

Intercultural Technology-Based Collaboration: Engaging U.S. and South African Preservice Teachers in Virtual Research Teams to Generate Solutions to Local Environmental Issues

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Abstract:

In order to inform teacher preparation practice, a social studies faculty member at the University of North Carolina Wilmington (Wilmington, NC USA) and a science education lecturer at Nelson Mandela University (Port Elizabeth, South Africa) designed an online exchange between preservice teachers enrolled in their respective methods courses. Goals of this virtual online exchange included: (a) to engage students in a collaborative learning experience whereby they share personal stories, information, and resources about their respective cultures, geographic regions, and local environmental issues; (b) to reinforce students' content knowledge and skills in the natural and social sciences in an authentic way; and (c) to model how to implement intercultural exchanges with their future students. While tentative conclusions might be drawn on the effectiveness of cross-cultural collaboration to generate solutions to local environmental issues, this study suggests other factors, such as instructional design, student motivation (intrinsic and external), student resilience in online learning, available technologies, time zone difference, and the role of instructors need to be addressed before meaningful collaboration between peer groups in different countries should be attempted.

Key Words:

asynchronous communication, collaborative learning, e-learning, environmental education, intercultural competence, global collaboration, inquiry-based learning, sustainability education.

Introduction

Emerging economic, digital, cultural, demographic and environmental forces are shaping young people's lives around the planet, and increasing their intercultural encounters on a daily basis. This complex environment presents an opportunity and a challenge. Young people today must not only learn to participate in a more interconnected world but also appreciate and benefit from cultural differences. Developing a global and intercultural outlook is a process – a lifelong process – that education can shape. (OECD, 2018, p. 4)

Teacher preparation programs outline the knowledge, skills, and dispositions required of licensed (qualified) teachers. Universally, these include content knowledge; critical thinking, collaborative problem-solving, and information communication technology skills (ICT); global awareness; and social responsibility (Department of Basic Education - DBE, 2011). Faculty are thus charged with the responsibility of not only preparing teacher candidates for their future classrooms, but also for a complex, diverse, and globally interdependent world (Cushner, 2014; Kissock & Richardson, 2010; Reimers, 2009). Despite a growing call for the globalization of teacher education, some argue that teachers lack requisite knowledge, skills, dispositions (Cushner & Mahon, 2009; Izadi, 2012; The Council of Chief State School Officers, 2006), and confidence (Reimers & McLean, 2009) in order to infuse global content and perspectives in their instruction. In fact, teacher preparation programs are considered among the least likely units on university campuses to emphasize students' global competence in their programs, particularly in the United States (Cushner & Mahon, 2009; Longview Foundation, 2008).

A promising approach to foster preservice teachers' (PSTs) global competence is the infusion of intercultural learning experiences across the teacher education curriculum. A key element of global education, intercultural learning helps to promote peace-building, conflict resolution, and respect for diverse perspectives in the classroom (Hammer, 2012; OECD, 2018). Intercultural competence, the desired outcome of intercultural learning experiences, is a multifaceted construct comprised of an individual's cognitive, affective, and behavioral (CAB) attributes, such as cultural self-awareness, perspective-taking skills, and open-mindedness (Hammer, 2010). Together, these CAB dimensions (appropriately coined one's mindset, skillset, and heartset) help to support "effective and appropriate interaction in a variety of cultural contexts" (Bennett, 2008, pp. 95-110). Engaging PSTs in inquiry-based, intercultural, collaborative research teams focused on solution-seeking affords such requisite experience, particularly in the use of culturally relevant pedagogies that engage students in researching issues of personal relevance (Ladson-Billings, 2017).

