



The Cross-Cultural Dimensions of Globalized E-Learning

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ABSTRACT

This exploratory study examined the effects of cross-cultural learning dimensions on e-learning outcomes for employees in functionally equivalent jobs in Western and Eastern cultures. Participants from the United States and India completed a Level 1 e-learning course designed in the United States. In addition, randomly selected completers then reported their interactions with the e-learning course in a survey. Learners from the two cultures achieved equitable learning outcomes, suggesting that characteristics of Level 1 e-learning courses mediate the effects of culture. In addition, while cross-cultural dimensions did appear to affect learners' preferences for and perceptions of e-learning, both Eastern and Western participants were willing to try new approaches to learning that did not align with their cultural profiles. Based on these results, the cultural adaptation process (CAP) model is presented as a preliminary guideline for adapting e-learning courses for other cultures. Accelerated dissemination of Level 1 courses could increase technological literacy. Education and technological innovation are strongly associated with advanced socio-economic development.

Keywords: computing in developing countries; cultural differences; distance learning; globalization; instructional design; learning outcomes; national culture; quasi-experimental study; Web course development

INTRODUCTION

The term *globalization* gained currency in the 1970s as Western corporations rapidly expanded into other parts of the world (Jarvis, 2002), accelerating cross-cultural exchanges (Walker & Dimmock, 2002). Industrial anthropolo-

gists have identified *cross-cultural dimensions* — categories of characteristics across which cultures can be compared and contrasted — such as how members of a culture communicate, perceive time, or view themselves in relation to the environment. As e-learning options proliferate and globalization continues, an expanding audience of learners is more likely

to encounter courses created by another culture. Most e-learning courses are designed in Western cultures; however, the largest and fastest-growing consumer groups live in Eastern cultures such as China, Japan, and India (Van Dam & Rogers, 2002). Educators will thus be challenged to provide e-learning opportunities that result in equitable learning outcomes for targeted cultures.

Learning outcomes were defined by Henderson (1996) as any results that reflect the acquisition of skills and knowledge, the effectiveness of instructional techniques, and students' perceptions or attitudes. Educational practitioners have begun to apply the concepts of cross-cultural dimensions to instructional design, presuming that adapting courses to suit the cultural profiles of learners will generate equitable learning outcomes. However, empirical research has neither conclusively supported nor disproved them. The purpose of this study was to better understand the effects of cross-cultural dimensions on e-learning in the globalized environment.

RESEARCH QUESTION

The problem is: "Are e-learning courses designed in a Western culture equally effective when used in an Eastern culture?" The research questions used to address this problem were as follows:

1. When taking an e-learning course designed in a Western culture, do participants from Eastern and Western cultures experience *equitable learning outcomes*?
2. Do they have different *preferences for or perceptions of e-learning*?
3. If there *are* strong similarities or significant differences in learning outcomes between the two cultures, in participants' use of features, or in their preferences or perceptions, are these similarities or differences *related* to the cross-cultural dimensions described in the literature?

REVIEW OF THE LITERATURE

According to a United Nations Development Program report (UNDP, 2001), the most developed, progressive, and economically stable countries in the world are those that are technologically advanced. Technological change and the building of human capabilities are interrelated: Each requires the development of the other for success. Thus, the UNDP report promoted "rethinking educational systems to meet the new challenges of technology" (2001, p. 84) through improved technology and technological education at a global level.

Domestically, providers of e-learning will be challenged to accommodate increasingly culturally heterogeneous audiences of learners. In 1997, 36% of students in the United States were from non-dominant ethnic groups, yet 86% of new teachers were white, and only 3% of teachers spoke a second language (National Center for Educational Statistics, as cited in Carter, 2000).

From an instructional point of view, incompatibilities between the cross-cul-

tural characteristics of e-learning courses and learners could cause inequitable learning outcomes (Henderson, 1996). For example, members of cultures may prefer to learn in a particular manner (Gardner, 1989; Horton, 1999), or they may have specific approaches to problem solving (Lave, 1988; Soh, 1999) and creativity (Gardner, 1989). Or, a pedagogical paradigm espoused by one culture could alienate or confuse targeted learners (Hall, 1981), as could unintentional cultural biases in instructional design (McLoughlin, 1999).

