

Analyzing Cultural Influences on ELearning Transactional Issues

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Abstract: Assessment of web-based distance learning often includes some measurement of Transactional Distance, a measure of the *psychological* distance students feel rather than a measure of the *physical* distance, which in distance learning can be large. Moore's *theory of transactional distance* emphasizes the role of interdependence and autonomy to decrease the individual's feeling of isolation. However, newer models of Transactional Distance which study the relationships students feel with each other, the instructor, the course material, and more recently, with the course interface can be used to analyze Transactional Distance when cultural issues are added. This paper assesses two computer science courses and measures the effects of cultural differences on Transactional Distance. The influence of *integrated* course management tools is also addressed.

Introduction

This research applied cultural difference measures to Transactional Distance measures, showing how various cultural differences indices increased or decreased Transactional Distance.

History of Transactional Distance

Moore and Kearsley (Moore and Kearsley, 1996) presented the notion that geographical distance could be "bridged using Technology, but both parties must seek to overcome the communication gap." Moore (Moore, 1993) describes the "universe of teacher-learner relationships that exist when learners and instructors are separated by space and/or time." This universe consists of interactions between learners and teachers, the structure of the instruction, and the self-directedness of the learner. Moore called these three parameters Interaction, Course Structure and Learner Autonomy. Transactional Distance leads to patterns of learner and teacher behavior, a psychological and communications space between the two, and potential misunderstanding and feelings of isolation. Transactional Distance is relative, different for different cultures and individuals as well as for each distance learning course.

Newer Models of Transactional Distance

Although Moore's theory of Transactional Distance, developed in the age of correspondence schools, applied in many ways to distance education, newer models assess students' relationships with other elements in the learning environment. Zhang (Zhang, 2003) proposes four dimensions: Transactional Distance between student and student (TDSS), Transactional Distance between student and teacher(s) (TDST), Transactional Distance between student and content (TDSC), and Transactional Distance between student and interface (TDSI), often the Course Management System. These four dimensions are particularly applicable when cultural influences are added.

Like the original variables, these vary according to the type of course, and other factors. This paper examines how they vary with two very different cultures for two computer science courses: one in web programming and one in programming language translation.

History of Cultural Differences in Web-Based Learning

Geert Hofstede's original Cultural Differences Model described four dimensions which he applies primarily to business, but also, to a lesser extent, to education. The following are from (Geert Hofstede Analysis, <http://www.cyborlink.com/besite/hofstede.htm>)

Power Distance Index (PDI) “focuses on the degree of equality, or inequality, between people in the country's society. A High Power Distance ranking indicates that inequalities of power and wealth have been allowed to grow within the society. These societies are more likely to follow a caste system that does not allow significant upward mobility of its citizens. A Low Power Distance ranking indicates the society de-emphasizes the differences between citizen's power and wealth. In these societies equality and opportunity for everyone is stressed. “

Individualism (IDV) “focuses on the degree the society reinforces individual or collective, achievement and interpersonal relationships. A High Individualism ranking indicates that individuality and individual rights are paramount within the society. Individuals in these societies may tend to form a larger number of looser relationships. A Low Individualism ranking typifies societies of a more collectivist nature with close ties between individuals. These cultures reinforce extended families and collectives where everyone takes responsibility for fellow members of their group.”

Masculinity (MAS) “focuses on the degree the society reinforces, or does not reinforce, the traditional masculine work role model of male achievement, control, and power. A High Masculinity ranking indicates the country experiences a high degree of gender differentiation. In these cultures, males dominate a significant portion of the society and power structure, with females being controlled by male domination. A Low Masculinity ranking indicates the country has a low level of differentiation and discrimination between genders. In these cultures, females are treated equally to males in all aspects of the society.”

Uncertainty Avoidance Index (UAI) “focuses on the level of tolerance for uncertainty and ambiguity within the society - i.e. unstructured situations. A High Uncertainty Avoidance ranking indicates the country has a low tolerance for uncertainty and ambiguity. This creates a rule-oriented society that institutes laws, rules, regulations, and controls in order to reduce the amount of uncertainty. A Low Uncertainty Avoidance ranking indicates the country has less concern about ambiguity and uncertainty and has more tolerance for a variety of opinions. This is reflected in a society that is less rule-oriented, more readily accepts change, and takes more and greater risks.”

It should be emphasized that these dimensions were applied to business relations first and then to other areas such as education.

