Cultural Implications in Educational Technology:

A Survey

Patricia A. Young
Associate Professor
Department of Education
University of Maryland at Baltimore County
1000 Hilltop Circle
Sherman Hall, Room 429
Baltimore, MD 21250
Email: pyoung@umbc.edu

Tutaleni I. Asino
Assistant Professor, Educational Technology
School of Educational Studies
Oklahoma State University College of Education
209 Willard Hall, Stillwater, OK 74078
405.744.8003 | tutaleni.asino@okstate.edu
http://edtech.okstate.edu

Abstract: Globally the design of information and communication technologies that consider culture is growing. There is a great need to be more explicit about the challenges and triumphs of considering culture. This chapter provides a review of literature as it relates to the most recent conceptualizations of educational technology and culture.

Internationally, research about culture and educational technology is on the rise. Scholars are researching Web Based Learning, Digital Literacy, Technology use, Social networks, Games, Mobile Technologies, Web 2.0, MOOCs and their relations to culture or cultural contexts. The research supports that there is a need to better understand how instructional designers, educators and innovators perceive culture in relation to the broad field of Educational Technology.

There is currently no agreed upon definition of what culture is in the field of educational technology. According to the Association for Educational Communications & Technology (AECT), "Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" (AECT Definition and Terminology Committee, 2008 p. 1). Spector (2015) adds that "Educational Technology involves the disciplined application of knowledge for the purpose of improving learning, instruction and/or performance" (p. 10). Examining the definition of Educational Technology, we argue that it is implicitly crucial to recognise the importance of culture when engaging in research in our field. It is impossible to improve learning, instruction and/or performance if one does not take into account the culture in which the learning is embedded, the technology is placed or the individuals or group who use the technology.

There is a broad spectrum of how culture is defined across disciplines. One often cited definition of culture is from UNESCO (2001) which characterises culture as "*that complex whole which includes knowledge, beliefs, arts, morals, laws, customs, and any other capabilities and habits acquired by [a human] as a member of society".* As can be seen from this definition, culture is very broad and is composed of everything that makes one human and everything that humans make. In educational technology research, conceptualizations of culture are often segmented into subcultures (school culture or organizational culture) and referenced with terms such as cultural conflict and culturally relevant as ways to operationalise the definition of culture within that specific context. That is, how is culture influenced by or influences technology.

Cultural implications in educational technology begins with understanding culture as everything that makes one human and that humans make by engaging with information and communication technologies to learn, use, interact, produce, consume, understand, invent, communicate, socialize, discover and perform.

Having conceptualized the above definition we explore the topic through the following two research questions:

- What research is being done in the field of educational technology around culture?
- How is culture being researched in the field of educational technology?

Our goal in this chapter was to conduct a review of the literature that explores how culture is being used and defined (whether explicitly or implicitly) in the research on educational technology. Given the over 1,000 articles in current journals of educational technology, we focused our review on a sample of articles across journals in distance education, distance learning, computer science, and educational technology published within the last five years (2011 – 2017). Using EBSCO Host Academic Search Premier, we gathered educational

technology articles and read to determine if culture was a central tenant. The articles that fell within our inclusion criterion covered the following topics: web-based learning, digital literacy, technology use, social networks, games, mobile and web 2.0. What we found was that most articles that fit with in our parameters do not make culture an explicit aspect of the research. The appearance or mention of culture is only incidental and when applied it is not about the culture of the people broadly but often focuses on a subculture. A discussion of each topic follows this section.

Web Based Learning

Web based learning, or learning that is facilitated through the internet, is exploding from educational to corporate contexts. Instruction is digital. These practices have been classified by the terms e-learning, online learning, and distance learning. E-learning has been characterized as learning through web based systems and associated with online training videos, learning management systems and online courses. Online learning has been characterized as learning that is computer supported, computer mediated, collaborative, interactive, distributive and self-regulated. Distance Learning is characterized as learning that is synchronous and asynchronous and enabled through web-based software or videoconferencing. This section examined the web-based literature and found that it focused on several areas: e-learning, on-line learning, distance education, cultural considerations (i.e., cultural contexts, Confucian heritage culture, and language and culture)

e-learning

The intersections of culture and e-learning, as reported by various research, focuses on two strands: the inclusion of culture in designing e-learning systems and resistance to technological changes. The research indicates that the culture of the learner affects their learning

performance (Aparicio, Bacao & Oliveira, 2016). This means that in designing elearning platforms; these platforms should make cultural considerations for international use (deFreitas & deMello, 2012; Lee, 2010; Jung, 2011). For example, in the development of e-learning courses, focused on improving airline customer service, there was limited integration of the cultural and language differences in an international flight crew. The airlines designed a culture neutral e-learning environment based on westernized perspectives. The elearning platform "served solely as a content repository based on the airlines cultural values. The airline did not emphasize core pedagogical values or recognize the learners' needs during the analysis and design phases of instruction (Neto, Smith & Pedersen, 2014; p. 1067)."

