Cultural Statistics and Instructional Design

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Abstract

In online education, a student's first point of contact is the Web interface, a GUI that must induce good feelings and trust. To achieve this, designer needs to be aware of cultural trends shared between members of target group. This requires mathematical formulas and statistical feedbacks so results can be stored, categorized, processed, and retrieved. For example a resulting bar chart can give a designer a vital clue as to what extend a target group tolerates teacher's interference. Efforts towards statistical representation of culture started since late twentieth century. They mostly concentrated on multinational organizations, but now with the table turned and employer being the end-user (students), more sensitivity to the cultural issues must be paid. This paper is a Call to the statisticians inviting them to explore this much-needed young science, with applications that go beyond just commerce and education.

Educational institutions can now reach more people and offer online degrees to more students, who may never ever step on their location's soil. However, when crossing the boundaries of lands, we often cross the boundaries of time as well. A true constructive learning system offers education at the learner's pace and time. The students should be able to login the learning system at their convenience, check their assignments, and take part in discussions by postings their views and giving feedbacks to those of their peers'. After all "learning is characterized not just by the processes within an individual learner but also by the processes shared by and affecting the members of a defined group" (Reiser & Dempsey, 2002). Asynchronous learning environments are blurring the borders that separate learners by lingual, cultural, and time differences. In an English language asynchronous learning system deployed by an institution or organization for a global audience, time difference is a non-issue, and the English language is only an important issue by how it maintains neutral in using references. The instructors and instructional designers, however, need to pay an extra attention to the *cultural issues*.

One of the earliest pioneers and perhaps the most influential psychologist on cultural theories is Lev Vygotsky (1896-1934). He explained that cultural development starts at childhood, first on the social or 'interpsychological' level, and then on the individual or 'intrapsychological' level (Vygotsky, 1978). Le Roi Jones (as cited in Forbes, 2006) describes culture simply as "how one lives and is connected to history by habit". In other words, culture is a learned behavior; it is not a physiological product that is inherited by a newborn genetically. Culture is an evolving discussion and is interpreted differently throughout the history based on the influences of its time and place. Tung (1995) describes culture as "an evolving set of shared beliefs, values, attitudes, and logical processes which provides cognitive maps for people within a given societal group to perceive, think, reason, act, react, and interact". Culture is a variable, not a constant.

"Culture affects who we are, how we think, how we behave, and how we respond to our environment. Above all, it determines how we learn" (Dunn & Marinetti, n.d.). The drop out rates in online courses is considered high and the lack of culturally appropriate learning is a major cause of it. "Students may question the merit in participation, or worse, feel disenfranchised if the course or learning resources do not fit their world view" ("Cross-cultural Issues", 2004).

"The acceptance, use and impact of WWW sites are affected by the cultural backgrounds, values, needs and preferences of learners" (McLoughlin & Oliver, 2000). Web interface is an influential contributor to the users' trust and acceptance of the course material, leading to "e-loyalty" (Cyr, Bonanni, Ilsever, & Bowes, 2005) amongst the participants. In an online learning platform, the Web interface design should be central to the overall delivery media design.

The sayings: "A picture is worth a thousand words" and the "First impression is the last impression" are not enough to emphasize the importance of the audio/visual elements that are used for a culturally diverse audience. An online learning system consists of Web pages displaying data in various colors, shapes, texts, languages, tones, logic, and order. How much will the learner understand and trust these collections will depend largely on the learner's cultural background.

Cultural diversity, however, is not limited to the geographical areas, for example different genders are also considered different cultural groups. Gender is the cultural representative of one's sexual identity. Gender is shaped by its dominant culture, and the expectations about attributes and behaviors appropriate to women or men and their relations (Schalkwyk, 2000). When seeking traits within any given group, we need to evaluate at least two other sub-traits (genders) within the same cultural group to be able to address all the related cross-cultural issues. Hence, when dealing with culture, there are a minimum of '$2 \times n$' cultural issues to account for. Where '2' represents gender types, and 'n' is the number of other cultures within the target group. According to Marcus and Gould (2000), even though not everyone may precisely fit within a unique pattern of a given society, there is enough statistical regularity to identify trends and tendencies. Representing culture statistically is an important first step in understanding them.

