Chapter 2
3D Virtual Learning Environment for Acquisition of Cultural Competence: Experiences of Instructional Designers

Stephen Petrina
University of British Columbia, Canada

Jennifer Jing Zhao
University of British Columbia, Canada

ABSTRACT

As educational systems emphasize and experiment with forms of online and remote learning, it is increasingly important to investigate the cultural competence of instructional designers. This chapter addresses the experiences of instructional designers in a 3D virtual learning environment designed for development of cultural competence. Design-based research (DBR) and user experience (UX) methodologies were employed to explore experience of six instructional designers in 3D virtual environment. A taxonomy of experience (ToE) established by Coxon guided qualitative data collection and analysis. Through examples and data, the chapter emphasizes the necessity for instructional designers to keep in mind the challenge of cultural diversity in the backgrounds of students and their own, and bring guidelines and principles into culturally sensitive and responsive instructional design processes. The authors recommend four future research directions, including cross-cultural instructional designer competencies along with research into cultural personas, avatars, and guest-host relations.

INTRODUCTION

Research in face-to-face and online classrooms suggests that students who have diverse cultural backgrounds present learning challenges if instructional designers fail to design culturally sensitive learning environments (Au & Kawakami,1994; Gay, 2000; Capell, Veenstra, & Dean, 2007). With the pervasive

DOI: 10.4018/978-1-7998-7638-0.ch002

use of educational technologies, more and more online learning platforms have become easily accessible to global learners, often with diverse cultural backgrounds. How educational and instructional designers design curriculum and courses in VLEs to best facilitate learning is a popular focus of research (Allen & Seaman, 2013; Chen, & Oakley, 2020; Mohamed, Schroeder, & Wosnitza, 2014). With advanced learning technologies (ALTs) integrated into games, online platforms, and virtual reality (VR) systems, questions of cultural competence are intensified.

New technologies provide new affordances and options for instructional designers, and the complexity of design to accommodate learners' cultural differences increases. Research suggests the need for instructional designers to be more aware of and responsive to cultural complexity during the design process, and to prevent developing culturally blind systems or unintentionally exclude cultural nuances, which results in culturally homogeneous educational resources or VLEs (Chen, Mashhadi, Ang, & Harkrider, 1999; Kawachi, 2000; Bentley, Tinney, & Chia, 2005; Young, 2008). Shortcomings of affordances are made abundantly clear as instructors transform traditional material and resources into digital formats for remote learning during Covid-19. Naïve assumptions that remote learning merely necessitates conversion of material from analog to digital prevail as students counter with expectations and demands for cultural competence and empathy. Out of convenience, most instructional designers and educators prioritized limited VLEs (e.g., learning management system) or video conferencing systems (e.g., Zoom). For more complex remote learning, 3D virtual worlds nonetheless have great potential.

To contribute to research in this area, this chapter reviews research on the acquisition of cultural competence in education and explores six instructional designers' experiences in virtual world design. To elicit responses and insights, we used OpenSimulator, an open-source platform for hosting 3D virtual worlds and the metaverse. The design of the virtual world went through multiple design-based research (DBR) iterations and was used to develop healthcare students' cultural competence (Zhao, 2019). We recommend four future research directions, including cross-cultural instructional designer competencies along with research into cultural personas, avatars, and guest-host relations. Although since the late 1960s, "instructional design" (ID) has often been used interchangeably with "curriculum design," "educational design" and "educational technology," in this chapter ID refers to the design and construction of learning objects on a micro level and learning systems on a macro level (Geis & Klaassen, 1972; Laverde, Cifuentes, & Rodríguez, 2007; Nelson, 2013; Petrina, 2004).

BACKGROUND

This section presents a review of the literature regarding cultural considerations for instructional designers in VLEs. Culture shapes not only how people feel, value, think, and behave, but also how people learn. "Multiculturalism," "cultural diversity," and "cultural pluralism" have been researched for decades. Cultural differences in increasingly global learning environments are also a well recognized fact (Au & Kawakami, 1994; Biggs, 1990; Edwards, 2000; Mahbubani, 2002; Young, 2008). The premise of instructional design for student or user variation is that "different continents, nations, regions, and communities hold different cultural, mental and cognitive models— customs, manners and behaviours— that provide kaleidoscopic perspectives in the way people see, feel, understand, and connect with the world" (Cabrero, 2014, p. 247).

Addressing the needs of learners with culturally diverse backgrounds, instructional design processes have been comprehensively researched. Research indicates that the more emphasis instructional designers

place on cultural needs of students, the more significant are improvements in motivation, self-regulated skills, and academic achievement (Au & Kawakami, 1994; Gay, 2000; Hollins, 1996; Hood, Littlejohn, & Milligan, 2015; Kleinfeld, 1975; Ladson-Billings, 1994, 1995). However, aspects of culturally diverse learners in VLEs have not been as fully explored as those in face-to-face classrooms (Edmundson, 2003, 2004; Catterick, 2007). With the development of new technologies, students' multicultural backgrounds that influence learning and the relevant pedagogical designs used in the development of VLEs have begun to be more widely researched (Chen & Oakley, 2020; Phan, 2018; Wang & Reeves, 2007).

For example, with the significant growth of global educational exchange, the population of international student and adult trainees worldwide have become more culturally diverse. There is a growing body of literature exploring the cultural aspects of developing and teaching cross-cultural online courses in North American and Asia. North American cities such as Vancouver are major destinations for international students and trainees. Chinese immigrants represent a bit more than 25% of all immigrants to metro Vancouver. Chinese students represent about 38% of all international students in British Columbia's postsecondary institutions (Heslop, 2018). Asian learners exhibit different learning styles and academic approaches compared to their western counterparts in VLEs (Biggs 1990, Watkins & Regmi 1990, Kember & Gow 1991; Chen & Oakley, 2020; Friesner & Hart, 2004; McCarty, 2005; Robinson, 1999). Zhang and Zhou (2010) investigated the experience of Chinese students in Canadian educational systems. Among a range a communication and social networking challenges, Chinese students are challenged to adjust to demands of group work for activities and projects. There are cultural differences in the experiences that students have in group work: instructional designers should have a level of cultural competence in recognizing the need to scaffold group work expectations and procedures. Culturally relevant learning objects and systems to respond to and accommodate students with various backgrounds make education more accessible and effective in VLEs (Edwards & Usher, 2000; Foster, 1995; Gay, 2000; Ladson-Billings,1995; Nieto, 1999; Allen & Seaman, 2013; Chen & Oakley, 2020).

Instructional designers' cultural backgrounds implicitly and explicitly affect the design of VLEs. Spronk (2004) states that culture, in learning contexts, is more profound and dynamic than surface features suggest. Instructional designers are not immune from the influence of their own cultural biases. A range of challenges and concerns are presented to instructional designers in cross-cultural contexts. Even though instructional designers are trained in professional settings, who they are and what they bring makes a difference in how design is approached (Rogers, Graham, & Mayes, 2007). Instructional design approaches can be selected without the instructional designers being fully aware of the cultural roots and philosophies that underpin them. Most design techniques are presented at face value rather than in a deeper cultural and philosophical context. Pedagogical choices made by instructional designers in online education are one of the most important focuses for researchers and practitioners alike (Van den Branden & Lambert, 1999; Pan et al., 2003; Chen & Oakley, 2020).

Therefore, it is imperative to raise the awareness of instructional designers to be more culturally competent and responsive in designing educational environments and scaffolding learning activities among students with diverse cultural backgrounds. It is also imperative to recognize cultural assumptions of instructional designers themselves, which is perhaps more fundamental. It is somewhat idealistic, as McLoughlin (1999) proclaims, to ensure that instructional designers need to cover every culture prior to adopting an instructional design model. But as an instructional designer, we can probably consciously trace significant educational origins to our cultural roots, further examine and reconcile our design practice to have a deeper understanding, and achieve possible pedagogical symbiosis (Henderson, 2007). For example, Pan et al. (2003) have tried in a longitudinal study to reveal the elements embedded in

Confucian pedagogy and Western pedagogy, and determine whether there is symbiosis or asymbiosis for these different pedagogies.

