CONSIDERING CULTURE IN E-LEARNING ENVIRONMENTS AND POST-SECONDARY LEARNING SUCCESS

Graduate Research Project

Submitted in Partial Fulfillment of Requirements

for the Degree of

Master of Arts in Community College Education

Central Michigan University

Submitted by

Orest Kinasevych

Research Advisors

Judith Simons Gold, Ph.D.

Kristen Warmoth, Ed.D.

December 30, 2011

Acknowledgements

I wish to thank and acknowledge my research advisors: Dr. Judith Simons Gold, for her encouragement and guidance throughout the research process, and Dr. Kristen Warmoth, for her insights and assistance in seeing me through the analysis and completion of this work.

I also would like to express my thanks to Northern Alberta Institute of Technology and to Red River College of Applied Arts, Science and Technology for their cooperation as research sites.

Table Of Contents

List Of Tables

Table 23.

List Of Figures

Chapter 1: Definition Of The Problem

Recent research indicates that the usage of course management systems (CMS)—software for delivering curriculum in online environments—has grown from 79.7% to 91.0% in the period from 2006 to 2009 (Smith, Salaway, & Borreson Caruso, 2009, p. 68). With the widely acknowledged, continuing expansion of online learning environments (Anderson, 2008; Johnson, Levine, Smith, & Stone, 2010; S. D. Smith et al., 2009; Spector, Merrill, Van Merrienboer, & Driscoll, 2007), instructional designers may well expect an increasing demand for appropriate e-learning applications for the benefit of learners. Educational applications may not have been the foundational purpose for which online media were invented. However, as in all educational settings, new tools should be subject to pedagogical considerations and effective instructional design (Abbeduto, 2006).

The areas of inquiry presented in this study represent several domains of research. In order to constrain the scope of the study, this chapter will define and identify the specific cross-disciplinary domains of interest and the research approach. Within this scope, a problem statement will be articulated along with research questions that will be used to formulate research hypotheses, to be articulated further in Chapter 3. Also to be described are specific limitations that may be encountered in the research process and analysis.

Research Scope

For the purpose of this study, three research domains were identified in which prior work has been done. These research domains—culture, online media, and education—are reflected in the literature as individual topics of study as well as in combined, interdisciplinary research. Research that considered the interaction of culture with online media was relatively robust, as was research in culture and learning. Interest in e-learning research is increasing. There has been

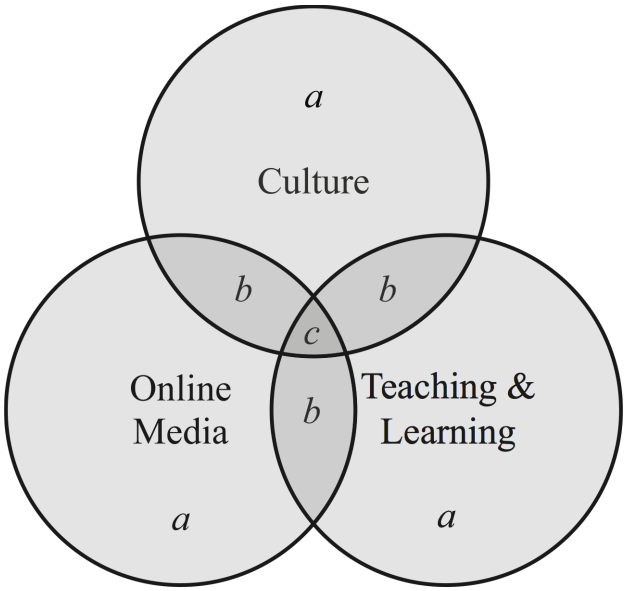

Figure 1: The relationships of the three domains under study—culture, online media, and education. Shown are the individual domains (a), the intersection of domain pairs (b), and the intersection of all three domains (c).

notably less research done at the intersection of culture, learning, and online media. This intersection of three domains will be the focus of this study. There is a consensus that such interdisciplinary research is increasingly of interest (Adeoye, 2007; Gunawardena, Wilson, & Nolla, 2003; Selinger, 2004; Verenikina, 2010).

The domain of culture encompasses anthropology, cultural psychology, sociology, human history, linguistics, and other sciences that examine the behaviours, beliefs, and artifacts of human populations (Joy & Kolb, 2009). The domain of online media encompasses computers and networked computing devices, and their software and operator interfaces (Nielsen, 1994). The domain of education, which may be referred to as pedagogy, encompasses research into the practices of teaching and learning, educational psychology, cognitive and brain sciences, and

allied fields (Woolfolk, Winne, & Perry, 2010). The current study will examine these three domains in interaction with each other. Figure 1 illustrates the relationships of the three domains under study. The literature shows research has been conducted within each domain individually (a), wherever pairs of domains intersect (b), as well as where all three domains intersect (c).

Extant research in the discipline of education—the principles and practices of teaching and learning—consider aspects such as learner characteristics and individual learning styles (Butler, 2004). Theoretical principles of interest in this study are the areas of constructivist learning and social constructivism where there is a degree of current interest in the literature (Ally, 2008). Ally's research agrees that the implementation of the principles of teaching and learning in all instructional practice, and particularly in online instruction, is important (2008).

The research literature suggests that culture is a complex, abstract topic with definitions difficult to construe (P. C. Rogers, Graham, & Mayes, 2007). It has complex and profound influence on research participants and investigators alike (Henderson, 1996). The effects of culture affect teaching and learning interactions (Catterick, 2006) as well as expressions such as language and online media. An understanding of culture may serve to address the conflicts that arise when culture is at issue (Henderson, 1996). This study will consider the work of Hofstede (2001) whose research into cultural dimensions will be used with the survey instruments of the current research. Criticisms of Hofstede's assertions challenge the organizational and national boundaries of culture that he selected, the uniformity of culture he claimed, the difference between practice and perception in the research participants, and the various operationalized definitions of culture (Catterick, 2006; McSweeney, 2002). Though the criticism is varied and vigorous, a comparative study of culture may not be possible without some starting point.

Hofstede's research has been recognized as having that value (2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004; Joy & Kolb, 2009; Sanchez-Burks & Lee, 2007).

Online media are of interest in this study as to the virtual visage presented to human operators. A key focus is the design of visual interfaces and how human operators interpret and manipulate them. Nielsen had developed frameworks for evaluating and understanding software interfaces. These frameworks have been effectively applied in other research (Adeoye, 2007; Nielsen, 1994).

The domains become increasingly of interest to the current study when their intersections are considered. Culture has been identified as an influence in teaching and learning. It affects notions of knowledge and learning. It also affects individuals' understandings of social interactions and obligations (Dyson, 2010). Teaching and instructional design can emphasize or de-emphasize cultural factors and thereby affect learning success (Henderson, 1996). It may well be that learners are influenced by their culture but so, too, are instructors and instructional designers, as are the theoretical and research underpinnings they may choose to apply (Callahan, 2005a; Dormann & Chisalita, 2002; Henderson, 1996; van Heerden & van Greunen, 2006). Culture, therefore, should be addressed in instructional design and teaching, as well as in learning.

The effects between culture and online media are seen to be mutual. Online media are manifested as a system of symbols (Dyson, 2010, p. 258) yet bear the limitations of hardware and software components (Reinecke & Bernstein, 2008, p. 3261). As a manifestation of culture, online media are seen to impose, significantly, an implicit culture on users (Adeoye, 2007; Dyson, 2010; Gunawardena et al., 2003). Culture can be seen to cause stratification with regards to access and use of online media, a phenomena referred to as a digital divide (DiMaggio, Hargittai, Neuman, & Robinson, 2001; E. M. Rogers, 2003). Availability may not always

translate into accessibility (E. M. Rogers, 2003). Many aspects interact with culture, from the level of socio-economic status (SES), through to the effects of globalization (E. M. Rogers, 2003). At the same time, it is difficult to gauge the implicit culture of any given online media, despite overt markers such as language (Dyson, 2010). In identifying a solution, researchers are asking whether multiple customization or single standardization may be the optimal approach (Callahan, 2005a).

Teaching and learning have also been studied in the context of online media. The growth of information and communication technology (ICT) applications in commerce, government, as well as in people's personal lives is reflected in education settings (Abbeduto, 2006). The existing range of literature on information technology (IT) usage in education suggests meaningful interest in its value (Ally, 2008; S. D. Smith et al., 2009). IT growth in education settings may be spurred by the promise of benefits such as improved teaching and learning, wider accessibility, more efficient resource allocation, and convenience (Abbeduto, 2006; Ally, 2008; S. D. Smith et al., 2009). The seminal purpose of online media might not have been for academic application; therefore, its design may lack fundamental pedagogical supports (Lopes, 2003). For this lack, pedagogy and the principles of teaching and learning are considered essential to e-learning (Ally, 2008). Conscientious instructional design, with appropriate content and strategies, may overcome the educational shortcomings of online media (Ally, 2008). Without such consideration, the worst approaches have been seen to be incorporated into e-learning (Lefoe, 1998). Instructional staff are a necessary implementation component, yet IT ability requires training and cannot be assumed (Lopes, 2003).

Learner perception of online media is considered significant. It affects acceptance of e-learning tools and motivation in e-learning contexts (Salaway & Borreson Caruso, 2007; S. D.

Smith et al., 2009). Otherwise, online media may become a barrier to learning (Salaway & Borreson Caruso, 2007). Learner perception of classroom IT can be gauged in several ways: considering the amount, appropriateness, and dependence on online media in classroom (Salaway & Borreson Caruso, 2007). Learner characteristics, such as age, also affect learner perceptions (S. D. Smith et al., 2009). Learners have expressed a preference for moderate levels of IT in the classroom, balanced with social and face-to-face interactions (Salaway & Borreson Caruso, 2007; S. D. Smith et al., 2009).

The nexus of the three primary domains will carry the key focus of this research. Culture is seen to interact with teaching and learning (Gunawardena et al., 2003; P. C. Rogers et al., 2007). Culture is also seen to influence and be influenced by online media (Gunawardena et al., 2003). Online media are the subject of research in teaching and learning, yet e-learning is a cultural product, dominated by the English-speaking West (Catterick, 2006). Researchers have noted that developing and newly-industrialized countries have been looking to e-learning technologies as a solution for inadequate educational resources (van Heerden & van Greunen, 2006). A cultural divide between the creators and users of e-learning tools presents a challenge to be addressed.

Purpose Of The Study

This study aims to have several applications. It aims to contribute to the literature regarding e-learning and how best to draw out its advantages in alternate cultural contexts. This study hopes to provide instructional designers with guidance for adapting their products to diverse learner populations. It may provide insights to instructors to deliver the appropriate blend of content, tools, activities, and interactions for their learners. The study may offer administrators direction for the appropriate evaluation, selection, and implementation of e-learning tools. Insights from the study may support learners by connecting their individual characteristics to

strategies benefiting their academic success. The study hopes to raise awareness and understanding of cultural considerations. This study may contribute to the idea of usability engineering as a viable approach for the design of e-learning tools. The study may help spur the development of specifications for the cultural aspects in e-learning tools. Ultimately, the study aims to contribute to the existing research and close the research gap to some small degree.

Problem Statement

Traditional classrooms and online learning environments alike incorporate the social interactions of the classroom participants and the interactions of the learners, instructional staff, and all contributors to that learning environment. Instructional designers are influenced by the cultures within which they live (Callahan, 2005a, 2005b; Dormann & Chisalita, 2002; Hargittai & Shafer, 2006; van Heerden & van Greunen, 2006). The work of instructional designers reflects this enculturation. At the same time, learners bring with them their own cultural perspectives. The many cultures and subcultures of human societies may not conveniently overlap and the likelihood of miscommunication increases, affecting learner success.

Several key issues arise in this study. One is that culture may significantly influence both design and use of online learning environments. Another is that online learning environments cannot be dismissed as culturally "neutral" (Henderson, 1996, p. 85). The pedagogical considerations that apply to traditional learning environments, such as learner culture, ought to apply to online learning, as well.

Research Questions

The following research questions have been formulated to guide the study presented in this paper.

Research question 1

What meaningful correlations, if any, exist between the uncertainty avoidance (UAI) cultural dimension and learner perceptions of usability of the e-learning tools?

Research question 2

What meaningful correlations, if any, exist within an e-learning environment between the perceived usability of the e-learning tools and learner success and self-efficacy?

Limitations

This study has several limitations. One limitation is the availability and characteristics of the participants. The participants will be selected from learners who had voluntarily enrolled into courses that used e-learning tools. Such learners may already hold positive views toward e-learning, including expectations or experiences of learning success. The study design does not attribute for learners who may be reluctant to use e-learning tools. Certain participants may be reluctant to participate through the web-based survey in this study.

A certain amount of commonality is expected between installations of the learning management systems (LMS) and between the various courses. No controls are in place that ensure the level of commonalities.

Learning success will be measured through subjective response. The learning success experienced by individual learners does not necessarily reflect the academic measures of success, as might be reflected through customary letter grades.

Although the Values Survey Module (VSM) instrument insists on the use of national characterization of the participants, this study has adopted a different point-of-view which may or may not invalidate the outcomes of the VSM questions. The VSM instrument itself has been criticized and may have certain problems that lead to shortcomings in the observations of culture

made in this study. Though culture has been acknowledged to affect learning style, "the exact nature of the influence of cultural dimensions, especially the relative effect of each dimension and the potential interactions among the dimensions, needs further empirical validation" (Joy & Kolb, 2009, p. 84).

The scope of this study does not allow for independent validation of usability questions based on the research of Nielsen. This study, therefore, relies on survey questions that have been used in prior research by Adeoye and Wentling (2007).

Another limitation/barrier is that of cultural errors in the design and administration of the survey. Specifically, in cultural research, the cultural values of the researchers may affect the observations, resulting in either Type 1 errors – incorrectly rejecting a null hypothesis – or Type 2 errors – incorrectly failing to reject a null hypothesis. For example, a Type 1 error could manifest itself as inadequate researcher attention to cultural cues. A Type 2 error could be seen when the researcher overcompensates for anticipated cultural effects. An active effort, such as examining instruments for validity and testing data for internal reliability, would be made to identify and to eliminate or minimize these effects (Callahan, 2005a; Storti, 1990; van de Bunt-Kokhuis, 2001). Moreover, this study must acknowledge that its own perspective is culturally shaped.

Cultural affiliation has been seen to influence not only the observed research subjects but the researchers, the observers, as well (Gunawardena et al., 2003, p. 771). This presents the challenge of point-of-view (POV), of emics and etics, which can be understood as native POV and observer POV, respectively (Gunawardena et al., 2003; Storti, 1990; van de Bunt-Kokhuis, 2001). Within research settings, this can lead to errors in the gathering of data (Gay, Mills, & Airasian, 2009; Storti, 1990). Culture researchers may endeavour to establish commonalities, or

"universal constructs" that define shared parameters, so that cultural characteristics can be distinguished from researcher "misperception" during data gathering and interpretation (Gunawardena et al., 2003, p. 771). Henderson presents "standpoint epistemology" as a position where the benefits assumed to be drawn from research work is founded on cultural values that may be in conflict (1996, pp. 97–98). Hall warns that "culture hides much more than it reveals and, strangely enough, what it hides, it hides most effectively from its own participants" (as cited in Gunawardena et al., 2003, pp. 753–754).

Definition Of Terms

As an interdisciplinary study, this research relies on terminology that reflects its composite nature. This section seeks to clarify how those terms are used here.

Distance learning, also referred to as distance education, is delivered outside the traditional classroom using media such as postal mail, telephone, radio, television, or over computer networks such as the Internet (McKeachie & Svinicki, 2006).

E-learning is a form of instructional delivery that uses electronic devices such as computers and mobile handsets or tablets. It is also referred to as online learning because of its reliance on digital communication networks such as the public Internet (Ally, 2008).

Learning management systems (LMS) are essentially software platforms that provided a variety of tools for managing instructional delivery in e-learning contexts. These can also be referred to as course management systems (CMS) or virtual learning environments (VLE) (Catterick, 2006, 2006; dela Pena-Bandalaria, 2007; Packham, Jones, Miller, & Thomas, 2004; Saade & Kira, 2009).

A hybrid learning environment is one that combines traditional classroom instruction with e-learning tools (Breen, 2007; Lopes, 2003).

Information technology (IT) refers to a wide range of electronic technologies for storing and transmitting data, typically in digital form. It is sometimes referred to as information and communication technologies (ICT), as well (Salaway & Borreson Caruso, 2007; S. D. Smith et al., 2009).

Activities that are described as being online are those that occur across computer networks, such as the public Internet, or within private, organizational computer networks. Often, such networks can also be accessed using other electronic devices such as mobile handsets.

Media are the channels or forms of communication. In this study, online media are presented in the form of on-screen graphics and text, digital audio and video, communications such as e-mail and text messaging, and similar forms of information conveyance. (S. D. Smith et al., 2009)

Within ICT, the terms asynchronous or synchronous refer to the particular temporal nature of a given communication. Asynchronous communication stores communication messages, typically to be retrieved at a later time. Synchronous communication is transmitted immediately to a recipient for immediate reception and possible response. (Gunawardena et al., 2003; McKeachie & Svinicki, 2006; P. C. Rogers et al., 2007)

The user interface (UI) is the part of a tool with which the tool-user directs the tool functions. In computer software, the user interface typically presents itself as a visual screen with graphical, interactive controls or facility for text-based commands (Nielsen, 1994)

Culture is a key term in this study. In part, it refers to the values, behaviours, and artifacts of human interactions. Culture is examined in greater depth in Chapter 2.

Chapter 2: Literature Review

This chapter will examine existing research as grouped by the domains and interdisciplinary areas identified in Figure 1. In particular, it will consider the interdisciplinary research where the three primary domains intersect. Its focus will be on observations relevant and applicable to the current study.

Teaching And Learning

The existing scientific literature on the topic of teaching and learning is broad in scope and substantial in its volume. This section is concerned with teaching and learning theories as might be relevant when considering culture and online media in the context of education. In this review, a number of applicable insights emerged. There seemed to be some agreement that multiple approaches may be in order when considering teaching and learning in contemporary contexts. Milly observed that "integrating several pedagogical methods will improve the likelihood of achieving effective learning" (2010, p. 2801). Strategies from behaviourist, cognitivist, and constructivist approaches to teaching and learning may all have something to contribute, where, as Ally observes:

> behaviorists' strategies can be used to teach the what (facts); cognitive strategies can be used to teach the how (processes and principles); and constructivist strategies can be used to teach the why (higher-level thinking that promotes personal meaning, and situated and contextual learning). (2008, p. 20)

Of these, the constructivist and social constructivist approaches have been gaining interest and application in traditional as well as in e-learning (Ally, 2008; Stacey, 1999). Constructivist learning theory holds that "although reality exists independent of the knower, what is known is individually and collectively constructed" (Henderson, 1996, p. 88). Lefoe agrees and expands

on this, stating that "learning is an active process of constructing rather than acquiring knowledge" and teaching "is a process of supporting that construction" (1998, p. 454). Constructivist learning theory also lends the values of "collaboration, personal autonomy, generativity, active engagement, reflectivity, personal relevance, and plurality of perspectives" (Lebow, as cited in Henderson, 1996, p. 88).

Joy and Kolb (2009) considered experiential learning theory in their research. This model proposes two modes of perceiving, one concrete and the other abstract, and two modes of internalizing, one being reflection and the other being activity. Transitioning through these four modes leads to a process of "experiencing, reflecting, thinking, and acting," that is, the process of learning (2009, pp. 70–71). Experiential learning theory also provides a model for learning style. Since learners are identified as individuals (Joy & Kolb, 2009; Woolfolk et al., 2010), their individual characteristics and environmental contexts are seen to affect their learning styles. Learning styles are important in that they can "affect [the individual's] potential for achievement" (Gunawardena et al., 2003, p. 764). Butler identified several learning style inventories developed by Kolb, Gregorc, and others, and noted that these "have determined which cognitive learning style ... corresponds to particular media, teaching methods and practices" (2004, p. 57). Butler's doctoral dissertation noted "significant" correlations between learning styles and instructional methods (2004, p. 106). Research has not yet identified reliable instructional design to address learning styles (Butler, 2004).

Culture

Culture pervades all human activity and can pose a significant "barrier to change" for innovation and development (E. M. Rogers, 2003, p. 26). Thus, culture must be adequately defined and understood for the purpose of studies such as this one (Callahan, 2005a). Culture

research touches upon diverse disciplines such that "the units of analysis chosen by culture researchers vary" (Joy & Kolb, 2009, p. 70). The result is a range of definitions throughout the current literature (Abdelnour Nocera & Camara, 2010; Callahan, 2005a; Gunawardena et al., 2003; MacGregor, Hsieh, & Kruchten, 2005; Woolfolk et al., 2010) as well as long-standing definitions such as proposed by Kluckhohn and Strodtbeck (1961), and definitions specific to fields such as education (Vygotsky, 1978). Defining culture is challenging and definitions may often seem contradictory (Callahan, 2005a; G. Hofstede, 2001). However, a sufficient definition can guide the research and serve to identify characteristics that were under the influence of culture (Joy & Kolb, 2009).

