Individualism (IDV):** *“the one side versus its opposite, collectivism, that is the degree to which individuals are integrated into groups”* [20].
- **Masculinity (MAS):** *“refers to the distribution of role between the genders”* [20].
- **Uncertainty Avoidance (UAI):** *“deals with a society’s tolerance for uncertainty and ambiguity”* [20].

A fifth dimension, **Long Term Orientation (LTO)**, referring to the interest for “*virtue regardless of truth*” [20], was added later and is not considered in the present study due to lack of data.

## 2. Method

An online questionnaire was developed to assess how people use computers in their daily lives as well as their attitudes towards learning and their learning behaviours. A snowball sampling method was used to recruit participants. The original sample included 264 respondents from around the world. Due to missing responses to some questions we filtered the data separately for gender, nationality, religion, and the Hofstede dimensions to maximize our sample size. The low sample size only allowed us to consider the effects of each factor (e.g., gender) separately rather than being able to examine the joint effects of these variables in a single analysis. We used ANOVA and MANOVA procedures to study group differences and bivariate correlations to investigate the effects of age and Hofstede dimensions on responses to questions.

There were 41 questions concerning attitudes and behaviours related to learning in general and on-line learning in particular (Table 1).

**Table 1.** Questions regarding attitudes towards learning and learning behaviours.<sup>1</sup>

Index	QUESTIONS	Significant?	Tab.3	Tab.4
1	I consider the scientific approach to be the best.	Yes		
2	I am more of a listener than a speaker.			Yes
3	In a debate, I strive to achieve mutual agreement	Yes		Yes
4	I think that almost everything can be analyzed			
5	I have a good knowledge of how computers work (technical view).	Yes		Yes
6	I have a good knowledge of how to work with computers (user view).	Yes		
7	I am skilled at surfing on the Web.	Yes		
8	I trust reason rather than feelings.	Yes		Yes
9	My actions are frequently influenced by emotions	Yes		Yes
10	It's difficult to get me excited or make me lose my temper	Yes		
11	I am inclined to rely more on improvisation than on careful planning	Yes		
12	The process of searching for solution is more important to me than the solution itself			Yes
13	I like to keep a check on how things are progressing	Yes		Yes
14	I trust e-Commerce services (service that offer you to buy something on the Internet).	Yes		
15	I trust world news that I can read on the Internet.	Yes		
16	I trust local news that I can read on the Internet.	Yes		Yes
17	I trust any information (not news) that I can find on the Internet.	Yes		Yes
18	I prefer to work alone than in a group.			Yes
19	I like to work in a library.			Yes
20	I like to work at the university/college/school/workplace.	Yes		Yes
21	I like to work in a coffee shop.			Yes
22	I like to work at home.	Yes		Yes
23	I like to learn alone by reading books.			
24	I like to learn alone by surfing the Internet.	Yes		Yes
25	I like to discuss with people on the Internet.			Yes
26	I like to play game on the Internet.	Yes		Yes
27	I think computers are useful for today's teaching practices.	Yes		
28	I think computer is a necessity for my daily life.	Yes		
29	I think computer is a necessity for my life at work.	Yes		
30	I think computer is a necessity for my social life.			Yes
31	I think computer is a necessity for my studies.	Yes		
32	During what I consider a boring lecture/presentation, ICSF...			
33	During what I consider an interesting lecture/presentation, ICSF...	Yes		Yes
34	When I'm doing scientific exercises alone (ex: mathematics...), ICSF...	Yes		Yes
35	When I'm doing scientific exercises in a group, ICSF...	Yes		
36	When I'm doing text exercises alone (ex: an essay...), ICSF...	Yes		Yes
37	When I'm doing text exercises in a group, ICSF...			
38	When I'm surfing on the Internet for working/studying purpose, ICSF...			Yes
39	When I'm surfing the internet during my spare time, ICSF...	Yes		
40	When I'm working on my computer, ICSF...			Yes
41	When I'm playing a good game on my computer, ICSF...			Yes

Note. ICSF... refers to "I can stay focused on this activity"

Some of these questions were taken from the Myers-Briggs personality test [15], and others were constructed by the authors of this paper. To facilitate our analysis we grouped the questions into 10 separate categories reflecting various topics. These topics were used to group questions for the MANOVA analysis.