This study highlights the effects of a technology-based collaboration in which North American (US) and South African (SA) PSTs collaborated in research teams to generate solutions to local and global environmental problems. Our environmental

problem focused on environmental pollution related to the benefits and limitations of single-use paper and plastic grocery store bags. This topic was conceptualized as an interesting vehicle for an international collaborative study such as this one as one that is common to both countries, whereas the approaches and attitudes from governing bodies and consumers may differ, thus affording multiple perspectives and intercultural learning. Kerlin, Carlsen, Kelly, and Goehring (2013) promote the concept of online international science class participation by pointing out a disadvantage of the 'traditional' science classroom is that data used by students are often generated only from their local environment or textbook. This, they claim, "...leads to simple analyses with expected outcomes and are only sometimes based on direct experiment or experiences in the environment" (p. 475). It is hoped the findings of this study will inform teacher educators of an effective means to partner their students with international peers in collaborative and authentic problem-solving projects mediated via technology.

Background

The participants in this study lived in two countries, situated thousands of miles apart and, while English may have been a common language through which communication could take place, it is the potential impact of the different cultures on issues of common interest and concerns that initially interested us.

Culture

The Organisation for Economic Co-operation and Development (OECD) (2018) provides a helpful synthesis of the concept of culture, illuminating why it is difficult to define:

...all individuals belong to multiple groups, and therefore have multiple cultural affiliations and identities (e.g., national, religious, linguistic, generational, familial, etc.). Although all people belong to multiple cultures, each person participates in a different constellation of cultures, and the way in which they relate to any one culture depends, at least in part, on the perspectives that are shaped by other cultures to which they also belong. In other words, cultural affiliations intersect, and each individual has a unique cultural positioning. (p. 8)

When investigating culture using an online environment, it is possible to view culture from two primary perspectives, namely, the notion of culture from the perspective of peoples in different parts of the world living their lives in different ways (i.e., a geographical and nationality perspective) and, second, from a perspective of a generational function (i.e., the idea that different age-groups, generations, perceive and function with technologies and 'new' media in different ways).

In this study we attempted to shift the emphasis away from the common perception of culture and cultural understanding, which posits "that intercultural understanding enables the bridging of the gap between relatively isolated cultural islands" (van Oord & Corn, 2013, p. 22) towards a 'relationality model' that suggests

...a move away from traditional approaches to the celebration of cultural difference, in which staff and students are categorised by national groups and are asked to share aspects of 'their' cultures. Focusing on relationality instead, students and staff could be encouraged to share individual life stories, allowing

individuals to narrate their cultural experiences and perspectives, discussing how these many-cultured experiences have shape their sense of self. (van Oord & Corn, 2013, p. 31)

The relationality model provided a framework guiding the formulation of the prompts used to generate discussion during the 10-week project, while the environmental problem, paper versus plastic bags, contributed towards a shared learning experience.

Culture and e-Learning

Edmundson (2007) suggests “E-learning courses are cultural artifacts, meaning each course is somehow affected by the culture that designed it” (p. 269), and while Lichy (2012) claims when working with the Internet and Generation Y students, we should begin to move away from an essentialist approach. She claims that there is a growing body of research suggesting that Gen Y students’ Internet behavior cannot be ascribed to cultural differences. The emergence of what she describes as an “international subculture” around GenY’s Internet and social networking debunks the essential literature that addresses Internet usage and cultures.

While we might have chosen to position our study in the relationality context of van Oord and Corn (2013), we need to be mindful of Swierczek and Bechter’s (2010) claim that “cultural features have an influence on Internet behaviours, such as usage, adoption, and foreign language acceptance and proficiency” (p. 293). Despite finding few empirical studies of cross-cultural e-learning programs, they were able to, using various sources, crystalized out three, what could be referred to as ‘cultural’ features that might impact e-learning programs. These ‘cultural’ features were:

- a high or low uncertainty avoidance, where the level of uncertainty avoidance is indicative of the degree of guidance required by participants;
- a high power distance which is linked to the role of ‘authority’; and
- the level of individualism displayed by participants, where individualism is contrasted to collectivism, suggesting the role played by the individual.