In VLEs, interactions between instructors and students, and among student peers, are different compared to those characterizing traditional classrooms. The presence of nonverbal communication cues is generally missing, which presents a very different situation for instructional designers (Phan, 2018). Also, practices and approaches usually applied in virtual learning often include different ways of thinking and acting by learners of diverse cultural backgrounds, which cause major barriers for designing VLEs and e-Learning resources (Ke, Chávez, & Herrera 2013; Dillon, Wang, & Tearle, 2007; Phan, 2018). Further, instructional designers' own cultural backgrounds manifest dynamically, which is different than in a traditional classroom as well.

Conceptualization and development of cultural competence are significant challenges as physical and virtual experience become noticeably blended and reality noticeably augmented and mixed. New media and technology are enabling more and more multisensory interactions including high-fidelity VR, artificial intelligence (AI), and other ALTs (Li, Daugherty, & Biocca, 2002, 2003; Soukup, 2000). Virtual experiences in 3D virtual worlds are multi-dimensional (e.g., affective, cognitive, haptic). In addition, they reduce temporal and psychological distance. According to Heeter's (2000) categorization, virtual experiences and indirect experiences are consistently mediated, and for the purposes of this chapter, mediated by a range of phenomena including cultural competence and sensitivity.

Cultural Competence

Cultural competence "emphasizes the ability to function effectively with members of different groups through cultural awareness and sensitivity" (Friedman & Hoffman-Goetz, 2006, p. 427). The "inter" prefix of intercultural competence indicates a two-way exchange of development and the give and take nature of two cultures in interaction. Bennett's (1986, 1993, 2004) "Developmental Model of Intercultural Sensitivity" (DMIS) gives a sense of cultural competence acquisition and promotes a movement from Denial to Defense to Minimization to Acceptance to Adaptation to Integration. Hammer, Bennett, and Wiseman (2003) describe this as a movement from "ethnocentrism" to "ethnorelativism" and developed an effective inventory for measuring intercultural competence acquisition (p. 424). The development of cultural competence is central to education and healthcare, among a range of other professions. This chapter limits the focus to instructional design.

Within an intercultural competence framework, the challenge is for both students and designers to change in ways that reflect awareness and sensitivity in exchange. While striving to meet academic and professional development milestones. A lack of intercultural competence in students and designers is a cause of the ineffectiveness of learning. Enhancing intercultural competence for students and designers has been a significant challenge for educational organizations across various disciplines (Sit, Mak, & Neill, 2017). Cross-cultural sensitivity training dates back to the late 1950s and continues to generate contradictory results and debates over its effectiveness (Bezrukova, Spell, Perry, & Jehn, 2016). Generally, cultural competence acquisition suggests a more comprehensive experience.

With intercultural competence training increasingly multi-method, researchers are interested in how variation in delivery methods and program formats could be delivered to improve the desired outcome. According to results from evaluation studies for cultural competence acquisition, with the same content coverage, whether delivered continuously in one session or in multiple sessions over a period of short time up to four weeks, the variation in the delivery methods, such as online or face to face in physi-

cal classrooms, did not differ significantly in training outcome (Goldstein & Smith, 1999; Caligiuri & Tarique, 2012).

To be more effective in cultural integration, training has been recommended for international students and trainees to increase their intercultural competence (Bhawuk & Brislin, 2000; Sit, Mak, & Neill, 2017). A variety of learning resources, courses, and curricula have been developed to foster and nurture the cultural competence of students and trainees, and a variety of methods were designed to help them understand different customs, beliefs, and communication strategies (Bhawuk & Brislin, 2000). Research suggests that cultural competence acquisition is more effective when distributed over longer periods of time, usually for several years as cultural competence goes beyond diversity awareness and sensitivity. It requires the development of an ability of individuals to effectively interact among others with different cultural backgrounds. However much we can rely on these findings for students, research on instructional designers' cultural competence acquisition is inadequate.

To facilitate cultural competence acquisition, there are two major aspects: culture-general and culture-specific (Capell, Veenstra, & Dean, 2007). Culture-general aspects are designed to apply to different groups of clients, while the culture-specific ones are usually limited to specific ethnic groups of clients. Ideally, instructional designers would be culturally responsive in a general sense and culturally sensitive in a specific sense. Here, general sense refers to the environments and procedures through which cultural competence can be gained, it is independent of any specific cultural context. Cultural-specific aspects refer to the cultural context the instructional design is situated in, which can be east African, east Indian, etc. These contexts are still dynamic and constructive instead of static, essentialist stereotypes. Cultural competence is dynamic and fluid but there are characteristics experts agree on (Campinha-Bacote, 1995, 1999; Hammer, Bennett, & Wiseman, 2003).

In summary, researchers have sought to embed cultural considerations so cultural pluralism can be accommodated in instructional design practice (Branch, 1997). It seems realistic to adopt functional instructional design models with cultural components already embedded into the model structures and design workflows. Various design models have been developed with cultural responsiveness in mind. Early on, Henderson (1996) emphasized that instructional design was a product of culture— instructional designers need to take culture into consideration. In turn, Henderson (1996, 2007) developed a Multiple Cultural Pedagogical Model for interactive multimedia instructional design. Edmundson (2007) introduced the cultural adaptation process (CAP) model for designing e-Learning for another culture. The CAP model includes guidelines for evaluating e-learning courses and matching them to the cultural profiles of targeted learners. Universal Design for Learning (UDL) is a framework proposed by Eberie and Childress (2007) for culturally diverse online learning design, to ensure that learning environments are universally consistent. For various reasons, no single ID model is sufficient for ensuring cultural sensitivity.

MAIN FOCUS: 3D VIRTUAL LEARNING ENVIRONMENT DESIGN

The research focuses on instructional designers' cultural experiences in a 3D virtual world initially designed for healthcare students. More specially, it focuses on the experiences of instructional designers in addressing the needs of culturally diverse learners, and how they provide pedagogically positive designs based on affordances of 3D virtual worlds. Most importantly, it also focuses on how instructional designers

Figure 1. Classroom in the 3D virtual world

reflect on their own cultural roots and values during the design process in the interactive and dynamic 3D virtual world to avoid bias and further develop more culturally competent instructional design practices.

As indicated, the research product is a 3D virtual world designed in OpenSimulator, which is also the field site. Simulation, embodiment, and interactivity were key affordances utilized to facilitate the acquisition of cultural competence (Anderson & Shattuck, 2012; Corder & U-Mackey, 2018; McKenney & Reeves, 2012; Reeves, Herrington, & Oliver, 2005; Squire, 2006; Zhao, 2019). The final 3D virtual world includes four main rooms: classroom, conference room, clinic, and café, which are elaborated below with screen shots (Figures 1-5).

Figure 2. Conference room in the 3D virtual world

Figure 3. Clinic in the 3D virtual world

Figure 4. Café in the 3D virtual world

Figure 5. The roles of the doctor, the nurse, and the patient in the 3D virtual world

1. **Classroom and Conference room:** Participants choose their session themes and character roles instead of being assigned. In the classroom, the content for the role-play scenarios is given through training packages for cultivating cultural competence in healthcare in multiple formats, including text, PowerPoint, and streaming videos. After discussing and planning effective and interesting scenarios for role-play, and then choosing roles and adopting appropriate clothes to symbolize the avatars, users enter the conference room. Doctor, nurse, and patient clothes help users imagine

themselves in respective roles for expressing various questions or concerns about cultural competence in a healthcare scenario they create. Virtual clothes for cultural variety were created and are stored in an inventory.

2. **Clinic:** Experiential learning in the virtual world begins in the virtual clinic. In the clinic, users play roles of doctor, nurse, and patient in open-ended scenarios. Scenarios adopted by users varied. A few scenarios challenged the English-speaking nurse and doctor to respond appropriately to patients that spoke English as a second language. This is a common communication scenario in healthcare professions. In another example scenario, users adopted different ethnic and cultural identities that then challenged the nurse and doctor to competently and appropriately give a positive diagnosis. These could be debriefed or informed in the conference room or users could enter the café to relax and debrief.
3. **Café:** The café room provides a casual setting for users to debrief content and scenarios, socialize, or plan ahead for another scenario.