<sup>1</sup> **Categories of the questions :** *Personality and Personal Values* (Q. 1-4), *Self Assessment of Computer Knowledge* (Q. 5-7), *Self Assessment of Affective Attitudes* (Q. 8-10), *Self Assessment of Knowledge Management Habits* (Q. 11-13), *Trust in Internet Services* (Q. 14-17), *Self Assessment of Working Situations* (Q.18-22), *Interest for Learning and/or Internet Activities* (Q. 23-26), *Opinion on Computer Usefulness* (Q. 27-31), *Self Assessment of Ability to Focus during Classic Activities* (Q. 32- 37) and *Self Assessment of Ability to Focus during Computer Activities* (Q. 38-41).

For questions 1 to 31, the Likert scale is: *corresponds - 1: not at all - 2: a very little - 3: a little - 4: moderately - 5: enough - 6: a lot - 7: exactly*. For questions 32 to 41, the Likert scale is - *1: less than 15 mns - 2: between 15 and 30 mns - 3: between 30 and 45 mns - 4: between 45 mns and 1 h - 5: between 1 h and 1:30 h - 6: between 1:30 h and 2 h - more than 2 h*.

### 3. Results

#### 3.1. Samples characteristics.

Descriptive statistics of the sample are presented in Table 2 below.

**Table 2.** Descriptive statistics of the sample.

Sample		N total	Age (Déviation)	Sex		Level of Education				Principal Occupation		
				Male (%)	Fem. (%)	UnderG (%)	Master (%)	PhD (%)	Other (%)	Student (%)	Empl. (%)	Other (%)
<u>Nation</u> (N=153)	Brazil	37	26.14 (4.54)	<b>23</b> (62.2)	14 (37.8)	<b>25</b> (67.6)	7 (18.9)	5 (13.5)	0 (0)	<b>18</b> (48.6)	16 (43.2)	3 (8.2)
	Canada	35	24.34 (5.18)	13 (37.1)	<b>22</b> (62.9)	<b>24</b> (68.6)	2 (5.7)	3 (8.6)	6 (17.1)	<b>25</b> (71.4)	8 (22.9)	2 (5.7)
	France	81	26.99 (10.1)	39 (48.1)	<b>42</b> (51.9)	9 (11.1)	<b>27</b> (33.3)	14 (17.3)	31 (38.3)	33 (40.7)	<b>34</b> (42.0)	14 (17.3)
<u>Religion</u> (N=243)	Christian	129	26.81 (8.48)	61 (47.3)	<b>68</b> (52.7)	<b>42</b> (32.6)	36 (27.9)	17 (23.2)	34 (26.3)	<b>70</b> (54.3)	47 (36.4)	12 (9.3)
	Muslim	52	30.42 (7.30)	<b>31</b> (59.6)	21 (40.4)	12 (23.1)	<b>21</b> (40.4)	16 (30.8)	3 (5.7)	20 (38.5)	<b>21</b> (40.4)	11 (21.1)
	Atheist	62	25.7 (6.66)	<b>35</b> (56.5)	27 (43.5)	<b>21</b> (33.9)	15 (24.2)	14 (22.6)	12 (19.3)	<b>31</b> (50.0)	22 (35.5)	9 (14.5)
<u>Sexe</u> (N=264)	Male	139	28.5 (8.73)			41 (29.5)	<b>44</b> (31.7)	23 (16.5)	31 (22.3)	60 (43.2)	<b>61</b> (43.9)	18 (12.9)
	Female	125	26.1 (7.11)			<b>41</b> (32.8)	35 (28.0)	25 (20.0)	24 (19.2)	<b>69</b> (55.2)	38 (30.4)	18 (14.4)

Fourteen additional questions were used to describe how our sample used computers and the Internet on a daily basis. The questions were grouped into a one-way MANOVA and ANOVAs to examine gender, religion, and nation differences. Due to limited space we will only highlight these findings. In general, males reported using the Internet more hours per day than females, particularly to play games, study, and read the news. With regard to differences in religion, Muslims reported using the internet more to study, while Atheists and Christians reported more internet use for work and discussion. In terms of nationality differences, Brazilians reported more internet use than the French and Canadians. This finding may indicate that the Brazilian sample represents a favoured sub population of respondents that have easy access to computers. The Brazilians reported using the internet for a greater length each day, particularly for informing themselves and for their work. The Brazilian sample was also more likely to have had some experience with e-Commerce and e-Learning. The bivariate correlations between each of the 14 questions and the respondents' scores on each of the four Hofstede dimensions did not appear to reveal any consistent relationships.