Theoretical Foundations

Hofstede (1984, 1997, 2001), Trompenaars and Hampden-Turner (1998), and Hall (1953, 1981) identified and characterized cross-cultural dimensions at the national level, primarily with respect to corporate business and communication. While they posited the probable effects of many of these dimensions on education, Gardner (1983, 1989), Henderson (1996), and others have explored similar concepts within the discipline of education.

Hofstede and Cross-Cultural Dimensions at the National Level

Hofstede (1984, 1997) established the practice of using *national cultures* in quantitative studies: samples of people living and working in the same country are reasonable representations of the national culture. He gathered data from questionnaires administered to 116,000 partici-

pants in 50 countries and three regions, identifying five cross-cultural dimensions that he portrayed as continua bounded by polar extremes. He calculated indices for each country, described below.

Power Distance Index (PDI)

The power distance index (PDI)—“the extent to which the less powerful members of institutions and organizations expect and accept that power is distributed unequally” (Hofstede, 1997, p. 27)—has ramifications in educational organizations. In nations with low PDI scores, such as the United States (PDI = 40), teachers and students tend to be perceived as equals. Teachers are facilitators of student-centered education rather than authoritative subject matter experts (SMEs). Students are expected to show initiative, solve problems, build their own knowledge base, question teachers, and initiate discussions. In high PDI nations such as India (PDI = 77), relationships between teachers and students are assumed inequitable. Teachers are authorities and SMEs; thus, students do not question their knowledge (Hofstede, 1997).

Individualism Index (IDV)

Hofstede (1997) defined individualistic societies as those “in which ties between individuals are loose” (p. 51). By contrast, collectivist societies are those “in which people from birth onwards are integrated into strong, cohesive *ingroups*, which throughout people’s lifetimes continue to protect them in exchange for unquestioned loyalty” (p. 51).

Members of collectivist societies tend to rely on their ingroups to determine social relationships in educational settings, and may even expect differential treatment dependent upon their social class. In contrast, students in high-IDV societies expect to be treated as equals among peers and faculty. They prefer to work as individuals and expect recognition for individual merit.

Globally, collectivist societies are predominant (Hofstede, 1997). From the perspective of education, this represents an important consideration. The United States and other high-IDV countries produce most instructional artifacts, including e-learning. Characteristics of these courses could significantly conflict with the values of collectivist societies that import them. The United States has the highest IDV (91) in Hofstede's study, while India has a much lower IDV of 48 (1997).

Masculinity Index (MAS)

Hofstede (1984) defined the dimension "masculinity versus femininity" in terms of how a culture socializes its members to perform gender roles. In a masculine culture, men are expected to be tough and assertive, while women are perceived as tender and modest. In a feminine culture, men and women are more likely to have similar roles; both are expected to be tender and modest, even if men also express some assertiveness.

Hofstede (1997) contended that, in high-MAS countries, students compete openly, are achievement conscious, and are disappointed by failure. An instructor's academic excellence and reputation are

important. In a low MAS culture, teachers and students have more relaxed expectations. The United States and India yielded similar MAS indices in Hofstede's work (62 and 56, respectively).

Uncertainty Avoidance Index (UAI)

Uncertainty avoidance is "the extent to which the members of the culture feel threatened by uncertain or unknown situations" (Hofstede, 1997, p. 113). Uncertainty avoidance is not risk avoidance; rather, it refers to a pattern of reducing ambiguity.

Hofstede (1997) felt that, in a high-UAI environment, the teacher is an expert and an unquestionable authority. Students prefer a structured learning environment, precise objectives, strict timetables, precise answers, and rewards for accuracy. In contrast, in low-UAI cultures, teachers act as facilitators of learning. Students are comfortable with vague objectives, loose timetables, multiple solutions to problems, and they seek to be rewarded for originality. The United States and India have similar, mid-range UAI scores of 46 and 40, respectively.

Long-Term Orientation (LTO)

Hofstede's fifth cross-cultural dimension, "short-term versus long-term orientation to time," was theorized after his original 1984 study. In general, Hofstede found that Eastern countries had relatively high LTOs, while Western countries yielded relatively low LTO scores. Hofstede did not propose specific ramifications of the LTO dimension on education, and it was not included in this study.