Newer Models and Influences of Cultural Differences in Web-based Distance Education

Hofstede added a fifth dimension after a study of Chinese employers and managers. This fifth dimension is:

Long-Term Orientation (LTO) “focuses on the degree the society embraces, or does not embrace long-term devotion to traditional, forward thinking values. High Long-Term Orientation ranking indicates the country prescribes to the values of long-term commitments and respect for tradition. A Low Long-Term Orientation ranking indicates the country does not reinforce the concept of long-term, traditional orientation. In this culture, change can occur more rapidly as long-term traditions and commitments do not become impediments to change.”

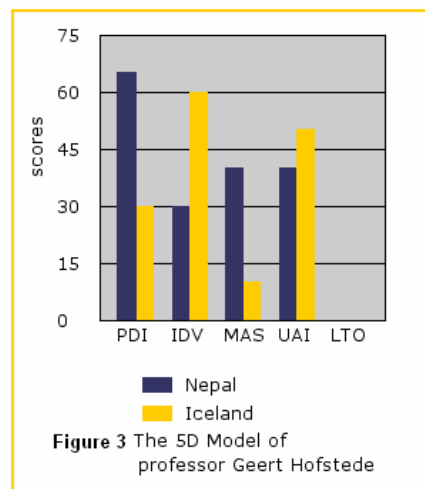
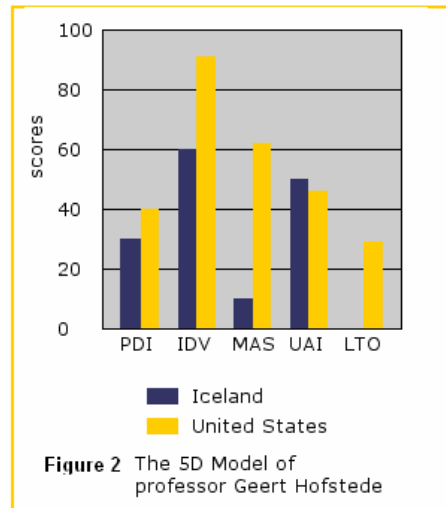
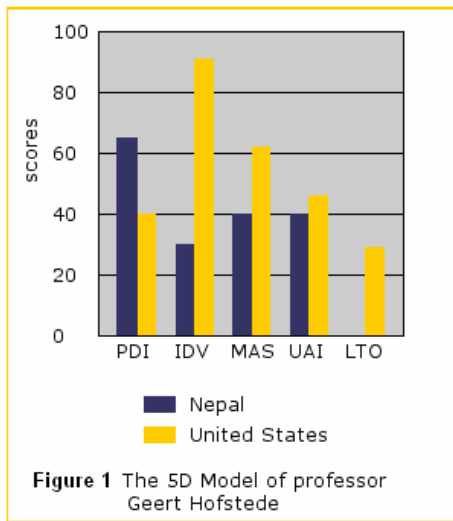
In addition, Hofstede has analyzed 56 countries including those discussed here: Nepal and Iceland. In some cases below, this instructor observed a different set of cultural values in the educational setting (culture) than for the culture at large.

Bates (1999), Dron (2004), Lim (2003), Liu (2004), Stull (1995), Tylee (2002) and Michael Moore himself (1994) have all addressed the cultural impact on distance learning. While these models and other cultural aspects such as universalism, achievement orientation, conservatism, self-direction, competence, and egalitarianism all can be analyzed for their contributions to Transactional Distance, Hofstede's Dimensions will be applied here. It should be emphasized that these dimensional values vary among individuals, and many of the conclusions drawn are from the author's observations in a limited context.

Finally, the author wants to emphasize that she was an American teaching to non-American cultures using an English language website where English was not their primary language

Hofstede's Data for Nepal and Iceland

Below (Fig. 1) shows Hofstede's data for the U.S. versus Nepal; Beside it, (Fig. 2) is the data for the U.S. versus Iceland while the last (Fig. 3) compares Nepal and Iceland. These graphs were created at: http://www.geert-hofstede.com/hofstede_dimensions.php



PDI (Power Distance Index) like the countries themselves, the cultures of Nepal and Iceland are quite different. Nepal's distinction between the social classes, age, sex, generation and status contribute to a high PDI while Iceland, with its 100% literacy and huge welfare system has a lower PDI than the U.S.

IDV (Individualism) Because Nepali's tend to be more *interdependent* than *independent*, they have a low IDV. Although Hofstede shows a higher IDV for Americans than for Icelanders (this may be true in the business world), this instructor found Icelanders and particularly Icelandic students to be extremely independent with a high IDV.