To observe culture by whatever definition is chosen, cultural factors, referred to as markers, can be used. Such markers can include language usage, tendency toward collectivist or individualist perspectives, social presence, understanding of time frames, technical skills, and others (Gunawardena et al., 2003). Culture can have a greater effect on behaviour than age and gender effects. Thus, cultural markers are significant, though less obvious, than many demographic characteristics (Gunawardena et al., 2003). "The essence of culture," suggest Trompenaars and Hampden-Turner, may not be "what is visible on the surface" (as cited in Gunawardena et al., 2003, pp. 753–754). Callahan notes that "other factors such as speech conventions, mental models, and metaphors are more difficult to grasp" and, therefore, more challenging to study or operationalize into research (2005a, p. 260). Verenikina (2010) considers activity as a potential marker for analysis when evaluating culture. The human propensity to interact and change the environment "is regarded as the fundamental unit of analysis" (2010, p. 19).

Culture has been considered from perspectives of time conception and communication styles. Time conception, as theorized by Hall (1977), is either monochronic or polychronic (MacGregor et al., 2005). Monochronic cultures tend to view time as linear, sequential, and ordered, while polychronic cultures perceive time as non-linear, unordered, and chaotic (Callahan, 2005a). Henderson suggests that the "modern world view" possesses "a conceptual view of information as hierarchical and time as linear and sequential" (1996, p. 86). Time can also be oriented in short- or long-term views (Adeoye, 2007). Further, Hall (1977) established that communication patterns could be categorized as high- and low-context, where communications convey meaning depending on various aspects of message context (Joy & Kolb, 2009; Marcus & Gould, 2001). In one example**,** "relationality, circularity, and harmony" are described as aspects of Asian communication, a "sharp contrast" to values embodied in Western communications (Gunawardena et al., 2003, pp. 756–757). Gunawardena et al. suggest that culture of individual learners may also affect their visual perception. Further, perception may manifest itself in how individuals interpret the behaviour of others in a process of attribution based partly on their "past experience or history" (2003, p. 758).

Several researchers considered culture from a perspective of values and systems of meaning. Kluckhohn and Strodtbeck examined culture through the lens of value orientations that provide "order and definition" (1961, p. 4) to human cognition and action (MacGregor et al., 2005). Values provide a "system of meanings" (Kluckhohn & Strodtbeck, 1961, p. 28) that can be observed within affinity or vocational groups, or other circles with shared motivations. The value orientations theorized by Kluckhohn and Strodtbeck are quantified along five scales: "human nature, the relationship of ... people with nature, time, individual or collective focus, and whether space is public or private" (MacGregor et al., 2005, p. 1) and each of these can be evaluated on

scales with three relative positions (Kluckhohn & Strodtbeck, 1961; MacGregor et al., 2005). Trompenaars and Hampden-Turner proposed a number of cultural scales, including universalism to particularism, neutral to emotional expression, specificity to diffuseness, and achievement to ascription (MacGregor et al., 2005). Trompenaars had also considered an "onion" model of culture, "in which core assumptions about life belong to the centre, followed by norms and values in the middle layers and the perceptible outer layer, which represents symbols, rituals and artefacts" (Abdelnour Nocera & Camara, 2010, p. 151). Hofstede, Neuijen, Daval Ohayv, and Sanders considered other perspectives for defining culture, arranging them also in a layered, onion-like model. This model held values at the core, wrapped within rituals, then within the notion of heroes, and with symbols at the topmost layer (1990).

Humans may interact in circles bound by geography, such as nations, or by common histories, such as ethnicities, and through communities of interest, preferences, behaviours, or organizational units. Writing systems and the influence of mass and electronic media may exert even greater influence (Callahan, 2005a; Gunawardena et al., 2003). Virtual, online communities —labelled "cybercommunities"—manifest their own sets of values and behaviours (Gunawardena et al., 2003, p. 754). Individuals "may belong simultaneously to multiple [cultural groups]", Callahan observed, "and each of them may influence preferences and behavior" (2005a, p. 263). Such affiliations may be voluntary or involuntary (Gunawardena et al., 2003) and affiliation within any given cultural grouping is not an exclusive proposition (Woolfolk et al., 2010). Affiliation does not automatically transfer the values and behaviours of the group onto individuals; however, such transference, termed enculturation, becomes more likely (Woolfolk et al., 2010). Enculturation is differentiated:

> between manifest culture (which is learned from words and numbers) and tacit-acquired culture (which is not verbal but is highly situational and operates according to rules that are not in awareness, not learned in the usual sense but acquired in the process of growing up or simply being in different environments) (Gunawardena et al., 2003, pp. 753–754).

Therefore, "internalisation is the transformation of inter-mental, external processes into intra-mental, internal ones. Internalisation occurs through the means of language (the signal system)" (Verenikina, 2010, p. 18).

Cultural communities may arise within parameters that are not necessarily within an individual's control or choosing (Gunawardena et al., 2003). Such parameters include power and influence, prestige or status, rural or urban, mobility, history, ethnicity and shared heritage, control over resources, national boundaries, geography, age, language, and home and family environments (Callahan, 2005a; Catterick, 2006; E. M. Rogers, 2003; Selinger, 2004; Woolfolk et al., 2010). Another such parameter is socio-economic status (SES). SES itself may be influenced by family income, parental occupations, and level of parental education (Woolfolk et al., 2010). The technological disenfranchisement known as the digital divide has been seen to result from, and contribute to, disparities in opportunities and social status (DiMaggio et al., 2001; E. M. Rogers, 2003).

Hofstede (2001) defined cultural commonalities with a set of bipolar scales of cultural dimensions (Joy & Kolb, 2009; Marcus & Gould, 2001). Hofstede's five dimensions are power distance, individualism, long-term orientation, masculinity, and uncertainty avoidance (Callahan, 2005b; G. Hofstede, 2001; Marcus & Gould, 2001). Though some themes embodied in Hofstede's model have been the subject of prior research, it is Hofstede's model that has seen

wide application and interest in a variety of research settings (Sanchez-Burks & Lee, 2007). Subsequent research has expanded on Hofstede's model, as in the Global Leadership and Organizational Effectiveness (GLOBE) study (House et al., 2004; Joy & Kolb, 2009).

Of interest to the current study is Hofstede's dimension of uncertainty avoidance. It is defined as "the extent to which the members of an organization or a society strive to avoid uncertainty by relying on established social norms, rituals, and bureaucratic practices" (House et al., 2004, p. 11) or in Hofstede's words, "the extent to which the members of a culture feel threatened by uncertain or unknown situations" (2001, p. 161). For example, "a culture with a high ranking in this area may rely upon strict, detailed rules and procedures in order to mitigate uncertainty," while "a culture with low uncertainty avoidance is more comfortable handling unknown events and thus relies less upon rules" (MacGregor et al., 2005, p. 2).

One significant criticism of Hofstede's work, if not the most significant, is the use of national boundaries for defining cultural groupings (McSweeney, 2002). National boundaries may not reflect "shared cultural history or ethnicity" so much as they are accidents of "geography and political expediency" (Catterick, 2006, p. 122). Catterick suggests that "even ethnicity may prove problematic, as it may indicate a shared heritage rather than cultural homogeneity" (2006, pp. 121–122). Such criticisms are shared among other researchers who point out that "culturally relevant" factors may be ignored or unaccounted because of the artificial restriction of national boundaries (Abdelnour Nocera & Camara, 2010, p. 150).

Culture may best be examined at the level of the social groups being studied. Referred to as "small cultures" (Holliday, as cited in Catterick, 2006, p. 122) this notion allows for the study of culture closest to the individual within the grouping of interest, recognizing the strong cultural effects of the social groups proximate to the individual (Joy & Kolb, 2009). The framework used

in the GLOBE study (House et al., 2004) defines culture by regional clusters as well as through cultural dimensions (Joy & Kolb, 2009). "Meaning-matching" may be the proper locus of cultural models rather than ones using the characteristics of nationality and artificially delineated physical proximity (Abdelnour Nocera & Camara, 2010, p. 153).

Despite criticism and limited response to the criticism, Hofstede's work has been cross-validated through various significant, large-scale studies (Callahan, 2005b; G. Hofstede, 2001). Gunawardena et al. note the uniqueness of Hofstede's "empirically supported" model in acknowledging "cross-cultural differences" (2003, p. 756). Criticism has also been reconciled by considering the point-of-view or paradigm of the research approach, as Callahan does when categorizing Hofstede's perspective as an interpretive paradigm, while a critical interpretation would be considered functionalist (2005b). In defence, Hofstede has stated that the "national culture [model] certainly does not represent the ultimate truth about the subject, but it has so far served as a useful framework" in research and application (G. Hofstede et al., 1990, p. 288).

Despite these various conflicts and contradictions, some common elements and vocabulary have been identified, and a definition becomes possible. Culture is seen as being complex and acquired through learning; it is connected to shared, abstract values and beliefs; it is concrete through behaviours and symbol systems; it is characterized by group membership; and it exhibits simultaneous "change and continuity" (Gunawardena et al., 2003; Henderson, 1996, p. 86; G. Hofstede, 2001; G. Hofstede et al., 1990; Kluckhohn & Strodtbeck, 1961; MacGregor et al., 2005). Given these parameters, a number of existing definitions stand out as appropriate to the current study. Wild suggested that culture "consists of a distinctive symbol system together with artifacts that capture and codify the important and common experiences of a group," Branch proposed that "culture is regarded as the epistemology, philosophy, observed traditions, and

patterns of action by individuals and human groups," and Matsumoto defined culture as "the set of attitudes, values, beliefs, and behaviors shared by a group of people, but different for each individual, communicated from one generation to the next" (as cited in Gunawardena et al., 2003, pp. 753–754). Perhaps the most appropriate definition for the current study can be found in Callahan, that culture can be seen as a "complex construct encapsulating shared values, group behavioral patterns, mental models, and communication styles" (2005a, p. 261). This definition should be seen as fluid, that it may change to account for the requirements of future research (Callahan, 2005a).

Online Media

Regardless of the underlying algorithms and devices used to enact the functionality of a given software application, the computer interface and its usability are key factors, "the point of interaction or communication" (Callahan, 2005a, p. 266), where the success of the software application may be measured (Nielsen, 1994). The current study will be concerned with this aspect of online learning tools.

Nielsen identifies characteristics that make a software application usable and notes that they may be "minor interface details" but where "every single element in a user interface places additional burden on the user in terms of having to consider whether to use that element" (1994, p. 15). Interface elements can include the "location of the information on the screen, the attributes of the screen (e.g., colour, graphics, size of text), the pacing of the information, and the mode of delivery (audio, visuals, animations, or video)" (Ally, 2008, p. 23). Nielsen asserts that the term "user friendly" distracts from the careful work that is required in interface design by limiting attention to this ostensibly "single dimension" of friendliness (1994, p. 23). Human operators "don't need machines to be friendly to them, they just need machines that will not

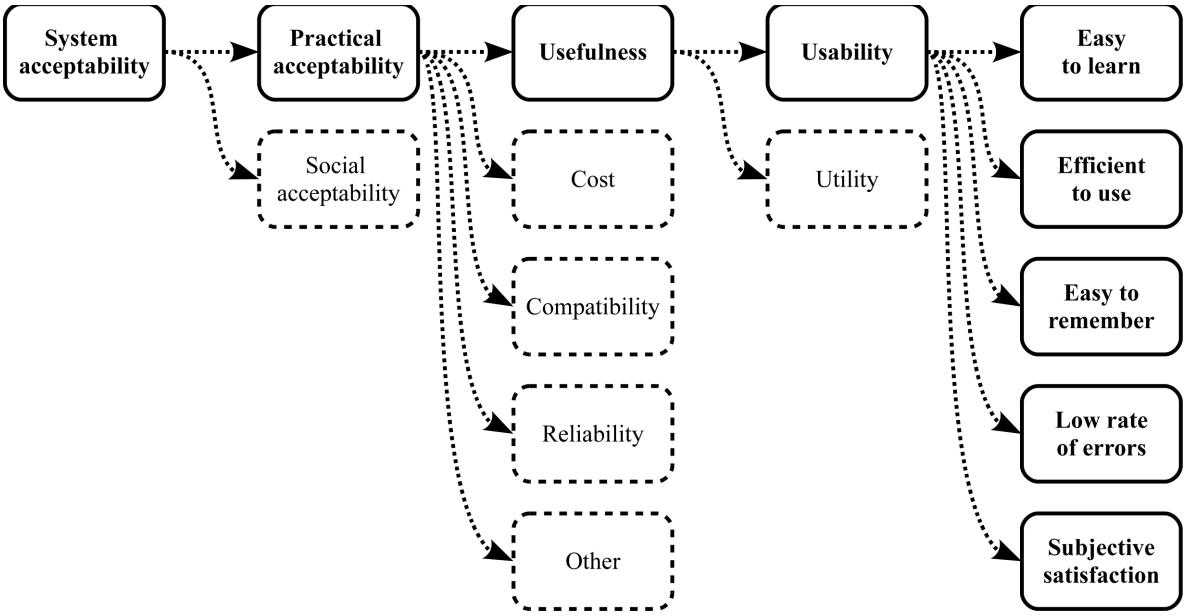

Figure 2: Factors of usability.

Adapted from Usability Engineering by J. Nielsen, 1994, (2nd ed.). San Diego, California: Academic Press, p. 23.

stand in their way when they try to get their work done" (1994, p. 23). Nielsen contends that the interface should not be taken for granted because even without the scrutiny of the system designers, ultimately, the usability "*will* be tested," but by the operators rather than designers (1994, p. 7).

Nielsen described heuristics through which the usability of an interface can be determined. These include the attributes of learnability, efficiency, memorability, low rate of error, and satisfaction (1994). Figure 2 illustrates the relationship of usability to its components, as well as its relationship to other software factors, for which priorities may need to be balanced in the development process (1994). Measure of usability may vary by user and task variability, these

defining utility and usefulness. As an example in the field of education, software "has high utility if students learn from using it" (1994, p. 25). Careful design would eliminate the need for "user customization" as the means by which to meet user needs (1994, p. 12).

Learning And Culture

The interactions of culture with teaching and learning have been discussed in education literature (Woolfolk et al., 2010) and in related research (Butler, 2004; Gunawardena et al., 2003; Henderson, 1996; Milly, 2010). Interest in the area of instructional design and culture has been growing (P. C. Rogers et al., 2007; Verenikina, 2010). This section will discuss the literature regarding culture in the context of learning and teaching.

The research literature agrees that individual preferences and characteristics affect learning achievement (Gunawardena et al., 2003). Individual learner differences can be seen in a number of characteristics such as "gender, age, social class, religion, multicultural exposure, education level, linguistic ability, expertise with technology, and task experience." Some intra-learner variances have been seen to affect learner behaviour both conducive and detrimental to learning (Dillon & Watson, as cited in Callahan, 2005a, p. 301). These variances may not be evident to the learner and ought to be addressed by instructional practitioners, especially in the context of e-learning (Catterick, 2006). Low socio-economic status, in particular, has been seen to have significant influence on school achievement. High-SES individuals show better school achievement. A learner within a low SES group may experience a self-perpetuating cycle of low expectations and low self-esteem (Woolfolk et al., 2010).

Cultural differences, too, "have a significant impact on the learning process" and "there is reason to believe that the differences in cultural socialization tend to influence learning preferences and produce different learning styles" (Joy & Kolb, 2009, pp. 69, 72). Cultural

factors have been seen to include “language, power distance, ... collectivist versus individualist tendencies, conflict, social presence, [and] time frame” (Gunawardena et al., 2003, p. 766). Affective characteristics, motivation, preparedness, anxiety, could all be seen to emanate from an individual’s culture (Saade & Kira, 2009). In a diverse group of learners, expectations were seen to vary in the following areas: “general cultural and social expectations, teaching and learning expectations, differences in the use of language and symbols, and technological infrastructure and familiarity” (P. C. Rogers et al., 2007, p. 214). Experiential learning theory, as a holistic learning model, considers environmental variables such as cultural influence (Joy & Kolb, 2009). “Culture has a significant effect in deciding a person’s preference for abstract conceptualization versus concrete experience” (Joy & Kolb, 2009, p. 83). High per-country uncertainty avoidance scores, as recognized in Hofstede’s research (2001), correlate with preference for abstract conceptualization over concrete experience and for reflective observation over active experimentation (Joy & Kolb, 2009).

Culture has been shown to manifest itself and be directed by language and communication, while communication is acknowledged to be “the very core of the educational process” (S. D. Smith et al., 2009, p. 60). These connections between culture and communication are evident in research in non-verbal communication, such as gaze and gestures (Gunawardena et al., 2003). Other research suggests that “language shapes our thinking, beliefs, and attitudes” (Whorf, as cited in Gunawardena et al., 2003, p. 759; P. C. Rogers et al., 2007) Language “represents a different way of thinking as well as a different way of speaking, and cognition is mediated and influenced by language” (Gunawardena et al., 2003, p. 759). P. C. Rogers et al. suggest that “when the language of cross-cultural instruction was English, instructional designers tend to forget about the impact of other cultural issues,” misgauging learners’ English language

proficiency, and not realizing that their misuse of "symbols, colors, and metaphors can unintentionally offend or alienate learners" (2007, pp. 204–205). Blanchard and Frasson saw learning as the "process of production of meanings" (2005, p. 2). Vygotsky observed the significance of language when it intersected with activity in the context of learning (1978). Language is seen to organize concepts and activity, from planning through to collaborative and independent activity (Lefoe, 1998; Verenikina, 2010, p. 18; Vygotsky, 1978), as well as learning activities (Stacey, 1999). Language affects the definitions of knowledge and learning within any given culture; that is, the very concepts of knowledge and learning are culturally shaped (Selinger, 2004). Thus, the process and institutions of learning are seen to convey cultural values (Callahan, 2005b).

Vygotsky further suggested that language symbolizes entities and their relations, where "first-order symbols," usually in the form of spoken language, represent the "objects or actions" while "second-order" symbols, usually as written language, represent the language constructs. (Vygotsky, 1978, p. 115). Language is seen as a tool, extending human capabilities, but within the "limitation of the tool" (Verenikina, 2010, p. 19). Language is also recognized as a symbolic system that is "internally oriented" (Vygotsky, 1978, p. 55).

The ordering of symbols, such as text and graphics, into their meanings take place through an individual's "knowledge structures," otherwise known as schemata (Callahan, 2005a, p. 286). Schemata permit cognitive efficiency in the interpretation of sensory information. Callahan discusses the role of schemata and significance of culture in communication (2005a). Callahan further discusses how culture influences schemata and that schemata can be seen as "socially shared ways in which cultural groups organize their behavior" (2005a).

Mental models, though similar to schemata, differ in that they are “dynamically constructed” and play a role in how an individual might respond to a new system that might be encountered. If the system was designed using a mental model different from the user’s, the interaction might be impeded (Callahan, 2005a, p. 270).

E. M. Rogers discusses the effect of shared social spaces of communication and interaction on human behaviour and their role in learning. An aspect of such interactions is that of observational modeling, in which the learner will adapt their own behaviours based on the patterns of behaviour they observe in their learning guide. Such modeling can transpire through personal relationships, public observation, or even through mass media such as television. (2003). The common understanding that learner and instructor may together attain is known as “intersubjectivity” (Verenikina, 2010, p. 18).

A number of studies have examined social interaction and culture in learning. Butler points out that learners expressed increased satisfaction with their learning where social interaction and presence took place (2004), an insight confirmed by Lopes (2003). Stacey provided the example that learners can compare their progress with their peers (1999). Learners expressed concern that loss of social interactions may have an impact on their learning success (Butler, 2004). Uzuner found that within high-context cultures (Hall, 1977) such sentiments were more pronounced and that high-context learners valued instructor interaction more than peer interaction (2009).

The notion of knowledge construction suggests that “meaning is imposed on the world by us,” and that knowledge is a cognitive ordering of perceived experience (Duffy and Jonassen, as cited in Lefoe, 1998, p. 455). This view of knowledge construction favours authentic learning contexts and a focus on learning process, rather than on learning outcomes (Henderson, 1996; Lefoe, 1998). It also recognizes the individual characteristics, such as learning preferences and

styles, of learners (Lefoe, 1998). Although the view of knowledge construction is of growing interest (Ally, 2008; Stacey, 1999), there is evidence that the notion of knowledge construction favours "Western values and educational practices" (Milly, 2010, p. 2798). Milly suggests that in some cultures instructors are regarded as experts and not as the facilitators of constructivist learning whom learners might be encouraged to challenge or question (2010).

Consideration of cultural aspects in learning environments may entail certain risks. One risk is the superficial implementation of cultural markers, referred to as tokenism (Gunawardena et al., 2001). The reverse, attempts to remove superficial cultural markers, may deal "an unintentional exclusion and silencing" of cultural issues (Henderson, 1996, p. 90). Milly observed, "teaching paradigms, as well as instructional media, are not neutral, but value-laden and ensuing instructional processes are subjective rather than objective" (2010, p. 2800), a perspective shared by P. C. Rogers et al. (2007). Henderson pointed out challenges to the supposed "neutrality of instructional design and the designer" and exposure of a "hidden curriculum" in both process and product (1996, p. 89), also asserting:

> instructional design and instructional designers do not exist in a vacuum; nor are they neutral. As part of their social and cultural fabric, they influence and are influenced by particular world views; their class, gender, culture, values, and ideologies; selected learning theories; and particular instructional design paradigms (1996, p. 85).

Thus, instructional design may be considered crucial in addressing culture within learning environments (Joy & Kolb, 2009). Woolfolk et al. encourage "culturally relevant pedagogy" (2010, p. 187). P. C. Rogers et al. suggest examining "general cultural and social expectations, teaching and learning expectations, differences in the use of language and symbols, and technological infrastructure and familiarity" (2007, p. 214). Another approach might be that

"when the variety of learners, cultures, and learning styles presents a challenge, [then] variety itself becomes the solution" (Sanchez and Gunawardena, as cited in Milly, 2010, p. 2802).