Geert Hofstede (1997) identified five dimensions of culture and used indexes as their representatives, so cultures can be distinguished and compared statistically. These dimensions are:

1. *Power Distance:* PDI (Power Distance Index) is the amount of tolerance in power distribution within a society. High PDI cultures may tolerate a degree of dictatorship from the leaders. Low PDI cultures on the other hand, see very little gap between the higher-ups and subordinates and expect more equalities. Some of the Web designs reflect this by the importance they give to social and informational hierarchies.
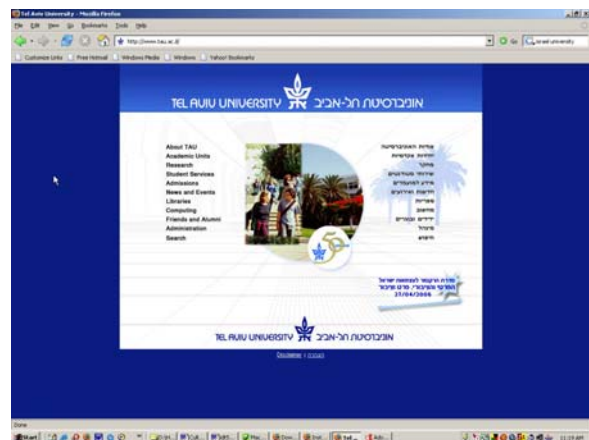
Hi PDI – Malaysia (http://www.unimas.my/)   *Lo PDI – Israel (http://www.tau.ac.il/)*

2. *Individualism vs. Collectivism:* Individualism pertains to cultures with loose ties. Members are expected to look after themselves and their immediate kin. Collectivism believes in strong social ties where the key is trust and loyalty in relationships with other members, and beyond the immediate kin.

IDV (Individualism Index) is used to measure this dimension. Web designs with high IDV usually reflect this by focusing on the youth, new ways, and personal goals.


Hi IDV – Australia (http://coca-cola.com.au/home_flash.htm)

Lo IDV – Singapore (http://www.coca-cola.com.sg/home/)

3. *Masculinity vs. Femininity:* This refers to gender roles within a culture. A culture is masculine when roles are distinctive and such qualities as assertiveness, toughness, and materialism are the dominant qualities. As opposed to the feminine cultures where the roles are overlapping, and qualities such as modesty, softness and family orientation are dominant. MAS (Masculinity Index) is used to measure these gender roles in different cultures. Web designs from countries with high MAS usually have a "mean-to-do-business" appearance. They have direct navigational access, are not very soft, and most of the time gender specific.


Hi MAS – Japan (http://www.mext.go.jp/english/)

Lo MAS - South Korea (http://english.moe.go.kr/)
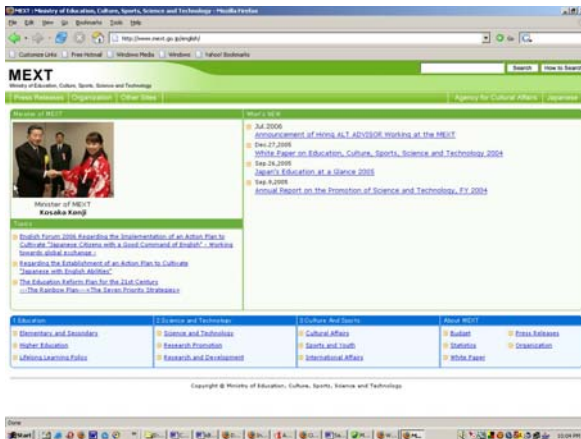
4. *Uncertainty Avoidance:* Different cultures react with different levels of anxiety to the unknown. High UAI (Uncertainty Avoidance Index) cultures are suspicious to changes and consider 'different' as dangerous. Low UAI cultures are more open to new ideas. High UAI Web pages offer choices with more expected results and they are usually simpler.
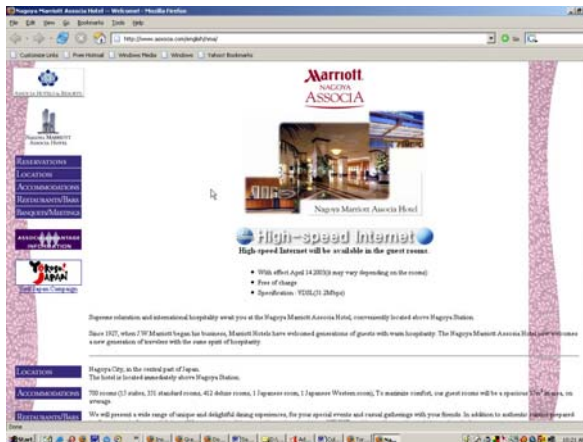
Hi UAI – Japan (http://www.dh.nagasaki-u.ac.jp/)   *Lo UAI – England (http://www.christie.nhs.uk/)*
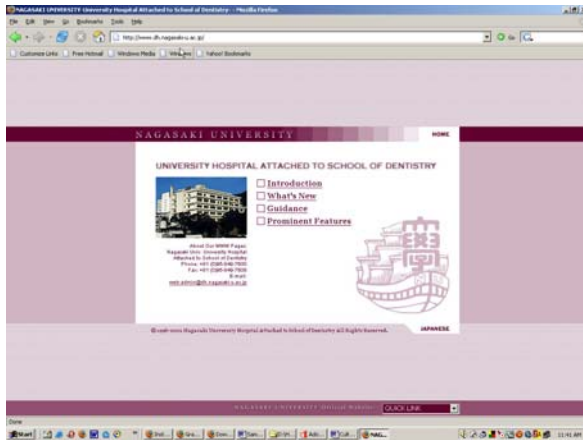
5. *Short-term vs. Long-term Orientation:* This dimension weighs the influence of tradition against progress. A short-term orientated culture is one that has strong traditional bonds, but values are not always measured logically and progress can be comprised for the sake of status and immediate results. In contrast, a long-term orientation sets a practical limit, while respecting traditional and social obligations. This dimension is measured by LTO (Long-Term Orientation) index. High LTO Web pages tend to emphasize on long-term relations.