#### 3.2. Group differences on learning attitudes and behaviours.

Table 3 indicates significant group differences for each of the 41 questions regarding learning attitudes and behaviours. Table 4 presents correlations between each of the 41 questions and the four Hofstede dimensions. As shown in Table 1, we found significant differences involving either gender, religion, nation, and/or Hofstede dimensions on 38 of the 41 questions (92.7 %).

**Table 3.** Group differences on 41 learning attitudes and behaviours questions.

Categories of the questions	Index (Cf tab. 2)	NATION			RELIGIOUS BELIEF				SEX			
		N	Mean	S.	N	Mean	S.	N	Mean	S.		
Personality and Personal Values	1	ns			Atheist	59	4,51	**	Male	133	5,08	**
					Muslim	47	5,47		Female	105	4,31	
					Christian	113	4,54					
	3	ns			Atheist	59	4,53	**	ns			
					Muslim	47	5,43					
					Christian	113	5,08					
Self Assessment of Computer Knowledge	5	Brazilian	35	5,69	**				Male	135	5,39	**
		Canadian	35	4,71		Ns			Female	122	4,11	
		French	80	4,35								
	6	Brazilian	35	6,20	**				Male	135	5,93	**
		Canadian	35	5,23		Ns			Female	122	4,89	
		French	80	4,95								
	7	Brazilian	35	6,17	*				Male	135	6,09	**
		Canadian	35	5,77		Ns			Female	122	5,46	
		French	80	5,53								
Self Assessment of Affective Attitudes	8	ns			Atheist	54	4,30	**	Male	130	4,82	**
					Muslim	50	5,06		Female	110	3,99	
					Christian	117	4,27					
	9	Ns			Ns			Male	130	4,21	*	
								Female	110	4,65		
	10	Ns			Ns			Male	130	4,52	**	
								Female	110	3,59		
Self Assessment of Knowledge Management Habits	11	Brazilian	32	3,13	*				Male	128	4,02	*
		Canadian	33	4,09		ns			Female	116	3,59	
		French	77	3,81								
	13	Ns			Atheist	59	4,63	*	ns			
					Muslim	48	5,29					
					Christian	121	5,06					
Trust in Internet Services	14	Ns			ns			Male	118	4,19	*	
								Female	102	3,68		
	15	Brazilian	32	5,00	*							
		Canadian	32	4,88		ns			ns			
		French	69	4,30								
	16	Brazilian	32	5,09	**							
	Canadian	32	4,88		ns			ns				
		French	69	4,26								
	17	Brazilian	32	2,53	**				ns			
		Canadian	32	4,13		ns						
		French	69	3,96								
Self Assessment of Working Situations	20	ns			ns			Male	83	4,99	*	
								Female	86	4,42		
	22	ns			Atheist	42	4,98	*	Male	83	4,67	**
					Muslim	25	4,36		Female	86	5,35	
					Christian	88	5,28					
Interest for Learning and/or Internet Activities	24	Brazilian	26	5,27	**				ns			
		Canadian	29	4,07								
		French	58	4,78		ns						
	26	ns			Atheist	52	3,85	**	ns			
					Muslim	34	2,53					
					Christian	91	3,03					
Opinion on Computer Usefulness	27	Brazilian	34	6,06	**	Atheist	55	4,93	**	ns		
		Canadian	28	4,71		Muslim	50	5,92				
		French	71	5,10		Christian	114	5,54				
	28	Brazilian	34	6,15	**	Atheist	55	4,95	**	ns		
		Canadian	28	4,89		Muslim	50	5,68				
		French	71	4,97		Christian	114	5,27				
	29	Brazilian	34	6,56	**				ns			
		Canadian	28	5,18		ns						
		French	71	5,63								
	31	Brazilian	34	6,44	**	Atheist	55	4,93	**	ns		
		Canadian	28	5,32		Muslim	50	6,36				
		French	71	5,18		Christian	114	5,92				
Self Assessment of Ability to Focus during Classic Activities	33	ns			Atheist	53	6,09	**	ns			
					Muslim	43	4,95					
					Christian	114	5,67					
	34	Brazilian	36	5,67	**				Male	123	5,39	*
		Canadian	30	4,07		ns			Female	107	4,78	
		French	72	4,94								
	35	Brazilian	36	5,19	**				ns			
		Canadian	30	3,93		ns						
		French	72	4,31								
Self Assessment of Ability to Focus during Computer Activities	36	ns			Atheist	53	5,47	*	ns			
					Muslim	43	4,51					
					Christian	114	5,32					
	39	Brazilian	31	5,45	*				ns			
		Canadian	23	5,17		ns						
		French	58	6,05								