The second issue of concern is resistance to e-learning technology that lies with both the users (faculty and students) and administrators at institutions of higher education. deFreitas and deMello (2012) found resistance by students and faculty against the implementation of new elearning technology in Brazilian business schools to be a cultural conflict, because this resistance was not consistent with administrative needs to improve teaching practices. The problems found in Macfadyen and Dawson's (2012) study of the adoption of technological innovations addressed the failure of the institutional culture within higher education, to acknowledge the degree of push back by individuals, and to understand how to motivate social and cultural change throughout the institution. Specifically, in this study, technological innovations were stifled by a culture of resistance and administrators inability to foster cultural change. This suggests that adopting e-learning will and can meet with much resistance by faculty. Further administrators need to be able to integrate these changes into the structure of the university and prepare faculty for what's to come.

The culture of the target audience who use any elearning tool should be considered when designing the product. Otherwise, elearning remains generic and misses the target learner.

Online learning

Amongst the research characterized as online learning and distance education, two themes emerge: culturally appropriate instruction in online learning and a learning culture. Research about culturally appropriate and culturally sensitive instruction focused on instructors need to develop cultural competency and diverse perspectives in their teaching. Instructors should design instruction that is culturally appropriate to diverse student backgrounds thereby acknowledging the differences in perspectives from international students. Specifically, instructors execution of course content might better align with the learners preferences (Alalshaikh, 2015, Cronjé, 2011, Gomez-Rey, Barbera & Fernandez-Navarro, 2016; Rawls & Hammons, 2016). Similarly Gomez-Rey, Barbera & Fernandez-Navarro (2016) identified important stages of the online experiences (e.g., pre-enrollment, in-class and course completion) as perceived by culturally diverse students (i.e., American, Chinese, Mexican and Spanish). They agreed that instructors should deliver culturally adaptive instruction that provides flexible activities. The reason for these cultural considerations, according to Barbera & Linder-VanBerschot, 2011, is that students from different cultural backgrounds perceive the online experience differently but still satisfactorily. Further, there needs to be "specific cultural adaptations" in the design of online learning to accommodate for these differences (Barbera & Linder-VanBerschot, 2011, p. 176).

Distance learning/education

The mention of an online environment or distance education presupposes some type of learning culture that is web-based, organized and criteria-based. Learning cultures evolve from

students engagement with the technological environment and human interactions. Chen, Wang, Kinshuk & Chen (2014) focused on learning cultures in higher education as articulated by one of the 4 pillars of the FLIP (Flexible Environment, Learning Culture, Intentional Content and Professional Educator) schema. In this classroom model, class time is student centered and focused on a flexible learning environment, self-paced vs. teacher directed instruction and an enriched learning experience. Xie, Miller & Allison (2013) examined the culture of learning communities in online classes maintaining that these communities have common characteristics such as online etiquette, rules, and disinhibition. Social conflict can affect the class culture causing cultural clashes (Kitade, 2012). However, online environments foster a culture of niceness. Instructors should, thereby, engender a positive culture within these online learning environments (Xie, Miller & Allison, 2013). Stewart, Harlow and DeBacco (2011) saw the classroom as a culture of its own whether local, distance or blended. Looking at the culture of learning from a Chinese context, Zhao, Chen & Panda (2014) advocated for the use of distance learning "vis a vis the traditional culture of learning in China" (p. 943). Zhao, Chen & Panda's (2014) findings suggest that males have "higher self-regulated learning" abilities than females (p. 955). Specifically during an online course that required self-regulated learning, females lacked the "capabilities" to self-monitor or self-evaluate and lagged in terms of learning content and using learning resources. This study concluded that this gender difference was consistent with prior research studies and the culture of learning in China. Similarly, Jung, Kudo & Choi (2012) contend that within the context of a Japanese study, instructional design should reflect the "Japanese way of learning (p. 1026)." The Japanese way of learning is supported in this research by Japan's students who preferred structured learning objectives and prepared outcomes (p. 1026).

cultural considerations

The use of the term cultural context has been diverse within online research. Cultural contexts have helped to define the location or place in which individuals live such as Spain or Ireland (Martinez de Morentin, Cortes, Medrano Apodaca (2014). Pseudoscientific beliefs, such as fortune telling, astrology or alternative therapy, are dependent on culture and cultural contexts (Tsai, Lin, Shih, Wu, 2015). For example, Tsai, Lin, Shih, Wu (2015) propose that an online argumentation system for argumentation instruction can lower pseudoscientific beliefs and further that these beliefs are culturally situated. Cultural contexts have also been conceptualized as socio-cultural when the tool of technology (discussion boards, wiki's) is seen as integral to the expectations and norms of the "context in which it is used" (p.118). In these examples, cultural contexts are specific to geography and psychology broadening how culture is viewed in technological contexts.