Learning And Online Media

Information and communication technologies (ICT) have emerged to augment the practices of teaching and learning (E. M. Rogers, 2003). ICT may be grouped and identified in various ways within academic contexts (dela Pena-Bandalaria, 2007). Comprehensive online environments and systems are sometimes referred to as Learning Management Systems (LMS) (Catterick, 2006; dela Pena-Bandalaria, 2007; Saade & Kira, 2009) or as Virtual Learning Environments (VLE) (Catterick, 2006; Packham et al., 2004). Combinations of classroom or face-to-face learning with online learning approaches may be referred to as hybrid learning (Breen, 2007; Lopes, 2003). Online learning is also known as e-learning, where learners interact with the software and with other individuals through a computer screen interface (Ally, 2008).

With e-learning, curriculum materials and instruction would be delivered through electronically networked digital devices, such as computers. These tools enable synchronous and asynchronous dialogue using computer-mediated communications (Gunawardena et al., 2003; P. C. Rogers et al., 2007). Updates and support can be delivered from any location to the learner over the network. These services can be available at times outside scheduled class times (Ally, 2008; Blanchard & Frasson, 2005; Butler, 2004). E-learning may make learning available to a more diverse range of learners and e-learning's diverse characteristics can affect learning success (Blanchard & Frasson, 2005).

E-learning can contribute to learner success in a number of ways. Convenience, in terms of time and location, is an oft-cited and popular reason for e-learning adoption by learners (S. D. Smith et al., 2009). E-learning is seen to transcend time zones by offering asynchronous and

synchronous learning opportunities (Ally, 2008; Butler, 2004). Physical remoteness is mitigated when learners have access to networked e-learning tools (Ally, 2008). E-learning can be efficient and flexible and it can help in the organization, management, and revision of course materials (Ally, 2008; Lopes, 2003). E-learning tools offer accessibility advantages, allowing learners timely access to learning materials, experts, as well as to their classmates and instructors (Ally, 2008). E-learning is seen to "facilitate collaboration and communication" (Lopes, 2003, para. 12), a perspective supported by several researchers (S. D. Smith et al., 2009; Stacey, 1999). Benefits that may be unique to e-learning include capabilities for simulation and visualization, which may be coupled with interactivity (Ally, 2008; Lefoe, 1998; Lopes, 2003). E-learning can eliminate many distractions that may occur in face-to-face interactions, allowing learners to focus, reflect on, and analyze the learning materials at hand (Stacey, 1999). Ally notes that simply placing learning materials into an online environment would not be considered online instruction (2008).

Despite the advantages noted in e-learning, instructional focus should remain on the learner and the instructional methods, a contention made by several researchers (Ally, 2008; Lopes, 2003; S. D. Smith et al., 2009; Verenikina, 2010). Verenikina stresses that advanced educational technologies "call for the use of advanced pedagogies" (2010, p. 21). Butler suggests that learning styles have been found to correspond to "particular media, teaching methods and practices" (2004, p. 57) that e-learning may not suit all learners, and that suitability may be a result of individual learning style. In e-learning as in other forms of learning, academic behaviours influence learning success (S. D. Smith et al., 2009).

Smith et al. assert that learner perceptions of e-learning are important. Information technology (IT) has become ubiquitous in learners' daily interactions, thus understanding their

perceptions can aid instructional design (2009). Olaniran adds that learner acceptance of e-learning starts with a positive disposition to it (2006). Learners who are IT "early adopters" were found to be more positive of e-learning (S. D. Smith et al., 2009, p. 82). Learners identified convenience as an e-learning advantage and a motivating factor (Butler, 2004; Olaniran, 2006; Saade & Kira, 2009; Salaway & Borreson Caruso, 2007). Learners also pointed to e-learning as providing organization, control, and accessibility, as well as interaction and communication with peers and instructors (Salaway & Borreson Caruso, 2007). In learner interviews, Smith et al. found that many respondents felt that e-learning improved their learning success (2009). This receptivity of information technology tools in learning environments is somewhat confounded by what learners themselves define as e-learning. The research of Smith et al. had found this definition changing over time and between various contexts (2009).

Research has identified at least one social barrier to e-learning adoption. Learners have expressed a preference for face-to-face interactions and the "human element" (Salaway & Borreson Caruso, 2007, p. 88; S. D. Smith et al., 2009, p. 76). In particular, learners also expressed a desire to maintain interaction with faculty and a preference for instructors who use a combination of e-learning and face-to-face interactions (Butler, 2004; Salaway & Borreson Caruso, 2007).

Research indicates certain other learner criticisms of e-learning. Learners have expressed concerns in how IT might be used in e-learning. This can include inconsistency, "underuse, overuse, inappropriate use, and overdependence" (Salaway & Borreson Caruso, 2007, pp. 16–17; S. D. Smith et al., 2009). Learners perceived problems with the technology used, its implementations, complexity of the tools, and its reliability and performance (S. D. Smith et al., 2009). Learners also found themselves inadequately prepared or trained for the tools they were

given (S. D. Smith et al., 2009) possibly because instructional staff had not correctly gauged learner readiness (Salaway & Borreson Caruso, 2007). Smith et al. suggest that learners' exposure to e-learning may be limited, leading to the frustration expressed (S. D. Smith et al., 2009). This frustration, in turn, can negatively affect learning success and satisfaction in e-learning contexts (S. D. Smith et al., 2009).

Saade and Kira conducted research into anxiety and self-efficacy in e-learning. They defined self-efficacy as "a construct often used to explain one's ability to judge how well [one] can execute a task to achieve a desired goal" that better predicts learning success than does past performance (Bandura, as cited in 2009, pp. 180–181). They found that anxiety does not correlate directly to successful e-learning abilities; rather, self-efficacy moderates anxiety and is thereby the better predictor of this success. It does so as a belief that magnifies or reduces anxiety, anxiety leading to fear, then to loss of focus, and thereby to decreased performance. Thus, low self-efficacy can be a "significant disadvantage" (2009, p. 180). Within e-learning, self-efficacy is seen to affect the perceived ease-of-use. Saade and Kira conclude that these findings point to the need for appropriate design of e-learning systems (2009).

Others have also stressed the importance of instructional design of e-learning tools. Butler indicates correlations between learning, satisfaction, and optimal e-learning design (2004). Ally points out that instructional design plays a larger role than does the choice of technology and lists a number of approaches and considerations (2008). Stacey notes the differentiation of content and author in e-learning, another consideration in e-learning design (1999).

The need for adequate training of and resources for instructors has been noted in the literature (Salaway & Borreson Caruso, 2007). Instructors are key to successful use of e-learning, due in part to their perceptions (Lopes, 2003). Instructors may have had inadequate exposure to

ICT and may not fully understand its potential impact (Lopes, 2003; Salaway & Borreson Caruso, 2007). Many post-secondary educational institutions have reported that course management systems (CMS) are only used sporadically by faculty (S. D. Smith et al., 2009). There is some agreement that optimal instructional design and curriculum development in e-learning requires a significant time investment (Lopes, 2003).

The literature points to a number of e-learning approaches that were found to be successful. Lecture recordings supported learners with lower attendance (S. D. Smith et al., 2009). Lecture notes posted prior to class time improved attendance and allowed learners to focus their attention (S. D. Smith et al., 2009). Prior face-to-face interactivity improves group interaction during subsequent online exchanges (Stacey, 1999). Overall increases in interactivity and strong pedagogical supports improve learner participation and success (Ally, 2008; Butler, 2004; Stacey, 1999; Verenikina, 2010). There may be no single e-learning technology but rather a combination of e-learning technologies and hybrid e-learning designs that may promote learner success. (Lopes, 2003; Milly, 2010). Adequate support, technical and otherwise, must be provided with e-learning (Lopes, 2003; Salaway & Borreson Caruso, 2007). Several activities have been noted as being less successful in e-learning, such as group work (Butler, 2004, p. 98).

Several theoretical perspectives support aspects of e-learning approaches. E-learning addresses diverse learning styles and learner characteristics (Ally, 2008; Catterick, 2006; Butler, 2004). Vygotsky's learning theories are seen as relevant to e-learning (Verenikina, 2010, p. 24). Henderson notes that a critical approach to instructional design may yield increased learner success (1996).

Culture And Online Media

Callahan's research considered questions and challenges at the juncture of culture and online media, acknowledging that the design of online media for culturally diverse users is a significant challenge. Culture has been seen to influence the design and use of computer interfaces, an effect for which Callahan provides examples (2005a).

Cultural schemata and mental models have been seen to affect how users perceive and interact with online media. Users were found to misapply the schemata of human interactions onto digital tools, treating those tools as "social actors" (Callahan, 2005a, p. 270). Familiarity with online media may not dispel how its form and content affect perceptions and understanding (Gunawardena et al., 2003; Lefoe, 1998).

Online media conveys culture bidirectionally and is seen as "mediated and mediating" (Abdelnour Nocera & Camara, 2010, p. 152), operating as both a tool and a signal. As such, it well illustrates McLuhan's dictum that "the medium is the message" (McLuhan, 1966, p. 23; S. D. Smith et al., 2009). Because culture affects perception, culture may introduce predispositions to or resistance against technological change and may be a significant conduit or barrier (E. M. Rogers, 2003).

Cultural markers, discussed earlier, are evident in online media as in other human artifacts. Markers in online media manifest themselves in the forms of written language, terminology, time and date systems, colour characteristics, layout and symmetry, image subject matter, representations of people, animation, interactivity elements, and use of multimedia (Ally, 2008; Barber & Badre, 1998; Callahan, 2005b). Cultural markers may be more or less prevalent depending on the provenance of the interface design. They have been found to increase communications success and usability within given cultures (Barber & Badre, 1998; Callahan,

2005b; Gunawardena et al., 2003; Lim, 2010). Uzuner points out that behaviours such as communication and collaboration in an online environment are influenced by culture (2009). The incorporation of audio elements in online media, for example, has bridged communication with the oral cultures of Australian indigenous peoples (Dyson, 2010).

At the same time, cultural markers differentiate aspects of online communications and interactions, potentially contributing to a digital divide. E.M. Rogers provides a simple example in the design of point-of-sale software, such that might be used in retail contexts, that displays currency information using digits, commas, and periods that do not correspond necessarily to the way that might be understood in other cultures (2003). Certain kinds of information design—an information hierarchy, for example—may hold certain meaning in some cultures but not in others (Callahan, 2005a). At a deeper level, there may exist an epistemological divide in how knowledge is structured, understood, and communicated (Henderson, 1996). Further, despite the incorporation of cultural understanding into online media, obstacles exist in how these tools, in general, may be understood by various cultural communities. Callahan's research observes that:

> the social, economic, and political forces that privilege technologically advanced nations over less developed nations may shape users' attitudes toward, and acceptance of, information technologies in ways that are beyond the control of individual designers. (2005a, p. 300).

As usage of and access to the internet reaches saturation, other divides may appear as skills divides, information literacy divides, and content divides (E. M. Rogers, 2003). Certain exclusionary behaviours are magnified within online media, such as verbal aggression, reduced social negotiation, and diminished consensus building (Henderson, 1996).

Usability of online media, as described by Nielsen (1994), is a factor of interest in this study. The usability of online media rests in part with cultural considerations incorporated into it (Abdelnour Nocera & Camara, 2010; Adeoye, 2007). Reinecke and Bernstein suggested that culture is important to usability, though experience with online media tempers culture's effects (2008). Preferences for online reading, in the form of "browse" or "focus," may be influenced by culture schemata, which would then play a part in the way information ought to be displayed (Callahan, 2005b, p. 287).

The research of Hofstede (2001) has been applicable in several studies of the interaction of culture and online media (Abdelnour Nocera & Camara, 2010; Adeoye, 2007; Callahan, 2005a, 2005b; Dormann & Chisalita, 2002; Marcus & Gould, 2000). Singh, Zhao, and Hu identified Hofstede's cultural dimensions, along with Hall's (1977) theories, as applicable to online media design (2005). Callahan found correlations between cultural dimensions and user interface characteristics and preferences, including several pertaining to uncertainty avoidance (2005b). This connection between uncertainty avoidance and user interface characteristics was also observed in the research of Marcus and Gould (2000) and MacGregor et al. (2005). The latter researchers supposed that individuals from high uncertainty avoidance cultures prefer structure and detail, while those from low uncertainty cultures relied on these less so, an observation shared by Callahan (2005b).

In applying existing insights into how culture and online media interact, researchers suggest that a single user interface design, as may be achieved through standardization, may not be appropriate or usable in all cultures (Callahan, 2005a; Nielsen, 1994). Extraneous elements are likely to add to the cognitive burden of the user (Nielsen, 1994). Rather, recognition of relevant cultural markers and behavioural characteristics may guide the design of customized, localized

interfaces (Barber & Badre, 1998). Users should be allowed to participate in the design phase to account for their mental models (Callahan, 2005a) and post-deployment user customization should not be considered a design solution (Nielsen, 1994). Nielsen enumerates numerous interface aspects that would require attention when addressing cultural needs. These include aspects such as linguistic elements, clarity, navigation, documentation, and concern for the level of ability of the user (1994).

Learning, Culture, And Online Media

Researchers have found strong correlations between culture and e-learning usage, motivation, and behaviour (Uzuner, 2009, p. 8). This connection may suggest that e-learning solutions, often developed within the contexts of culturally dominant developed nations, may not serve the needs of developing nations and minority culture communities (Henderson, 1996). Simply peppering learning materials with "music, pictures, and [the] first language of the students' cultures," and similar tokenism, would bear little connection to learners' cultural values (Henderson, 1996, p. 92).

Culture, as a learner characteristic, is seen as a strong influencer in e-learning (Uzuner, 2009). Learners may experience a negative academic impact when they feel culturally alienated or uncomfortable (Shattuck, as cited in Uzuner, 2009). Learners within certain cultures were found to be less inclined to use e-learning (Uzuner, 2009). Gunawardena et al. enumerate a number of cultural factors that have been found to impact e-learning success (Gunawardena et al., 2003). Strother (2003) found correlations between Hofstede's cultural dimensions and learner behaviours within face-to-face and online classrooms.

E-learning is seen as a cultural artifact, "embedded with the cultural values, preferences, characteristics, and nuances" of the originating culture (Selinger, 2004; Edmundson, as cited in

Uzuner, 2009, pp. 8–9). The hierarchical organization of information, for example, is a cultural construct, laden with different meanings within differing cultural contexts (Callahan, 2005a).

Hofstede identified the application of cultural dimensions, and specifically uncertainty avoidance, to research in learning (2001). A number of researchers have applied these cultural criteria to e-learning research. Blanchard and Frasson considered Hofstede's individualism metric, found strong correlations, and suggested aspects of culture for e-learning design based on their research. (Blanchard & Frasson, 2005, para. 1). Qi, Boyle, and Xue (2007) also proposed e-learning design consideration based on their research using Hofstede's dimensions. The doctoral dissertation of Evers (2001) categorized cultural backgrounds according to Hofstede's dimensions, as well as to the measures established by Hall and Trompenaars, and found strong connections between culture and e-learning interactions. Other research has considered the interactions of uncertainty avoidance with e-learning (Callahan, 2005b; Marcus & Gould, 2001; Olaniran, 2006; van Heerden & van Greunen, 2006).

Research by Adeoye (2007) and by Adeoye and Wentling (2007) examine e-learning usability in the context of Hofstede's cultural dimensions. In both examples, the researchers used the Hofstede national model and cultural indices. Participants in the study by Adeoye and Wentling were observed in a laboratory setting. This study examined possible correlations of the uncertainty avoidance cultural characteristic—expressed as an Uncertainty Avoidance Index (UAI) score—to learner interaction with e-learning tools.

Using variables identified through Nielsen's usability research, the researchers found a number of significant correlations between learners' cultures and their e-learning interactions (2007). One of their findings was that members of groups with higher UAI scores showed higher

scores for learnability time, while members of groups with lower UAI scores had higher memorability path scores (Adeoye, 2007, p. 5).

Instructional design, therefore, is where cultural obstacles can be mitigated in e-learning systems. As has been demonstrated, "instructional designers do not exist in a vacuum; nor are they neutral" (Henderson, 1996, p. 85; P. C. Rogers et al., 2007). Their culture has an influence on the learning theories to which they subscribe, the design processes they apply, and the education experiences they create (Henderson, 1996; Wild, 1999). The intent of e-learning instructional design must include addressing the cultural needs of learners with a balance of the academic culture (Henderson, 1996). Involving learners in the design process may allow for greater alignment to their mental models (Callahan, 2005a, p. 270).

A number of approaches may aid instructional designers. Social constructivist learning theory may address collaborative aspects of e-learning environments (Kanuka and Anderson, as cited in Stacey, 1999), an extension of the connectivity and non-linear world-views of constructivist learning theory (Henderson, 1996). The constructivist view would further encourage "values of collaboration, personal autonomy, generativity, active engagement, reflectivity, personal relevance, and plurality of perspectives" (Henderson, 1996, p. 88). An eclectic paradigm that acknowledges "multiple cultural realities" through design that allows high "variability and flexibility" has been advocated by researchers in culture and e-learning (Gunawardena et al., 2003, p. 766). Designers are encouraged to consider context, as well as content, authentic learning, and evaluation and testing of the instructional design (P. C. Rogers et al., 2007).

In practical terms, researchers advise culturally-appropriate e-learning design, specific to the learners' cultural needs (Milly, 2010). This could include consideration of learner motivation, cognitive engagement, and learning supports (Ally, 2008). In some cases, hybrid learning

environments are advised (Lopes, 2003). Social presence in the form of face-to-face interactions is preferred by many learners and more so in certain cultures (Uzuner, 2009). In distance learning environments, local tutors may be the bridge to make learning “culturally and pedagogically relevant” (Selinger, 2004, p. 223; Uzuner, 2009).

Chapter 3: Methodology

This study was non-experimental, causal-comparative in nature. The research procedure identified and selected research participants from an appropriate population, administered a questionnaire to the participants, and then analyzed the questionnaire responses with descriptive and inferential statistical methods.

Data Collection

This study aimed to examine the survey responses of learners at post-secondary institutions in Canada. Participants were selected based on their use of a course-based online learning system. The specific research sites chosen for this study were Northern Alberta Institute of Technology (NAIT) in Edmonton and Red River College (RRC) in Winnipeg. These colleges provide post-secondary technical and applied education within urban settings in Canada. Both offer certificate, diploma, apprenticeship, and a small number of degree programs. Prior to data collection, research approvals were obtained (see Appendix A: Research Approval, Central Michigan University, Appendix B: Research Approval, Northern Alberta Institute of Technology, and Appendix C: Research Approval, Red River College).

Survey participants were invited from a population that had used WebCT, a web-based e-learning platform provided by each school. The common software platform provided an adequate level of similarities and commonalities, despite possible configuration differences between schools and even between courses.

Appropriate staff at each research site compiled a list of e-mail addresses of learners who had used each school's e-learning system over the previous academic term. Each site's staff extracted from these e-mail address lists a set number of random e-mail addresses using software provided by the study author. Invitations to participate were then sent by the staff at each research site to

the randomly selected e-mail addresses. The e-mail addresses were not available to the study author. Initial invitations were sent (see Appendix E: Participant Invitation) along with two subsequent reminders (see Appendix F: Participant Reminder and Appendix G: Participant Final Reminder). The reminder messages were sent to all original invitees since there was no provision for identifying which invitees had already responded.

The survey was administered through a web-based form. To assure confidentiality and privacy of the participants, and to comply with the legal obligations of the participant Canadian colleges, the survey was placed on a web server located in Canada, the domain was secured using a digital certificate to encrypt data in transit, and access to the server was done through encrypted protocols. All responses were submitted anonymously with no personally identifying information.

In order to encourage participation, invited participants were offered entry into a separate draw for a fifty dollar Amazon.ca gift certificate. On completing the survey, each respondent was presented with a link to a separate web page where they would indicate the email address they would like to enter in the draw. There was no association between their survey response and the request to be entered into the draw, nor was any identity information requested for the draw. The gift certificate only required an email address for the recipient.

When participants first accessed the survey, they were presented with a research consent form (see Appendix H: Research Consent). If consent was given, the time of the consent was recorded as part of the survey process. The time of arrival at the survey and the time at which the survey was completed were also recorded. These time markers were intended to confirm the validity of the data and for auditing purposes. At the conclusion of the data collection period, the

survey data was exported from the web server database. Data was stored on a secured device for a limited period of time, to be destroyed after the conclusion of this research.

Survey Instrument

The primary tool of this study was a survey instrument (see Appendix I: Survey Questions). The survey was designed to elicit several categories of responses from the participants. One category of twenty-one Likert-scale questions was adapted with permission from Adeoye and Wentling (2007) (see Appendix D: Permission To Use Survey Instrument). As described earlier, the research of Adeoye and Wentling examined the usability of e-learning environments using an experimental approach and its instruments were based on research by Nielsen (1994). The inclusion of these questions provided a means for comparing and contrasting findings from this current study to the earlier one. These usability questions were numbered w01 through w21 (see Table 20).