In different sessions, participants can choose different themes or exchange roles with other players when in the virtual world, signaled in part by the avatar wearing clothes from the inventory. "Repeating a scenario with the same or different characters can sometimes afford a more in-depth examination and add to the experience" (Lowenstein, 2011, p. 194). Users in this research were able to repeat the scenarios and play the same or different roles in the virtual environment.

Participant Recruitment and Setting

Data were collected by gathering the responses and attending to instructional designer experiences in 3D virtual world in related healthcare education fields in postsecondary institutions. Participants were recruited on voluntary basis. Consent was obtained before participation.

Initial participants included two instructional designers, who have more than ten years experience in curriculum design in VLEs in health disciplines in Canadian universities. A subsequent iteration was added with four instructional designers from Canadian universities and Chinese universities. The ethnic backgrounds of instructional designers include Asian Canadian, Caucasian Canadian, and Chinese. Participants represent eastern and western backgrounds. The designers had wide-ranging experiences of cross-cultural design working in a variety of subjects (Table 1).

Table 1. Participant List

DBR Iteration	Date	Participants	Pseudonyms
3	January – March 2018	2 instructional designers	2 instructional designers: Yuliana, Yvette
5	March – July 2018	2 instructional designers	2 instructional designers: Yuliana, Yvette
8	March – July 2020	4 instructional designers	4 instructional designers: Hua, Olivia, Daisy, Leo

Methods: Design-Based Research (DBR) and User Experience (UX)

The primary methodology was design-based research (DBR) while the secondary methodology was user experience (UX). The two were used in complementary ways to explore instructional designers' experience in a 3D virtual learning environment. The taxonomy of experience (ToE) established by Coxon (2007) guided data collection and qualitative data analysis (QDA). McKenney and Reeves's (2012) DBR model was adopted, in which the iterative process does not prescribe fixed, set pathways for iterations. Rather, many potential routes can be designed according to this model.

A secondary methodology in this study is User Experience (UX). Touloum, Idoughi, and Seffah (2012) define UX as "something felt by the user, or by a group of users, following the use of a product (or service), or during its interaction with the product (usability and aesthetics), or even a possible use (or purchase) of a product". "We use the word 'something,'" they continue, "to refer to the broad meaning that covers the term experience (emotions, perceptions, reactions)" (pp. 2994-2995).

Design-Based Research (DBR) Iterations

This initial study followed a DBR process through early work and testing pilots, building prototypes, and developing design products over seven iterations between January 2017-December 2018 (Table 2).

A new iteration, the eighth micro-cycle was added in March-July 2020, with a focus on exploring instructional designer experiences. To produce a more culturally sensitive and responsive VLE, in the newly added iteration more avatars were designed representing different ethnic backgrounds. Also, four additional instructional designers, Hua, Olivia, Daisy, and Leo, were recruited and interviewed.

Data Coding and Analysis

We developed a usable system to support learning in a 3D virtual world as well as to facilitate exploration of instructional designer experiences. The data analysis is organized through iterative reviews of interview scripts, screen shots, and notes taken in the virtual world. Interview participants were recruited on a voluntary basis. Potential participants were presented with a cover letter, consent form, and interview questionnaire. Users were encouraged to express their experiences during the semi-structured interview. Experiential and existential elements of the ToE helped shape the questions for instructional designers. Interview data were entered into Microsoft Office 365 Excel spreadsheets and analyzed using the SEEing technique created by Coxon (2007), which is a structural interpretation of the experiential phenomena. Details of this analysis are provided in the next section.

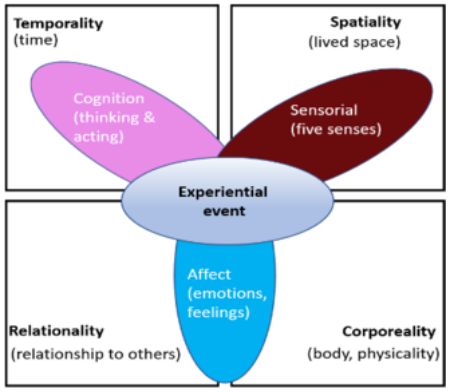
Taxonomy of Experience (TOE)

The ToE established by Coxon (2007) guided data collection and qualitative data analysis. This ToE offers a multi-layered way to understand user experience and is responsive to researching virtual experience and user experience. Figure 6 depicts Coxon's (2007) taxonomy, which contains sensorial, affective, cognitive, and contextual experiential elements within an existential framework of temporality, spatiality, relationality, and corporeality. These existentials derive from van Manen's (1990, pp. 101-106) distillation of Merleau-Ponty's (1962) units of experience.

Table 2. DBR iterations, participants and focuses

DBR Iteration	Participants	Data Source	Focus
First Micro-cycle: Analysis and Exploration	The researcher	No formal data collection	Problem identification and diagnosis.
Second Micro-cycle: Design and Construction	The researcher, 1 digital arts builder.	No formal data collection	Instructional design, 3D virtual world, and tentative product production.
Third Micro-cycle: Evaluation and Reflection	2 instructors, 2 instructional designers, 2 digital arts builders.	Audio recordings and notes from interviews with instructors, instructional designers, and digital arts builders.	Evaluation of the skeleton design through in-world observation and individual interview methods. Data collection and qualitative, inductive analysis conducted.
The Fourth Micro-cycle: Re-design and Construction	The researcher, 1 digital arts builder.	No formal data collection	Based on the previous evaluation and reflection, improvements including managing user cognitive load, broader roles in role plays, and creating more objects for the learning environment.
Fifth Micro-cycle: Re-Evaluation and Reflection	10 students, 5 instructors, 2 instructional designers, 2 digital arts builders.	Nurse Cultural Competence Scale instrument (NCCS) Audio recordings and notes from interviews with students. In-world images captured during the process of student learning activities.	Survey using the NCCS instrument provides an initial perspective on students' prior learning. In-depth interviews with the participants using the framework of Taxonomy of Experience.
Sixth Micro-cycle: Re-design and Construction	The researcher, 1 digital arts builder.	In-world images captured during the process of student learning activities.	Three more clinics created, more patient beds, medical equipment and supplies added, more clothes for different professions created to provide greater flexibility for participants to do role plays and other activities. A student café room created.
Seventh Micro-cycle: Implementation and Spread	The researcher	In-world images captured during the process of student learning activities.	Two main outputs, maturing interventions, and theoretical understanding summarized.
Eighth Micro-cycle: Re-design and Construction	6 instructional designers	Audio recordings and notes from interviews with instructional designers.	Interviews with four added instructional designers. Data collection and qualitative, inductive analysis conducted.

Figure 6. Taxonomy of experience. Adapted from Coxon (2007)



Coxon (2007) described three types of experience. Sensorial experience includes five senses. It involves a "sense of" things, such as sight, smell, touch, and sound, and contributes to aesthetic and ergonomic appreciation within experiences. Affective experience contains emotions, feelings, and moods, which significantly influence the nature of an experience. Cognitive experience includes conation, which is reflective thought of external doing, and cognition, which is reflexive thought of internal thinking, such as personal identity (Petrina, 2010). Cognition and conation are interwoven constructs in which experiential information is processed and considered in terms of possible future interactions.

The contextual components are the existential parameters within which any experience takes place, with many layers of complexity. They are usually understood in relation to a specific experiential event. This contextual space has layers of complexity and can be partially understood by being broken down into existential component parts in relation to a specific experiential event (Coxon, 2007). In order to understand the nature of experience, inputs from sensorial, affective, cognitive, and contextual factors all need to be thoroughly considered. The nature of experience requires understanding within a context, which includes "four dimensions" of existence (space, time, the physical body, and its relationships to other people). These existential factors are differentiated from contextual factors (Table 3).