Research has found that Asian countries (China, Vietnam, Singapore, Korea and Japan) who abide by the Confucian heritage culture share the characteristics of collectivist cultures such as belonging to the group, in-group cohesion and approval, and valuing harmony (Chen, Chou & Cowan, 2014; Xu, Du & Fan, 2014). These characteristics may influence student's emotional behaviors (e.g., feedback) in online environments (Xu, Du & Fan, 2014). Jung, Kudo & Choi (2012) also document that the collaborative process in an online environment can be stressful for Japanese students; in particular Japanese students may fear a loss of face by team members relationships and the opinion of others. Similarly, Zhu (2012) found significant cultural differences between Chinese students from a Confucian Heritage and Flemish student's satisfaction with their online performance, learning environment and construction of knowledge in group discussions. For example, the Chinese students indicated a greater satisfaction with the

collaborative aspects of online learning. The Flemish students expressed greater satisfaction with the results of the online group work. Overall, the findings reveal that the culture of the individual influences how they perceive interactions in an online environment.

Some research has explored the connections between language and culture. This research posits that language and culture are inseparable. Therefore, "Culture can be taught as an internal part of language in technology-enhanced intercultural interactions (Chen & Yang, 2014, p. 264)." Chen & Yang, (2014) investigated students language development and intercultural communicative competence (including knowledge, attitudes, intercultural awareness and skills) with Taiwanese seventh graders and participants from 5 different countries (Canada, Ghana, Lebanon, the Netherlands and Taiwan). Through the United Beyond Our Diversity project, students engaged in online exchanges through Wiki's and Moodle. Participants were able to examine their biases and stereotypes and further develop their language and cross cultural awareness (Chen & Yang, 2014). This research suggests that students who learn a foreign language online benefit from this experience because it offers authentic examples of language use and cultural experiences (Angelove & Zhao, 2016; Cho, 2016). However contrary to these studies, Wu, Yen & Marek's (2011) study of Taiwanese students learning English as a Foreign Language in an online setting found more value in learning English through face-to-face interactions with American native language speakers.

The research on e-learning, online learning, and distance learning are beginning to merge based on the advances in technologies and software applications. Web based learning through cultural contexts means that learning is more human centered. However, web-based learning is challenged by the resistance of individuals, institutions, and traditions. To move forward, other research has found the benefits of establishing learning cultures and the value of language

acquisition in technological contexts. Web based learning research seems to benefit from its interpretation and implementation through cultural contexts.

Digital Literacy

Digital literacy remains broadly defined as the knowledge acquired through the use of information and communication technologies. In this review of digital literacy in cultural contexts, three strands were found to be prevalent: cultural capital, designs for learning and cross-cultural learning.

Hatlevik & Christophersen (2013) argued that a Norewegian student's cultural capital is a high predictor of digital competence. They defined cultural capital according to Pierre Bourdieu's interpretation to mean the location of a person within the social space. Digital competence are the skills, attitudes and knowledge that enable learners to use, participate, and work with digital media. In this case, the study proposes that students who had a large number of books at home had more cultural capital than those who did not.

Cultural contexts also focused on research related to designs for learning. Designs for Learning, as described by Kress & Selander (2012), proposes that teachers have become designers through their planning processes and assessment practices, and students have become designers by taking responsibility for their own learning. This research argues that new conceptualizations of learning are a result of these new virtual spaces, blended media and communicative patterns. These new signs of learning can be called "cultures of recognition" because learning must now be understood in these e-learning contexts (Kress & Selander, 2012, p.266). Through media, students learn cultural competencies and social skills (Wasson & Vold, 2012). Wasson and Vold (2012) advocate for a "participatory culture of learning" that requires students to be active versus passive participants in acquiring intellectual and artistic content (p.

255). Students engage in peer assessment as they engage in this participatory culture of learning (Wasson & Vold, 2012). Assessment is a component in design for learning environments.

Shadiev and Huang (2016) designed a set of cross-cultural learning activities supported by a computer aided translation and speech-to-text recognition system with the goal of determining the effectiveness of these systems in cross-cultural learning. This research sought to enable bicultural information and interaction exchange between ten high school students (six Chinese native speakers from Taiwan and four Russian native speakers from Uzbekistan) who did not share a common language. The findings revealed the potential of these systems to help students communicate independently and provide an authentic context for cross-cultural learning.