A second category of questions were drawn from the Values Survey Module (VSM), an existing, validated survey instrument based on the work of Hofstede (2001; G. Hofstede, Hofstede, Minkov, & Vinken, 2008a, 2008b). Four Likert-scale questions were included from this instrument. These questions were specific to the cultural variable of uncertainty avoidance (see Table 18 and Table 19). The VSM manual provided instructions and formulae for the interpretation of responses.

A third category of questions considered aspects of learning, specifically, learner success and learner self-efficacy. This category was comprised of five Likert-scale questions labeled a01 through a05 (see Table 21). These questions were designed by the study author. Question a01 was concerned with general academic satisfaction. The responses to this question could be used to compare against respondent satisfaction with e-learning tools. Question a02 was interested in

the degree to which the e-learning system contributed to academic success. Question a03 asked for the respondent's level of confidence in using online tools. Question a04 was concerned with self-efficacy with online learning tools. Question a05 was concerned with general learner self-efficacy. Questions a04 and a05 would provide a comparative view of learner self-efficacy in relation to the e-learning tools. Responses to these questions could also be considered in aggregate.

Finally, a set of categorical, demographic questions were included in the questionnaire. Questions v29 through v34 were taken from the demographic questions of the VSM. Four demographic questions, numbered a06 through a09, were devised by the study author to gather additional demographic data. These were concerned with the time spent in formal education, as well as each respondent's chosen academic field. Question a07 would validate each set of responses by confirming whether the respondent was a student at one of the research sites. The demographic questions served as potential grouping variables. Table 23 summarizes the set of demographic questions.

Variables

A key independent variable was the Uncertainty Avoidance Index (UAI) culture variable identified through the VSM (G. Hofstede, Hofstede, Minkov, & Vinken, 2008a). This was identified to be a characteristic of the entire respondent cohort or its subgroups. Four questions were used to identify the UAI variable in the respondent group. The validation and factor analyses of this instrument had been previously established in research (G. Hofstede et al., 1990). Although the instrument documentation insisted on groupings based on "national" boundaries (G. Hofstede, Hofstede, Minkov, & Vinken, 2008b, p. 2), subgroups appropriate to the current

study were defined based on the notion of "small cultures" (Holliday, as cited in Catterick, 2006, p. 122) with UAI indices calculated accordingly.

The intent of the VSM is to assign a comparative cultural index to nationally delineated groupings of respondents. The VSM directs that respondents should be selected from a minimum of two regions differentiated by nationality. The cultural indices derived from the survey questions could then be used to compare any hypothesized characteristics of the respondent groups (G. Hofstede, 2001; G. Hofstede, Hofstede, Minkov, & Vinken, 2008a, 2008b). In the current study, the cultural distinctions were not assigned by nationality. The assumption here was that if a demographic grouping characteristic can be reasonably tied to a cultural grouping, such as the distinctions between regional post-secondary schools selected in this study, then the cultural distinctions detected by the VSM index could be said to be correlated to that demographic grouping. To be clear, a characteristic such as age may not be as strong a cultural differentiator, while years of education may be stronger, and regional proximity being stronger still.

The e-learning environment was another independent variable in this study. This variable was controlled by limiting it to a single software environment, in the case of this study, to the WebCT software. A limitation in this approach was that configurations, support, and training may have differed between research sites and courses. For the purpose of this study, however, a common set of software characteristics and features was presumed.

Respondent characteristics in the form of demographics were another set of independent variables. As already noted, the demographic questions provided potential grouping variables. The demographic questions incorporated from the VSM were also for potential use for further analysis with the VSM procedures (G. Hofstede, Hofstede, Minkov, & Vinken, 2008b).

Learner success and self-efficacy were considered dependent variables in this study. The survey was being administered as a post-treatment questionnaire connected to participants' experiences with the e-learning system. These questions gathered the respondents' subjective assessments regarding their own learning success in relation to their own expectations and to the e-learning environment.

The variables derived from the Adeoye and Wentling (2007) usability questions were considered dependent variables when they are evaluated against the UAI culture variable. These variables would address as a composite the usability characteristics defined by Nielsen: learnability, efficiency, memorability, low rate of error, and satisfaction. When the usability variables were evaluated against the respondent learner success variables, these being considered dependent variables, the usability variables were then treated as independent variables.

Data Analysis Methods

Descriptive statistics were used first to gain basic information about the participants and their responses (Gay et al., 2009). For each survey question, a set of frequencies was calculated along with their mean values. To determine the range of variability within the responses, the standard deviations (SD) were calculated. The relatedness of the responses were gauged using the Pearson *r* correlation coefficient. A coefficient near 1 or -1 would indicate higher relatedness while a coefficient near 0 would indicate lower relatedness (Gay et al., 2009).

Inferential statistics were used to determine the degree to which the responses might reflect, or generalize to, the larger population (Gay et al., 2009). The *t* test, a test of significance, was used for this purpose at given levels of probability.

Hypotheses

In order to configure appropriately the statistical analysis, this study was predicated on the following null hypotheses. These hypotheses were based on the research questions articulated in Chapter 1.

H1. For post-secondary learners using e-learning tools, there is no correlation between the uncertainty avoidance (UAI) cultural dimension and learner perceptions of usability of the e-learning tools.

H2. For post-secondary learners using e-learning tools, there is no correlation between the learner perceptions of usability of the e-learning tools and learner success and self-efficacy.

Chapter 4: Data Analysis

This chapter will provide an analysis of the data collected from the study survey. The data collection process and the variables will first be described. A series of descriptive statistics will examine the internal consistency reliability of the data, the frequency of responses, their means and standard deviations. The Values Survey Module (VSM) formula will be applied to demographic groupings. Possible correlations will be considered using independent samples t-tests and bivariate correlation tests. Inferential statistics will be used to see if any of the findings can be generalized to the entire population.

Data Collection

Each research site had an initial pool of potential participants from which random individuals were invited. For Northern Alberta Institute of Technology (NAIT), the pool had 9,321 potential participants, while at Red River College (RRC), the pool was estimated at 7,495 potential participants. Staff at each research site were charged with compiling a list of participant e-mail addresses. At each site, a randomized subset of 400 e-mail addresses was generated from each initial pool for a total of 800 participants. Research site staff sent survey invitations by e-mail to the 800 participants. Subsequently, there were 106 accesses to the web-based survey. Of these, 72 gave research consent and 42 completed the survey. Of the 42 completed responses, two were deemed invalid because the research site for the respondents could not be confirmed, leaving 40 valid response sets.

Variables

Four sets of variables were developed as part of this study. One set of variables probed the cultural characteristics of the respondent groups. Another set of variables aimed to determine the usability of the e-learning tools as perceived by the respondents. A third set of variables were

concerned with the respondents' level of learning satisfaction and self-efficacy. Lastly, a set of variables was developed to characterize the demographic aspects of the respondents. The questions used to collect data for these four groups of variables are found in Appendix I.

For the culture variables in this study, the Values Survey Module (VSM) provided an instrument and procedures through which the cultural dimensions of respondent groupings could be quantified and compared (G. Hofstede, Hofstede, Minkov, & Vinken, 2008a). The specific cultural dimension of interest was that of uncertainty avoidance for which an Uncertainty Avoidance Index (UAI) would be derived. The VSM provided four survey questions specific to UAI. These were numbered v16, v20, v24, and v27 and are listed in Table 18 and Table 19.

The usability variables used in this study were adapted from the earlier research of Adeoye and Wentling (2007). These variables addressed the characteristics of usability defined by Nielsen (1994). For this study, these usability characteristics were considered individually and as a single, composite score of usability. The survey questions for these variables, numbered w01 to w21, are found in Table 20.

An additional set of survey questions were concerned with the variables of learner success and learner self-efficacy. These questions considered both the online learning experiences of the respondents as well as their learning satisfaction in general. This part of the survey instrument was devised by the principal investigator. The questions for these variables were labeled a01 through a05 and are listed in Table 21 and Table 22.

The demographic variables were collected to determine any potential correlations to respondent characteristics. The VSM set out its own demographic questions concerning gender, education level, employment, age grouping, and nationality. To this, the study author added questions that confirmed the research site, the academic major or focus of studies, and the

number of years of post-secondary education. The survey questions for these variables are listed in Table 23. These questions were numbered a06 through a09, and v29 through v34.

Descriptive Statistics

Tests of the data were conducted to determine the level of internal consistency of reliability within the survey questions. The survey questions were categorized into four sets: UAI, usability, learning, and demographics. Each of these sets of questions represented categorically different variables and was necessarily different from the other sets. To determine internal consistency of reliability, the questions would be evaluated as a whole and as individual sets.

The UAI questions—numbered v16, v20, v24, and v27—were a subset of a larger, existing instrument which had been itself validated (G. Hofstede, Hofstede, Minkov, & Vinken, 2008b). In the current study, these questions were found to have a Cronbach alpha of -0.073. This negative average covariance among items suggested that the set of questions did not conform to the reliability model assumptions. A possible contributor to this result may have been that these questions were sufficiently, but necessarily, disparate in their focus. The low number of respondents also may have contributed to this finding. A split-half reliability test with Spearman-Brown correction determined an alpha of 0.384, confirming the very low internal consistency.

The usability questions w01 through w21 were found to have high internal consistency with a Cronbach alpha of 0.938, or 0.940 when based on standardized items. A split-half reliability test indicated a 0.907 score with the Spearman-Brown correction formula for both equal and unequal lengths, reflecting the high internal consistency found. These results were derived despite the low response level. Note that questions w10, w14, and w16 were reverse-coded prior to analysis.

The responses to questions pertaining to learning, numbered a01 through a05, were found to have low internal consistency with a Cronbach alpha of 0.616, or 0.607 when based on standardized items. The low internal consistency may be due to a low response level (Gay et al., 2009). The results of a split-half reliability test indicated 0.637 for equal length and 0.644 for unequal length after application of the Spearman-Brown correction formula, confirming the finding of low internal consistency.

The demographics questions were concerned with a wide range of respondent characteristics. These questions were found to have very low internal consistency with a Cronbach alpha calculated as 0.485. A split-half reliability test provided scores of 0.271 and 0.273 for equal and unequal lengths respectively, after application of the Spearman-Brown correction formula. A likely cause for the low internal consistency of this set of questions was the low relatedness between the questions themselves, though a low response rate could also have been a factor here.

As a whole, a split-half reliability test of all applicable survey questions revealed a score of 0.022 after the Spearman-Brown adjustment. A Cronbach alpha of 0.779 indicated moderate internal consistency. The survey questions as a whole were dissimilar in many respects, which likely accounts for the low reliability measure. Though, again, a small response set could have contributed to this result.

Frequencies

The questions used to derive UAI scores were key to the current study in that they helped identify the cultural characteristics of respondent groups. A summary of the response to these questions follows.

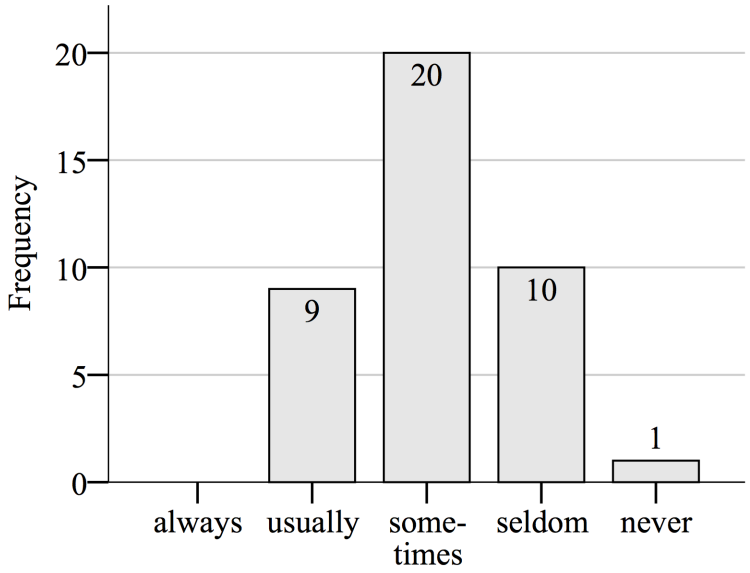

Figure 3: Response frequency to question v16, "How often do you feel nervous or tense?" Note: Coded 1 for "always," 2 for "usually," 3 for "sometimes," 4 for "seldom," and 5 for "never." N=40, Mean 3.08, SD 0.764.

Question v16 asked for the level of respondent anxiety. No respondents (0%) indicated "always," 9 respondents (22.5%) indicated "usually," 20 respondents (50.0%) chose "sometimes," 10 respondents (25.0%) chose "seldom," and one respondent (2.5%) indicated "never." The scale was coded 1 for "always," 2 for "usually," 3 for "sometimes," 4 for "seldom," and 5 for "never." Using these coding values, the mean score for the responses was 3.08 and the SD was 0.764. Figure 3 illustrates the response frequencies to this question.

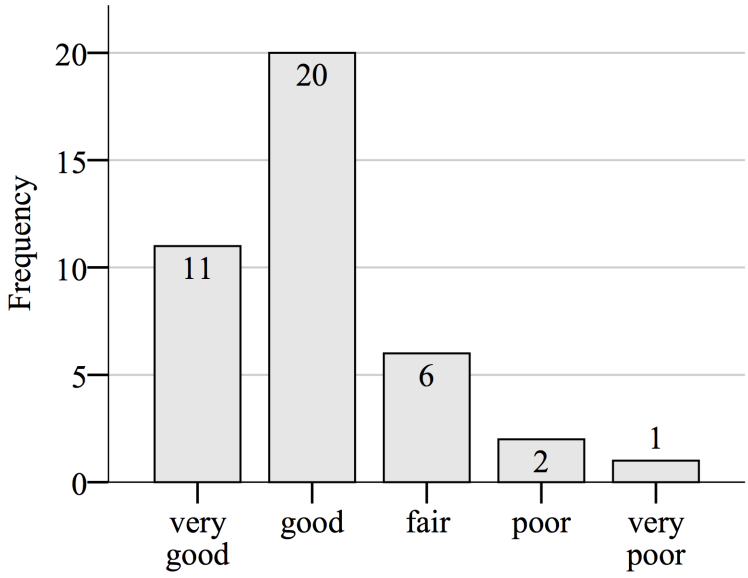

Figure 4: Response frequency to question v20, "All in all, how would you describe your state of health these days?"

Note: Scale was coded 1 for "very good," 2 for "good," 3 for "fair," 4 for "poor," and 5 for "very poor." N=40, Mean 2.05, SD 0.932.

Question v20 asked about the current health of the respondent. Of these, 11 respondents (27.5%) chose "very good," 20 respondents (50.0%) chose "good," 6 respondents (15.0%) indicated "fair," 2 respondents (5.0%) chose "poor," and 1 respondent (2.5%) indicated "very poor." This scale was coded 1 for "very good," 2 for "good," 3 for "fair," 4 for "poor," and 5 for "very poor." Based on these coding values, the mean score for this set of responses was found to be 2.05 and the SD was 0.932. Figure 4 illustrates the response frequencies to this question.

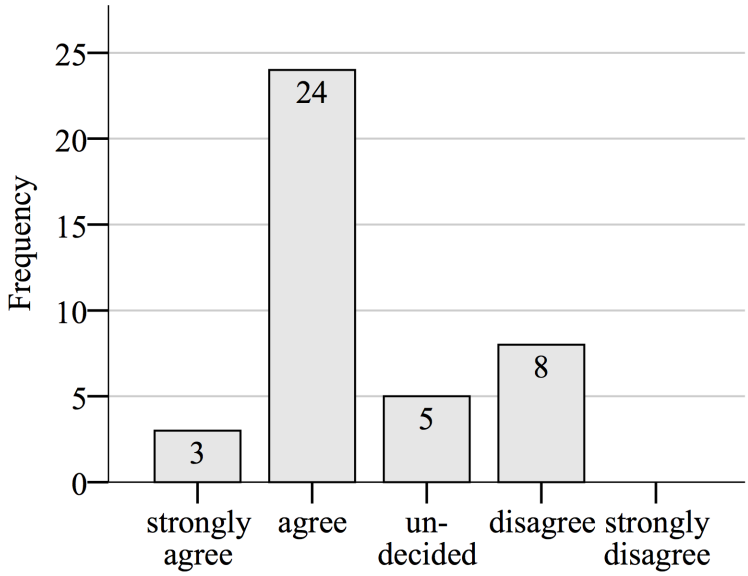

Figure 5: Response frequency to question v24, "One can be a good manager without having a precise answer to every question that a subordinate may raise about his or her work."
Note: Scale was coded 1 for "strongly agree," 2 for "agree," 3 for "undecided," 4 for "disagree," and 5 for "strongly disagree." N=40, Mean 2.45, SD 0.904.

Question v24 was concerned with respondents' perception of management practice. Of these, 3 respondents (7.5%) indicated "strongly agree," 24 respondents (60.0%) indicated "agree," 5 respondents (12.5%) chose "undecided," 8 respondents (20%) indicated "disagree," and no respondents (0%) chose "strongly disagree." The scale was coded 1 for "strongly agree," 2 for "agree," 3 for "undecided," 4 for "disagree," and 5 for "strongly disagree." Using these coding scales, the mean score for these responses was 2.45 and the SD was 0.904. Figure 5 illustrates the response frequencies for question v24.

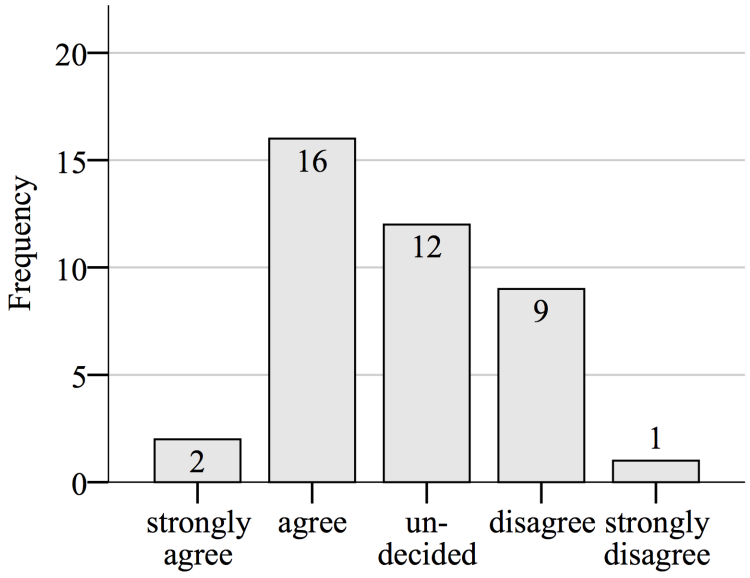

Figure 6: Response frequency to question v27, "A company's or organization's rules should not be broken—not even when the employee thinks breaking the rule would be in the organization's best interest."

Note: Scale was coded 1 for "strongly agree," 2 for "agree," 3 for "undecided," 4 for "disagree," and 5 for "strongly disagree." N=40, Mean 2.78, SD 0.947.

Question v27 was interested in respondents' perception of rules. There were 2 respondents (5.0%) who chose "strongly agree," 16 respondents (40.0%) chose "agree," 12 respondents (30.0%) indicated "undecided," 9 respondents (22.5%) indicated "disagree," and 1 respondent (2.5%) chose "strongly disagree." This question was coded 1 for "strongly agree," 2 for "agree," 3 for "undecided," 4 for "disagree," and 5 for "strongly disagree." Using these coding scales, the mean score for this question was 2.78 with a SD of 0.947. Figure 6 illustrates the response frequencies for this question.

Response frequencies for the four preceding UAI responses are presented in Table 1 and Table 2. A summary of descriptive statistics for these responses is given in Table 3.

In addition to the set of VSM questions, detailed above, from which will be derived the UAI, a set of questions concerning usability were given to the respondents. These questions, labelled w01 through w21, aimed to elicit subjective responses assessing the usability of the e-learning tools. A composite usability score was calculated from the 21 usability questions. For this composite score, the scales of questions w10, w14, and w16 first were reverse coded so that they reflect the direction of responses to the other questions. These questions were coded 1 for "strongly agree," 2 for "agree," 3 for "neither agree not disagree," 4 for "disagree," and 5 for "strongly disagree ." A mean was calculated for each respondent case and a composite mean was found to be 3.600 with a SD of 0.642. Table 4 summarizes the response frequencies to these questions. Table 5 shows the descriptive statistics for the responses to the usability questions.

A set of questions concerning learning were provided to the respondents. These five questions were labelled a01 through a05. Table 6 summarizes the frequency of responses to these questions. These questions were coded 1 for "strongly agree," 2 for "agree," 3 for "neither agree nor disagree," 4 for "disagree," and 5 for "strongly disagree." Using these coding values, the following means were calculated for questions a01 through a05, respectively (with standard deviations in parentheses): 2.15 (0.770), 2.78 (1.074), 2.05 (0.783), 2.05 (0.815), and 2.15 (0.802). Table 7 summarizes the descriptive statistics for this set of questions.

The fourth set of questions asked for demographic information. These questions were designed to capture data that may differentiate the respondents with shared characteristics. These questions asked about gender, age group, years of post-secondary and overall education, employment status, academic major, and nationality.