Swierczek and Bechter (2010) noted the “level of usage and adoption are negatively influenced by high uncertainty avoidance” (p. 292). For example, high uncertainty avoidance was noted in participants whose posts had all, or some of, the following characteristic: highly structured and usually very short – a couple of sentences – coupled with direct responses to topics with few responses to others posts. The ‘power distance’ factor tends to be aligned with “the level of authority and responsibility to determine the use of IT applications” (Swierczek & Bechter, 2010, p. 293).

The third cultural feature contrasts the individualistic with a collectivist approach to interactions. The concepts listed in Table 1 (Swierczek & Bechter, 2010, p. 295) were of interest to us because of the perceived stereotypes that the US approach to life is a more individualistic one, while the South African approach (underpinned by concepts summarized by Ubuntu¹) might be considered as more a collective approach to societal interactions.

¹ Ubuntu might be translated into English as “I am because you are.”

Table 1: Individualistic and Collectivist Cultural Features

Individualistic Cultural Features	Collectivist Cultural Features
Communication Style	Communication Style
Informal	Formal
Direct	Indirect
Delegative	
Independent	Interdependent
Self-identity	Group identity
Freedom	Self-restraint
Equality	Hierarchical control

Source: Swierczek & Bechter (2010)

In addition to the three main cultural factors influencing cross-cultural e-Learning, numerous “non-cultural” factors might impact on e-learning programs (e.g., language, technology, the instructor’s role and the level of interaction required).

The Online Learning Environment

One of the benefits of living in a technologically wired, global environment is the ability to, almost effortlessly, communicate, both synchronously and asynchronously, with just about anyone, anywhere in the world. An asynchronous learning network (ALN) is a technology-mediated communication system supporting collaboration between groups of people working towards a common goal, providing opportunities for participants to “extend think time, and retain contribution of ideas so that instructors and learners can stop to think and understand without missing intervening conversation” (Chang & Lim, 2002, p. 84). Kerlin et al. (2013) refer to virtual learning communities (VLC), similar to ALNs, and that any global environmental project is suitable for use in a VLC – hence this study focusing on environmental pollution and single-use paper and plastic bags.

Noting the popularity of social networking sites (SNS) like Facebook, Lichy (2012) claimed “it would seem logical that educators could take advantage of this mode (SNS) of communication by integrating applications (for example closed-group discussions) into the learning experience” (p. 112). A caveat, however, is when using SNSs in an international collaboration, albeit on a secure and private ‘site,’ is that they are not immune to the same issues of concern present in other SNSs. For example, Lichy (2012) emphasized “not everyone is comfortable with the idea of sharing information online, worrying that sensitive or compromising data could be inadvertently published” (p. 102).

Lichy (2012) noted while many studies have examined the rise in popularity of SNS, they were situated in largely national or monolingual cultures. Hence, the researchers seldom considered the impact of socio-spatial factors on digital inequality nor did they include the influence of students operating across different cultures and within multi-lingual environments. One of our assumptions was the medium used to facilitate the communication and collaboration between US and SA PSTs, the educational social networking site (SNS) Ning², would be an appropriate technological platform. This was based on the perception that the majority, if not all, the participants, could be considered

² <http://www.ning.com/>

as belonging to the so-called Y-Generation or the Facebook generation (Lichy, 2012). We do, however, acknowledge there are extensive limitations of assigning characteristics to whole generations of students. According to Lichy (2012), members of this 'generation' (born between 1976 and 1994) are described as being "multi-taskers, confident and team players" (p. 102), and, as such, the nature of the collaboration appeared to be well suited to the characteristics of the participants in this study. Lichy (2012) suggested as a result of the increasing popularity of SNSs, there is "perhaps an argument for integrating academic materials and e-learning platforms into social networks" (p. 103). A warning, sounded by Lichy (2012), was that at the time of her study there was little evidence to suggest students wanted to use SNSs in their academic work – possibly preferring to separate their social from their academic online activity. An anticipated future spin-off of our study is that, if the participants deemed it a positive experience, they may attempt to use SNSs for national and international collaboration in their future classes. Lichy (2012) suggests if one accepts 'generational' theory, then the Y-Generation, who it is suggested 'celebrate' diversity, may be better proponents of international collaboration than their X-generation predecessors, who are reported to merely 'accept diversity.' Encouraging for our study was that Lichy (2012) found "strong signs of converging Internet usage among Gen Y students (irrespective of the widespread claims of cultural difference)" (p. 104).