This research demonstrates that digital literacy holds the same high level of importance as any other form of literacy. As new technologies permeate this society, we must be responsive in providing learners with the tools they need to become competent users and learners. Part of this process will be enabling learners to understand what they know through their own cultural capital, encourage learners to be designer of their own learning and prepare learners to adapt to the changing face of technology.

Technology use

Technology use varies from culture to culture and can be articulated as theory, practice or a societal factor that enhances or impact on people. The research has indicated that the following strands are most prevalent: school culture, cultural models, Confucian Heritage Culture, and the language of culture.

The organizational culture of educational institutions is referred to as a school culture. A school culture might include the mission, vision, plans, values or norms shared by school

members (Tezci, 20110. School culture can also influence teachers buy-in to technology integration (Koh, Chai & Tay, 2014; Perrotta, 2013; Tezci, 2011). In Blau & Presser's (2013) study, the school culture was changed dramatically by the implementation of a school management system to engage in e-leadership by secondary school principals in Israel. Specifically, principals were able to make decisions based on data, monitor student and teacher performance, assign staff tasks via the school management systems and interact with parents, teachers and students. This tool dramatically changed school culture.

Cultural models define the technology use amongst individuals and cultures. Russell et al (2013) argue that culture is an important construct in the field of instructional design & technology and that comprehensive descriptive models, like Young's Culture Based Model, serve as a "lens for exploring cultural dynamics" (Russell, Kinuthia, Lokey-Vega, Tsang-Kosma, & Madathany, 2013, p.707). Lotz, Law and Nguyen-Ngoc (2014), similarly, offered a process model to examine learning design patterns within an international scope. In this model, the relationship between artifacts, behaviors and values reveal a pattern for designers to develop internationalized learning designs; thereby culture is very relevant to design. The educational technology acceptance (ETA) model, adapted from the unified theory of acceptance and use of technology (UTAUT), allows for correlational verification between the acceptance and the culture. For Nistor, Gogus & Lerche, the combination of ETA and culture resulted in significant relationships (Nistor, Gogus, & Lerche, 2013). These cultural models demonstrate the varied purposes that models can be as evaluative tools to more accurately define cultures and explain educational technologies.

Culture is rooted in the beliefs and values of societies; and these cultural factors influence a culture's technology adoption (Fong et al., 2014; Iriti, Bickel, Schunn & Stein, 2016). In a

Confucian Heritage Culture, Fong et al. (2014) concluded that support by Hong Kong and Taiwan teachers was critical to the adoption of digital teaching portfolios. Similarly, Yuen (2017) found that digital inequity is rooted in its cultural context. Yuen evaluated that the values held by communities who practice Confucian heritage culture may interfere with parents willingness to adopt, access and use ICTs as it relates to their children. This practice can create digital inequities for students. Basically, this means that the cultural backgrounds of individuals or groups may inhibit them from accessing new technologies thereby creating digital inequities. The implications of this could be grave as these groups will be left behind in the technological revolution.

Indigenous communities are losing their elder speakers and thereby their native language. Technology provides a way to expose learners to the language in many domains and contexts (e.g., conferencing, social networks, virtual environments). Indigenous language revitalization has been confronted with many issues that prevent technology and learner connections such as: accessibility to computers, economic factors (human resources, finances), environmental (weather, water, electricity) and technological (computer equipment, infrastructure, software, support and training) (Galla, 2016). In this example, indigenous communities become bound by their cultures challenges to use technology to retain the life blood of their communities--language.

Technology use research is very broad and could well be classified in other sections of this chapter. However, most of this research sought to provide examples of how technology has been used in school cultures through cultural models (theory), as a blockade to cultural adoption of technology (practice) and through language loss (impact on people). This research suggests

that technology use by groups and people vary based on cultural context. This infusion of culture and technology demonstrates its symbiotic relationship.

Social networks

Research on social networks and culture reveal an acknowledgement that cultural shifts are impacted by technologies and that learning is mediated by sociocultural contexts and affordances of new technologies (Turvey, 2012). The research coalesce around language learning, teacher practice, cross-cultural interactions and participatory culture.

One area where culture and social network research intersect is on supporting language learning cross culturally. Language and culture are intimately related, and social networking sites can be used to connect learners studying a language to learners in the culture where the language originates. This connection provides language learners opportunities to improve their language skills(Aydin 2012). As an example, Yen, Hou, & Chang (2015) integrated Facebook and Skype into their English as a Foreign Language Class. The three phase integration process consisted of an initial classroom lecture, Facebook discussion in subgroups, and Skype negotiations with opposing groups. An analysis supports that Facebook is effective in increasing writing and speaking skills because it gives learners opportunities to improve their speaking and writing skills through peer-to-peer and self-correction behaviors on the platform. The study is representative of research illustrating that social media sites like Facebook can be beneficial language learning environments.