Table 3. Meta-themes and sub-themes of ToE

	Meta-themes	Sub-themes
Experiential elements	body- somatic experience/ sensorial experiences (five senses)	sight, touch, sound, comfort-ergonomics, and appearance aesthetics
	heart- affective experience (emotions, feelings)	Positive-negative emotions
	head-cognitive experience (thinking and acting)	conation- reflective experience, reflective thought of external doing; cognition- reflexive experience, reflexive thought of internal thinking
Existential factors	spatiality (space)	
	temporality (time)	
	corporeality (body, physicality)	motion, standing, moving, sitting, body movements
	relationality (Relation to others)	
Contextual factors	environmental factors, regulatory factors, social factors	

Data Coding and Analysis Through TOE-SEEing

The analytic approach of SEEing facilitated the use of the ToE for data analysis, which includes nine steps to categorize and analyze users' interview data. User experience is analyzed through a series of progressive steps to extract the essences of the experience and allow them to be "seen", which provides a way to make abstract concepts comprehensible and visible. This method offers an opportunity to look deeper into the data collected while extracting conclusions (Coxon, 2007). The nine-step process of the ToE-SEEing process is described in the following paragraphs. The nine steps are:

Step 1 Submersion and Data Gathering

Step 2 Descriptive Narratives
Step 3 Sorting Fragments into ToE Themes
Step 4 Developing Meaning(s)
Step 5 Essential Elements
Step 6 Super-Ordinary Elements
Step 7 Weight
Step 8 Superordinary Summary Words
Step 9 Summary Word Descriptions

It begins by transforming the users' interview fragments and ends by synthesizing them into superordinary themes. Overall, the first three steps of the ToE-SEEing included gathering and transcribing data, establishing structure, and storing information about an experience. Steps four to five are the analysis phases to allow deeper meaning to be "seen". Finally, this analytical process results in seven overall category elements. Microsoft Office 365 Excel worksheet was customized and adopted for this analysis.

FINDINGS AND DISCUSSION

In step 7 of the SEEing process, with the rating from 1 to 7 in relation to how important the superordinary elements are to instructional designers' cultural competence acquisition experience (7 is the most important), we set the weight based on the knowledge gained during the immersion in step 1, our extensive literature review, and comprehensive working experience: Epistemology -7, Simulation - 6, Embodiment - 5, Language and Translation - 4, Management support - 3, Training - 2, Technical Aspects - 1.

Moreover, the number of times the experience was mentioned by instructional designers during interviews was also counted in the study. In the end, superordinary elements with the weight of higher values and appearing more times have higher importance levels. The final outcomes are listed in the following paragraphs in an order of decreased importance from the highest to lowest. Relevant literature and participant comments are summarized in each element category to inform deeper layers of understanding of instructional designers' experiences.

Epistemology Supportive of Multiple Perspectives and Embedded Values - 7

Based on the extensive research in online learning, a culturally responsive instructional design built upon eclectic pedagogical paradigms and shared epistemological systems are recommended (Bentley, Tinney, & Chia, 2005; Henderson, 1996; Henderson, 2007; McLoughlin, 1999; Rogers, Graham & Mayes, 2007). Research recommends adopting an epistemology that is supportive of multiple perspectives, so as to create learning environments in which instructors and students from different cultural backgrounds feel comfortable enough to share their opinions (McLoughlin, 1999; McLoughlin & Oliver, 2000, Wang & Reeves, 2007), and to discuss embedded values honestly, explicitly, and upfront with students in class (Bentley, Tinney, & Chia, 2005; Chen, Mashhadi, Ang, & Harkrider, 1999). During the interviews in this study, one instructional designer commented:

Look[s] like western instructional design models and protocols have become global standards. A westernized pattern of thinking has been dominated during [the] instructional design process for virtual

learning. Hopefully there are some Asian, African, and other pedagogical orientations [that] will be introduced to construct and implement culturally-sensitive online education. (Iteration 8/Hua)

Another clarified: "For instructional design in 3D virtual worlds, the inclusion of the culture components should be educationally meaningful from pedagogical perspectives to improve learning rather than superficial cosmetic design, such as modifications to the skin coloring, hair, or eyes of avatars. We need to focus on cognitive functions" (Iteration 8/ Olivia).

Therefore, instructional designers recommend understanding how different pedagogies are perceived in different cultures, and seek ways to incorporate various pedagogies into the 3D virtual learning environment design. This includes setting goals, tasks, and assessment so that learners from different cultural backgrounds can have options and choose those that best match their educational needs.

Language and Translation - 6

During the process of instructional design in VLEs, cultural issues may arise not only from pedagogical assumptions, but also from language problems. Language barriers are a major concern in globalized e-Learning, including in 3D virtual learning environments. We probably have all learned through experience that language cannot solely rely on online automatic translations of English into the targeted language or vice versa as they can be too literal and therefore inaccurate. If used this way, students have to guess what the instructor really means, which prevents effective communication and sharing ideas (Hutchinson et al., 2005; Tractinsky, 2000). An instructional designer commented on her own experiences during the study:

We had one course which needed to translate traditional Chinese content to simplified Chinese. It can be performed automatically by auto translation software. But the actual terms and idioms have different underlying meanings in mainland of China compared to Hong Kong, Macau, and Taiwan where traditional Chinese is used. It is recommended that local professionals have proofreading for the courses. (Iteration 8/Hua)

Therefore, cultural differences should be addressed during local processes of curricular and course design so differences in context can be handled thoroughly and cultural values embedded in the contexts can be fully acknowledged instead of simply literally translated. Another instructional designer commented "We as instructional designers consider educational context including stories, etiquette, and images, and make sure they are familiar to the targeted culture. We should avoid taboos and etc. to make curriculum and courses compatible to another culture" (Iteration 8/Daisy).

Researchers recommend the use of simplified writing structures, and standardized language as much as possible to avoid local expressions, idioms, slang and colloquialisms, which would possibly enhance communication for all (Bentley, Tinney, & Chia, 2005). "Translation processes can also be to practise standard language," one participant agreed, "such as rewriting the content without idioms or dialects, and changing spelling and phrases to more standard ones" (Iteration 8/Leo).

Management Support - 5

The designers reflected and expressed the urgent need to address culture components in instructional design processes in virtual learning environments, but noted that they were bound by organizational expectations and policies: the extra time and resources needed to understand, evaluate, and design cultural contexts during design are not supported.

Instructional Designers in this study commented on the organizational challenges they faced. "I would say it is probably mostly organizational because peer instructional designers usually understand the value of culture components during design, but their academic levels usually are not decision makers in university, so we need to get buy-in" (Iteration 8/Hua). "Our management just ignored it as they don't think understanding and supporting cultural design is feasible and important" (Iteration 8/Olivia). "The management thinks there are a lot of constraints of budget and resources" (Iteration 8/Daisy). A fourth instructional designer added:

It is difficult to get buy-in from key stakeholders to access necessary resources and on-going support. The proposed solutions can be an ongoing process of informing and educating the management…. One possible solution to address this issue can be through disseminating relevant educational research during seminars and workshops, and inviting management to attend and get informed about the significance of cultural design in facilitating effective learning of global learners. (Iteration 8/Leo)

Training Through Workshops and Seminars - 4

In this study instructional designers expressed the needs for training through workshops to build cultural competence among themselves. Currently there are no defined standards and levels for cultural competence requirements. Instructional designers need to acquire more knowledge and skills to address a variety of cultures during design processes.

Two participants commented: "I as an instructional designer do have a strong desire to learn more about the cultural needs of learners. Currently we do not have a clear approach and focus for cultural analysis during the needs assessment process" (Iteration 8/Leo). "There must be some personal bias. We lack knowledge on how to approach the instructional design process with cultural components embedded; not sure what exactly to look for in culture related design" (Iteration 8/Hua).

Standards and common knowledge pools for the workshops and seminars are recommended by instructional designers. "It is difficult to access cultural resources. defined training and information resources may help build instructional designers' cross-cultural design skills and increase their level of cultural expertise" (Iteration 8/Hua). "Making information on cultural profiles easily accessible for designers during needs assessment and other design process are helpful" (Iteration 8/Olivia).

Complexity of the Technical Aspects - 3

Comments regarding the technical interface of the 3D virtual world were generally mixed. For example, one instructional designer acknowledged: "It's easy to use. It can create blended learning scenarios to provide the flexibility of learning. Students can be either in a classroom, or at home through distributed learning" (Iteration 5/Yuliana).