Hi LTO – Japan (http://www.associa.com/english/nma/)   *Lo LTO – USA (http://marriott.com/property/propertypage/YYZEC)*

	PDI		IDV		MAS		UAI		LTO	
Countries	**rank**	**score**	**rank**	**score**	**rank**	**score**	**rank**	**score**	**rank**	**score**
Arab countries	7	80	26/27	38	23	53	27	68		
Australia	41	36	2	90	16	61	37	51	15	31
Brazil	14	69	26/27	38	27	49	21/22	76	6	65
Canada	39	39	4/5	80	24	52	41/42	48	20	23
China								1	118	
East Africa	21/23	64	33/35	27	39	41	36	52		
France	15/16	63	10/11	71	35/36	43	10/15	86		
Great	42/44	35	3	89	9/10	66	47/48	35	18	25

Britain										
Hong Kong	15/16	68	37	25	18/19	57	49/50	29	2	96
India	10/11	77	21	48	20/21	56	45	40	7	61
Iran	29/30	58	24	41	35/36	43	31/32	59		
Israel	52	13	19	54	29	47	19	81		
Japan	33	54	22/23	46	1	95	7	92	4	80
Malaysia	1	104	36	26	25/26	50	46	36		
Mexico	5/6	81	32	30	6	69	18	82		
Singapore	13	74	39/41	20	28	48	53	8	9	48
South Korea	27/28	60	43	18	41	39	16/17	85	5	75
Taiwan	29/30	58	44	17	32/33	45	26	69	3	87
USA	38	40	1	91	15	62	43	46	17	29

Hofstede's (1991) five cultural dimensions. (adopted from Marcus & Gould, 2000)

Hofstede's cultural model is not the only one, to name a few: 4-dimensional model of Hall and Hall (1990), 14-dimensional model of Reeves (1992), 7-dimensional model of Trompenaars (1993), 19-dimensional model of Collis, Vingerhoets, and Moonen (1997), and 9-dimensional model of Khaslavsky (1998).

In an effort to make available a basic open tool to measure cultural tendencies of target groups, the author has created an instrument called Calculature© which is located at www.InstructionalDesigns.org. Calculature uses Hofstede's cultural indexes, and includes visual elements such as colors and fonts to represent trends. Studies can be created by anyone for any cultural group, be it a country, a village, or a corporation. After all, corporations have their own specific cultures too. The results evolve as database populates with time.

The participants select the cultural 'topic' they wish to participate in, enter their profiles, and answer the questionnaire. The participants' demographic profiles are limited to:
- Gender
- Age
- Country
- Language
- Religion

Questions include those pertaining to the cultural dimensions and responses to a limited variety of Web-friendly colors and fonts:

1. (PDI) To what degree do you accept the power of your higher-ups?
   a. Hi (100) - I accept my supervisors', managers', and leaders' authorities without any questions asked and look up at them as teachers and gurus.
   b. Lo (0) - I see very little gap between the higher-ups and subordinates and expect more equalities.
2. (IDV) How strongly or loose do you define your relation with others in your group?
   a. Hi (100) - I believe that I am an island, an individual responsible only for me and my growth, and my family's well being.
   b. Lo (0) - I believe in strong social ties where the key is trust and loyalty in relationships with other member, and members are expected to contribute into the well-being of the collective.
3. (MAS) How do you describe your nature?

a. Hi (100) - Assertive, tough, go-getter, materialistic.
b. Lo (0) - Modest, easy going, soft, family oriented.
4. (UAI) How do you treat uncertainties?
a. Hi (100) - I do not like changes at work place or at home. I am reluctant to new ideas and look at them with suspicion.
b. Lo (0) - I am open to changes and look forward to new ideas, even if the outcome is not guaranteed.
5. (LTO) How closely you follow traditional and religious values?
a. Hi (100) - I follow my religious and traditional values for whatever I do in my day-to-day life and expect the same from others. I trust them completely and follow them blindly.
b. Lo (0) - I may respect my religious and traditional values but always weigh the consequences, and if in a situation I find them not appropriate or practical, I will ignore them.
6. What color you like best?
7. What color you like the least?
8. What color is the happiest?
9. What color is the saddest?
10. What color is most energizing?
11. What color is most romantic?
12. What color is most spiritual?
13. What font is most appealing?
14. What font is least appealing?