*Trompenaars and Hampden-Turner's
Cross-Cultural Study*

Trompenaars and Hampden-Turner (1998) also researched cross-cultural dimensions at the national level; like Hofstede, they were primarily interested in the effects on business. Their analysis of surveys (from over 30,000 corporate managers from more than 100 countries) identified eight cross-cultural dimensions, some of which were similar to Hofstede's. Each of their dimensions, like Hofstede's, was described as a continuum bounded by two extreme, opposing characteristics. However, in contrast to Hofstede, they held that in practice, cultural groups display both extremes of all dimensions, but show a preference or tendency toward one extreme in most situations. Unlike Hofstede, they rarely speculated on the implications of cross-cultural dimensions in education.

In the first category, "relationships and rules," Trompenaars (1998) identified five dimensions across which cultures could be compared and contrasted. *Universalism versus particularism* relates to the balance between rules and relationships. Universalists tend to adhere to rules. In a particularist society, rules are flexible guidelines over which relationships always take precedence.

The *individualism versus communitarianism* dimension, similar to Hofstede's IDV index, refers to the tendency to perceive oneself primarily either as an individual or as a member of a group. In an individualistic culture, members value personal achievement and responsibility. The communitarian society, meanwhile, privileges the achievement of group goals.

They frequently make decisions via consensus or defer decisions to an authoritative entity.

Members of *affective versus neutral* cultures may be, respectively, emotionally expressive or emotionally detached and objective, in verbal or non-verbal communication.

Specific versus diffuse relates to "the degree to which we engage others in *specific* areas of life...or *diffusely* in multiple areas of our lives" (Trompenaars & Hampden-Turner, 1998, p. 83) and accounts for the degree and level of interaction between people. In *specific* cultures, for example, the "boss" is the authority in the office, but beyond that environment, he or she is no longer granted the same deference. Conversely, in *diffuse* cultures, members confer authority to superiors across most environments. Members of specific cultures tend to use direct and purposeful communication, while diffuse cultures tend to be less direct, often to the point of appearing evasive.

The *achieved status versus ascribed status* dimension relates to whether a culture determines status according to accomplishments or according to markers of group membership. In achievement-oriented cultures, according to Trompenaars and Hampden-Turner (1998), authority is tied to one's task or job, whereas in an ascription-oriented culture, titles clarify status. This dimension shares characteristics with Hofstede's PDI.

Trompenaars and Hampden-Turner (1998) also identified two dimensions in the category "attitude toward time." *Orientation to past, present, and future*

reflects how cultures perceive the importance of each of these periods. The dimension *sequential versus synchronic* is related to whether time is perceived as linear and composed of discrete events, or as circular and composed of integrated, overlapping events.

Lastly, Trompenaars and Hampden-Turner (1998) categorized "attitudes toward the environment." Members of *inner-directed* cultures believe they have significant control over the outcome of events, aggressively trying to manage situations, whereas members of *outer-directed* cultures believe they are subject to an external locus of control, and thus are more comfortable and flexible when confronted with change.

Hall's Perspectives of Cultural Differences

In Hall's (1981) words: "Culturally based paradigms place obstacles in the path to understanding because culture equips each of us with built-in blinders, hidden and unstated assumptions" (p. 220). He envisioned cultural differences as poles on opposite ends of continua that resemble the indices and characteristics, respectively, of Hofstede (1984, 1997) and Trompenaars & Hampden-Turner (1998).

According to Hall (1981), members of *M-time* cultures tend to emphasize schedules, promptness, and segmentation of activities. Their communication is low context, depending more on direct language than on subtle signals. In contrast, members of *P-time* cultures engage in multiple activities simultaneously and tend to focus

on relationships and the completion of transactions rather than on scheduled events. Their communication is high context, as it is dependent upon what they already know about their culture.

According to Hall (1981), American education tends to be linear, compartmentalized, and lacking in creativity and problem-solving techniques. As members of a low-context culture, Americans tend to use sparse communication, especially in technologically driven environments.

Applications of National-Level Cross-Cultural Dimensions in Education

Educational researchers and practitioners have begun to incorporate the findings of national-level studies into e-learning. Marcus and Gould (2001), for instance, proposed redesigning the user interface of Web pages to match the known cultural dimensions of the target culture as described by Hofstede (1997).