MAS (Masculinity) The historic lack of education for women in Nepal is an example of the high masculinity dimension as defined by Hofstede. Iceland has one of the lowest dimensions of masculinity in the world.

UAI (Uncertainty Avoidance Index) Because of the importance of religion to the Nepali's and the peaceful relationship between Buddhists and Hindus, Nepali's have a high tolerance for differences in behavior; additionally, this is not a culture that pays as much attention to rules as do the U.S. and Iceland. Thus Nepali's have a medium-low UAI. Icelanders have a higher, but still medium UAI.

LTO (Long-Term Orientation) Long Term Orientation means focusing on the future. Its opposite, Short Term Orientation, means focusing on the past and present, by respecting tradition. Both Nepal and Iceland seem to be medium on this scale (and perhaps higher than the U.S.). Nepal's high unemployment rate contributes to a lower LTO, while its religious orientation and respect for traditions stresses patience and a higher LTO. Iceland respects its past (settled by Vikings), but, as a European nation, actively invests in its future.

Methodology

Measurement included analysis of bulletin board postings and archives, chat room logs, lurking (the course management system contains tools which note student access of various content and tools), pre- and post surveys of students, quality of projects and exams and analysis of emails. Because of the relative nature of both Transactional Distance and Cultural Differences, measurement is difficult. Continuing development of the measures is an integral part of this research.

Results

In what follows, the reader is reminded of the following abbreviations, repeated here for easier reference:

PDI: Power Distance Index

IDV: Individualism

MAS: Masculinity

UAI: Uncertainty Avoidance Index

LTO: Long-Term Orientation

Nepali Students

The first three months of the course took place face-to-face in the classroom at Kathmandu University in Nepal. The last two months took place via distance learning (while the instructor was teaching the second course described below in Iceland).

Nepal is an exceedingly poor country with high unemployment that stresses rote learning over creativity. It has been involved in a Civil war for the last seven years. The students did not have an adequate background for some of the course material, and this was eliminated from the course, nor did they expect to spend as much time on the course as mastering the material would require.

TDSS (Transactional Distance between Student and Student) The students were not "equal" in Nepali society because two of them were actually also instructors. Thus, the high PDI of Nepali culture effectively divided the class into three groups (the two instructors were not equal either). Within the larger "just student" group, the low IDV resulted in a vast amount of working together even when they were not supposed to. MAS was not a factor for this

all male class. The Nepali low-medium-valued UAI was also not a factor, nor could the instructor detect any LTO influence. Thus, PDI increased the Transactional Distance for some students (the two students who were instructors), while IDV decreased the Transactional Distance for the larger group who worked together.

TDST (Transactional Distance between Student and Teacher) Because of the high PDI, Nepali students place teachers higher in the power hierarchy and have been “trained” not to ask questions so other techniques were needed to discover if they understood the material. Because of the low IDV, however, when they were “collected in the lab” they were not hesitant to ask questions when they viewed the material there. Perhaps they viewed the instructor as “one of them” there. In addition, the low IDV caused them to post “as a group” to the bulletin board rather than individually. Because the instructor was female and they were all male, the high Masculinity of Nepali culture may have increased TDST, although this instructor could not detect it. Nepali’s medium UAI didn’t seem to influence TDST. The only influence of LTO observed was a lack of commitment shown by the students – the high unemployment rate and political unrest make the future uncertain for most students. Thus, PDI and IDV increased Transactional Distance, although the group postings helped to decrease it for the group as a whole, and the other three dimensions didn’t have a discernible effect.

TDSC (Transactional Distance between Student and Content) Textbooks are considered “better” (higher PDI) sources of information than web pages. Although the material from two instructor textbooks had been transcribed onto the web site, students mentioned wanting a “real” (i.e., paper) text. Thus, PDI increased Transactional Distance. The low IDV also increased TDSC because students did not have the independence required to search for supplemental content on the web: independent learning had not been encouraged in their educational background. It is well known that learner independence aids web-based learning. Web-based education was new to them (and they preferred the f-2-f portion of the course). The medium valued UAI contributed to TDSC as this was a new way of learning for them. As mentioned previously, the medium LTO increased Transactional Distance somewhat because they did not see the relevance of the material to their careers.