Note. NS indicates a non-significant difference; \* indicates  $\alpha \leq .05$ ; \*\* indicates  $\alpha \leq .001$ .

**Table 4.** Correlations between learning attitude and behaviour questions and the four Hofstede dimensions.

Categories of The questions	Index	N	PDI	IDV	MAS	UAI
Personality and Personal Values	2	225	$r = 0.136$ *	$r = -0.153$ *	$r = -0.134$ *	ns
	3	225	ns	$r = -0.148$ *	ns	ns
Self Assessment of Computer Knowledge	5	210	$r = 0.179$ *	ns	ns	ns
Self Assessment of Affective Attitudes	8	219	ns	$r = 0.231$ **	ns	ns
	9	224	$r = 0.141$ *	$r = -0.312$ **	ns	ns
Self Assessment of Knowledge Management Habits	12	215	$r = 0.139$ *	ns	ns	ns
	13	172	ns	$r = 0.184$ *	ns	ns
Trust of Internet Services	16	224	$r = 0.239$ **	$r = -0.175$ *	ns	ns
	17	218	$r = 0.171$ *	ns	ns	ns
Self Assessment of Working Situations	18	173	$r = 0.17$ *	ns	$r = -0.151$ *	ns
	19	220	ns	$r = -0.257$ **	ns	ns
	20	219	$r = 0.143$ *	$r = -0.217$ **	ns	ns
	21	215	ns	$r = -0.172$ *	ns	ns
	22	225	ns	$r = -0.198$ *	$r = 0.147$ *	ns
Interest of learning and/or Internet Activities	24	225	ns	$r = 0.138$ *	ns	ns
	25	220	ns	ns	ns	ns
	26	218	ns	$r = 0.15$ *	ns	ns
Opinion on Computer Usefulness	30	221	$r = 0.134$ *	ns	ns	ns
Self Assessment of Ability to Focus during Classic Activities	33	206	$r = 0.154$ *	$r = -0.232$ **	ns	ns
	34	208	$r = 0.185$ *	$r = -0.223$ **	ns	ns
	36	216	$r = 0.149$ *	ns	ns	ns
Self Assessment of Ability to Focus during Computer Activities	38	223	$r = 0.238$ **	ns	ns	$r = 0.143$ *
	40	223	$r = 0.273$ **	ns	ns	$r = 0.187$ *
	41	169	$r = 0.178$ *	ns	ns	$r = 0.182$ *

Note. NS indicates a non-significant difference; \* indicates  $\alpha \leq .05$ ; \*\* indicates  $\alpha \leq .001$ .

The MANOVAs for assessing gender effects on the 10 categories of responses to 41 questions about learning behaviours and attitudes revealed differences for personality and values (multivariate  $F(4,233) = 4.342, p = .002$ ), self evaluation of computer knowledge (multivariate  $F(3,253) = 14.845, p < .0005$ ), self evaluation of affective knowledge (multivariate  $F(3,233) = 10.859, p < .0005$ ), and working situation (multivariate  $F(5,163) = 3.417, p = .006$ ). Univariate results indicate that men have a tendency to evaluate themselves as more competent in data processing than women, to give more credit to the rational approach and refer less to their feelings when making decisions. Men also show greater confidence in online activities. If these tendencies were confirmed by future research, it would indicate that how an individual interacts with an AIED system could effectively be adapted to the gender of the learner. For example, support could be made more affective for female learner than for males.