This study had the potential to address three of the specific features of effective learning environments suggested by Blumenfeld, Kempler and Krajcik (2006). These features were: First, authenticity, defined as "... meaningful problems create a 'need-to-know situation' to learn specific ideas and concepts and provide a reason to understand. They provide students with multiple opportunities to work with concepts, as the class keeps coming back to the driving question, the real world problem under study" (p. 479). Second, collaboration, and, lastly, technology, where "technology has motivational benefits as a 'hook' to get student participation. It also can help sustain interest and promote cognitive engagement" (Blumenfeld, Kempler & Krajcik, 2006, p. 484).

The Authentic Issue – Paper versus Plastic

The recently enacted United Nations Sustainable Development Goals (SDGs) (UN DESA, n.d.) highlights the complexity of the materials economy and the consequences of consumerism as humans extract raw materials from the earth and manufacture, distribute, consume, and dispose of goods. SDG 12 specifically targets the sustainable and responsible use of natural resources, human behaviors that directly and indirectly impact nearly all other SDGs and their targets (Le Blanc, 2015), especially those linked to poverty; the health of humans, other animals, and ecosystems; and climate change. In identifying a specific consumer good for our inquiry, single-use paper and plastic bags, we determined that a host of concepts could be readily addressed in our respective methods courses.

Sustainability issues and solution-focused pedagogies are predominant in US science and social studies curriculum standards. The Next Generation Science Standards (NGSS), for example, include the effects of human activities on the Earth and engage students in devising solutions to reduce negative impacts on living things in the local environment (NGSS Lead States, 2013). Some argue, however, that the NGSS

authors reduce sustainability to “a set of global problems affecting all humans equally and solvable through the application of science and technology” with little examination of the complex and nuanced social, cultural, and political dimensions related to sustainability issues and solutions (Kirchgasler & Weeth Feinstein, 2015, p. 121). For this reason, it is important to integrate sustainability in social studies education whereby students understand how intercultural contexts must be considered when devising solutions to complex problems (as the SDGs emphasize). Like in science, sustainability concepts and topics are naturally connected to the National Council for the Social Studies standards under strands like *culture; people, places, and environment; production, distribution, and consumption; and global connections* (NCSS, 2012). Integrating concepts across disciplines through the lens of sustainability can enhance relevance and connection to students’ lives (Muthersbaugh & Kern, 2012).

In the SA curriculum for Foundation Phase, the concept of environmental concern appears in the form stressing the “responsibility towards the environment” (DBE, 2011, p. 5) and “understanding the relationship between people and the environment” (DBE, 2011, p. 8). This policy document highlights the ways in which people pollute the environment and the importance of recycling (DBE, 2011, p. 20 & 56). From a basic human rights perspective, environment rights are enshrined in section 24 of the South African Constitution in that “Everyone has a right to an environment that is not harmful to their health and well-being (1996, p. 1251). This section of the constitution refers to the rights of future generations to a similar environment. With this in mind, South Africans have little choice, as the law, taking its cue from the constitution, requires all plastic bags to be ‘sold’ to the customer at a rate determined by legislation.

The guided inquiry model developed by Murdoch (2010) was chosen as the most appropriate to use as the context in which the participants would collaborate using an authentic environmental problem. The model with its six steps (tuning in, finding out, sorting out, going further, making conclusions and taking action) provided the inquiry cycle through which the environmental issue was addressed.

Research Design and Methodology

This study involved collaboration between a social studies teacher educator from the University of North Carolina Wilmington, and a science education lecturer at Nelson Mandela University. Following a review of our courses, we selected interdisciplinary topics that address concepts in both social studies and science. These were physical and cultural geography and humans’ impact on the environment.