However, the findings in this study also revealed that participants needed technical support at the beginning in order to learn effectively. The participants' previous experience with online games, even with 3D virtual worlds directly, does not automatically transfer to the mastery of essential controls in the OpenSimulator 3D virtual world. "A training package should be provided as an option from my instructional design perspective, which can reduce the learning curve and anxiety. A short instructional video can help users to get many features quickly" (Iteration 5/Yuliana).

Therefore, orientation sessions for the navigation control, view control, and other basics are recommended to increase users' confidence early in the course. After a short orientation, ample time should be arranged to let participants explore and learn how to control their avatars, such as moving and changing clothes, and how to click on various objects to easily participate in the activities in the virtual world. Also, various and flexible communication methods are advocated as well. "It is really helpful students and instructors can have private discussions, as well as group discussions. Various communication channels allow students to send private messages to someone and to the whole class publicly" (Iteration 8/Olivia).

Supporting users requires more than just explaining how the technical pieces work and helping them get familiar with tools and controls in the virtual world. Social skills and cultural awareness are essential in the orientation session (Jones, Ramanau, Cross, & Healing, 2010). An instructional designer commented: "For the group work, instructional designers should provide multiple options. Students with different cultural backgrounds may have different learning preferences. In addition to addressing pedagogical objectives in online education, we need to take students' learning preferences based on their cultural backgrounds into consideration as well" (Iteration 8/Daisy).

Experiences in Simulation in 3D Learning Environments - 2

As media rich platforms, 3D virtual worlds offer the possibility of learner experiences that enhance deep learning through realistic simulation (Corder & U-Mackey, 2018; Davies et al., 2015; Delwiche, 2006; de Freitas & Neumann, 2009). Virtual worlds allow the development of simulation activities that otherwise would be difficult due to its high cost. Most instructional designers' experiences regarding simulation were positive. "There is no risk. It's always safe for students to try. No concerns as those when they have when deal with real patients, feeling a much safer environment. No ethical concern" (Iteration 5/Yuliana). "The simulated environment is pretty realistic. Some cultural aspects of learning can definitely transfer more effectively through this contextual layer" (Iteration 8/Leo).

To create educative experience for students, it is essential to design in the 3D virtual world with concrete association with real world learning spaces. To best facilitate learning transfer, the virtual space should often replicate real world scenarios and simulations, scaffolds, and virtual learning activities. Lectures presented with PowerPoint, professional seminars, the virtual clinic and hospital visits, role plays, and video streams in this research are drawn from the real-world experiences of health subject-related scenarios.

Synchronous role plays decrease interpersonal boundaries and facilitate group dynamics to conduct learning tasks. Complex decisions can be taken in real time to apply theory to practice in complex situations (Hew & Cheung, 2010). "You don't know the reaction the patient [avatar] will present. It is dynamic in real time. It is two-way interaction" (Iteration 5/Yuliana).

Experiences in Embodiment in 3D Learning Environments - 1

Virtual worlds shape the embodiment of learners in the form of avatars, among other features (Thomas & Brown, 2009). With identities acted out or expressed through avatars, learners can immerse in 3D content through interacting with other users' avatars. Through role play scenarios in the 3D virtual world in this study, instructional designers understand more about their own powers and limitations. "I like the play scenarios to practice cultural competency. Things are so dynamic. Decisions are made in real time. This really helped me realize the cultural context [in which I was] originally situated" (Iteration 5/Yuliana). Enhancements were suggested as well. "The avatar is a bit simplified, hope to have more facial expressions" (Iteration 5/Yuliana). The more control one has over an avatar the more one experiences a sense of embodiment, immersion, and presence. In our research with students, a participant independently reiterated what Yuliana, an instructional designer, indicated: "I like the clothes and my appearance in the [virtual] world. If the facial mapping is more like me, it will make me feel more like the avatar is me" (Iteration 5/Ethan).

The success level with which avatars engage learners is highly dependent on the level participants can project themselves into or identify with the avatar. Designers can adopt a variety of design methods through which learning activities develop within the learning space, encourage learners to characterize themselves as avatars to enhance the experience of virtual worlds and promote engagement. An instructional designer commented: "Embodiment depends on how much control you have over the avatar. Also, the time, you won't get the embodiment feeling if you just play 15 minutes. But if you have played for days, more embodiment will be built" (Iteration 5/Yuliana). She continued: "Interestingly, if you watch the video games kids play, the avatars are not polished at all, no real face, actually just boxes. But they are so attached to them. I think because they have the full control over it. I think more control brings more embodiment feeling" (Iteration 5/Yuliana). "Students can learn from peers. When students switch to different roles (different embodiments), they all bring their own prior knowledge and experiences. Multiple perspectives and approaches contribute to the cultural learning scenarios" (Iteration 5/Yuliana).

FUTURE RESEARCH DIRECTIONS

Despite the development of competencies and standards for instructional designers, cultural competence is nearly systematically overlooked or taken for granted (Rogers, Graham, & Mayes, 2007). Two of the International Board of Standards for Training, Performance and Instruction's (IBSTPI) (2012) *Instructional Designer Standards* allude to cultural sensitivity but are overly general:

7(b) Determine characteristics of the physical, social, political, and cultural environment that may influence learning, attitudes, and performance. 12(e) Accommodate social, cultural, political, and other individual factors that may influence learning. (pp. 4, 5)

Similarly, the International Society for Technology in Education's (ISTE) (2017) *Standards for Educators* includes cultural competence as a collaborator item rather than a design item:

4(d) Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning. (p. 2)

One future research direction is identifying, detailing, and evaluating or measuring cultural competencies for instructional designers. Bezrukova, Spell, Perry, and Jehn's (2016) review of research in cultural sensitivity training is poignant: "A key finding from our analysis is that integrated training worked well along with training that focused on both skill-building and awareness. From these conclusions a question arises: what exactly needs to be integrated" (p. 1245)? Future research into instructional designers' cultural competence should attend to scales, such as Hammer, Bennett, and Wiseman's (2003), along with characteristics identified by cross-cultural communication experts (Lynch, 2011):

- Respects individuals from other cultures
- Makes continued and sincere attempts to understand the world from others' points of view
- Is open to new learning
- Is flexible
- Has a sense of humor
- Tolerates ambiguity well
- Approaches others with a desire to learn (p. 104)

The Association for Talent Development (ATD) (2015) builds on these for their global designer and trainer competencies. Identifying and measuring competencies of instructional designers assumes an acknowledgement of their cultural biases and stereotypes. Documenting what designers know (i.e., cognition) and what they may express in addition (i.e., implicit cognition) require creative, comprehensive measures.

A second research direction is testing virtual worlds and other related objects and systems for access, equity, and inclusion, or cultural pluralism and variation, through diverse personas and UX methods (Cabrero, 2014; Cabrero, Winschiers-Theophilus, & Abdelnour-Nocera, 2016). In design, a persona is a fictitious user that shares commonalties with a target audience or small group when interacting with the process or product. More specifically, a persona is a "communicational evocation of a set of users with shared aims on technological needs and requests, and it is mostly built by designers based on users' real data" (Cabrero, Winschiers-Theophilus, & Abdelnour-Nocera, 2016, p. 149). Research should focus on the challenges of developing diverse personas in instructional design and the procedures designers use to make learning objects and systems inclusive. As Cabrero, Winschiers-Theophilus, and Abdelnour-Nocera (2016) caution, "a lack of cross-cultural validity, local relevancy, and designerly liability make personas prone to false or oversimplified representations in depicting local populaces" (p. 149). Personas are underutilized in instructional design and it is important that researchers document how and when designers collect "users' real data" to depict target student groups. Research into development and uses of personas is increasingly imperative as AI tutors, pedagogical agents, VR systems, and related ALTs are included in products for interactive learning (Aleven, Beal, & Graesser, 2013; Baylor, 2007; Gutica & Petrina, 2020; Wang & Petrina, 2013; Wang, Petrina, & Feng, 2017).