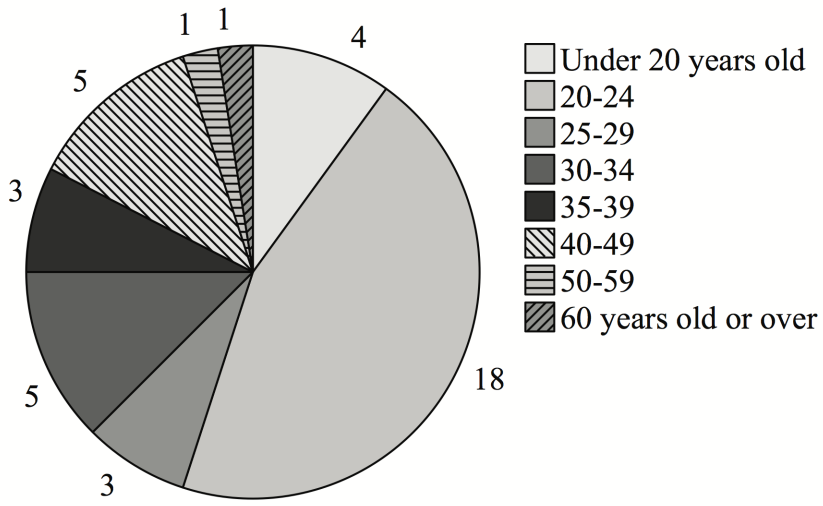

Figure 7: Proportions of respondent age groups (question v30).

Note: N=40.

For question v29, 17 of the respondents identified themselves as male (42.5%) and 23 as female (57.5%).

For question v30 regarding their age groups, 4 respondents (10.0%) identified as “under 20,” 18 respondents (45.0%) as “20-24,” 3 respondents (7.5%) as “25-29,” 5 respondents (12.5%) as “30-34,” 3 respondents (7.5%) as “35-39,” 5 respondents (12.5%) as “40-49,” 1 respondent (2.5%) as “50-59,” and 1 respondent (2.5%) as “60 or over.” Figure 7 illustrates the response proportions to this question.

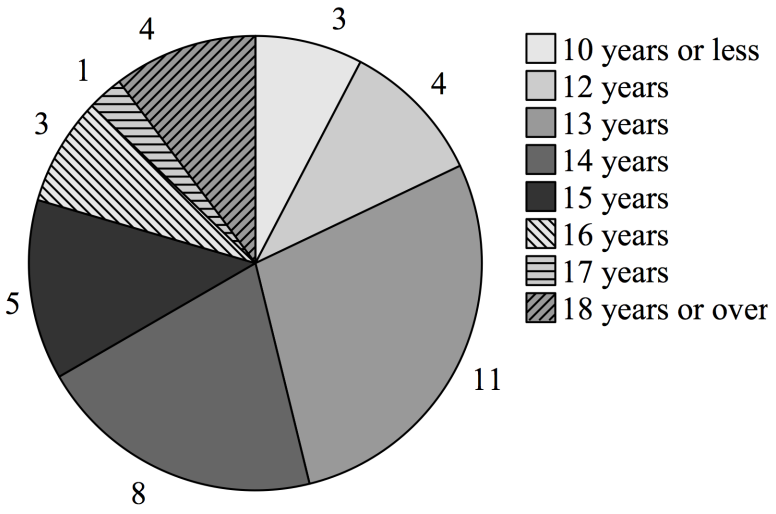

Figure 8: Proportions of responses to question v31, "How many years of formal school education (or their equivalent) did you complete (starting with primary school)?"
Note: N=40.

Question v31 asked for the number of years of formal education completed. One of the respondents (2.5%) chose "10 years or less", 3 respondents (7.5%) chose "11 years", 4 respondents (10.0%) said "12 years", 11 respondents (27.5%) indicated "13 years", 8 respondents (20.0%) indicated "14 years", 5 respondents (12.5%) said "15 years", 3 respondents (7.5%) indicated "16 years", 1 respondent (2.5%) indicated "17 years", and 4 respondents (10.0%) indicated "18 years or over." Figure 8 illustrates the response proportions for this question.

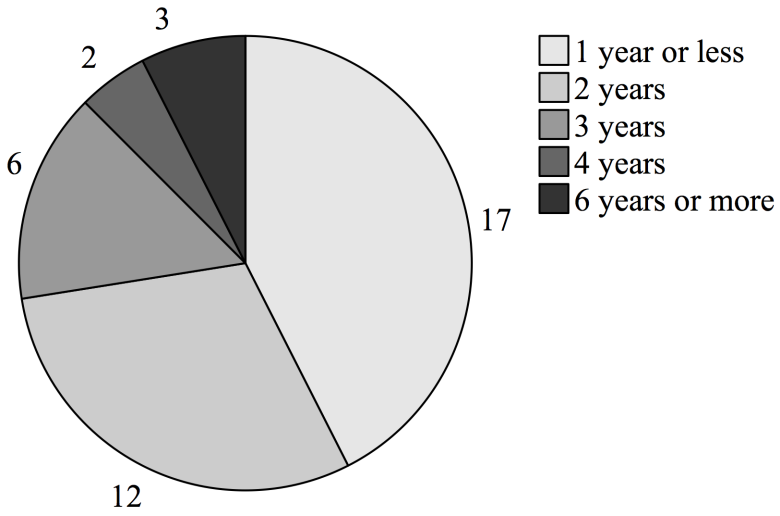

Figure 9: Proportions of respondent post-secondary education (question a06).

Note: N=40.

Similarly, question a06 asked for the number of years of post-secondary education completed. On this question, 17 respondents (42.5%) indicated “1 year or less,” 12 respondents (30.0%) indicated “2 years,” 6 respondents (15.0%) indicated “3 years,” 2 respondents (5.0%) indicated “4 years,” no respondents (0%) indicated “5 years,” and 3 respondents (7.5%) indicated “6 years or more.” Figure 9 illustrates the response proportions regarding this question.

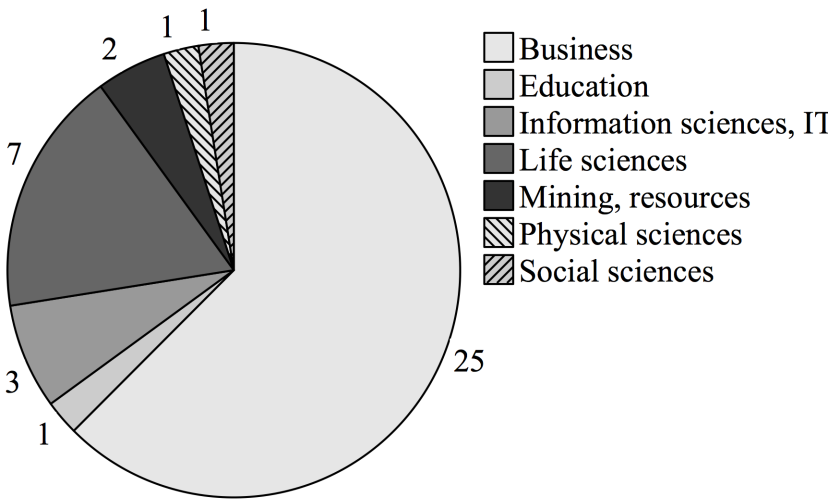

Figure 10: Proportions of respondent academic majors (questions a08 and a09).

Note: N=40.

Questions a08 and a09 were concerned with courses of studies. Ten of the respondents indicated “other” and provided an alternate academic major. These were keyed to the existing options if appropriate or otherwise defined into a general academic field. Figure 10 illustrates the proportion of the academic majors.

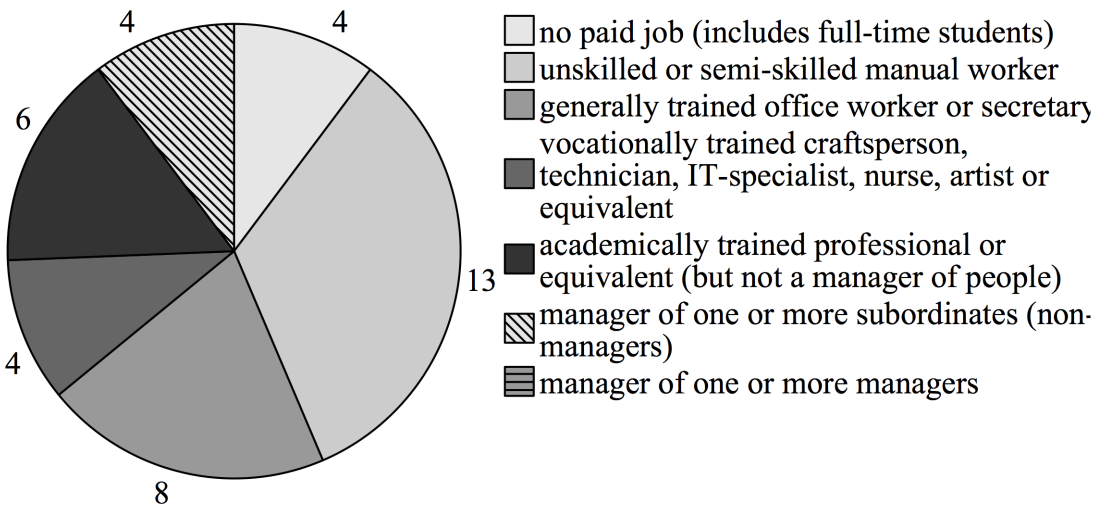

Figure 11: Proportions of respondent employment categories (question v32).

Note: N=40.

Question v32 asked about any employment in which the participant was engaged. Of the responses, 4 respondent indicated "no paid job (includes full-time students)," 13 respondents indicated "unskilled or semi-skilled manual worker," 8 respondents chose "generally trained office worker or secretary," 4 respondents said "vocationally trained craftsperson, technician, IT-specialist, nurse, artist or equivalent," 6 respondents indicated "academically trained professional or equivalent (but not a manager of people)," 4 respondents indicated "manager of one or more subordinates (non-managers)," and no respondents indicated "manager of one or more managers." Figure 11 illustrates the proportions of these responses.

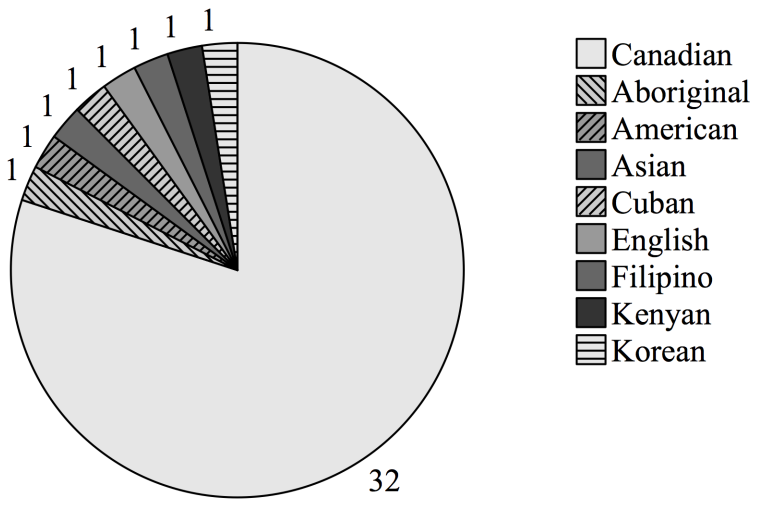

Figure 12: Response frequencies for nationalities (question v33).

Note: N=40.

Questions v33 and v34 asked respondents to identify their nationality, along with their nationality at birth, if different. These questions were gathered as part of the VSM questions and may be used for future study of cultural factors as described in the VSM. Of the responses, 32 respondents (80.0%) identified as Canadian. The remaining 8 respondents identified as one of each of Aboriginal, American, Asian, Cuban, English, Filipino, Kenyan, and Korean. Three respondents identified alternate birth nationalities. Figure 12 illustrates the proportions of nationalities that were identified.

To confirm that participants were affiliated with a valid research site, question a07 asked respondents for the name of their educational institution. Two sets of responses were rejected as non-valid since the respondent institutions did not match the research sites selected for this study.

Correlations

The defined VSM process for identifying cultural characteristics of a population assumes that the research to which it is applied makes use of at least two distinct nationalities with which respondents would identify. Once the data are gathered, the VSM formula would be used to determine a cultural dimension score for each nationality grouping, thereby assigning a relative cultural index to each nationality. The literature review in Chapter 2 identified a number of characteristics, as alternatives to nationality, that could be used to demarcate cultural groupings. These included parameters such as mutual interests or organizational units such as workplaces or schools. The demographics gathered in this study were examined to see if the respondents could be grouped by such characteristics. Four such grouping characteristics emerged from the demographic variables. These groupings were age group, research site, post-secondary education, and overall education. Each of these groupings could be partitioned into two independent sections. Age groups could be partitioned by younger and older respondents. Respondents could be partitioned according to their educational institution, one of the two research sites. Respondents could also be partitioned according to whether they had less or more years of post-secondary or overall education.

To arrive at an applicable score from the UAI questions, the VSM provided the following formula: UAI = 40(m20 - m16) + 25(m24 - m27) + C(ua) (G. Hofstede, Hofstede, Minkov, & Vinken, 2008b, p. 9). The values for m16, m20, m24, and m27 were taken from survey questions v16, v20, v24, and v27, respectively. A constant, shown in the formula as C(ua), would be selected to adjust the resulting index to a value between 0 and 100. The UAI for the entire respondent group was then calculated from the mean scores for each of the four questions. Using the means of responses to survey questions v16, v20, v24, and v27, the UAI formula provided a

raw score of -49.45. Once a constant had been selected, in this case C(ua) = 100, the UAI score for the purpose of this study was set as 50.55.

With age group as a grouping characteristic, the respondents could be divided into two sections. One section consisted of 22 respondents who reported their age as 24 years or younger while the other section consisted of 18 respondents who reported their age as 25 years or older. A UAI score was calculated for each section. For the section of younger respondents, the UAI was found to be 46.14. For the section of older respondents, the UAI was found to be 56.67. The difference between these scores was 10.53.

Research site was also used as the grouping characteristic as there were two post-secondary educational institutions chosen as research sites. Of the demographic variables, this one most resembled geographic distance as could be equated to nationality. For this characteristic, 17 respondents reported NAIT as their educational institution, while 23 identified RRC as theirs. The UAI calculated for these sections was 44.71 for the NAIT respondent section and 55.43 for RRC respondent section. The difference between these scores was 10.72.

Using years of post-secondary education, the demographic data allowed for a cutoff point between fewer or more years of post-secondary education. Learners are more likely to enter voluntarily into post-secondary education, as opposed to primary or secondary education. Post-secondary academic environments can be expected to exert their own cultural influence which may or may not have some consistency across all colleges and universities. In any event, the number of years spent within a post-secondary environment could be seen as a cultural differentiator, without ascribing causation. In this study, 17 respondents indicated completing one year or less of post-secondary education, while 23 completed 2 or more years. The respondent section with fewer years of post-secondary education was found to have a UAI score of 41.18.

The respondent section with more years of post-secondary education was found to have a UAI score of 58.04. The difference between these scores is 16.86.

The grouping variable for overall education identified respondents' total years of formal education. There were 19 respondents indicating 13 years or less formal education. There were 21 respondents reporting 14 years or more formal education. The respondent section with fewer years of education was found to have a UAI score of 38.95. The respondent section with more years of education was found to have a UAI score of 61.67. The difference between these scores was 22.72.

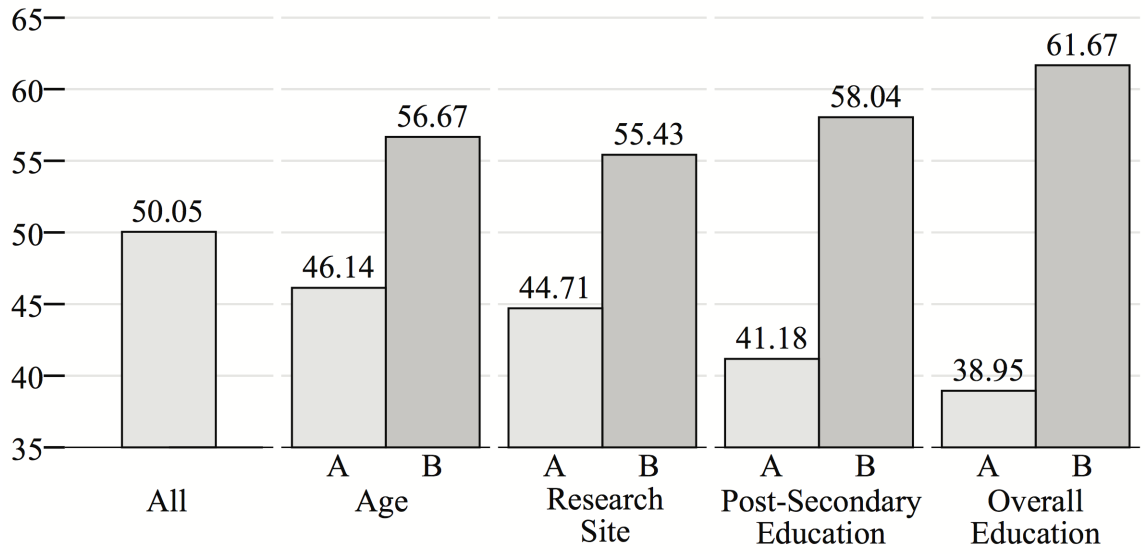

Figure 13: Comparison of UAI scores for several grouping variables and their sections.

Note: The UAI for the respondents in aggregate is labeled "All." For "Age," A represents the younger respondent section while B represents the older one. "Research site" illustrates NAIT as section A and RRC as section B. "Post-secondary education" has A representing the respondent section with fewer years and B the one with more years. "Overall education" shows respondents with fewer years in section A and those with more years in section B. A higher UAI score indicates a greater degree of uncertainty avoidance relative to groupings with lower UAI scores.

Figure 13 provides a visualization of how the UAI scores of the four demographic grouping variables relate to each other. The UAI for the respondents in aggregate was 50.05, marked "All" in the figure. Younger respondents are represented as section A at "Age" and older respondents are shown as section B. For "Research Site," respondents from NAIT are shown as section A, while RRC respondents are shown as section B. Respondents with fewer years of post-secondary education are shown as section A at "Post-secondary education," while those with more years are

shown as section B. Respondents with fewer years of overall education are shown as section A above “Overall education,” while those with more years are shown as section B. The key piece of information here is the relative difference between the low and high scores for each of the demographic grouping variables. The greater the difference between the two measures, the greater the relative distance along the cultural dimension being measured.

The next question might be whether these differences in cultural dimension scores are statistically significant. To answer this question, a series of independent samples t-tests were completed. The respondents were grouped using grouping variables. The UAI scores for these grouping variables were then compared for any significance. These tests would consider the UAI scores on either side of the section cutoff point for each grouping variable.

In each case, the independent samples t-test was performed at a confidence interval (CI) of 0.95. The Levene test for equality of variances was examined first to determine if equal variances were to be assumed in the remaining results. For age group, research site, post-secondary education, and overall education groupings, the significance was found to be 0.367, 0.398, 0.646, and 0.200 respectively, meaning no significant variance was found in any of the cases and, therefore, equal variances would be assumed for the remaining results. Examining the results for t-test equality of means, the significance (2-tailed) was found to be 0.621 (df=38), 0.617 (df=38), 0.430 (df=38), and 0.329 (df=37) for age group, research site, post-secondary education, and overall education groupings, respectively. These findings indicate that there was no significance under the t-test for equality of means for any of the groupings. Therefore, differences in the UAI scores could not be accounted for by any single grouping alone.

The sets of variables—culture, usability, and learning—were investigated to determine any possible correlations between them. This was done with bivariate correlation tests using the Pearson correlation coefficient**.**

A set of bivariate correlation tests examined the four culture variables against the 21 usability variables. The usability variables were first converted to z scores. When investigating the UAI scores for age group and overall education groupings against the usability z scores, no significant correlation was found at the $p<0.05$ level (2-tailed). When considering the UAI scores for research site, usability question w16 was found to have a moderate correlation of -0.411 with significance of 0.010 ($p<0.05$; 2-tailed). When the UAI scores for post-secondary education were examined, a moderate correlation was found for usability question w04 where the correlation was -0.433 with significance of 0.007 ($p<0.01$; 2-tailed). No other significant correlations were found between the uncertainty avoidance cultural dimension and respondents' perceptions of the usability of the e-learning tool. Table 8 provides further details of these correlation tests.

The next set of correlation tests examined the usability variables against the learning variables. The raw results for each set of variables were first transformed into z scores. The 21 usability scores were then tested against the five learning scores. This yielded a total of 105 observations. Of these, 28 observations were found to be significant at the $p<0.01$ level. Another 24 observations were significant at the $p<0.05$ level. All significant correlations were negative, meaning an inverse correlation was found in each instance. Table 9 details these findings.

Inferential Statistics

Two sets of inferential statistical tests were completed to determine if the results obtained in this study reflect results that might be obtained for the entire population. Independent samples t-tests were used to compare the means of two independent samples (Gay et al., 2009). In the first

set, usability was examined using, as the independent samples, the demographic groupings identified earlier: age groups, research sites, years of post-secondary education, and years of overall education. In the second set, usability perception was used as the independent sample for examining learning success.

Uncertainty avoidance and usability

The first set of inferential tests were to compare the means of the perceptions of usability. The grouping variables were done by the demographic characteristics identified earlier. The cut-points for these variables were set as for the A-B sections defined earlier. The intent was to see what patterns might emerge if the differentiated UAI scores, assigned to the A-B sections identified earlier, are taken into account when the t-tests are applied to the usability variables. The usability scores were standardized to z scores to allow for consistent comparisons.