The MANOVAs for assessing the effect of religion on the 10 categories of questions revealed multivariate differences for personality and values (multivariate  $F(8,428) = 3.195, p = .002$ ), interest in different activities (multivariate  $F(8,344) = 2.066, p = .038$ ), opinions about the usefulness of computers (multivariate  $F(10,426) = 3.854, p < .0005$ ), and ability to focus on classic tasks (multivariate  $F(12,406) = 2.493, p = .004$ ). Univariate results indicate Muslims differ in their personality and values, show greater trust of reasoning rather than feeling, like to work at home, and rate computers as more useful. Atheists are more inclined to rely on improvisation, i.e. using the internet to play games, and indicate a greater ability to focus on classic (i.e. non computer-related) activities. Overall, atheists and Muslims demonstrate more similar patterns than Christians. However, the differences associated with religion should be taken with strong caution. It is recognized that religious belief is a factor which has great impact on the attitudes and behaviours of individuals but it may be difficult to draw strong conclusions about the effects of religion found in our study since affirming a religious belief might have different meaning from one individual to another, some people linking this affirmation to an important practice of religious rituals, and others relying instead on family and social heritage to claim their

membership to a religious group. Furthermore, using religion in the adaptation mechanisms of AIED systems is likely to encounter legal and ethical restrictions.

The MANOVAs for assessing the effect of nationality revealed multivariate differences for self evaluation of computer knowledge (multivariate  $F(6,242) = 3.184$ ,  $p = .005$ ), trust of internet services (multivariate  $F(8,256) = 7.718$ ,  $p > .0005$ ), opinions about the usefulness of computers (multivariate  $F(10,254) = 3.002$ ,  $p = .001$ ), and task focusing with computers (multivariate  $F(8,214) = 3.412$ ,  $p = .001$ ). Univariate results indicate a tendency for Brazilians to rate themselves higher on computer knowledge, to show greater trust of world and local news and less trust of other information reported on the internet, a greater preference for learning alone by surfing on the internet, higher ratings of the usefulness of computers, and greater ability to focus on classic and computer activities. Brazilians seem to have great confidence in the information they obtain on-line whereas the French demonstrate some degree of wariness. It would be interesting to see if this tendency would be confirmed by further studies. Generally, the responses of French and Canadians (of which the large majority are Québécois) are rather similar whereas the responses of Brazilian differ more. It should be noted that when interpreting the differences between nations, the Brazilian sample was heavily comprised of male respondents. This may limit the generalizability of the findings. However, if the differences related to nation and religion were due to differences in gender distributions, one might expect the responses of the Brazilian group to mimic the male answers, and the atheists and Muslims may also be expected to follow the tendencies of male answers. However, responses to several questions (Q. 1, 8, 11, 22), indicate different patterns for males, and the aforementioned samples, suggesting that each variable contributes some independent predictive power.

Finally, many weak correlations were noted between the Hofstede dimensions (particularly IDV and PDI) and responses to the learning attitudes and behaviour questions. The predictive utility of Hofstede dimensions seems relatively modest and may have limited use as single sources of prediction. Indeed similar concerns are raised in [14]. Rather, we suggest that prediction could be augmented by combining this information with other variables like those investigated here.

#### 4. Conclusion

Our results indicate some relationships that warrant further attention in future studies (e.g., *personality and personal values with religion; emotional attitudes with gender, and IDV; confidence in Internet services with nationality and PDI; opinions about the utility of computers with nations; appreciation of work contexts with IDV; concentration on traditional activities with PDI; concentration on information technology activities with nations, PDI and UAI*). Analyses involving the age of respondents (not presented here due to space limitations) also indicate the potential importance of this variable. It would also be informative to examine how such effects are modulated by factors like respondent's knowledge of data processing, level of education, and familiarity with the internet. Unfortunately, we were unable to examine combinations of such effects in the current study due to our limited sample.

We also believe that some of our findings are not necessary significant, or at least should be taken with caution, especially those involving religion, since affirming a religious identity can have a different meaning from one individual to another.

No single factor provided sufficiently robust predictions for our objective of adaptation in AIED. Prediction would probably be increased by combining several of these factors. We envision testing the use of such combinations in the future. In addition, study of how other factors (e.g., level of education) modulate the predictions would also be desirable.

The results reported here are intended to be exploratory in nature. That being said, it is still important to identify several limitations of the current study. First, the representativeness of the sample suffers from several potential sources of bias. The sample was self-selected (snowball sampling) and several subpopulations are overrepresented. Furthermore, the sample size obtained did not permit us to examine the joint effects of variables. Future efforts should employ representative sampling methods that target adequately large sample size to permit such analyses. Finally, the context of collecting data over the internet does not provide controlled conditions and therefore allows other factors to potentially influence respondents' behaviours.