In short, instructional designers should keep in mind the challenge of diversity in their products. Although not stressed by participants, avatars and associated features, such as skin tone and clothing, should reflect cultural diversity. Closely related to research into personas, this is a third recommended direction for research within 3D virtual worlds, ALTs, and VR platforms as user content and vendor

content often limit avatars and clothing to western skin features and styles. An avatar is "the graphical representation of a user of a digital media product functioning as a focus for the user's agency within a virtual world" (Liboriussen, 2014, p. 38). Nowak and Fox's (2018) extensive review found that users "select avatars they believe will help them meet interaction goals, which could include revealing or concealing elements of their identity to other users" (p. 40). Granted, as instructional designers in our research reported, users split attention between avatar representation and virtual world content and rules. Hence, it is important for researchers to explore whether and how designers provide a range of choices of avatars with visible cultural or racial characteristics and roles. Harrell and Lim (2017) stress that rather than considering avatars as "mere technically constructed visual artifacts," "a more expansive view holds that virtual identities serve as important ways through which people represent or express themselves" (p. 53). Along with Harrell and Harrell (2012), they prove insightful findings and methods for researching diverse avatars within an empirical "computational identity systems" framework (p. 57).

Fourth, we recommend future research into guest-host relations as analogous to interdependencies among students or users, instructional designers, and their objects or systems (Zhao, 2019, pp. 137-142). Eames (1972) describes the guest and host relationship that he and his wife emphasized in their design work: "One of the things we hit upon was the quality of a host.... a very good, thoughtful host, all of whose energy goes into trying to anticipate the needs of his [or her] guests— those who enter the building and use the objects in it" (p. 16). Williams (2018) elaborates, arguing that the "designer as host" "is catalyst for a series of actions and encounters to take place, which may involve a specific piece or shape, or may include the transformation of that piece through learning experiences. The host facilitates learning, exploration, adaptation and interaction" (p. 287). Host-guest relations are conceptually dimensions of hospitality (Hawthorne, 1932). This could be a productive analogy for conceptualizing cultural competence in instructional design in that not all hosts and guests act the same (e.g., some hosts are frustrating or uncomfortable while some guests are rude). Aitken's (1991) commentary on the *Wu-Men Kuan* is insightful: "Host and guest... we switch roles and have fun" (p. 99). Instructional design may require role switching and code switching in ways that can be informed by other forms of design, such as architectural and fashion design. The host does not always have full authority and the guest is not always being controlled. The dynamic interactions between the host and guest build the fundamental relationship among them. And further, the host and guest cooperate with each other. This demands reconceptualizing the traditional hierarchical structure of design into one of a networked heterarchy (Williams & Fletcher, 2010).

CONCLUSION

This chapter addressed the challenges and problems of the cultural competence of instructional designers. We stressed the importance of empirical research with instructional designers. We found that using a tangible instructional product as a sounding board, such as the 3D virtual world designed in OpenSimulator, keeps the participants grounded and concrete. That said, we analyzed interview data collected from six instructional designers' experiences and found seven themes related to the cultural aspects of the virtual world design. These themes can potentially contribute to building culturally effective virtual worlds and sensitive learning environments. An effective instructional designer needs to consider not only the students' cultural background, but also their own cultural background and biases. In turn researchers need to explore the cultural competence of instructional designers. We recommended

four future research directions, including cross-cultural instructional designer competencies along with research into cultural personas, avatars, and guest-host relations. As educational systems across the world are emphasizing and experimenting with forms of online and remote learning, it is increasingly important to enhance and improve the cultural competence of instructional designers.

REFERENCES

Adamo-Villani, N., Richardson. J., Carpenter, & Moore, G. (2006). A photorealistic 3d virtual laboratory for undergraduate instruction in microcontroller technology. In *SIGGRAPH '06: ACM SIGGRAPH 2006 Educators program* (pp. 21-25). ACM Digital Library.

Aitken, R. (1991). *The gateless barrier: Translation and commentary on the Wu-Men Kuan*. North Point.

Aldrich, C. (2009). *Learning online with games, simulations, and virtual worlds*. Jossey-Bass.

Aleven, V., Beal, C. R., & Graesser, A. C. (2013). Introduction to the special issue on advanced learning technologies. *Journal of Educational Psychology*, *105*(4), 929–931. doi:10.1037/a0034155

Allen, I. E., & Seaman, J. (2013). *Changing course: Ten years of tracking online education in the United States*. Sloan Consortium.

Anderson, T., & Shattuck, J. (2012). Design-based research: A decade of progress in education research? *Educational Researcher*, *41*(1), 16–25. doi:10.3102/0013189X11428813

Association for Talent Development. (2015). 10 Cultural competencies of the successful global trainer. *Culture Ready*. http://www.cultureready.org/blog/10-cultural-competencies-successful-global-trainer

Au, K. H., & Kawakami, A. J. (1994). Cultural congruence in instruction. In E. R. Hollins, J. King, & W. C. Hayman (Eds.), *Teaching diverse populations: Formulating a knowledge base* (pp. 5–23). State University of New York Press.

Baylor, A. L. (2007). Pedagogical agents as a social interface. *Educational Technology*, *47*(1), 11–14.

Bell, M. W. (2008). Toward a definition of "virtual worlds.". *Journal of Virtual Worlds Research*, *1*(1), 1–5.

Bennett, M. J. (1986). A developmental approach to training intercultural sensitivity. *International Journal of Intercultural Relations*, *2*(2), 179–186. doi:10.1016/0147-1767(86)90005-2

Bennett, M. J. (1993). Towards ethnorelativism: A developmental model of intercultural sensitivity (revised). In R. M. Paige (Ed.), *Education for the intercultural experience* (pp. 21–41). Intercultural Press.

Bennett, M. J. (2004). Becoming interculturally competent. In J. S. Wurzel (Ed.), *Toward multiculturalism: A reader in multicultural education*. Intercultural Resource Corporation.

Bentley, J., Tinney, M. V., & Chia, B. (2005). Intercultural internet-based learning: Know your audience and what they value. *Educational Technology Research and Development*, *53*(2), 117–126. doi:10.1007/BF02504870

Betancourt, J. R., Green, A. R., & Carillo, J. E. (2002). *Cultural competence in health care: Emerging frameworks and practical approaches*. The Commonwealth Fund.

Bezrukova, K., Spell, C. S., Perry, J., & Jehn, K. (2016). A meta-analytical integration of over 40 years of research on diversity training evaluation. *Psychological Bulletin*, *142*(11), 1227–1274. doi:10.1037/bul0000067 PMID:27618543

Bhawuk, D. P. S., & Brislin, R. W. (2000). Cross-cultural training: A review. *Applied Psychology*, *49*(1), 162–191. doi:10.1111/1464-0597.00009

Biggs, J. (1990) *Asian students' approaches to learning: Implications for teaching overseas students*. Paper presented at the Eighth Australasian Learning and Language Conference, Brisbane, QLD: Australia.

Cabrero, D. G. (2014). Participatory design of persona artefacts for user eXperience in non-WEIRD cultures. *Proceedings of PDC '14 Companion*, 247-250. 10.1145/2662155.2662246

Cabrero, D. G., Winschiers-Theophilus, H., & Abdelnour-Nocera, J. (2016). A critique of personas as representations of "the other" in cross-cultural technology design. *Proceedings of AfriCHI '16*, 149-154. 10.1145/2998581.2998595

Caligiuri, P., & Tarique, I. (2012). Dynamic cross-cultural competencies and global leadership effectiveness. *Journal of World Business*, *47*(4), 612–622. doi:10.1016/j.jwb.2012.01.014

Campinha-Bacote, J. (1999). A model and instrument for addressing cultural competence in health care. *The Journal of Nursing Education*, *38*(5), 203–206. doi:10.3928/0148-4834-19990501-06 PMID:10438093

Campinha-Bacote, J., & Padgett, J. (1995). Cultural competence: A critical factor in nursing research. *Journal of Cultural Diversity*, *2*(1), 31–34. PMID:7663899

Capell, J., Veenstra, G., & Dean, E. (2007). Cultural competence in healthcare: Critical analysis of the construct: Its assessment and implications. *Journal of Theory Construction & Testing*, *11*, 30–37.