Marinetti and Dunn (2002) proposed adapting courses of varying complexity to the cross-cultural dimensions of a culture, as identified in the literature, to accommodate the presumed preferences of different groups. Their adaptation strategies are summarized in Table 1. For the purpose of discussion, each level of course complexity has been assigned a number.

For example, based on the table, for Level 1 courses, simple *translation* of content would be adequate as a cultural adaptation technique. For Level 2 courses, in which content or tasks are more complex but universally familiar, *localization* could ensure that concepts and technical

Table 1. Descriptions of course Levels 1-4 (adapted with permission from Marinetti & Dunn, 2002)

Complexity Level	Level 1	Level 2	Level 3	Level 4
<i>Content Type</i>	Simple information, knowledge, news	Low level, cognitive “hard skills”; simple knowledge and core concepts	Some soft skills; complex knowledge, such as regulatory or financial information; business strategy and most business skills	Mostly “soft skills,” such as attitudes and beliefs; many complex management skills
<i>Content Examples</i>	Product knowledge, company procedures	Application software, other electronic skills	Project management, presentation skills, marketing strategy	Negotiation skills, motivation, teamwork, conflict resolution
<i>Content Adaptation – What people learn</i>	Translation only; content and context culturally neutral	Translation plus context adaptation, examples as required	Translation plus context adaptation, examples and some modular content	Significant proportion of content and context is unique per culture
<i>Instructional Strategy Adaptation – How people learn</i>	None	Minor changes	Required at key points; re-ordering information, representation of concepts, alternative media, etc.	Significant proportion unique per culture; may require alternative course architectures
<i>Adaptation Strategies</i>	Translation	Localization	Modularization	Origination

Note: From Cultural Adaptation: A Necessity for Global E-Learning, by A. Marinetti and P. Dunn, 2002. [Web page]. Available: <http://www.learningbites.net/learningbites/main%20feature1a.htm>. Copyright 2002 by Marinetti and Dunn. Adapted with permission.

tasks are achievable by the targeted culture. Localization may be described as “the process of converting material . . . into a format that is technically, linguistically, and culturally appropriate for countries outside the original market” (Transware, 2002). These superficial changes, called *soft-multiculturalism* by Henderson (1996), include slang, humor, gestures, units of measure, law, taboos, etiquette, and so forth (Transware, 2002). For Level 3 courses, Marinetti and Dunn (2002) proposed *modularization*, which entails adapting only those components of the e-learning course that vary between the de-

signing and recipient culture, and that could affect learners’ outcomes. Finally, for course content that is complex or culturally differentiated, Marinetti and Dunn recommended *origination* — creating a new course with the full participation of the target culture.

Any of the above techniques, singularly or in combination, could simplify the adaptation process and reduce the costs of redesign, subsequently improving the cultural compatibility of e-learning courses. However, the presumed need to adapt e-learning courses to the cultural dimensions of targeted learners remains unproven by

research. In addition, the possibility that a cultural group could accept or adapt to the dimensions of the culture in which an e-learning artifact originated remains unexplored.

Cross-Cultural Dimensions in Education

At a high level, culture influences multiple aspects of education, from the obvious such as educational structures, governance, delivery systems, and teaching styles (Thomas, 1990), to the subliminal, such as values or the purpose of education (Gardner, 1989; Mosa, 1999; Jarvis, 2002).

Gardner (1983) argued that cultures value different types of intelligence and different forms of knowledge. These intelligences are not cross-cultural dimensions per se, but his theory of multiple intelligences suggests that one culture could prefer one cluster of intelligences to another, and that education could be designed to accommodate those intelligences. In another study (1989), he found that the Chinese prefer a *mimetic* approach to education: teachers (and educational materials) are treated as unquestioned repositories of knowledge. In contrast, Americans were moving toward a *transformative* approach to education: teachers act as coaches, eliciting desired qualities from students.

Henderson (1996) proffered a comprehensive *multiple culture model* (MCM) specifically for investigating cross-cultural characteristics in education, with 14 dimensions represented as continua with polar extremes, reminiscent of those

used by Hall (1981), Hofstede (1984, 1997), and Trompenaars and Hampden-Turner (1998). In the model, the course features and characteristics represented on the left side reflect the objectivist-instructionist pedagogical paradigm, while those on the right reflect the constructivist-cognitive paradigm.