With age group selected as the grouping variable, the cut-point was set between 24 years or younger and 25 years or older. In this t-test, the Levene's test for equality of variances did not identify any usability questions with significance ($p<0.05$), therefore, equal variance was assumed for the remaining findings in this test. The t-test for equality of means did not identify any significant findings ($p<0.05$, 2-tailed). Table 10 provides details for this test.

The usability preferences were next examined against the research site grouping variable. The research site groupings were NAIT and RRC. In the Levene's test, usability questions w15 through w21 were seen as significant ($p<0.05$) with scores of 0.045, 0.009, 0.009, 0.032, 0.027, 0.014, and 0.006, respectively. For these items, the remaining findings were considered with equal variances not assumed. Of these remaining findings, only usability question w16 was significant on the t-test for equality of means with a score of 0.009 ($p<0.01$; 2-tailed). For questions where equal variances were assumed, no significance was found ($p<0.05$; 2-tailed).

Table 11 summarizes the findings where equal variances were assumed. Table 12 summarizes the findings where equal variances were not assumed.

The usability preferences were compared against the post-secondary education grouping variable. The groupings for post-secondary education were one year or less, and two years or more. With Levene's test for equality of variances, items w03, w12, w13, w18, and w20 were found to be significant with scores of 0.016, 0.021, 0.047, 0.013, and 0.008, respectively ($p<0.05$). For these items, the equality of variances was not assumed in the remaining findings. However, there were no significant equality of means in these findings ($p<0.05$; 2-tailed). For questions where equal variances were assumed, one usability question, w04, had significance of 0.015 ($p<0.05$; df=38; 2-tailed). Tables 13 details the data where equal variances were assumed. Table 14 details the findings where equal variances were not assumed.

The last test in this series considered usability with the overall education grouping variable. The groupings for overall education were 13 years or less, and 14 years or more. Levene's test for equality of variances identified items w04, w14, and w17 as significant with scores of 0.039, 0.010, and 0.033, respectively ($p<0.05$). For these items, equal variances were not assumed for the remaining findings. For these and all remaining items, no significance was found in t-test for equality of means ($p<0.05$; 2-tailed). Table 15 details these findings with equal variances assumed. Table 16 details the findings where equal variances were not assumed.

Although some significant observations were found in these tests, no patterns appear to have emerged that would suggest that an inference could be made between these data and the general population on the question of uncertainty avoidance and usability.

Usability and learning success

In this last test, learning success was tested for inferences using a composite usability z score as a grouping variable. The cut-point for the usability z score grouping variable was 0.1803, its median value. No significant variances were found in the Levene's test ($p < 0.05$), so equal variances were assumed for the remaining observations. In the t-test for equality of means, learning variables a02 and a03 were significant with 0.025 and 0.013 significance respectively ($p<0.05$; 2-tailed). In addition, a composite z score for the learning variables was also found to be significant with 0.023 ($p<0.05$; 2-tailed). Table 17 details this data with equal variances being assumed.

Although a few significant observations were found in this test, no patterns emerged that would suggest that any inference could be made between these data and the general population on the question of usability and learning success.

Summary

When considering the internal consistency of reliability in the survey responses, reliability was only found in the set of items that probed perceptions of usability. In comparison to the other survey questions, this set appeared to have some degree of uni-dimensionality which may account for this finding. The low reliability of the remaining questions may be attributed to the low response rate or to the disparate nature of their wordings.

Scores for the UAI culture variable were determined using demographic groupings. Some variance was apparent, as shown in Figure 13. None of these variances were found to be statistically significant, however.

The data were examined for any correlations using bivariate correlation tests with the Pearson *r* correlation coefficient. In examining the UAI scores against usability, moderate

correlations were found when culture was considered by research site and item w16, and when culture was considered by post-secondary education and item w04. When examining usability perception scores against the learning success scores, out of 105 total observations, 28 were found to be significant at $p<0.01$, and another 24 were found to be significant at $p<0.05$.

A series of inferential tests were performed to examine usability in relation to culture groupings and to examine learning success by applying a usability grouping variable. In the first case, the culture groupings were set to the four demographic characteristics for which a culture index was determined. In the second case, the usability grouping was split along the median of respondent perceptions.

The inferential test for usability examined by culture found no significant observations when considered by age groups. When considered by research site, significance was found in equality of variance in items w15, w16, w17, w18, w19, w20, and w21. For equality of means, significance was found in item w16. When considered by post-secondary education, equality of variance was significant in items w03, w12, w13, w18, and w20, while significance was found in the equality of means for item w04. Finally, in considering overall education as the culture grouping variable, significance was found in the equality of variance in w04, w14, w17, and w20. In this last test, no significance was found in the t-test for equality of means.

In the inferential test that examined learning success using usability perception as a grouping variable, no significance was found in the tests for equality of variance. In the t-test for equality of means, items a02, a03, and a composite learning success score were found to be significant.

Hypotheses

The first null hypothesis in this study, H1, was as follows: “For post-secondary learners using e-learning tools, there is no correlation between the uncertainty avoidance (UAI) cultural dimension and learner perceptions of usability of the e-learning tools.” Although there was some variance detected in the UAI scores, none of them was found to be statistically significant. All subsequent analyses could not, as a result, be correlated to the cultural scores. Therefore, this study failed to reject the H1 null hypothesis.

The second null hypothesis in this study, H2, was as follows: “For post-secondary learners using e-learning tools, there is no correlation between the learner perceptions of usability of the e-learning tools and learner success and self-efficacy.” There were a moderate number of significant observations when the usability and learning success data were examined for correlations. On further examination using inferential statistics, there appeared to be some significance in two of the learning success items. However, no pattern was found from which clear inferences could be drawn. Therefore, this study failed to reject the H2 null hypothesis.

Chapter 5: Summary, Conclusions, Recommendations

Summary

The primary purpose of this study was to identify potential relationships between learner culture, the design of e-learning tools, and learner success. Through an understanding of such relationships, those charged with the design and deployment of e-learning tools might better address culture as a significant learner characteristic. Current literature identifies a number of studies that have investigated the intersections of the three research domains presented here—culture, online media, and education. This current study may not have demonstrated any clear relationships among these domains. Nonetheless, a number of concluding observations and recommendations can be made.

The research objective in this study was to gather appropriate survey data, analyze the data, and determine the degree of correlation and inference that could be drawn from those data. The limitations of this study were several, so an understanding of the extant research domains was needed to most effectively configure the study procedure and to describe the data. Attention was given to assigning an appropriate culture metric, as well as an appropriate vocabulary and heuristics for interface design.

The study made use of a multi-faceted survey instrument. This instrument included an existing set of survey questions regarding culture (G. Hofstede, Hofstede, Minkov, & Vinken, 2008a), a set of questions concerning usability used previously in another study (Adeoye & Wentling, 2007), a set of questions concerning learning success, and demographic questions. Participants provided subjective responses based on their experiences with e-learning tools. Responses were then analyzed for statistical correlations and inferences.

Some significant observations were uncovered by this study. However, there were no conclusive findings. In particular, the study failed to reject the null hypotheses. A low number of respondents may have contributed to these results.

When the demographic groupings were examined for cultural variances, some variance was found, but none was statistically significant. Thus, it was not clear that the demographic groupings could themselves account for variances in culture scores, though the literature suggests that certain characteristics could account for cultural variance (Catterick, 2006; House et al., 2004). The demographic groupings were examined against usability perceptions for any correlations. Out of 84 observations, only two were found to have any significant correlation. Further, when examined for inferences to the general population, there were few significant results. Of 84 observations, only 15 were found to have significant variance with two results having means that were significant. Together with an apparent lack of correlation of the demographic groupings to the culture scores, these data failed to reject the null hypothesis that they were addressing, H1.

When examining for correlations between usability perceptions and learning success, a moderate number of significant observations was found. Of 105 observations, there were 28 significant observations at $p<0.01$ and an additional 24 significant observations at $p<0.05$. When usability perceptions were considered for inferences, significance on the equality of means was found on two of the five learning success items, as well as on a learning success composite score. These data, though, did not appear to present any further patterns. The study, therefore, failed to reject the second null hypothesis, H2.

Conclusions

This study was able to identify frameworks for examining culture in the context of e-learning. In particular, the Hofstede model (2001) and the uncertainty avoidance cultural dimension have been considered in related research. This model provides validated survey instruments along with directions for interpretation (G. Hofstede, Hofstede, Minkov, & Vinken, 2008a, 2008b). Additional studies have considered how this cultural model may apply in online media, teaching and learning, and in e-learning (Butler, 2004; Callahan, 2005a; Henderson, 1996; Milly, 2010). The current study demonstrated one way in which cultural dimensions may be considered in e-learning research.

This study also considered vocabularies for interface design. These vocabularies went well beyond superficial aesthetic attributes. Indeed, significant research has been done in the cognitive and psychological aspects of interactive information display (Ally, 2008; Butler, 2004; Nielsen, 1994; Stacey, 1999). Nielsen, in particular, provides a comprehensive usability heuristic for such interactive design (1994). This vocabulary and set of approaches had been used in a number of studies (Adeoye & Wentling, 2007; Callahan, 2005a). Outside the research context, Nielsen's work provides practical direction for user interface design, in general.

Another insight based on the existing literature was that standardization and a "one size fits all" approach may not be adequate when addressing culture in e-learning (Bray, 2005, p. 71; Uzuner, 2009, p. 15). At the other extreme, interface customization performed by the learner may also not be optimal to successful learning (Nielsen, 1994). Instead, careful consideration of culture by instructional designers, with a view to learning success, may yield optimal e-learning design (Callahan, 2005a).

The low response rate in the current study may have been the result of any number of factors. Among these factors is the way that the survey invitations were presented and worded. Fewer than 14% of the invitees accessed the online survey. The content or form of the research consent may have been a factor. Of the participants who arrived at the consent form, only 68% gave their consent and started the survey. The survey itself may have presented some obstacles to completion, since fewer than 60% of those giving consent completed the survey.

Another possibility for the low response rate may be attributed to some form of electronic messaging fatigue, where the invitees may have been overwhelmed by the various communications they receive. Invitees may have chosen to ignore the invitation because of the lack of relevance to themselves, in what might simply have been an act of managing their communication priorities (Selm & Jankowski, 2006).

Recommendations

A number of recommendations can be made on the basis of this research project. Specific to the survey data in this study, recommendations can be made regarding research approaches that may yield more concrete information for understanding cultural issues in e-learning. The Hofstede model appears to be applicable to groupings that are not necessarily delineated by nationality. Several research studies are in agreement on this insight (Abdelnour Nocera & Camara, 2010; Catterick, 2006; House et al., 2004; Joy & Kolb, 2009). Though the variances found in this study were not statistically significant, the research procedure identified cultural affiliation and enculturation through appropriate demographic groupings. Future study would be required, with an adequate sample size, to determine the validity of this insight.

A larger pool of respondents would have benefited this study. Given the rate of respondent attrition between invitation and survey completion, a traditional, paper-based survey would be

recommended. A paper-based survey could also account for potential respondents who may be disinclined from participating in an online survey, particularly in a study which is gauging respondent perception of online tools. Also, it may be advisable to present the survey within a classroom setting. This provides a number of potential advantages beyond an improved response rate. One such advantage might be the inclusion of respondents who may have chosen not to use e-learning tools. Other advantages would be that the demographics of place and proximity can be more specific, as well as the identification of academic majors. If an online survey is preferred, the allocation of classroom time and computer access for completion of the survey may also lend the advantages already noted.

The current study relied upon subjective measures of learning success. Although this may be a valid metric in studies such as this one, future studies may endeavour to examine academic grades, or some other objective measure, as the appropriate measure of learning success.

Among the merits of the experimental research design used by Adeoye and Wentling is that of a consistent user interface which the researchers can control (2007). In the current study, a degree of interface consistency was assumed due to the common e-learning platforms in use at the research sites. A future study may confine its research to a more controlled e-learning environment.

A pre- and post-test survey design may be useful in better understanding how respondent perceptions change with regard to e-learning use and academic progress. A pre- and post-test design could also be used to determine stability or flux within the cultural dimension scores.

Specific to the literature, there were several methods identified for quantifying cultural dimensions within learner groups. There were also a number of insights and approaches to instructional design that account for culture in e-learning. The most prominent of these was

Hofstede's cultural dimensions model. This model had been used with some degree of success for research in software interface design, generally, and in e-learning design, more specifically. The author of the current study would recommend that, in light of the use of Hofstede's model in e-learning research, as well as its recognized validity in cultural research, instructional designers find ways to benefit from the insights it may provide.

Another finding in the literature is the notion of usability in software design. The limitations imposed by existing devices on user interfaces warrants some attention. The psychological and cognitive advantages of appropriate usability design have room to grow in the academic sphere. The usability approaches identified here may yield positive results in the instructional design of e-learning. The study author would suggest that existing e-learning design approaches may not be adequate in the context of culture. Instructional designers are, therefore, encouraged to adopt the usability engineering approaches espoused in the literature.

Post-secondary education administrators, too, may gain from the insights into cultural dimensions and software usability. A standardized e-learning solution may not be an appropriate answer to the question of addressing diverse learner populations, especially outside Western, English-speaking societies. The study author recommends that administrators implement criteria that will ensure that e-learning platforms allow for cultural refinements by their instructional designers. Administrators should also allow for adequate face-to-face support, as suggested in the literature.

References

Abbeduto, L. (Ed.). (2006). Should schools embrace computers and technology? (Issue summary). *Taking sides* (4th ed., pp. 308-309). Dubuque, Iowa: McGraw-Hill Contemporary Learning Series.

Abdelnour Nocera, J. L., & Camara, S. (2010). Reflecting on the usability of research on culture in designing interaction. In F. Sudweeks, H. Hrachovec, & C. Ess (Eds.), *Proceedings of the Seventh International Conference on Cultural Attitudes towards Technology and Communication* (pp. 150-162). Presented at the Cultural Attitudes Towards Communication and Technology, Vancouver: Murdoch University.

Adeoye, B. (2007). Is there a relationship between national culture and the usability of an e-learning system? In R. Carlsen (Ed.), *Society for Information Technology and Teacher Education International Conference 2007* (pp. 3-9). San Antonio, Texas, USA: AACE.

Adeoye, B., & Wentling, R. M. (2007). The relationship between national culture and the usability of an e-learning system. *International Journal on E-Learning*, *6*(1), 119-146.

Ally, M. (2008). Foundations of educational theory for online learning. *The theory and practice of online learning* (2nd ed., pp. 15-44). Athabasca, Alberta: Athabasca University Press. Retrieved from http://www.aupress.ca/index.php/books/120146

Anderson, T. (Ed.). (2008). *The theory and practice of online learning* (2nd ed.). Athabasca, Alberta: Athabasca University Press. Retrieved from http://www.aupress.ca/index.php/books/120146

Barber, W., & Badre, A. (1998). Culturability: The merging of culture and usability. Presented at the Conference on Human Factors and the Web, Basking Ridge, New Jersey: AT&T Labs. Retrieved from http://zing.ncsl.nist.gov/hfweb/att4/proceedings/barber/

Blanchard, E., & Frasson, C. (2005). Making intelligent tutoring systems culturally aware: The use of Hofstede's cultural dimensions. *International Conference in Artificial Intelligence.* Presented at the International Conference in Artificial Intelligence, Las Vegas, Nevada. Retrieved from http://www.iro.umontreal.ca/labs/HERON/r6.php

Bray, E. (2005). Culture - The "error of omission" in online distance education. *Yokkaichi University Journal of Environmental and Information Sciences*, *91*(1), 69-80.

Breen, P. (2007). Lessons from an international e-learning project. *International Review of Research in Open and Distance Learning*, *8*(3), 1-10.

Butler, T. J. (2004). *Students' learning styles and their preferences for online instructional methods*. Seton Hall University. Retrieved from http://domapp01.shu.edu/depts/uc/apps/libraryrepository.nsf/resourceid/1A1EF05720885DAD85256EBD00695732/$File/Butler-Thomas-J_Doctorate.pdf

Callahan, E. (2005a). Interface design and culture. In American Society for Information Science (Ed.), *Annual Review of Information Science and Technology* (Vol. 39, pp. 257-310).

Callahan, E. (2005b). Cultural similarities and differences in the design of university websites. *Journal of Computer-Mediated Communication*, *11*(1). Retrieved from http://jcmc.indiana.edu/vol11/issue1/callahan.html

Catterick, D. (2006). Do the philosophical foundations of online learning disadvantage non-Western students? In A. Edmundson (Ed.), *Globalized E-Learning Cultural Challenges* (pp. 116-129). Hershey, Pennsylvania: Idea Group Inc.

dela Pena-Bandalaria, M. (2007). Impact of ICTs on open and distance learning in a developing country setting: The Philippine experience. *International Review of Research in Open and Distance Learning*, *8*(1).

DiMaggio, P., Hargittai, E., Neuman, W. R., & Robinson, J. P. (2001). Social implications of the internet. *Annual Review of Sociology*, *27*, 307-336. doi:doi:10.1146/annurev.soc.27.1.307

Dormann, C., & Chisalita, C. (2002). Cultural values in web site design. *Eleventh European Conference on Cognitive Ergonomics*. Presented at the Eleventh European Conference on Cognitive Ergonomics, Catania, Italy. Retrieved from from http://www.cs.vu.nl/~claire/Hofstede-dormann.pdf

Dyson, L. (2010). Indigenous Peoples on the Internet. In M. Consalvo, C. Ess, & R. Burnett (Eds.), *The Handbook of Internet Studies*. Wiley-Blackwell.

Evers, V. (2001, September). *Cultural aspects of user interface understanding: An empirical evaluation of an e-learning website by international user groups*. British Library, British Thesis Service, Wetherby, West Yorkshire.

Gay, L. R., Mills, G. E., & Airasian, P. W. (2009). *Educational research: Competencies for analysis and applications* (9th ed.). Upper Saddle River, New Jersey: Prentice Hall.

Gunawardena, C. N., Nolla, A. C., Wilson, P. L., Lopez-Islas, J. R., Ramirez-Angel, N., & Megchun-Alpizar, R. M. (2001). A cross-cultural study of group process and development in online conferences. *Distance Education*, *22*(1), 85. doi:10.1080/0158791010220106

Gunawardena, C. N., Wilson, P. L., & Nolla, A. C. (2003). Culture and online education. In M. G. Moore & W. G. Anderson (Eds.), *Handbook of distance education* (pp. 753-775). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Hall, E. T. (1977). *Beyond culture*. New York: Anchor Books.

Hargittai, E., & Shafer, S. (2006). Differences in actual and perceived online skills: The role of gender. *Social Science Quarterly*, *87*(2), 432-448. doi:10.1111/j.1540-6237.2006.00389.x

Henderson, L. (1996). Instructional design of interactive multimedia: A cultural critique. *Educational Technology Research and Development*, *44*(4), 85-104. doi:10.1007/BF02299823

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, California: Sage Publications, Inc.

Hofstede, G., Hofstede, G. J., Minkov, M., & Vinken, H. (2008a). *Values Survey Module 2008*. Geert Hofstede BV. Retrieved from http://stuwww.uvt.nl/%7Ecsmeets/VSM08English.doc

Hofstede, G., Hofstede, G. J., Minkov, M., & Vinken, H. (2008b). *Values Survey Module 2008 Manual*. Geert Hofstede BV. Retrieved from http://stuwww.uvt.nl/%7Ecsmeets/ManualVSM08.doc

Hofstede, G., Neuijen, B., Daval Ohayv, D., & Sanders, G. (1990). Measuring organizational cultures: A qualitative and quantitative study across twenty cases. *Administrative Science Quarterly*, *35*(2), 286-316.

House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (Eds.). (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Thousand Oaks, California: Sage Publications, Inc.

Johnson, L., Levine, A., Smith, R., & Stone, S. (2010). *2010 Horizon Report*. Austin, Texas: The New Media Consortium. Retrieved from http://www.nmc.org/publications/2010-horizon-report

Joy, S., & Kolb, D. A. (2009). Are there cultural differences in learning style? *International Journal of Intercultural Relations*, *33*(1), 69-85. doi:10.1016/j.ijintrel.2008.11.002

Kluckhohn, F. R., & Strodtbeck, F. L. (1961). *Variations in value orientations*. Evanston, Illinois: Row, Peterson.

Lefoe, G. (1998). Creating constructivist learning environments on the web: The challenge in higher education. *ASCILITE '98 Conference Proceedings*. Presented at the ASCILITE '98, University of Wollongong: ASCILITE '98.

Lim, L. (2010). Impacts of culture on web usability. In F. Sudweeks, H. Hrachovec, & C. Ess (Eds.), *Proceedings of the Seventh International Conference on Cultural Attitudes towards Technology and Communication* (pp. 124-134). Presented at the Cultural Attitudes Towards Communication and Technology, Vancouver: Murdoch University.

Lopes, V. (2003). An exploration of the use of information and communication technologies in the college classroom. *College Quarterly*, *6*(1). Retrieved from http://www.collegequarterly.ca/2003-vol06-num01-fall/lopes.html

MacGregor, E., Hsieh, Y., & Kruchten, P. (2005). Cultural patterns in software process mishaps: Incidents in global projects. *ACM SIGSOFT Software Engineering Notes*, *30*(4), 1-5. doi:10.1145/1082983.1083116

Marcus, A., & Gould, E. W. (2000). Cultural Dimensions and Global Web User-Interface Design. Retrieved from http://amanda.com/resources/hfweb2000/hfweb00.marcus.html

Marcus, A., & Gould, E. W. (2001). *Cultural dimensions and global web design: What? So what? Now what?* Emeryville, California: Aaron Marcus and Associates, Inc. Retrieved from http://www.www.amanda.com/resources/hfweb2000/AMA_CultDim.pdf

McKeachie, W. J., & Svinicki, M. D. (2006). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (12th ed.). Boston, MA: Houghton Mifflin.