## References

- [1] Biggs, J. B., Teaching across cultures. In F. Salili, Chiu, C., Hong, Y (Eds), *Student Motivation : The culture and context of Learning*, New York: Plenum Press (2001), 293-308.
- [2] *1st Workshop on Culturally Aware Tutoring Systems (CATS2008)*, Montréal, Canada, in conjunction with ITS2008, <http://www.iro.umontreal.ca/~blanchae/CATS2008>
- [3] Blanchard, E. G., Mizoguchi, R., Designing Culturally-Aware Tutoring Systems: Towards an Upper Ontology of Culture, *1<sup>st</sup> Workshop on Culturally Aware Tutoring Systems*, Montreal, Canada (2008), in conjunction with ITS2008.
- [4] Cassady, J. C., Mohammed, A., Mathieu, L., Cross-Cultural Differences in Test Perceptions: Women in Kuwait and the United States. *Journal of Cross-cultural Psychology*, 35:6 (2004) 713-718.
- [5] Chirkov, V. I., Ryan, R. M., Kim, Y., Kaplan, U., Differentiating autonomy from individualism and independence: A self-determination theory perspective on internalization of cultural orientations and well-being, *Journal of Personality and Social Psychology*, 8 : 1 (2003), 97-110.
- [6] Fischer, R., Smith, P. Reward Allocation and Culture: a Meta-Analysis, *Journal of Cross-Cultural Psychology*, 34:3 (2003), 251-268.
- [7] Ishida, T., Fussell, S. R. & Vossen, P. T. J. M.. Intercultural Collaboration: First International Workshop (IWIC 2007). *Springer LNCS 4568*. Berlin: Springer-Verlag (2007).
- [8] Hofstede, G., *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*, 2nd edition, London: Sage (2001).
- [9] House, R. J., Hanges, P. J., Javidan, M., Dorfman, P., Gupta, V., *Culture, Leadership and organizations: The Globe study of 62 societies*, Thousands Oaks, Ca: Sage (2004).
- [10] Johnson, W. L., Serious use of a serious game for language learning, *International Conference on Artificial Intelligence in Education*, Marina del Rey, USA (2007), 67-74.
- [11] Kirkman, B. L., Lowe, K.B., Gibson, C. B., A quarter century of culture's consequences: a review of empirical research incorporating Hofstede's cultural values framework, *Journal of International Business Studies* 37 (2006), 285-320.
- [12] Lane, H. C., Gore, M G., Gomboc, D., Karnavat, A., Rosenberg, M., Intelligent Tutoring for interpersonal and intercultural skills, *Interservice/Interindustry Training, Simulation and Education Conference*, Orlando, FL (2007).
- [13] Mesquita, B., Frijda, N. H., Scherer, K. R., Culture and Emotion, *Handbook of Cross-Cultural Psychology vol.2: Basic processes and Developmental Psychology*, Boston: Allyn & Bacon (1997), 255-297.
- [14] Miller, C. A., Smith, K., Culture, Politeness, and Directive Compliance: Does Saying Please Make a Difference, *NATO RTO Symposium HFM142 on Adaptability in Coalition Teamwork*, Copenhagen (2008).
- [15] Myers, I. B., McCaulley, M. H., Quenk, N. L., Hammer, A. L., *MBTI Manual (A guide to the development and use of the Myers Briggs type indicator)*, 3<sup>rd</sup> edition, Consulting Psychologists Press (1998).
- [16] Ogan, A., Jones, C., Alevan, V., Pause, Predict and Ponder: Use of Narrative Videos to Improve Cultural Discussion and Learning, *CHI conference*, Florence, Italy (2008).
- [17] *First International Workshop on Enculturating Interfaces*, in conjunction with IUI2008 <http://mm-werkstatt.informatik.uni-augsburg.de/documents/ECI/>
- [18] Reinecke, K., Bernstein, A., Culturally Adaptive Software: Moving Beyond Internationalization, *HCI International Conference* (2007).
- [19] Salili, F., Chiu, C., Hong, Y., *Student Motivation: The culture and context of learning*, New York: Plenum Press (2001).
- [20] <http://www.geert-hofstede.com> , last consultation April 13<sup>th</sup> , 2009.