THE STUDY METHODOLOGY

For this study, the 14 dimensions on the MCM were reduced to none, thereby creating the *simplified multiple cultural model* (SMCM) (Edmundson, 2004):

1. **Pedagogical Paradigm:** *Instructionist/Objectivist–Constructivist/Cognitive*. Four closely related dimensions—*Epistemology, Pedagogical Philosophy, Underlying Psychology, and Goal Orientation*—were combined to create a singular dimension, Pedagogical Paradigm.
2. **Experiential Value:** *Abstract–Concrete*. When instruction has abstract experiential value, learning is removed from reality. Instruction with concrete experiential value integrates the learning process with the learner's world.
3. **Teacher Role:** *Didactic–Facilitative*. A didactic exposition of knowledge, such as a lecture, contrasts with facilitative pedagogical techniques that enable exploratory learning without controlling outcomes.
4. **Value of Errors:** *Errorless Learning–Learning from Experience*. Under an errorless learning paradigm, students learn until they generate no mistakes or

the instructional method does not allow for errors. In contrast, the learning from experience approach to instruction uses errors in the educational process.

5. **Motivation:** *Extrinsic–Intrinsic*. Extrinsic motivation originates from factors outside the learner, such as the need for high grades or the presence of engaging materials. Intrinsic motivation comes from an internal desire to learn.
6. **Accommodation of Individual Differences:** *Non-Existent–Multifaceted*. In some contexts, learning and knowledge are structured so that there is no need for accommodation of individual differences. When accommodation of individual differences is existent, on the other hand, knowledge and learning are presented in a variety of ways so that learners can utilize the tools that most suit their preferences.
7. **Learner Control:** *Non-Existent–Unrestricted*. In this dimension, the student either learns along a predetermined path or by independent discovery.
8. **User Activity:** *Mathemagenic–Generative*. A mathemagenic approach permits learners to access the same content in different ways, while a generative approach encourages learners to engage in the process of creating and elaborating content.
9. **Cooperative Learning:** *Unsupported–Integral*. In this dimension, learners work independently or learning is encouraged through cooperative activities.

Certain SMCM dimensions (e.g., cooperative learning) may be manifesta-

tions of cross-cultural dimensions at the national level, while others may simply reflect learner preferences or subliminal effects of culture. To date, however, relatively few studies have examined cross-cultural dimensions within e-learning courses. Likewise, few researchers have administered an e-learning course designed by one culture to individuals in another culture with the intention of measuring potential differences in learning outcomes.

The experimental design best suited to part one of this study was the post-test-only control group design (Campbell & Stanley, 1963; Leedy & Ormrod, 2001; Tuckman, 1978) diagrammed in Figure 1.

Pre-testing was neither desirable nor useful in this study, as the researcher was interested in the differences between learning outcomes caused by the culture, rather than the knowledge or skills generated by the e-learning course.

Seven hundred fifty-seven technology workers in functionally equivalent roles were required by their company to take a Western-designed e-learning course. The software upgrade tutorial was designated

Figure 1. Post-test-only control group design

R1	X	O1
R2		O2

R = randomly selected members of the groups under study; X = the treatment (i.e., the culture of each of the two groups); O = the observations or measurements of differences between the two groups (i.e., tutorial results and questionnaire responses)

as a Level 1 course, according to the criteria described by Marinetti and Dunn (2002). From this group, 250 were randomly selected (for a confidence interval of 95%) to participate in the study: 204 from a Western culture (U.S.) and 46 from an Eastern culture (India). Data on learning outcomes were analyzed using student's *t* tests for unequal *n* using StatDisk (Triola, 2001).

In part two of the study, the 250 participants were invited to complete an online post-course questionnaire, which included questions based on the SMCM dimensions, in order to identify: (a) learning outcomes not recorded by the learning management system, and (b) the participants' preferences for and perceptions of e-learning, based on potential cultural differences and their overall experiences with the genre. Responses were analyzed using student's *t* tests for unequal *n* using StatDisk (Triola, 2001).

Finally, the researcher explored possible relationships between the learning outcomes, and participants' preferences and perceptions to the cross-cultural dimensions described in national-level research.