McLuhan, M. (1966). *Understanding media: The extensions of man* (2nd ed.). New York: Signet Books.

McSweeney, B. (2002). Hofstede's model of national cultural differences and their consequences: A triumph of faith – a failure of analysis. *Human Relations*, *55*(1), 89-118. doi:10.1177/0018726702551004

Milly, S. (2010). Accommodating cultural differences in web-delivered education: Instructional design for international distance learning. *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010* (Vol. 2010, pp. 2798-2804). Chesapeake, Virginia: AACE. Retrieved from http://editlib.org/p/35036

Nielsen, J. (1994). *Usability Engineering* (2nd ed.). San Diego, California: Academic Press.

Olaniran, B. (2006). Challenges to implementing e-learning in lesser-developed countries. In A. Edmundson (Ed.), *Globalized E-Learning Cultural Challenges* (pp. 18-34). Hershey, Pennsylvania: Idea Group Inc.

Packham, G., Jones, P., Miller, C., & Thomas, B. (2004). E-learning and retention: Key factors influencing student withdrawal. *Education + Training*, *46*(6/7), 335-342. doi:10.1108/00400910410555240

Qi, M., Boyle, T., & Xue, Y. (2007). The impact of cultural issues on learning object design and development. *Service Oriented Approaches and Lifelong Competence Development Infrastructures* (pp. 106-113). Presented at the TENComptence Open Workshop, Manchester, UK: The Institute for Educational Cybernetics.

Reinecke, K., & Bernstein, A. (2008). Predicting user interface preferences of culturally ambiguous users. *CHI '08 extended abstracts on Human factors in computing systems* (pp. 3261-3266). Presented at the CHI '08: Conference on human factors in computing systems, Florence, Italy: ACM. doi:10.1145/1358628.1358841

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: Free Press.

Rogers, P. C., Graham, C. R., & Mayes, C. T. (2007). Cultural competence and instructional design: Exploration research into the delivery of online instruction cross-culturally. *Educational Technology Research and Development*, *55*(2), 197-217. doi:10.1007/s11423-007-9033-x

Saade, R. G., & Kira, D. (2009). Computer anxiety in e-learning: The effect of computer self-efficacy. *Journal of Information Technology Education*, *8*, 177-191.

Salaway, G., & Borreson Caruso, J. (2007). *The ECAR Study of Undergraduate Students and Information Technology, 2007*. Boulder, Colorado: EDUCAUSE. Retrieved from http://www.educause.edu/13903

Sanchez-Burks, J., & Lee, F. (2007). Cultural Psychology of Workways. In S. Kitayama & D. Cohen (Eds.), *Handbook of cultural psychology* (pp. 346-369). New York: Guilford Press.

Selinger, M. (2004). Cultural and pedagogical implications of a global e-learning programme. *Cambridge Journal of Education*, *34*(2), 223-239. doi:10.1080/0305764041000170058 9

Selm, M., & Jankowski, N. W. (2006). Conducting Online Surveys. *Quality & Quantity*, *40*(3), 435-456. doi:10.1007/s11135-005-8081-8

Singh, N., Zhao, H., & Hu, X. (2005). Analyzing the cultural content of web sites: A cross-national comparison of China, India, Japan, and US. *International Marketing Review*, *22*(2), 129-146. doi:10.1108/02651330510593241

Smith, S. D., Salaway, G., & Borreson Caruso, J. (2009). *The ECAR Study of Undergraduate Students and Information Technology, 2009*. Boulder, Colorado: EDUCAUSE Center for Applied Research. Retrieved from http://www.educause.edu/ecar

Spector, J. M., Merrill, M. D., Van Merrienboer, J., & Driscoll, M. P. (Eds.). (2007). *Handbook of research for educational communications and technology* (3rd ed.). Routledge/Taylor & Francis Group.

Stacey, E. (1999). Collaborative learning in an online environment. *The Journal of Distance Education / Revue de l'Éducation à Distance*, *14*(2). Retrieved from http://www.jofde.ca/index.php/jde/article/viewArticle/154/379

Storti, C. (1990). *The art of crossing cultures*. Intercultural Press.

Strother, J. (2003). Cross-cultural issues for Asian e-learners: An analysis based on Hofstede's cultural dimensions. In G. Richards (Ed.), *World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2003* (pp. 1978-1984). Phoenix, Arizona, USA: AACE.

Uzuner, S. (2009). Questions of culture in distance learning: A research review. *International Review of Research in Open and Distance Learning*, *10*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/viewArticle/690

van de Bunt-Kokhuis, S. (2001). On-line learning at universities in developing countries: From leap-frogging to antelope-jumping—specific needs and solutions. *Higher Education in Europe*, *26*(2), 241-246. doi:10.1080/03797720120082633

van Heerden, A., & van Greunen, D. (2006). Culture and the information architecture of web-based learning. *Proceedings of the Conference on Information Technology in Tertiary Education*. Presented at the Conference on Information Technology in Tertiary Education, Pretoria, South Africa.

Verenikina, I. (2010). Vygotsky in Twenty-First-Century Research. *World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010* (Vol. 2010, pp. 16-25). Presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications 2010, Toronto: AACE. Retrieved from http://www.editlib.org/p/35264

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Cambridge, Massachusetts: Harvard University Press.

Wild, M. (1999). Accommodating issues of culture and diversity in the application of new technologies. *British Journal of Educational Technology*, *30*(3), 195-200.

Woolfolk, A., Winne, P. H., & Perry, N. E. (2010). *Educational Psychology* (4th ed.). Toronto: Pearson Canada Inc.

Tables

Table 1:

Response frequencies: cultural factors, part 1

"To what extent do you agree or disagree with each of the following statements?:"

		strongly agree	agree	un-decided	disagree	strongly disagree
v24	One can be a good manager without having a precise answer to every question that a subordinate may raise about his or her work	3	24	5	8	0
v27	A company's or organization's rules should not be broken–not even when the employee thinks breaking the rule would be in the organization's best interest	2	16	12	9	1

Note: N=40. Responses were coded as 1 for "strongly agree," 2 for "agree," 3 for "undecided," 4 for "disagree," and 5 for "strongly disagree."

Table 2:

Response frequencies: cultural factors, part 2

"Please consider the following:"

		always	usually	some-times	seldom	never
v16	How often do you feel nervous or tense?	0	9	20	10	1

		very good	good	fair	poor	very poor
v20	All in all, how would you describe your state of health these days?	11	20	6	2	1

Note: N=40. Responses to question v16 were coded as 1 for "always," 2 for "usually," 3 for "sometimes," 4 for "seldom," and 5 for "never." Responses to question v20 were coded as 1 for "very good," 2 for "good," 3 for "fair," 4 for "poor," and 5 for "very poor."

Table 3:

Descriptive statistics: cultural factors

		Mean	SD	N
v16	How often do you feel nervous or tense?	3.08	0.764	40
v20	All in all, how would you describe your state of health these days?	2.05	0.932	40
v24	One can be a good manager without having a precise answer to every question that a subordinate may raise about his or her work	2.45	0.904	40
v27	A company's or organization's rules should not be broken–not even when the employee thinks breaking the rule would be in the organization's best interest	2.78	0.947	40

Table 4:

Response frequencies: usability

		strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
w01	The graphics used allowed me to find information quickly.	6	23	5	6	0
w02	The graphics were visually appealing.	4	15	16	5	0
w03	The amount of graphics was appropriate.	3	30	3	3	1
w04	The colour schemes used in the system were helpful.	4	16	13	5	1
w05	The amount of screen explanation was adequate for performing the tasks.	3	18	9	10	0
w06	Navigational features were consistent throughout the system.	7	23	5	5	0
w07	Menus in the system were self-explanatory.	4	25	5	4	1
w08	Display messages were easy to understand and free of jargon.	5	23	9	2	1
w09	The directions provided with the system were clear.	2	19	9	8	1
w10	I had problems and lost my place in the system.	3	7	6	22	2
w11	The use of terms throughout the system was consistent.	7	24	7	2	0
w12	Terminology used in the system was easy to understand.	8	23	6	3	0
w13	It was easy to remember the terms used in the system.	4	26	6	4	0
w14	Using this system was a very frustrating experience.	2	4	9	21	3
w15	I felt I could be a productive user of the system.	4	22	8	5	1

		strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
w16	I felt that many of the things I did with the system may have been wrong.	1	6	8	20	4
w17	The system was very pleasant to use.	5	22	6	7	0
w18	It was easy to remember how to locate information in the system.	7	21	6	6	0
w19	It was easy to learn to use this system.	8	22	4	5	1
w20	When I made an error using the system, I was able to recover easily and quickly.	4	16	12	6	2
w21	Overall, I was satisfied with the system.	5	24	3	8	0

Note: N=40, except w04, w07, w09, w14, and w16 where N=39. Responses were coded as 1 for "strongly agree," 2 for "agree," 3 for "neither agree nor disagree," 4 for "disagree," and 5 for "strongly disagree."

Table 5:

Descriptive statistics: usability

		Mean	SD	N
w01	The graphics used allowed me to find information quickly.	3.72	0.905	40
w02	The graphics were visually appealing.	3.45	0.846	40
w03	The amount of graphics was appropriate.	3.78	0.800	40
w04	The colour schemes used in the system were helpful.	3.44	0.940	39
w05	The amount of screen explanation was adequate for performing the tasks.	3.35	0.949	40
w06	Navigational features were consistent throughout the system.	3.80	0.883	40
w07	Menus in the system were self-explanatory.	3.69	0.893	39
w08	Display messages were easy to understand and free of jargon.	3.72	0.847	40
w09	The directions provided with the system were clear.	3.33	0.955	39
w10	I had problems and lost my place in the system.	2.68	1.071	40
w11	The use of terms throughout the system was consistent.	3.90	0.744	40
w12	Terminology used in the system was easy to understand.	3.90	0.810	40
w13	It was easy to remember the terms used in the system.	3.75	0.776	40
w14	Using this system was a very frustrating experience.	2.51	0.970	39
w15	I felt I could be a productive user of the system.	3.58	0.931	40
w16	I felt that many of the things I did with the system may have been wrong.	2.49	0.970	39

		Mean	SD	N
w17	The system was very pleasant to use.	3.63	0.925	40
w18	It was easy to remember how to locate information in the system.	3.73	0.933	40
w19	It was easy to learn to use this system.	3.77	1.000	40
w20	When I made an error using the system, I was able to recover easily and quickly.	3.35	1.027	40
w21	Overall, I was satisfied with the system.	3.65	0.949	40

Note: Responses were coded as 1 for “strongly agree,” 2 for “agree,” 3 for “neither agree nor disagree,” 4 for “disagree,” and 5 for “strongly disagree.” Questions w10, w14, and w16 were reverse coded. Mean = 3.600, SD = 0.642.

Table 6:

Response frequencies: learner success and self-efficacy

		strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
a01	In general, I'm satisfied with my learning progress.	6	25	6	3	0
a02	My academic success has been improved because of the online learning web site.	6	9	14	10	1
a03	I think I know how to use online tools effectively.	8	25	4	3	0
a04	I think I'm able to benefit from online learning tools.	9	23	5	3	0
a05	I think learning is something that comes easily to me.	8	20	10	2	0

Note: N=40. Responses were coded as 1 for "strongly agree," 2 for "agree," 3 for "neither agree nor disagree," 4 for "disagree," and 5 for "strongly disagree."

Table 7:

Descriptive statistics: learner success and self-efficacy

		Mean	SD	N
a01	In general, I'm satisfied with my learning progress.	2.15	0.770	40
a02	My academic success has been improved because of the online learning web site.	2.78	1.074	40
a03	I think I know how to use online tools effectively.	2.05	0.783	40
a04	I think I'm able to benefit from online learning tools.	2.05	0.815	40
a05	I think learning is something that comes easily to me.	2.15	0.802	40

Note: Responses were coded as 1 for "strongly agree," 2 for "agree," 3 for "neither agree nor disagree," 4 for "disagree," and 5 for "strongly disagree."

Table 8:

Correlations: usability and demographic grouping variables

		Age groups	Research site	Post-secondary education	Overall education
w01	The graphics used allowed me to find information quickly.	-0.047 0.779	-0.115 0.493	-0.055 0.743	-0.003 0.985
w02	The graphics were visually appealing.	0.091 0.585	0.003 0.984	-0.246 0.137	-0.109 0.520
w03	The amount of graphics was appropriate.	0.184 0.269	0.036 0.832	-0.234 0.157	-0.041 0.811
w04	The colour schemes used in the system were helpful.	-0.034 0.838	0.019 0.912	-0.433** 0.007	-0.279 0.095
w05	The amount of screen explanation was adequate for performing the tasks.	0.024 0.884	-0.049 0.770	0.009 0.956	0.050 0.771
w06	Navigational features were consistent throughout the system.	0.020 0.904	-0.073 0.664	0.056 0.739	0.181 0.283
w07	Menus in the system were self-explanatory.	0.032 0.848	-0.013 0.936	-0.116 0.490	0.001 0.993
w08	Display messages were easy to understand and free of jargon.	0.141 0.397	0.069 0.679	0.005 0.976	0.127 0.455
w09	The directions provided with the system were clear.	0.013 0.938	-0.076 0.652	-0.125 0.454	0.105 0.537
w10	I had problems and lost my place in the system.	0.176 0.292	-0.143 0.391	0.118 0.479	0.048 0.776
w11	The use of terms throughout the system was consistent.	-0.081 0.628	-0.132 0.430	-0.058 0.728	0.012 0.943
w12	Terminology used in the system was easy to understand.	-0.255 0.122	-0.096 0.566	-0.168 0.314	-0.027 0.872
w13	It was easy to remember the terms used in the system.	-0.130 0.437	0.073 0.663	-0.077 0.646	0.142 0.402
w14	Using this system was a very frustrating experience.	0.218 0.188	-0.246 0.136	0.192 0.249	-0.293 0.079
w15	I felt I could be a productive user of the system.	0.003 0.985	-0.093 0.577	-0.035 0.834	0.247 0.140

		Age groups	Research site	Post-secondary education	Overall education
w16	I felt that many of the things I did with the system may have been wrong.	0.218 0.188	-0.411* 0.010	0.246 0.136	-0.046 0.785
w17	The system was very pleasant to use.	0.123 0.463	-0.100 0.550	0.017 0.920	-0.026 0.880
w18	It was easy to remember how to locate information in the system.	-0.016 0.925	-0.029 0.865	-0.089 0.596	-0.043 0.798
w19	It was easy to learn to use this system.	0.044 0.794	-0.088 0.600	0.079 0.637	0.045 0.791
w20	When I made an error using the system, I was able to recover easily and quickly.	0.021 0.901	-0.213 0.200	-0.213 0.200	0.053 0.756
w21	Overall, I was satisfied with the system.	0.068 0.685	-0.166 0.319	0.011 0.948	-0.003 0.984

Note: **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). Missing values were excluded listwise, N=38.

Table 9:

Correlations: usability and learner success

		a01	a02	a03	a04	a05
w01	The graphics used allowed me to find information quickly.	-.381* .015	-.461** .003	-.378* .016	-.328* .039	.094 .566
w02	The graphics were visually appealing.	-.185 .253	-.281 .079	-.112 .490	-.033 .838	.011 .945
w03	The amount of graphics was appropriate.	-.194 .231	-.150 .356	.018 .910	.018 .914	-.146 .369
w04	The colour schemes used in the system were helpful.	-.251 .118	-.285 .074	-.417** .007	-.255 .113	-.062 .702
w05	The amount of screen explanation was adequate for performing the tasks.	-.214 .184	-.474** .002	-.266 .097	-.255 .112	.098 .549
w06	Navigational features were consistent throughout the system.	-.332* .036	-.427** .006	-.319* .045	-.306 .054	-.065 .690
w07	Menus in the system were self-explanatory.	-.208 .198	-.397* .011	-.471** .002	-.452** .003	.073 .656
w08	Display messages were easy to understand and free of jargon.	-.210 .192	-.464** .003	-.598** .000	-.574** .000	.025 .881
w09	The directions provided with the system were clear.	-.200 .215	-.392* .012	-.500** .001	-.364* .021	-.044 .786
w10	I had problems and lost my place in the system.	-.064 .696	.381* .015	.417** .007	.342* .031	-.300 .060
w11	The use of terms throughout the system was consistent.	-.466** .002	-.382* .015	-.475** .002	-.372* .018	-.232 .150
w12	Terminology used in the system was easy to understand.	-.263 .101	-.351* .027	-.558** .000	-.342* .031	-.134 .409
w13	It was easy to remember the terms used in the system.	-.322* .043	-.346* .029	-.485** .002	-.345* .029	-.021 .900
w14	Using this system was a very frustrating experience.	.010 .953	.255 .113	.446** .004	.398* .011	-.176 .278
w15	I felt I could be a productive user of the system.	-.231 .152	-.252 .117	-.181 .263	-.242 .133	-.187 .247
w16	I felt that many of the things I did with the system may have been wrong.	-.082 .615	.273 .089	.353* .026	.369* .019	-.295 .065

		a01	a02	a03	a04	a05
w17	The system was very pleasant to use.	-.279 .081	-.552** .000	-.505** .001	-.519** .001	.009 .958
w18	It was easy to remember how to locate information in the system.	-.084 .607	-.396* .011	-.472** .002	-.420** .007	-.046 .777
w19	It was easy to learn to use this system.	-.088 .588	-.574** .000	-.575** .000	-.552** .000	.075 .645
w20	When I made an error using the system, I was able to recover easily and quickly.	-.295 .064	-.531** .000	-.437** .005	-.359* .023	-.097 .554
w21	Overall, I was satisfied with the system.	-.207 .200	-.507** .001	-.563** .000	-.541** .000	.003 .984

Note: N=40, except w04, w07, w09, w14, and w16 where N=39. Missing values were excluded pairwise. ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Table 10:

T-test: usability with age grouping variable, equal variances assumed

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w01	The graphics used allowed me to find information quickly.	0.003	0.959	0.364	38	0.718
w02	The graphics were visually appealing.	1.882	0.178	-0.709	38	0.482
w03	The amount of graphics was appropriate.	3.897	0.056	-0.811	38	0.423
w04	The colour schemes used in the system were helpful.	0.022	0.884	0.380	38	0.706
w05	The amount of screen explanation was adequate for performing the tasks.	0.132	0.718	-0.565	38	0.576
w06	Navigational features were consistent throughout the system.	2.023	0.163	-0.213	38	0.832
w07	Menus in the system were self-explanatory.	0.386	0.538	-0.357	38	0.723
w08	Display messages were easy to understand and free of jargon.	0.084	0.774	-0.727	38	0.471
w09	The directions provided with the system were clear.	0.067	0.797	-0.145	38	0.885
w10	I had problems and lost my place in the system.	1.195	0.281	-1.239	38	0.223
w11	The use of terms throughout the system was consistent.	0.063	0.803	0.508	38	0.615
w12	Terminology used in the system was easy to understand.	2.379	0.131	1.265	38	0.214
w13	It was easy to remember the terms used in the system.	2.263	0.141	0.609	38	0.546
w14	Using this system was a very frustrating experience.	0.005	0.942	-1.420	37	0.164
w15	I felt I could be a productive user of the system.	0.022	0.882	0.118	38	0.907

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w16	I felt that many of the things I did with the system may have been wrong.	0.850	0.363	-1.258	37	0.216
w17	The system was very pleasant to use.	0.023	0.879	-0.596	38	0.555
w18	It was easy to remember how to locate information in the system.	0.654	0.424	0.017	38	0.987
w19	It was easy to learn to use this system.	0.223	0.639	-0.330	38	0.743
w20	When I made an error using the system, I was able to recover easily and quickly.	0.028	0.867	-0.214	38	0.832
w21	Overall, I was satisfied with the system.	1.976	0.168	-0.431	38	0.669

Table 11:

T-test: usability with research site grouping variable, equal variances assumed

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w01	The graphics used allowed me to find information quickly.	2.310	0.137	-0.587	38	0.561
w02	The graphics were visually appealing.	0.019	0.891	-0.131	38	0.897
w03	The amount of graphics was appropriate.	0.108	0.744	0.465	38	0.645
w04	The colour schemes used in the system were helpful.	0.011	0.916	0.279	38	0.782
w05	The amount of screen explanation was adequate for performing the tasks.	0.977	0.329	-0.686	38	0.497
w06	Navigational features were consistent throughout the system.	0.741	0.395	-0.502	38	0.618
w07	Menus in the system were self-explanatory.	0.046	0.831	-0.239	38	0.812
w08	Display messages were easy to understand and free of jargon.	1.079	0.305	0.496	38	0.623
w09	The directions provided with the system were clear.	0.075	0.786	-0.513	38	0.611
w10	I had problems and lost my place in the system.	0.833	0.367	-1.038	38	0.306
w11	The use of terms throughout the system was consistent.	1.863	0.180	-0.726	38	0.472
w12	Terminology used in the system was easy to understand.	3.078	0.087	-0.666	38	0.509
w13	It was easy to remember the terms used in the system.	1.842	0.183	0.305	38	0.762
w14	Using this system was a very frustrating experience.	1.379	0.248	-1.603	37	0.117