Research on social networks and culture also reveal challenges to acceptance in the existing culture of teacher practice. Manca and Ranieri (2016), in their study of Italian academics, argue that challenges facing social networks as teaching and learning tools include cultural resistance which stems from social factors such as the perceived erosion of teachers'

traditional roles, concerns of how to manage relationships with students when engaging on social media and issues concerning privacy. This culture of resistance is in contrast to a recognition that social networks can also be a tool for integrating culture in teaching practices. Chuang (2016) argues that social media can facilitate online group collaboration as well as present opportunities and challenges for culturally responsive teaching (CRT). For pre-service teachers who will go out into an increasingly multicultural educational environment, social network environments provide an opportunity to practice incorporating multicultural information, resources, and materials in their practice. Melo-Pfeifer (2015) highlights how blogs can be used for language teaching by helping learners develop plurilingual and intercultural competences. A blog can be used for pedagogical purposes to promote interaction of language and culture by enabling interactions between users, authors and the community at large. However, regardless of the advantages and opportunities, the benefits will not be realized if there is resistance to incorporating culture into teaching.

Social network sites provide an opportunity to study and understand cross-cultural interactions which are occurring with more frequency at educational institutions. Cook and Pachler (2012) found that social technologies provide users opportunities to communicate, interact, share, and make meaning. However, the technologies also provide space for a conversation on how the affordance of the technological innovations (e.g. ability to tag digital resources such as images) differ cross culturally (i.e the distinction between what is acceptable to be posted and tagged from culture to culture). While social networks can increase cross-cultural collaborative interactions, Stepanyan, Mather and Dalrymple (2014) cautioned that an emerging pattern is that participants from the same culture were more likely to interact with each other than interact with those of a

different culture. In other words, more effort should be made to provide students cross cultural collaborative opportunities globally and not only with cultures that are similar.

Social networks are also seen in the literature as promoting a participatory culture. Research by Song, Williams, Pruitt & Schallert (2017) demonstrate that social networks sites such as Pinterest create a participatory culture, "characterized by distributed cognition, accessibility for creation and participation, and informal learning and support, creating democratic ways of collaborating among participants to share and celebrate multiplicity and heterogeneity of ideas as individuals execute their knowledge and expertise in creative ways" (pg. 34). Beyond sharing, social networks can also been seen as as a form of participatory technology that impacts scholarship practice. According to Veletsianos and Kimmons (2012), social networks provide for a new form of scholarship, referred to as Networked Participatory Scholarship that allow scholars of different cultures to "share, reflect upon, critique, improve, validate, and otherwise develop their scholarship" (pg. 768). However, perceptions around the issues of participatory cultures can differ by subject. Issues which inhibit teachers from adopting more participatory approaches were more prevalent in Applied Sciences than in Social Sciences and more influential in the Social Sciences than in Mathematics, Computer Science and Natural Sciences (Manca & Ranieri, 2016). This research indicates that the benefits to participatory culture vary depending on the domain of scholarship.

While causality between social network technology and culture is difficult to prove, the research indicates that both are undeniably intertwined in a complicated fashion (Veletsianos & Kimmons, 2012). Social networks and their use in the larger culture are influenced by various subcultures such as university culture, scholarship culture and the culture of acquiring or valuing knowledge. The research in this area suggests that the focus should not be placed solely on how

technologies such as social networks influence or transform the culture of education or educational scholarship, but an emphasis should also be placed on examining what emerging tools (facebook, twitter, etc.) reveal about scholars producing the research (Veletsianos & Kimmons, 2012). While it is important to examine the interplay between social media and culture, it is also significant to examine the connection between social media, the subculture and the larger culture.

Games

Incorporating game-based approaches in learning is a common practice across many domains. Over the last two decades, digital games have become an increasingly popular subject to study in education (Dickey, 2011). The literature reviewed supports an emergence of three themes as they relate to culture: 1) accessibility, 2) theoretical perspectives, and 3) engagement across cultures.