SUMMARY OF FINDINGS

Members of both groups achieved equitable learning outcomes when they took the software upgrade tutorial. There were no significant differences ($\alpha = .05$) between learning outcomes (number of attempts needed to complete the course, scores of each attempt, and time needed for each attempt). Responses on the questionnaire provided additional information

on how they navigated and used the course, and their perceptions of its effectiveness. Both groups needed no more than three attempts to complete the course. An average of 85% of the participants completed the course on the first attempt in an average of 68 minutes, with an average score of 85.5%. While the U.S. participants felt that the tutorial did not completely meet its objectives, both groups agreed that they had *applied* most of what they had learned to their work. Both groups used the course features (demonstrations, handouts, and navigation tools) in the same manner, although Americans tended to print more handouts than Indian participants did. Both groups acknowledged that they had experienced confusion in the past with language and format in e-learning, which indicated that they had taken e-learning courses more complex than the Level 1 tutorial used in this study.

Participants expressed equal acceptance of the course characteristics manifested in behavioral/objectivist and cognitive/constructivist paradigms. With respect to those features and characteristics, participants preferred that the instructor/course designer manage the design elements; the establishment of course objectives; the selection of activities and instructional methods; examples; and the determination of the best path to learning. These features are typically selected during the *design process*.

Participants also indicated that they preferred being guided by a facilitator rather than instructed by an expert, controlling the pace of learning, testing themselves by experimentation, learning from

their mistakes, and applying course knowledge and skills to their own activities. In other words, participants expected to control *how they interacted with the course*, although both groups indicated that they would be open to trying other approaches to learning.

Participants' responses indicated that two of the nine dimensions of the SMCM are related to certain cross-cultural dimensions described at the national level. The dimension of *cooperative learning* on the SMCM shares characteristics with Hofstede's IDV dimension, Trompenaars and Hampden-Turner's individualism versus communitarianism dimension, and Hall's M-time versus P-time dimension. The *origin of motivation* on the SMCM shares characteristics with Hofstede's IDV and MAS dimensions, as well as Trompenaars and Hampden-Turner's individualism versus communitarianism dimension.

Two other SMCM dimensions seem potentially related to those identified at the national level, though not as strongly as *cooperative learning* and *origin of motivation*. *Teacher role* from the SMCM appears to share characteristics with Hofstede's MAS dimension, with Trompenaars and Hampden-Turner's specific versus diffuse dimension, and with Hall's low-context versus high-context dimension. *Learner control* on the SMCM appears to share characteristics with Hofstede's PDI, and Trompenaars and Hampden-Turner's inner-directed versus outer-directed dimension. *Value of errors* on the SMCM seemed weakly related to Trompenaars and Hampden-Turner's universalism versus particularism,

the dimension encompassing the value of rules.

Thus, while this study did not explore statistical correlations between cultural dimensions and learner preferences, there appear to be potential relationships between at least four dimensions of the SMCM and dimensions identified by other researchers. These findings suggest the need for studies of cultural dimensions in Level 1 to 4 courses, as greater course complexity may raise stronger responses, more cultural preferences, and more obvious relationships to national-level cross-cultural dimensions.

CONCLUSION

New Perspectives on E-Learning

The findings in this exploratory study offer five new perspectives on the e-learning environment that could change how instructors/designers create courses, how consumers adapt and/or export Western-designed e-learning courses, and how Level 1 e-learning can be used to promote global education and economic development.

First, the features of Level 1 courses appear to create a learning environment conducive to equitable learning outcomes, as their low-context nature introduces the fewest cross-cultural effects: communication is minimized; interaction is nonexistent; and language is blunt, technical, and sparse (Hall, 1981).

Second, learners seem to differentiate between the features of courses that are generated during the design process (and are thus beyond their control) and

those that drive learner interaction with the course, which they prefer to control. Knowing this, course developers should expect to determine e-learning course goals and objectives, types of learning activities, instructional method(s), and the overall “path” to learning. At the same time, they should expect that learners will prefer facilitation of learning rather than authoritative instruction, control of the pace of learning, learning from experimentation or mistakes, and application of learning to their own needs.

Third, since members of both cultures were amenable to trying course features representing contrasting pedagogical paradigms, there is potential to introduce an *eclectic paradigm* — a combination of instructivist/objectivist and constructivist/cognitive — as suggested by Henderson (1996), to other cultures.