Catterick, D. (2007). Do the philosophical foundations of online learning disadvantage non-western students? In A. Edmundson (Ed.), *Globalized e-learning cultural challenges* (pp. 116–129). IGI Global. doi:10.4018/978-1-59904-301-2.ch007

Chen, A., Mashhadi, A., Ang, D., & Harkrider, N. (1999). Cultural issues in the design of technology-enhanced learning systems. *British Journal of Educational Technology*, *30*(3), 217–230. doi:10.1111/1467-8535.00111

Chen, K., & Oakley, B. (2020). Redeveloping a global MOOC to be more locally relevant: Design-based research. *International Journal of Educational Technology in Higher Education*, *17*(1), 9. doi:10.118641239-020-0178-6

Collis, B. (1999). Designing for differences: Cultural issues in the design of WWW-based course-support sites. *British Journal of Educational Technology*, *30*(3), 201–215. doi:10.1111/1467-8535.00110

Corder, D. & U-Mackey, A. (2018). Intercultural competence and virtual worlds. In S. Gregory & D. Wood (Eds), *Authentic virtual world education: Facilitating cultural engagement and creativity* (pp. 25-44). New York, NY: Springer.

Coxon, I. (2007). *Designing (researching) lived experience* (Unpublished Ph.D. Dissertation). University of Western Sydney, QLD.

Davies, D., Arciaga, P., Dev, P., & Heinrichs, W. L. (2015). Interactive virtual patients in immersive clinical environments: The potential for learning. In I. Roterman-Konieczna (Ed.), Simulations in medicine: Pre-clinical and clinical applications (pp. 139-178). Berlin: Walter de Gruyter GmbH & Co KG.

de Freitas, S., & Neumann, T. (2009). The use of 'exploratory learning' for supporting immersive learning in virtual environments. *Computers & Education*, *52*(2), 343–352. doi:10.1016/j.compedu.2008.09.010

de Freitas, S., Rebolledo-Mendez, G., Liarokapis, F., Magoulas, G., & Poulovassilis, A. (2010). Learning as immersive experiences: Using the four-dimensional framework for designing and evaluating immersive learning experiences in a virtual world. *British Journal of Educational Technology*, *41*(1), 69–85. doi:10.1111/j.1467-8535.2009.01024.x

Delwiche, A. (2006). Massively multiplayer online games (MMOs) in the new media classroom. *Journal of Educational Technology & Society*, *9*(3), 160–172.

Eames, C. (1972). Digby Diehl's interview with Charles Eames. *Los Angeles Times*. Retrieved from https://www.eamesoffice.com/the-work/the-guest-host-relationship/

Eberie, J. H., & Childress, M. D. (2007). Universal design for culturally diverse online learning. In A. Edmundson (Ed.), *Globalized e-learning cultural challenges* (pp. 239–254). Information Science. doi:10.4018/978-1-59904-301-2.ch014

Edmundson, A. (2003). Decreasing cultural disparity in educational ICTs: Tools and recommendations. *Turkish Online Journal of Distance Education, 4*(3).

Edmundson, A. (2007). The cultural adaptation process (CAP) model. In A. Edmundson (Ed.), *Globalized e-learning cultural challenges* (pp. 267–290). Information Science. doi:10.4018/978-1-59904-301-2.ch016

Edwards, R., & Usher, R. (2000). *Globalisation and pedagogy: Space, place and identity*. Routledge.

Foster, M. (1995). African American teachers and culturally relevant pedagogy. In J. A. Banks & C. A. M. Banks (Eds.), *Handbook of research on multicultural education* (pp. 570–581). Macmillan.

Friedman, D. B., & Hoffman-Goetz, L. (2006). A systematic review of readability and comprehension instruments used for print and web-based cancer information. *Health Education & Behavior*, *33*(3), 352–373. doi:10.1177/1090198105277329 PMID:16699125

Friesner, T., & Hart, M. (2004). A cultural analysis of e-learning for China. *Electronic Journal on E-Learning*, *2*(1), 81–88.

Gay, G. (2000). *Culturally responsive teaching: Theory, research, and practice*. Teachers College Press.

Geis, G. & Klaassen. (1972). It's a word, it's a name, It's ... an educational technologist. *Educational Technology*, *12*(12), 20–22.

Goldstein, D. L., & Smith, D. H. (1999). The analysis of the effects of experiential training on sojourners' cross-cultural adaptability. *International Journal of Intercultural Relations*, *25*(1), 157–173. doi:10.1016/S0147-1767(98)00030-3

Hammer, M. R., Bennett, M. J., & Wiseman, R. (2003). Measuring intercultural sensitivity: The intercultural development inventory. *International Journal of Intercultural Relations*, *27*, 421–443.

Harrell, D. F., & Harrell, S. V. (2012). Imagination, computation, and self-expression: Situated character and avatar mediated identity. *Leonardo Electronic Almanac*, *17*(2), 74–91.

Harrell, D. F., & Lim, C.-U. (2017). Reimagining the avatar dream: Modeling social identity in digital media. *Communications of the ACM*, *60*(7), 50–61.

Hawthorne, C. O. (1932). Hospital provision as a social service. *British Medical Journal*, *2*(3736), 117–121.

Heeter, C. (2000). Interactivity in the context of designed experience. *Journal of Interactive Advertising*, *1*(1), 3–14.

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

Henderson, L. (2007). Theorizing a multiple cultures instructional design model for e-learning and e-teaching. In A. Edmundson (Ed.), *Globalized e-learning cultural challenges* (pp. 130–153). Information Science.

Heslop, J. (2018). *International students in BC's education systems— Summary of research from the Student Transitions Project*. https://www2.gov.bc.ca/assets/gov/education/post-secondary-education/data-research/stp/stp-international-research-results.pdf

Hew, K. F., & Cheung, W. S. (2010). Use of three-dimensional (3-D) immersive virtual worlds in K-12 and higher education settings: A review of the research. *British Journal of Educational Technology*, *41*(1), 33–55.

Hollins, E. R. (1996). *Culture in school learning: Revealing the deep meaning*. Erlbaum.

Hutchinson, H. B., Rose, A., Bederson, B. B., Weeks, A. C., & Druin, A. (2005). The international children's digital library: A case study in designing for a multilingual, multicultural, multigenerational audience. *Information Technology and Libraries*, *24*(1), 4–9.

International Board of Standards for Training. Performance and Instruction. (2012). *Instructional designer standards*. https://ibstpi.org/download-center-free/

International Society for Technology in Education. (2017). *Standards for educators*. https://www.iste.org/standards/for-educators

International Standards Organisation. (2019). *Ergonomics of human-system interaction— Part 210: Human-centred design for interactive systems* (ISO 9241-210:2019) https://www.iso.org/obp/ui/#iso:std:iso:9241:-210:ed-2:v1:en

Jones, C., Ramanau, R., Cross, S., & Healing, G. (2010). Net generation or digital natives: Is there a distinct new generation entering university? *Computers & Education*, *54*(3), 722–732.

Kawachi, P. (2000). To understand the interactions between personality and cultural differences among learners in global distance education: A study of Japanese learning in higher education. *Indian Journal of Open Learning*, *9*(1), 41–62.

Kember, D., & Gow, L. (1990). Cultural specificity of approaches to study. *The British Journal of Educational Psychology*, *60*, 356–363.

Kennedy, P. (2002). Learning cultures and learning styles: Myth-understandings about adult (Hong Kong) Chinese learners. *International Journal of Lifelong Education*, *21*(5), 430–445.

Kleinfeld, J. (1975). Effective teachers of Eskimo and Indian students. *The School Review*, *83*(2), 301–344.

Komiyama, Y. (2007). Japanese learning styles in the online learning environment. In J.B. Son (Ed.), Internet-based language instruction: Pedagogies and technologies. Toowoomba, AU: Asia-Pacific Association for Computer-Assisted Language Learning.

Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, *32*(3), 465–491.

Laverde, A. C., Cifuentes, Y. S., & Rodríguez, H. Y. R. (2007). Toward an instructional design model based on learning objects. *Educational Technology Research and Development*, *55*(6), 671–681.