Table 12:

T-test: usability with research site grouping variable, equal variances not assumed

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w15	I felt I could be a productive user of the system.	4.296	0.045	-0.434	37.963	0.666
w16	I felt that many of the things I did with the system may have been wrong.	7.555	0.009	-2.756	35.656	0.009
w17	The system was very pleasant to use.	7.667	0.009	-0.502	37.295	0.618
w18	It was easy to remember how to locate information in the system.	4.934	0.032	-0.240	37.954	0.811
w19	It was easy to learn to use this system.	5.293	0.027	-0.612	37.812	0.544
w20	When I made an error using the system, I was able to recover easily and quickly.	6.672	0.014	-1.394	34.125	0.172
w21	Overall, I was satisfied with the system.	8.335	0.006	-1.054	37.736	0.299

Table 13:

T-test: usability with post-secondary grouping variable, equal variances assumed

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w01	The graphics used allowed me to find information quickly.	0.020	0.889	0.236	38	0.815
w02	The graphics were visually appealing.	0.766	0.387	1.683	38	0.101
w04	The colour schemes used in the system were helpful.	1.426	0.240	2.559	38	0.015
w05	The amount of screen explanation was adequate for performing the tasks.	0.105	0.748	0.350	38	0.728
w06	Navigational features were consistent throughout the system.	0.540	0.467	-0.215	38	0.831
w07	Menus in the system were self-explanatory.	1.899	0.176	0.844	38	0.404
w08	Display messages were easy to understand and free of jargon.	1.021	0.319	-0.121	38	0.904
w09	The directions provided with the system were clear.	1.890	0.177	0.811	38	0.423
w10	I had problems and lost my place in the system.	0.784	0.381	-0.451	38	0.655
w11	The use of terms throughout the system was consistent.	3.054	0.089	0.297	38	0.768
w14	Using this system was a very frustrating experience.	0.291	0.593	-1.096	37	0.280
w15	I felt I could be a productive user of the system.	1.082	0.305	0.076	38	0.940
w16	I felt that many of the things I did with the system may have been wrong.	0.049	0.826	-1.603	37	0.117
w17	The system was very pleasant to use.	0.381	0.541	-0.213	38	0.832

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w19	It was easy to learn to use this system.	0.446	0.508	-0.372	38	0.712
w21	Overall, I was satisfied with the system.	0.953	0.335	-0.017	38	0.987

Table 14:

T-test: usability with post-secondary grouping variable, equal variances not assumed

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w03	The amount of graphics was appropriate.	6.340	0.016	1.220	36.574	0.230
w12	Terminology used in the system was easy to understand.	5.817	0.021	1.152	36.349	0.257
w13	It was easy to remember the terms used in the system.	4.233	0.047	0.552	36.040	0.585
w18	It was easy to remember how to locate information in the system.	6.811	0.013	0.615	36.064	0.542
w20	When I made an error using the system, I was able to recover easily and quickly.	7.781	0.008	1.368	36.626	0.180

Table 15:

T-test: usability with overall education grouping variable, equal variances assumed

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w01	The graphics used allowed me to find information quickly.	0.175	0.678	-0.320	37	0.751
w02	The graphics were visually appealing.	0.001	0.972	0.632	37	0.531
w03	The amount of graphics was appropriate.	1.735	0.196	0.060	37	0.952
w05	The amount of screen explanation was adequate for performing the tasks.	0.212	0.648	-0.313	37	0.756
w06	Navigational features were consistent throughout the system.	2.284	0.139	-1.578	37	0.123
w07	Menus in the system were self-explanatory.	0.267	0.608	-0.320	37	0.750
w08	Display messages were easy to understand and free of jargon.	0.702	0.407	-1.099	37	0.279
w09	The directions provided with the system were clear.	0.283	0.598	-0.918	37	0.365
w10	I had problems and lost my place in the system.	0.718	0.402	-0.739	37	0.465
w11	The use of terms throughout the system was consistent.	0.262	0.612	-0.487	37	0.629
w12	Terminology used in the system was easy to understand.	0.012	0.914	-0.447	37	0.658
w13	It was easy to remember the terms used in the system.	0.119	0.732	-1.402	37	0.169
w15	I felt I could be a productive user of the system.	0.060	0.808	-1.813	37	0.078
w16	I felt that many of the things I did with the system may have been wrong.	3.653	0.064	0.205	36	0.839
w18	It was easy to remember how to locate information in the system.	0.462	0.501	-0.298	37	0.768

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w19	It was easy to learn to use this system.	0.505	0.482	-0.788	37	0.435
w20	When I made an error using the system, I was able to recover easily and quickly.	2.264	0.141	-0.922	37	0.362
w21	Overall, I was satisfied with the system.	0.146	0.704	-0.504	37	0.617

Table 16:

T-test: usability with overall education grouping variable, equal variances not assumed

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
w04	The colour schemes used in the system were helpful.	4.566	0.039	1.416	31.325	0.167
w14	Using this system was a very frustrating experience.	7.504	0.010	1.750	30.286	0.090
w17	The system was very pleasant to use.	4.880	0.033	-0.190	34.145	0.851

Table 17:

T-test: learning success with usability grouping variable, equal variances assumed

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
a01	In general, I'm satisfied with my learning progress.	0.117	0.735	-0.406	38	0.687
a02	My academic success has been improved because of the online learning web site.	1.898	0.176	-2.331	38	0.025*
a03	I think I know how to use online tools effectively.	3.253	0.079	-2.596	38	0.013*
a04	I think I'm able to benefit from online learning tools.	0.001	0.976	-1.582	38	0.122
a05	I think learning is something that comes easily to me.	0.231	0.634	-0.390	38	0.699
	Composite	2.585	0.116	-2.370	38	0.023*

Note: * Correlation is significant at the 0.05 level (2-tailed).

Appendices

Appendix A: Research Approval, Central Michigan University

CMU
CENTRAL MICHIGAN UNIVERSITY

March 17, 2010

Dear Mr. Kinasevych:

Central Michigan University's Institutional Review Board (CMU-IRB) has conducted an exempt review on your research protocol IRBNet ID 154130-2, "Post-Secondary Learners' Cultural Values and Perceptions of Online Learning Environments." The IRB has received your response to the required stipulations. As the information satisfies the federal criteria for approval at 45 CFR 46.110 and the requirements set by the CMU-IRB, final approval has been granted on March 17, 2010, for data collection to proceed at Red River College, Sheridan Institute of Technology and Advanced Learning and Northern Alberta Institute of Technology.

Contingent approval pending the receipt of permission letters for the following research sites has also been granted: Durham College and University of Ontario Institute of Technology. Data collection at these sites may not proceed until the CMU-IRB has received and approved these stated permission letters.

As Principal Investigator of this project, you are required by federal regulations to inform the IRB of any proposed changes in your research that will affect human subjects by submitting a *Change in Protocol* form. Changes should not be initiated until written IRB approval is received. Unanticipated problems or serious unexpected adverse events should be reported to the CMU-IRB as they occur.

When your project has been completed, please submit an *End of Project* report to close the file. Forms can be found on-line at http://www.orsp.cmich.edu/Forms.htm#I

The CMU-IRB wishes you success with this research. If you have questions, please do not hesitate to contact me at 989-774-6401.

Sincerely,

Deborah Stanek
Assistant Coordinator
CMU Institutional Review Board

OFFICE OF RESEARCH AND SPONSORED PROGRAMS, FOUST 251, MOUNT PLEASANT, MI 48859
TELEPHONE (989) 774-6777; FAX (989) 774-3439

Appendix B: Research Approval, Northern Alberta Institute Of Technology

The Northern Alberta Institute of Technology
Research Ethics Board
Certificate of Ethics Approval for Fully-Detailed Research Proposal

Applicant(s): Orest Kinasevych

Co-Investigator(s): Dr. Judith Gold (Graduate Supervisor)

Organization: Central Michigan University

Project Title: Post-Secondary Learners' Cultural Values and Perceptions of Online Learning Environments.

Grant/Contract Agency: None

Research Ethics Application #: 2010-08

Research Ethics Approval Expiry Date: April 15, 2011

Certification of The Northern Alberta Institute of Technology
Research Ethics Approval

I have received your application for research ethics review and conclude that your proposed research meets the Northern Alberta Institute of Technology Policy for research involving human subjects (IR 10.0). On behalf of the Northern Alberta Institute of Technology's Research Ethics Board (NAIT REB), I am providing research ethics approval for your proposed project.

This research ethics approval is valid for one year. To request a renewals after (today's date + 1 year) please contact me and explain the circumstances, making reference to the research ethics review number assigned to this projects (see above). Also, if there are significant changes to the project that need to be reviewed, or if any adverse effects to human participants are encountered in your research, please contact me immediately.

Chair, Research Ethics Board

Printed Name: Dr Randy W. Dreger Signature: _____
Date: April 15, 2010

Appendix C: Research Approval, Red River College

RED RIVER COLLEGE
OF APPLIED ARTS, SCIENCE AND TECHNOLOGY

RESEARCH ETHICS BOARD

CERTIFICATE OF APPROVAL

PRINCIPAL RESEARCHER	DEPARTMENT	NUMBER
Orest Kinasevych	CMU Cohort	**2009/10-14**

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT
Red River College

CO- RESEARCHERS
N/A

SPONSORING AGENCIES
N/A

TITLE:
Online Learning and Cultural Dimensions

APPROVAL DATE	TERM (YEARS)	AMENDMENT	AMENDMENT APPROVED	ANNUAL REPORT/ RENEWAL DUE DATE
March 11, 2010	One			March 11, 2011

CERTIFICATION

The protocol describing the above-named project has been reviewed by the Red River College Research Ethics Board and the procedures were found to be acceptable on ethical grounds for research involving human subjects.

Approval of the Research Ethics Board by:
Ashley Blackman, Chair

This Certificate of Approval is valid for the above term provided there is no change in the experimental procedures.

Appendix D: Permission To Use Survey Instrument

RE: Request for permission 2011.07.04 7:44 PM

Subject: RE: Request for permission
From: "Dr. Adeoye Blessing Foluso" <adeoye1@msn.com>
Date: 2010.01.30 9:05 PM
To: <okinasevych@rrc.mb.ca>

Hopefully you have received my go ahead respond. Goodluck.

Blessing F. Adeoye, Ph.D, DTM.
http://www.adeoye.com

If you cannot do great things, do small things in a great way.
- Napoleon Hill
Success isn't how far you got, but the distance you traveled from where you started.

Date: Sat, 23 Jan 2010 11:32:38 -0600
From: okinasevych@rrc.mb.ca
To: rmcwent@illinois.edu; badeoye@CSI.COM
Subject: Request for permission

Dear Dr. Cordova-Wentling and Dr. Adeoye,

I'm writing to request permission to use a 21-item questionnaire from a 2007 research study you had published.

I'm working to complete my graduate research project as part of the M.A. in Education program at Central Michigan University. My graduate research project will examine the relationship of culture to learner self-efficacy with online learning systems. I plan to gather data using a survey instrument applied to a pool of post-secondary students who had recently used online learning systems. My survey will include questions from Hofstede's Value Survey Module 2008 (see listing below) as well as questions regarding general learner success and satisfaction.

My research also requires survey questions that will assess respondents' assessment of the online learning system. The questions you had used in your 2007 research reflected key aspects noted in the literature and would fit the intent of my research. In addition, I expect that I would be better able to discuss my data in relation to existing research, such as yours, if certain survey questions are similar.

The following are the 21 questions I'd like to use, taken from your 2007 paper:

---
1. The graphics used allowed me to find information quickly.
2. The graphics are visually appealing.
3. The amount of graphics was appropriate.
4. The color schemes used in the system are helpful.
5. The amount of screen explanation was adequate for performing the tasks.
6. Navigational features are consistent throughout the system.
7. Menus in the system were self-explanatory.
8. Display messages were easy to understand and free of jargon.
9. The directions provided with the system were clear.
10. I had problems and lost my place in the system.
11. The use of terms throughout the system is consistent.
12. Terminology used in the system is easy to understand.
13. It is easy to remember the terms used in the system.
14. Using this system was a very frustrating experience.
15. I feel I could be a productive user of the system.
16. I felt that many of the things I did with the system may have been wrong.
17. The system was very pleasant to use.
18. It is easy to remember how to locate information in the system.
19. It was easy to learn to use this system.
20. When I made an error using the system, I was able to recover easily and quickly.
21. Overall, I am satisfied with the system.

May I include these questions in my survey instrument? Of course, I intend to appropriately reference your work.

Thank you for your consideration.

- Orest Kinasevych

RE: Request for permission 2011.07.04 7:44 PM

--
References

Adeoye, B., & Wentling, R. M. (2007). The relationship between national culture and the usability of an e-learning system. *International Journal on E-Learning, 6*(1), 119-146.

Hofstede, G. (2008, January). *Values Survey Module 2008 Questionnaire*. Geert Hofstede BV. Retrieved from http://stuwww.uvt.nl/%7Ecsmeets/VSM08English.doc

--
Orest Kinasevych
Orest Kinasevych BES CAE
Instructor, Creative Arts

Red River College of Applied Arts, Science and Technology
160 Princess Street, Room W302
Winnipeg, Manitoba, CANADA R3B1K9
T: +1 (204) 949-8500 E: okinasevych@rrc.mb.ca

Appendix E: Participant Invitation

Survey Invitation

As a student at a selected Canadian post-secondary institution, you are invited to participate in a survey about your experiences with online learning tools used at your college or university.

Your input is extremely valuable to the research study being conducted. Please proceed to the following web address to participate.

Thank you.

https://www.kinasevych.ca/survey/20100330/

Appendix F: Participant Reminder

Survey reminder

You were recently invited to participate in a survey about your experiences with online learning tools used at your college or university.

If you have not yet completed the survey, please proceed to the following web address to participate.

Your input is extremely valuable to the research study being conducted.

Thank you.

https://www.kinasevych.ca/survey/20100330/

Appendix G: Participant Final Reminder

Survey reminder

You were recently invited to participate in a survey about your experiences with online learning tools used at your college or university.

If you have not yet completed the survey, please proceed to the following web address to participate.

Your input is extremely valuable to the research study being conducted. Once you complete the survey, you'll be able to enter a draw for a $50 Amazon.ca gift certificate.

Thank you.

https://www.kinasevych.ca/survey/20100330/

Appendix H: Research Consent

Purpose

This study aims to determine how adult students' cultural values may affect their ability to use online learning tools. You are being asked to participate because you are an adult student who has had an opportunity to use an online learning web site, such as Angel, Blackboard, Desire2Learn, Moodle, WebCT, or other.

Study procedures

This study is being conducted in the form of a survey that you may fill out online. If you prefer, you may print the survey form, complete it by hand, and send it by regular mail or fax. Once the surveys are completed, they will be used to find any patterns from all the responses given. The survey is estimated to take less than ten minutes to complete. No follow-up will be made. The online survey must be completed from your educational institution.

Confidentiality

You will have been contacted directly by your institution to participate in this study. The researcher has no identifiable information about you. You will not be required to provide your name or any personally identifiable information as part of this study. When you access the survey, the connection between your web browser and the survey web pages will be secure. The hosting server resides in Canada and is protected by Canadian laws. In addition to your responses, the date and time of your visit will be recorded. Once collected, data will be transferred securely to an external hard-drive accessed from a password-protected computer. Backup data will be stored on optical disk in a bank safety deposit box. Once the study is completed and the data is no longer needed, the external hard-disk will be reformatted and any

backup disks will be shredded. Manually completed surveys will have their data appended to the electronic data and will be stored with the backup data disk.

Risks and vulnerability

The survey will ask some questions about your personal values. Some questions will ask you to critically reflect on your experience with online learning web sites. These questions may make some participants uncomfortable.

Benefits of the research

This research aims to expand the knowledge of how online learning systems may be better designed to accommodate the cultural diversity of learners.

Remuneration/compensation

On completion of the online survey, you will be presented with a form through which you may enter a draw for a $50 (fifty dollars, Canadian funds) Amazon.ca gift certificate. If you choose to send your survey by regular mail, a survey form and and entry form are provided at a link at the bottom of this page. Whether you choose to participate online or by mail or fax, your entry form information will be kept separate from your survey responses.

Dissemination

You may request a copy of the research report whether or not you participate in the study. Contact the researcher for more information.

Principal investigator/researcher

Orest Kinasevych

Telephone: (204) 949-8500

E-mail: okinasevych@rrc.mb.ca

Research advisor

Judith S. Gold

Telephone: (586) 453-4777

E-mail: gold1js@cmich.edu

Contact for information about the study

If you have any questions or desire further information with respect to this study you may contact Orest Kinasevych, the principal investigator, at okinasevych@rrc.mb.ca or 204-949-8500.

If you are not satisfied with the manner in which this study is being conducted, you may report (anonymously if you so choose) any complaints to the Institutional Review Board by calling 989-774-6777, or addressing a letter to the Institutional Review Board, 251 Foust Hall, Central Michigan University, Mt. Pleasant, Michigan, USA 48859.

Consent

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without jeopardy to your standing as a student or to your relationship with the institutions involved in this research project. By clicking the submit button at the conclusion of the online survey form, or by sending your manually completed survey by mail or fax, you will be indicating that you have reached the age of majority and that you consent to the use of your responses for this research study.

Appendix I: Survey Questions

Table 18:

Survey questions, culture factors, part 1

"To what extent do you agree or disagree with each of the following statements?:"

No.	Question	Response choices
v24	One can be a good manager without having a precise answer to every question that a subordinate may raise about his or her work	a) strongly agree, b) agree, c) undecided, d) disagree, e) strongly disagree
v27	A company's or organization's rules should not be broken - not even when the employee thinks breaking the rule would be in the organization's best interest	a) strongly agree, b) agree, c) undecided, d) disagree, e) strongly disagree

Table 19:

Survey questions, culture factors, part 2

“Please consider the following:”

No.	Question	Response choices
v16	How often do you feel nervous or tense?	a) always, b) usually, c) sometimes, d) seldom, e) never
v20	All in all, how would you describe your state of health these days?	a) very good, b) good, c) fair, d) poor, e) very poor

Table 20:

Survey questions, usability

"Consider the online learning system or web site that you've used most recently at your college or university. Select the level to which you agree or disagree with each statement below."

No.	Question	Response choices
w01	The graphics used allowed me to find information quickly.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w02	The graphics were visually appealing.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w03	The amount of graphics was appropriate.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w04	The colour schemes used in the system were helpful.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w05	The amount of screen explanation was adequate for performing the tasks.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w06	Navigational features were consistent throughout the system.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w07	Menus in the system were self-explanatory.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w08	Display messages were easy to understand and free of jargon.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w09	The directions provided with the system were clear.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w10	I had problems and lost my place in the system.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w11	The use of terms throughout the system was consistent.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w12	Terminology used in the system was easy to understand.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w13	It was easy to remember the terms used in the system.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w14	Using this system was a very frustrating experience.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w15	I felt I could be a productive user of the system.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree

No.	Question	Response choices
w16	I felt that many of the things I did with the system may have been wrong.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w17	The system was very pleasant to use.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w18	It was easy to remember how to locate information in the system.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w19	It was easy to learn to use this system.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w20	When I made an error using the system, I was able to recover easily and quickly.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
w21	Overall, I was satisfied with the system.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree

Table 21:

Survey questions, learner self-efficacy

"Please respond to the following:"

No.	Question	Response choices
a03	I think I know how to use online tools effectively.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
a04	I think I'm able to benefit from online learning tools.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
a05	I think learning is something that comes easily to me.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree

Table 22:

Survey questions, learner satisfaction

"Consider your overall academic experience. Select the level to which you agree or disagree with each statement below."

No.	Question	Response choices
a01	In general, I'm satisfied with my learning progress.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree
a02	My academic success has been improved because of the online learning web site.	a) strongly agree, b) agree, c) neither agree nor disagree, d) disagree, e) strongly disagree

Table 23:

Survey questions, demographics

"Some information about yourself (for statistical purposes):"

No.	Question	Response choices
v29	Are you:	a) male, b) female
v30	How old are you?	a) Under 20, b) 20-24, c) 25-29, d) 30-34, e) 35-39, f) 40-49, g) 50-59, h) 60 or over
v31	How many years of formal school education (or their equivalent) did you complete (starting with primary school) ?	a) 10 years or less, b) 11 years, c) 12 years, d) 13 years, e) 14 years, f) 15 years, g) 16 years, h) 17 years, i) 18 years or over
a06	How many years have you completed as a college/university student?	a) 1 year or less, b) 2 years, c) 3 years, d) 4 years, e) 5 years, f) 6 years or more
a07	What is the name of the university or college you are attending?	
a08	What is the focus of your current academic studies?	a) social sciences, b) life sciences, c) education, d) humanities, e) engineering, f) fine arts, g) physical sciences, h) business, i) other
a09	If you answered 'other' in the previous question, please indicate the focus of your studies here.	
v32	If you have or have had a paid job, what kind of job is it / was it?	a) No paid job (includes full-time students), b) Unskilled or semi-skilled manual worker, c) Generally trained office worker or secretary, d) Vocationally trained craftsperson, technician, IT-specialist, nurse, artist or equivalent, e) Academically trained professional or equivalent (but not a manager of people), f) Manager of one or more subordinates (non-managers), g) Manager of one or more managers
v33	What is your nationality?	
v34	What was your nationality at birth (if different)?	