TDSI (Transactional Distance between Student and Interface) None of the students had ever even seen a Course Management System before, and didn’t see its relevance at first. The Course Tools unlike standard tools like Blackboard, WebCT, Moodle and Manhattan *integrate* into the web site, usually decreasing TDSI. Like the online content, the online communication tools had a low “power” and thus the high Nepali PDI increased Transactional Distance. Their low IDV increased TDSI as they posted to the bulletin board as a group rather than individually, and like many student group activities everywhere, not all students were actively involved; they never answered another’s questions on the bb. Even the low Nepali UAI also increased TDSI because they were uncertain how the Course Management System “fit in” with their learning. There was no observed MAS effect. Their medium LTO may have increased TDSI as they saw no short-term use of the Course Tools (except for looking up their grades which they did frequently).

Icelandic Students

In 1955, the Icelandic author Haldór Laxness won a Nobel Prize for his 1946 book “Independent People” which described a man too independent for his own good. Icelanders pride themselves on their *independence*. This trait emerged in the course at the University of Iceland where half the students chose to take the course via web-based distance learning.

Technologically savvy and computer literate, the Icelandic students needed little in the way of support to thrive. The distance learners did as well or better than their peers who chose to come to class (at 8 a.m. in the dark of winter!).

TDSS (Transactional Distance between Student and Student) The low PDI in Iceland meant there was no increase in TDSS because of this dimension. The high IDV (this instructor found it to be higher than Hofstede’s figures) increased TDSS because the Icelandic students didn’t help their classmates out by posting answers even if they knew the answer. On the project, most Icelandic students worked separately rather than in teams. MAS had no influence. Icelanders medium UAI had an effect for some students as, again, the distance learning aspect was new, and they didn’t know the “rules” for interacting with their fellow students. No effect was observed for LTO.

TDST (Transactional Distance between Student and Teacher) Like the Nepali’s, Icelandic students do not ask questions of instructors. Although PDI is low for the culture in general, there is a higher separation between students

and their “elders” (instructors). Thus, there is a higher PDI in education, increasing the TDST. The fierce independence (high IDV) also increased TDST because students did not wish to appear unknowledgeable to the instructor, even if they did not understand something. UAI and LTO did not have any observable effect; the female instructor did detect a slight increase in TDST from the male students even though Iceland has low MAS, culturally.

TDSC (Transactional Distance between Student and Content) High web literacy and the high IDV decreased TDSC: students had no trouble going out on the web to find information and answers. PDI had no influence, nor did MAS, UAI and LTO.

TDSI (Transactional Distance between Student and Interface) The high IDV and medium UAI both increased TDSI as the students did not use the communication tools much in the Course Management System. They didn’t even seem to access the grades very much. PDI, MAS, and LTO had no discernible effect.

Summary

The following tables summarize the effect of Hofstede’s Cultural Dimensions on Transactional Distance. The “+” indicates that Transactional Distance is increased while “-” means it is decreased.

<i>Nepal</i>	TDSS	TDST	TDSC	TDSI
PDI	+	+	+	+
IDV	-	+/-	+	+
MAS		+?		
UAI			+	+
LTO			+	+?

<i>Iceland</i>	TDSS	TDST	TDSC	TDSI
PDI		+		
IDV	+	+	-	+
MAS		+?		
UAI	+			+
LTO				

In the following section, these results will be applied to effective strategies for teaching these students.

Strategies for Web-based Distance Learning Courses

The desire is to *decrease* Transactional Distance across the four dimensions Student-Student, Student-Teacher, Student-Content and Student-Interface. Analyzing the “+” and -’s in the above chart with respect to cultural differences may produce ways to improve distance learning and decrease Transactional Distance:

Nepali students

Nepali students do not have as much access to computers and the Internet although this increases by the day. The rote-learning in Nepali education needs to be addressed for web-based distance learning to be effective. But cultural influences need to be addressed the most:

TDSS: The high PDI will surely decrease in years to come, but for now, the instructor needs to know that some students may be unable to interact well with one another. For example, if students are to give feedback on other students’ projects, they could be asked whose project they would like to evaluate. Because of their high *interdependence* (low IDV - decreased TDSS) much of the course should focus on group rather than individual activity.

TDST: High PDI as it applies to TDST can be decreased by the instructor, not the student, taking the initiative to increase interactions. Since the IDV influence in lab-type environments decreased TDST, a way to simulate these in web-based courses may help these *interdependent* students see the instructor as “one of them in the learning process.” As more women are encouraged to seek education, the MAS influence on TDST will eventually decrease.

TDSC: Although web material may eventually gain in “status”, right now efforts should be made to supply students with bound texts and material. Again, the students who already interact well with each other should be encouraged to interact with each other to understand the course material since their IDV is low. UAI will decrease as students become more exposed to web-based learning. Explaining the relevance and application of the material will help overcome the increase in TDSC due to LTO.