Fourth, certain SMCM dimensions appear to affect e-learning. The dimensions of cooperativism versus individualism and origin of motivation appear to have strong effects on e-learning preferences, and may thus be characterized as *critical cultural dimensions*. Three dimensions — teacher role, learner control, and possibly value of errors — have indeterminate impact, but are likely to matter and, until further research indicates otherwise, could be treated as critical dimensions. The remaining dimensions—user activity, experiential value, and accommodation of individual differences—may be described as *assistive cultural dimensions*.

Finally, there appears to be a dichotomy between the cultural “profiles” of learners and their actual preferences: while several of the large-scale trends that

define cultural groups may need to be accommodated for in e-learning courses above Level 1, a significant number of these dimensions are best viewed as “possible preferences,” rather than as ultimate and final outlooks.

Cultural Adaptation Process (CAP) Model

The cultural adaptation process (CAP) model in Figure 2 is proposed as a preliminary guideline for: (a) evaluating existing e-learning courses, (b) creating cultural profiles of targeted learners, (c) developing culturally appropriate e-learning courses, and (d) framing future research studies. It is based on a synthesis of findings in this study, but it also incorporates the findings on cross-cultural dimensions from research in industrial anthropology and education.

The model provides a matrix in which, from left to right, course complexity is considered, and from top to bottom, the steps in adapting an e-learning course for a targeted culture are presented. Users of the model will need to know the cross-cultural dimensions of the targeted learners for cooperative learning, origin of motivation, and most likely, learner control, teacher role, and value of errors. They will need to identify the level of the course they expect to use, adapt, or create, then match course characteristics to the *critical* cross-cultural dimensions of targeted learners. Next, the preferences of the targeted learners should be assessed, using surveys or interviews, according to the *assistive* dimensions of the model. Future research may indicate that other dimen-

Figure 2. The cultural adaptation process (CAP) model (Edmundson, 2004)

	Level 1	Level 2	Level 3	Level 4
Step 1: Evaluate content type and examples.	Simple information, core knowledge, news, or updates, such as product knowledge, company procedures	Low-level, cognitive hard skills; simple knowledge and concepts, such as those used in application software; most computer-related skills	Some soft skills; complex knowledge, such as project management, presentation skills, marketing strategy	Mostly soft skills; attitudes and beliefs, such as negotiation skills, motivation, teamwork, conflict resolution
Step 2: Identify pedagogical paradigm, include instructional methods, etc.	Instructivist-objectivist, with behavioral objectives and sharply-focused goals; low-context communication; mimetic	More closely related to instructivist-objectivist than constructivist-cognitive paradigm	More closely related to constructivist-cognitive than instructivist-objectivist paradigm	Constructivist-cognitive with cognitive objectives, unfocused goals; high-context communication; transformative
Step 3: Identify media	Lecture, handouts, simple demonstrations	Satellite broadcasts, audio conferencing, recordings, television	Threaded discussions, list servers, online chat, email	Videoconferencing, web-based training, streaming media, and web conferencing
Step 3: Identify critical national level cross-cultural dimensions of learners and associated features and characteristics of the course. The following dimensions of e-learning appear to be closely related to those found at the national level. Research indicates that a user's cultural profile (see the works of Hofstede, etc.) will dictate what learners are likely to strongly prefer with respect to these dimensions.				
Critical Cross-Cultural Dimensions	Unsupported	Cooperative Learning*		Integral
	Extrinsic	Origin of Motivation*		Intrinsic
	Non-existent	Learner Control		Unrestricted
	Didactic	Teacher Role		Facilitative
	Errorless learning	Value of Errors		Learning from experience
Step 4: Identify assistive national level cross-cultural dimensions and associated features and characteristics of the course. The following dimensions are related to the potential preferences of groups of e-learners. Assess their preferences before modifying or developing any e-learning course, as these seem to change based on variables other than cross-cultural dimensions at the national level.				
Assistive Cross-Cultural Dimensions	Mathemagenic	User Activity		Generative
	Abstract	Experiential Value		Concrete
	Non-existent	Accommodation of Individual Differences		Multifaceted
Step 5: Adaptation Strategies	Translation	Localization	Modularization	Origination

sions should be included in the model, that certain assistive dimensions should be rated as critical, or that current dimensions classified as critical are more aptly described as assistive.