Li, H., Daugherty, T., & Biocca, F. (2001). Characteristics of virtual experience in electronic commerce: A protocol analysis. *Journal of Interactive Marketing*, *15*(3), 13–30.

Li, H., Daugherty, T., & Biocca, F. (2002). Impact of 3-D advertising on product knowledge, brand attitude, and purchase intention: The mediating role of presence. *Journal of Advertising*, *31*(3), 43–57.

Liboriussen, B. (2014). Avatars. In M.-L. Ryan, L. Emerson, & B. J. Robertson (Eds.), *The Johns Hopkins guide to digital media* (pp. 37–40). Johns Hopkins University Press.

Lynch, E. W. (2011). Developing cross-cultural competence. In E. W. Lynch & M. J. Hanson (Eds.), *Developing cross-cultural competence: A guide for working with children and their families* (pp. 71–118). Brookes.

Mahbubani, K. (2002). *Can Asians think: Understanding the divide between East and West*. Steerforth Press.

McCarty, S. (2005). Cultural, disciplinary and temporal contexts of e-learning and English as a foreign language. *eLearn, 4*. Retrieved May 12, 2006, from http://www.elearningmag.org/subpage.cfm?section=research&article=4-1

McGreal, R. (2004). Learning objects: A practical definition. *International Journal of Instructional Technology & Distance Learning*, *1*(9).

McKenney, S. E., & Reeves, T. C. (2012). *Conducting educational design research*. Routledge.

McLoughlin, C. (1999). Culturally responsive technology use: Developing an on-line community of learners. *British Journal of Educational Technology*, *30*(3), 231–243.

McLoughlin, C., & Oliver, R. (2000). Designing learning environments for cultural inclusivity: A case study of indigenous online learning at tertiary level. *Australian Journal of Educational Technology*, *16*(1), 58–72.

Mohamed, A. M. F. Y., Schroeder, A. C. U., & Wosnitza, M. (2014). What drives a successful MOOC? An empirical examination of criteria to assure design quality of MOOCs. In *The proceedings of 2014 IEEE 14th international conference on advanced learning technologies*. Athens, GR: IEEE.

Nelson, W. A. (2013). Design, research, and design research: Synergies and contradictions. *Educational Technology*, *53*(1), 3–11.

Nieto, S. (1999). *The light in their eyes: Creating multicultural learning communities*. Teachers College Press.

Nisbett, R. (2004). *The geography of thought*. Simon & Schuster.

Nowak, K. L., & Fox, J. (2018). Avatars and computer-mediated communication: A review of the definitions, uses, and effects of digital representations. *Review of Communication Research*, *6*, 30–53.

Pan, C.-C., Tsai, M.-H., Tsai, P.-Y., Tao, Y., & Cornell, R. (2003). Technology's impact: Symbiotic or asymbiotic impact on differing cultures? *Educational Media International*, *40*(3-4), 319–330.

Petrina, S. (2004). The politics of curriculum and instructional design/theory/form. *Interchange*, *35*(1), 81–126.

Petrina, S. (2010). Cognitive science. [Design and engineering cognition] In P. Reed & J. E. LaPorte (Eds.), *Research in technology education* (pp. 136–151). Glencoe-McGraw Hill.

Phan, T. (2018). Instructional strategies that respond to global learners' needs in massive open online courses. *Online Learning*, *22*(2), 95–118.

Reeves, T. C., Herrington, J., & Oliver, R. (2005). Design research: A socially responsible approach to instructional technology research in higher education. *Journal of Computing in Higher Education*, *16*(2), 97–116.

Robinson, B. (1999). Asian learners, western models: Some discontinuities and issues for distance educators. In R. Carr, O. Jegede, W. Tat-meg, & Y. Kin-sun, (Eds.), The Asian distance learner (pp. 33-48). Hong Kong, ROC: Open University of Hong Kong.

Rogers, P., 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.

Sit, L., Mak, A. S., & Neill, J. T. (2017). Does cross-cultural training in tertiary education enhance cross-cultural adjustment? A systematic review. *International Journal of Intercultural Relations*, *57*, 1–18.

Soukup, C. (2000). Building a theory of multi-media CMC. *New Media & Society*, *2*, 407–425.

Spronk, B. (2004). Addressing cultural diversity through learner support. In B. J. Walti & C. O. Zawacki-Richter (Eds.), *Learner support in open, distance and online learning environments* (pp. 169–178). Bibliothecksund Informationssystem der Universitat Oldenburg.

Squire, K. (2006). From content to context: Videogames as designed experience. *Educational Researcher*, *35*(8), 19–29.

Stork, M. G., Zhang, J., & Wang, C. X. (2018). Building multicultural awareness in university students using synchronous technology. *TechTrends*, *62*(1), 11–14.

Thomas, D., & Brown, J. S. (2009). Why virtual worlds can matter. *International Journal of Learning and Media*, *1*(1), 37–49.

Touloum, K., Idoughi, D., & Seffah, A. (2012). User eXperience in service design: defining a common ground from different fields. In J. C. Spohrer & L. E. Freund (Eds.), *Advances in the human side of service engineering* (pp. 257–269). Springer.

Tractinsky, N. (2000). A theoretical framework and empirical examination of the effects of foreign and translated interface language. *Behaviour & Information Technology*, *19*(1), 1–13.

Tu, C. H. (2001). How Chinese perceive social presence: An examination of interaction in online learning environment. *Educational Media International*, *38*(1), 45–60.

Wang, C., & Reeves, T. C. (2007). The meaning of culture in online education: implications for teaching, learning and design. In A. Edmundson (Ed.), *Globalized e-learning cultural challenges* (pp. 1–17). IGI Global.

Wang, F., & Hannafin, M. J. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research and Development*, *53*(4), 5–23.

Wang, Y., & Petrina, S. (2013). Using learning analytics to understand the design of an intelligent language tutor– Chatbot Lucy. *International Journal of Advanced Computer Science and Applications*, *4*(11), 124–131.

Wang, Y., Petrina, S., & Feng, F. (2017). Designing VILLAGE (Virtual Immersive Language Learning Environment): Immersion and presence. *British Journal of Educational Technology*, *48*(2), 431–450.

Watkins, D., & Regmi, M. (1990). An investigation of the approach to learning of Nepalese tertiary students. *Higher Education*, *20*, 459–469.

Williams, D. (2018). Fashion design. In K. Fletcher & M. Tham (Eds.), *Routledge handbook of sustainability and fashion* (pp. 234–242). Routledge.

Williams, D., & Fletcher, K. (2010). Shared talent: An exploration of the potential of the "shared talent" collaborative and hands on educational experience for enhanced learning around sustainability in fashion practice. In *Sustainability in design: Now! challenges and opportunities for design research, education and practice in the XXI century* (pp. 1096–1004). Greenleaf Publishing Ltd.

Working Party on the Information Economy. (2011). *Virtual worlds- Immersive online platforms for collaboration, creativity and learning*. OECD.

Young, P. A. (2008). Integrating culture in the design of ICTs. *British Journal of Educational Technology*, *39*(1), 6–17.

Zhang, Z., & Zhou, G. (2010). Understanding Chinese international students at a Canadian university: Perspectives, expectations, and experiences. *Canadian and International Education. Education Canadienne et Internationale*, *39*(3), 43–58.

Zhao, J. J. (2019). Design of a 3D virtual learning environment for acquisition of cultural competence in nurse education: Experiences of nursing and other health care students, instructors, and instructional designers (Unpublished Ph.D. Dissertation). University of British Columbia, Vancouver, BC.

KEY TERMS AND DEFINITIONS

Cultural Competence: Ability to design and respond for "diverse values, beliefs and behaviors, including tailoring delivery to meet [students'] social, cultural, and linguistic needs" (Betancourt, Green, & Carillo, 2002, p. 5).

Instructional Design: Analysis and development or design of learning objects, products, and systems.

Intercultural Competence: The "inter" prefix added to "cultural competence" indicates a two-way exchange of development and the give and take nature of individuals from two different cultures in interaction.

User Experience: Methodology to account for "perceptions and responses that result from the use and/or anticipated use of a product, system or service" (International Standards Organisation, 2019).