At the intersection of culture and games in education is a recognition that games are an integral part of the human social and cultural environment, that attracts people's interest, attention and allows participants access to inaccessible worlds (Kordaki & Gousiou, 2016). Often cultural spaces can be inaccessible especially to people with a wide range of disabilities (Brown, McHugh, Standen, Evett, Shopland, & Battersby 2011). Put simply, it can be difficult for someone with a physical disability to travel to many of the popular cultural attractions around the world. When designed and used well, digital educational games are able to promote, support and engage especial those with learning disabilities (Ke & Abras, 2013) by providing an environment to gain confidence and independence to travel virtually to different cultures. This affordance can particularly be beneficial if designers ensure that the metaphors used in games are appropriate for

the targeted groups, and the language used especially when translated is appropriate and without mistakes (Brown, McHugh, Standen, Evett, Shopland, & Battersby, 2011). What is significant and different about the research with regards to games and culture is the use of the term accessibility. Often the term is used as a reference to making tools usable to people with different abilities, however the reviewed research add a different dimension, that of accessibility in terms of transporting individuals virtually to experience different cultures.

Two theoretical perspectives standout in the research on games and culture: Cultural-Historical Activity Theory (CHAT) and Sociocultural Perspective. One theory that is examined with regards to games in education is CHAT. Lazarou (2011) argues that for more than a decade there has been a debate on whether CHAT could be an appropriate theoretical framework for the design of computer tools such as games. Lazarou (2011) produced a scenario-based educational game focused on "the teaching and learning of 'Expansion and Contraction of Air' in primary science, a subject that existing research suggests is conceptually difficult for students (p. 424). The design team used CHAT "as a methodological and analytical tool to guide the design of a new computer tool and its accompanying pedagogy" (p. 437) and found that the use of CHAT was essential to producing a computer game that was not only usable but also useful. Sociocultural perspectives appear to be prevalent in the research on games as they relate to culture. Research with a sociocultural perspective reveal constructs that play a central role to learning especially in the domain of second language acquisition (Peterson, 2016). Hämäläinen and Oksanen (2012) set out to study knowledge construction through 3D learning games from a socio-cultural perspective. The socio-cultural perspective recognizes that collaboration, learning and shared knowledge constructions emerge from a social context. Sociocultural perspectives are important when looking at research on games because the very nature of games is such that

regardless of what computer game is being played, learners, especially children will transform it to suit their purpose. This purpose forms children's culture where they construct their own forms of play, expression, and understanding (Vangsnes, Økland, & Krumsvik, 2012). In their work with preschool teachers in Norway, Vangsnes, Økland, & Krumsvik (2012) found that being unaware of the sociocultural perspectives manifested in children's cultures leads to difficulty by teachers in realizing didactical implications on how games impact student's learning process. Beserra, Nussbaum, Zeni, Rodriguez & Wurman (2014) concur that culture is a factor that influences learning and student interest when interacting with game-based activities. The involvement in a digital game is greater for the student when the narrative of the game is closer to the sociocultural context of the learner (Beserra, Nussbaum, Zeni, Rodriguez & Wurman, 2014).

A third research strand emerging around games and culture is the suitability of digital games to engage learners across multiple cultures. Clark, Nelson, Chang, Martinez-Garza, Slack, & D'Angelo (2011) investigated the potential of a digital game to support students exploration of core science concepts in Taiwan and the United States. The researchers argue that the high level of motivation seen by students when playing the games supports the notion that games can engage a large spectrum of learners from multiple cultural backgrounds. Digital games such as massively multiplayer online role-playing game (MMORPG) present opportunities for addressing culturally bound stereotypes such as those of males as dominant leaders and females as obedient followers (Jang & Ryu, 2011). MMORPGs provide a space for acquiring leadership in digital spaces which can be transferred to the real world. In their study with Britons and Spaniards participants, Guillén-Nieto & Aleson-Carbonell (2012) demonstrated how a game can teach intercultural communication and positively impact intercultural communicative

competence. Games in education can provide interactive relationships with local sites and heritage (Chen, Shih, & Ma, 2014). They can facilitate experiential contact with digital representations of cultural content, objects or places, and enabling acquisition of procedural knowledge relative to the cultural domain such as the possibility to understand roles in past societies as that of an athlete in ancient Olympic games through a walk through game of ancient Olympia (Malegiannaki & Daradoumis, 2017).The benefits of interactive relationships through games is also fraught with challenges because game-based approaches that fully integrate culture in training and learning are still scarce. Malegiannaki and Daradoumis (2017) research analyzed 34 digital games that allow learner to have physical or virtual interact with a cultural place and its objects. The authors argued that some of what exists instead serve as games for cultural tourism, giving a cursory view of cultural elements.

The research on the intersection of culture and games in education acknowledges culture as an integral part of the learning process. While there is valuing of the capability of games as an educational technology, there is also a realization that to truly harness the power, more research is needed in how to move games from the research arena into everyday formal educational experiences (Ketelhut & Schifter, 2011). Such research is important considering that games and gameplay have their own culture. Just like the broader culture, game culture is also made up of rules where violating them can upset the system (Dickey, 2011). In other words, while there is a robust body of research on the benefits from the use of games in education, it is also necessary to increase the research on the subcultures (i.e. school culture, organization culture etc.) and their role in the adoption process and utility of games for learning.