For the first two questions (PDI and IDV), there are two scenarios involved:
- At Work.
- In Politics.

Reason being that the author believes the relations, expectations, and roles are not identical in the two environments. It is popularly believed, however, that cultural values most of the time impact all environments similarly, i.e. family, work, and politics overlap. So by separating these two in our study we have the opportunity to see how far which theory stands true.
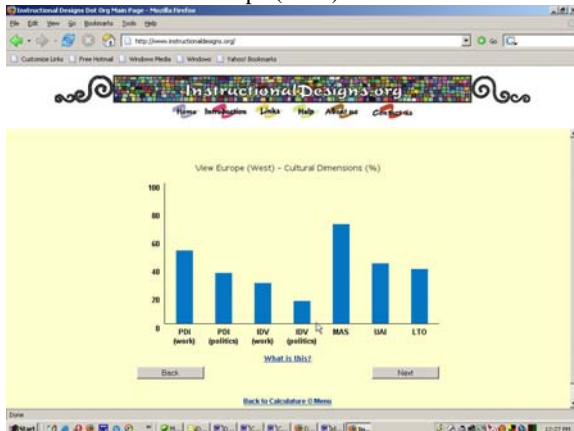
Europe (West)	Europe (East)
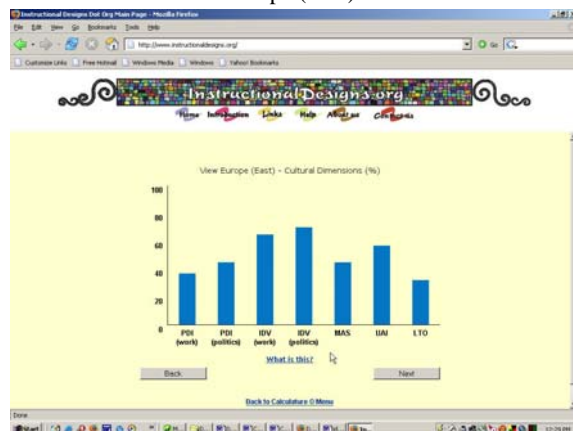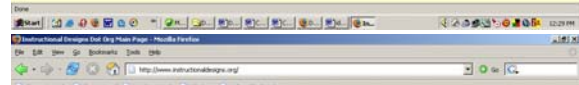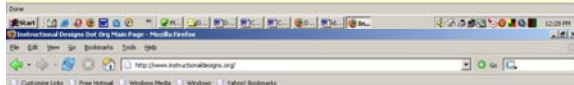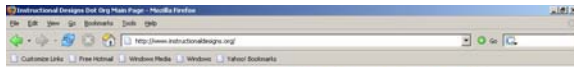
Results of a study at its initial stage (April 2006). The results may change with time.

Faiola and Matei (2005) propose a new theoretical construct that they call cultural cognition theory (CCT), that instead of focusing on the user it explores the source – Web designer's cognitive style. So "by observing the design of graphics, text, and information architecture, we can understand how processes of strategizing by culturally diverse web designers influence their cognitive skills toward a holistic or analytic orientation". McLoughlin and Oliver (2005) warn that "the design of Web based instruction is not culturally neutral, but instead is based on the particular epistemologies, learning theories and goal orientations of the designers themselves", and "one of the limitations in current instructional design models is that they do not fully contexualize the learning experience, and are themselves the product of particular cultures". So in Calculature, the actual interpretations of results are left to the designers because such interpretations need to be handled case by case and within the unique frameworks of both the target groups, and the designers.

Cultural diversity is not just alarms and whistles, it is the salt and pepper of learning, it is in fact a constructive challenge. Diversity can bring richness to the learning, and students who learn in such an environment become better critical thinkers, communicators, problem-solvers and team players (Sugar & Bonk, 1998). Students from different cultures interacting within a structured learning experience, develop greater openness and understand of 'others', and that results in greater productivity (McArthur, n.d.).

Much of the research so far in cultural statistics is inter-country related. The readily available economical and political data make tabulating and formulating comparisons easier. However, with increase in the migration of citizens to virtual communities, there is an immediate need to go beyond countries and focus on the citizens of the world. Cultural statistics today is at its infancy, there is much yet to be discovered beyond our borders.

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