TDSI: Web-based distance learning will need to gain in status to avoid the high PDI influence and the low IDV which makes students want to interact physically with an instructor. Since Nepali students are quite grade conscious, giving them points for posting both *individual* questions and answers to the bb or chat room (something this instructor dislikes because it encourages artificial postings) might be worth pursuing.

Icelandic Students

The high Internet use among Icelanders (one of the highest in the world) and Icelanders natural independence would seem to make web-based distance learning successful. However, a number of cultural issues can make such learning even better:

TDSS: Independent work will appeal to the Icelandic distance learner. Since communication is known to decrease TDSS, incentives to post, as with the Nepali students may help to decrease TDSS. Icelanders like to party and adding a WebCafe (virtual bar?) to the integrated tools might decrease TDSS for the course.

TDST: While PDI isn't as high as with Nepali's it does cause some increase in TDST. Adding the WebCafe to the course tools as described above might also decrease TDST. As with the Nepali students, instructors need to be proactive here as PDI may prevent students from easing the TDST.

TDSC: Icelanders' high IDV make this a strength already for them: TDSC is already low.

TDSI: As they become more used to Course Management Systems, their medium UAI will help decrease TDSI, and encouragement to use the communication tools, while artificial, may overcome the strong IDV influence on TDSI.

Conclusions

This paper analyzed two web-based courses for five cultural dimensions on four Transactional Distance measures. While much more analysis needs to be done, ways to improve web-based delivery were possible to discover. Continued analysis is taking place adding instructor cultural issue analysis. ELearning, when an instructor is from one culture and students are from another, requires awareness of cultural influences on both sides.

References

Barrett, Steven (2002), Overcoming Transactional Distance as a Barrier to Effective Communication over the Internet. *International Education Journal*, Vol. 3, No. 4, 34-42.

- Bates, Tony (1999), Cultural and Ethical Issues in International Distance Education, *UBC/CREAD 99*, Vancouver, Canada.
- Campbell, Malcolm et al (2004), Using Online Technologies: Does Culture Matter?, *ELearn 04*, Washington, DC.
- Dron, Jon (2004), Termites in the Schoolhouse: Stigmergy and Transactional Distance in an E-learning Environment, *ED-MEDIA 04*, Lugano.
- Garrison, Randy (2000), Theoretical Challenges for Distance Education in the 21st Century: A Shift from Structural to Transactional Issues, *International Review of Research in Open and Distance Learning* 1 (1), 1-17.
- Hofstede, Geert, (2001) *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations, 2nd Edition*. Thousand Oaks CA: Sage Publications, 2001, ISBN 0-8039-7323-3.
- Hofstede, Geert(a), *Geert Hofstede Analysis*, Retrieved April 2005 from <http://www.cyborlink.com/besite/hofstede.htm>
- Hofstede, Geert (b), *Geert Hofstede Analysis*, Retrieved April 2005 from http://www.geert-hofstede.com/hofstede_dimensions.php
- Jung, Hye Yoon (2004), Immediacy, Solidarity and Learner Empowerment in Distance Educations, *SITE 04*, Phoenix, AZ.
- Lemone, Karen (2004) Learning Can Be a Long Shot: Distance Learning Characteristics of Two Cultures, *ELearn 04*, Washington, DC.
- Lemone, Karen (2005) Putting Tools into Courses, not Courses into Tools, *SITE 05*, Phoenix, AZ.
- Lim, Grace (2003), The Cultural Component of Global Distance and Online Learning, *ICCE 2003*, Hong Kong.
- Liu, Geping et al (2004) Comparison of E-Learning in Distance Education in Different Cultural Settings (2004), *ELearn 04*, Washington DC.
- Moore, M. (1986) Self-directed learning and distance education, *Journal of Distance Education* 1 (1), 7-24.
- Moore, Michael G. (1994). "Is there a Cultural Problem in International Distance Education?" *Conference on Internationalism in Distance Education*. University Park: The Pennsylvania State University.
- Stull, J. B. and Von Till, B. (1995). Hofstede's Dimensions of Culture as Measurements of Student Ethnocentrism: A Quasi-experimental Study. *Western States Communication Association*.
- Tylee, J (2002), Cultural issues and the online environment, Australian Society for Educational Technology *International Education and Technology Conference*.
- Zhang, A. (2003). Transactional distance in web-based college learning environments: Toward measurement and theory construction, *Doctoral dissertation, Virginia Commonwealth University*.