Mobile

Mobile technologies are part of global everyday life. The focus of mobile technologies in relation to culture can be divided into three research strands: 1) providing organizational culture support, 2) authentic learning and assessment, and 3) supportive technologies for L2 learners. The first strand views mobile devices as able to provide an organizational culture of support. Lea and Callaghan (2011) report on the process of developing and delivering m-learning to placement students in the healthcare industry who often feel isolated when in service. The researchers argued that the success of mLearning initiatives for students in placements was contingent upon understanding the overall context of where the initiative would take place, and such contexts includes departmental and university culture. In their study of workday practices of school heads and principals in Chilean schools, López, Ahumada, Galdames, & Madrid (2012) refer to culture in the sense of how mobile devices can help in developing a culture of learning and support school leaders with issues that emerge from everyday school culture.

The second strand of research focuses on the utility of mobile devices as essential to authentic learning and assessment, enabling students to learn in situ about local cultures and ecosystems (Santos, Cook, & Hernández-Leo, 2015; Huang, Liao, Huang & Chen, 2014). Hwang and Chang (2011) combined the Formative Assessment-based Mobile Learning (FAML) approach with mobile devices as the technology and the Chin-An temple in southern Taiwan as a learning environment to bring local culture and the ancient customs of Taiwan to learners. The utility of mobile devices in Hwang and Chang's is an example of how mobile devices can be used to evaluate cultural experiences in context. Similarly, Chu (2014) used mobile devices in an eighteen-week course that introduced learners to the indigenous languages, culture, and history of Taiwan where it was found that students who learned in the physical world with mobile devices experienced a higher cognitive load which then led to a negative effect on their learning

achievements. The above case illustrates works designed to bring learners closer to the local culture and recognition that learning is embedded in cultural contexts that give rise to the need to use mobile devices (Chan, Walker, and Gleaves, 2015).

The third strand is using mobile devices as a supportive technology for L2 (second language) learners. Mobile devices enable seamless support in language learning from the classroom to executing language related tasks outside of the classroom (Lan and Lin 2016). This support is indispensable especially for learners in immersive language learning experiences (Ma, 2017) and can take various forms such as providing mobile-assisted oral feedback for learners through voice messaging functions of texting apps such as WeChat (Xu & Peng (2017). However, while the research supports the use of mobile devices to support L2 learners in different cultural contexts, it is also important to emphasize that mobile assisted language learning (MALL) is not perceived equally cross culturally. Viberg and Grönlund (2013) used Hoefstede classifications of cultures to investigate whether cultural factors affected university student attitudes towards the use of mobile technologies in second and foreign language learning in Sweden and China. The researchers concluded that in their study, "the hypothesis that cultural differences impact the perceptions of, and attitudes toward, mobile technology for language learning among students must be rejected," (p. 178) because no significant evidence could be found to support it. Rather gender had a slightly more impact on attitude towards mobile devices for learning than the cultural environment of participants. Hsu (2013), alternatively, illustrated that a student's culture does influence their perception of whether the mobile device should be an educational tool. Overall the research on MALL is significantly tilted towards the technological development rather than learners (Hsu, 2013).

Web 2.0

The term Web 2.0 in the research is used to reference the evolution of the web from its early days when only a few could contribute to the current state where technologies allow for greater contribution, collaboration and interaction. The availability and ease of use of web 2.0 tools enables contributions from user from around the world, including communities that are often ignored (Huang, Chen, & Mo 2015) and further cementing the impact of the internet cross culturally. The research around this topic can be characterized as both explanatory and exploratory. From an explanatory perspective, the research is focused on explaining that technology should be understood to be embedded in the cultural values of people (Pereira,Baranauskas, & da Silva, 2013). From an exploratory vantage point is an interest in comparative studies that explore the effect of Web 2.0 applications cross culturally (Bohemia & Ghassan, 2012; Yoo & Huang, 2011). What is consistent, in explanatory and exploratory research about Web 2.0 and culture, is that culture pervades every aspect of life (Pereira, Baranauskas, & da Silva, 2013).

MOOCs

The initial chorus of researchers espousing the benefits of Massive Open Online Courses (MOOCs) globally was based on the notion that MOOCs open up new venues to access education from institutions around the world without the sticker price. Some argued that the platform would "soon become the de facto way to remediate and educate a broad swath of students in a wide variety of content areas" (Cook & Santos, 2016, p. 318). Pangeni (2016) suggested that in small countries such as Nepal for example, the addition of open and distance learning options such as MOOCs will change the education culture, by enabling Nepali Higher Education Institutions to reach students across the country and around the world. MOOCs

provide a “new learning culture” or online community for Nepali learners. Such examples have led to MOOCs being referred to as an equalizing force (Rolfe, 2015).