The CAP model represents a new, but not complete, perspective on the cross-cultural dimensions of e-learning courses and learners. Feedback from the use of the systematic model and further

research would help fashion a reliable tool for consumers of e-learning.

Based on findings in this study, the researcher proposes five new perspectives on e-learning that could represent means to effectively adapting or creating e-learning courses for use in other cultures. Such actions could increase access to technology education, improve technological literacy, and introduce new technologies

across and between cultures, thereby increasing socioeconomic development across the ever-expanding e-world.

REFERENCES

- Campbell, D.T. & Stanley, J.C. (1963). *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin.
- Carter, R.T. (2000). Reimagining race in education: A new paradigm for psychology. *Teachers College Record*, 102(5), 864-898.
- Edmundson, A.L. (2004). *The cross-cultural dimensions of globalized e-learning*. Doctoral Dissertation, Walden University, USA.
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.
- Gardner, H. (1989). *To open minds: Chinese clues to the dilemma of contemporary American education*. New York: Basic Books.
- Hall, E.T. (1981). *Beyond culture: Into the cultural unconscious*. Garden City, NY: Anchor Press.
- Henderson, L. (1996). Instructional design of interactive multimedia: A cultural critique. *Educational Technology Research and Development*, 44(4), 85-104.
- Hofstede, G.H. (1984). *Culture's consequences: International differences in work-related values* (abridged edition, volume 5). Newbury Park, CA: Sage Publications.
- Hofstede, G.H. (1997). *Cultures and organizations: Software of the mind* (2nd edition). New York: McGraw-Hill.
- Horton, W. (1999, 2003). *Multicultural multimedia: Teaching and reaching the whole wide world*. William Horton Consulting. Retrieved February 14, 2003: www.horton.com
- Jarvis, P. (2002). Globalization, citizenship and the education of adults in contemporary European society. *Compare: A Journal of Comparative Education*, 32(1), 5-19.
- Lave, J. (1988). *Cognition in practice: Mind, mathematics, and culture in everyday life*. Cambridge, MA: Cambridge University Press.
- Leedy, P.D. & Ormrod, J.E. (2001). *Practical research: Planning and design* (7th edition). Upper Saddle River, NJ: Prentice-Hall.
- Marcus, A. & Gould, E.W. (2001). *Cultural dimensions and global Web user-interface design: What? So what? Now what?* AM+A. Retrieved August 25, 2002: http://www.amanda.com/resources/hfweb2000/AMA_CultDim.pdf
- Marinetti, A. & Dunn, P. (2002). *Cultural adaptation: A necessity for global e-learning, Learning bites*. Retrieved August 25, 2002: <http://www.learningbites.net/learningbites/main%20feature1a.htm>
- McLoughlin, C. (1999). Culturally responsive technology use: Developing an online community of learners. *British Journal of Educational Technology*, 30(3), 231-245.
- Mosa, A.A. (1999). Culture in education and mass media: Conformation or confrontation. *Educational Media International*, 36(1), 34-41.

- Soh, K.-C. (1999). East-West difference in views on creativity: Is Howard Gardner correct? Yes and no. *Journal of Creative Behavior*, 33(2), 112-125.
- Thomas, R.M. (Ed.). (1990). *International comparative education: Practices, issues and prospects*. Oxford: Pergamon Press.
- Transware. (2002). *What is localization?* Retrieved September 21, 2002: www.transwareplc.com
- Triola, M.F. (2001). *Elementary statistics* (8th edition). Boston: Addison-Wesley.
- Trompenaars, A. & Hampden-Turner, C. (1998). *Riding the waves of culture: Understanding cultural diversity in global business* (2nd edition). New York: McGraw-Hill.
- Tuckman, B.W. (1978). *Conducting educational research* (2nd edition). New York: Harcourt Brace Jovanovich.
- UNDP. (2001). *Human development report 2001: Making new technologies work for human development*. New York: United Nations Development Program.
- Van Dam, N. & Rogers, E. (2002). E-learning cultures around the world. *e-Learning*, 3(5), 28-32.
- Walker, A. & Dimmock, C.A.J. (eds.). (2002). *School leadership and administration: Adopting a cultural perspective*. New York: Routledge Falmer.

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