Their massiveness and ability to reach a global audience has also necessitated the need to examine how culture manifests itself or influences this still emerging platform (Loizzo & Ertmer, 2016). MOOCs naturally create learning cultures that could potentially impact learners’ beliefs and attitudes. However investigating culture in MOOCs proves to be a challenge because of the diverse makeup of its users (i.e., culture, geographic, language, ethic, social, backgrounds; Rolfe, 2015). The benefit of the platform being available for free globally ensures that thousands to even hundreds of thousands can enroll in one course. From a research standpoint however this mass enrollment can sometimes be problematic in studying culture in depth hence leading to studies that look at nationality and research that looks at subcultures. Zhang, et al (2016), set out to explore how learners in a MOOC “from various cultures prefer to communicate with each other” (p. 809) What emerged from the result was that the majority of participants preferred synchronous means and female learners were more likely to indicate interest in studying within groups. What could not be easily accomplished here however, especially given the quantitative nature of the study, is an explanation of how these preferences manifest cross culturally. Examining MOOCs through a subculture lens has been shown as possible. Grünewald and Meinel (2015) examined how to encourage and develop a culture of participation. The researchers argued that in MOOCs, like online learning, there is often a dilemma where people are hesitant to contribute since they feel like the only ones contributing. They receive nothing, but if no one contributes then the group does not perform well and course engagement becomes affected. Similarly, Loizzo and Ertmer (2016) examined a subculture using virtual ethnography, an internet-based research methodology developed by Bianco & Carr-Chellman(2002), which

they reference as a learning culture in MOOCs. The authors contend that the research, models and theories that promote meaningful learning can be viewed as coming together to form a MOOC learning culture. Loizzo and Ertmer (2016) coined the term MOOCocracy to explain adult learners' perceptions of their experiences within a "MOOC learning culture." The term "encapsulate the construct of a democratic global social learning culture that is developing in social science MOOCs with predominantly adult learner participants" (p. 1026). MOOCs represent a platform where cross cultural learning has infinite possibilities.

Discussion

This chapter examined the treatment of culture in current educational technology research. What is evident from the research is that an interest in culture as a variable in education in general and educational technology specifically continues to increase. The reasons for this are wide and varied, but undoubtedly the two that stand out are the influence of sociocultural approaches that emphasize the recognition of social and cultural experiences as formative to learning. The other factor is opening the global educational complex by various technologies that enable individuals from different corners of the planet to contribute to educational technology on their own behest. As research from various cultures contribute to the body of knowledge and as more research is done comparatively across nations examinations of culture will only grow. Consequently, there is a need for more cultural considerations of how the design of curriculums, experiences, and technologies for education influence and affect learning. Without these cultural considerations, we continue to dance in the dark about how to best educate people.

Global literacy is a theme across all these media. There is an emphasis on how to use technologies to support literacy and improve access to learning materials across populations.

Educational technology research often does not acknowledge that these media are for the privileged few. Only those who have the financial means can gain access. Therefore, research focuses on the privileged few and maybe conducted from a privileged perspective. Examinations of culture in educational technology must be cognizant that despite best efforts, some folks will be left behind. How can researchers examine culture if its only for the select few? The cultural lens provides a more inclusive perspective. It is important that this movement be enacted by all stakeholders--universities, colleges, technology providers and distributors of accessible content. If people can't access learning technologies at home, work or school, then global literacy is doomed to fail.

Often we talk around and research around culture. We use proxies that are easier to quantify and categorize such as gender, but ignore issues around ethnicity and the role it plays. "culture as a construct is a contested space in terms of how it is defined, whom it references and how, and who can legitimately write or research about it" (Dickson-Deane, Bradshaw & Asino, 2018, p. 1). Hence, this leaves many questions that need to be explored with regards to culture and educational technology. Culture-based studies in educational technologies need to be inclusive of examining not just the technologies but also the context that provides a need for the use of the technology. For example, with MOOCS, one does not only need to have internet access, but sustained internet access, as such the issue of culture around MOOCs must also include issues of access and the digital divide. Moreover given that most educational technology is western based and relies on the knowledge of the English language examining culture in educational technology must also explore issues of cultural disconnects that prevent people from engaging. Researchers must begin asking and seeking to answer what happens when one has access to the technology but do not possess the required literacy or knowledge of the language

(lingua franca). We must explore ways to get people who don't participate in these groups access. Access without opportunity leaves out many valuable voices that stifle global technological and educational progress.

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