Research Design

This qualitative study entailed an analysis of students’ perceptions before, during, and following an online exchange.

Research Questions

Research questions addressed by this study were:

1. What are US and South African preservice teachers’ (PSTs) perceptions of their respective countries and cultures before, during, and following an online collaborative research project?

2. Does engagement in international, online collaborative research projects impact PSTs' understanding of global issues and human cultures?
3. What opportunities and challenges surface during an e-learning project involving PSTs in two different countries and cultural contexts?

Participants

Participants ranged in ages between 21 and 35 (the overall median age was 21 years old, 22 and 21 for the US and SA participants, respectively). All were full-time students at either a US or SA university where they were studying towards becoming elementary (primary school) teachers. The 29 US participants (3 males, 26 females) were senior undergraduate students enrolled in a social studies methods course and taking a number of subject methods courses during the semester prior to their student teaching internship (school-based teaching practice). There were 76 female South African participants studying towards a four-year Bachelor of Education degree, specializing in Foundation Phase (FP) Studies (i.e., FP is Grades R – 3, children aged 4 to 9). Their course focused on natural science and geography.

Challenges

Our intercultural collaboration faced three primary challenges: participants' language skills; technology access; and learner motivation. As noted earlier (Swierczek & Bechter, 2010), language of communication plays a pivotal role in any online collaborative exercise. All US students were English-first language speakers. The SA participants were either English-first language speakers (n=37 or 50%) or proficient in English as a first additional language attending university where English is the language of teaching and learning (LoLT).

Any online collaboration remains heavily dependent on the availability and reliability of the technologies available to participants. The US students had consistently reliable, high-speed Internet access both on and off campus. While the technologies were available to the SA students, the ease of access to computers on-campus and the unreliability of connectivity off-campus mitigated against this being an effortless process.

A third factor that might influence the effectiveness of an e-learning collaboration is the role played by the instructor (Swierczek & Bechter, 2010). Being an exploratory study, where neither researcher nor students had engaged in this type of specifically focused academic activity before, we could not afford for the project to collapse due to student passivity. As such, both researchers, who were the primary lecturer for their respective groups, played a role in motivating, encouraging and cajoling their classes into continuing their participation in the study. The electronic platform supporting the study was Ning, and this was initiated and managed by the US researcher, while the SA researcher administered the use of the Learning Management System (LMS) Moodle.

Swierczek and Bechter's (2010) final factor involved the level of interaction required by the participants. In both the US and SA situations, the collaboration involved a small section of their overall course, and in addition to being voluntary, might not have been considered as 'high' stakes by many students.

Choice of Online Platform

Having earlier noted the extensive use of SNSs, such as Facebook, among students, a choice had to be made of a suitable platform on which to situate the study. Lichy (2012) suggested it “could be problematic to separate social side (of SNS) from academic materials” (p. 112) and as such we accepted Lichy’s (2012) recommendation that it might be more profitable to use an independent pedagogical platform when using SNSs for academic work. We thus chose Ning as the independent SNS platform.

Procedures

Both the US and SA courses were delivered using a face-to-face format; however, due to the time difference, communication between groups was asynchronous. Using the Ning site, participating students were randomly placed in research teams of between 8-12 students. Working from within these groups, individual students posted in the forum according to prompts and deadlines set forth by the respective instructors. Discussions related to course lectures and readings on environmental issues were emphasized in both the US and SA courses.

Phases of the Research

This study followed a similar method to that of Kerlin et al. (2013) where instructional units were designed to enable shared goals and activities between different members of the Ning groups. The phases of the research were separated out into a number of activities (see Table 2).

Table 2: Research Phases by Activity

Week	Activity
Week 1	Online pre-assessment of partnership country.
Week 2	Students joined Ning site, creating a profile with brief biography and posting a photograph. Students were randomly assigned to a small group.
Week 3	Online pre-assessment of environmental issues. Discussion focus on culture with sample prompts: <i>What describes the important elements of my culture? How do we celebrate these elements? What describes me?</i>
Week 4	Discussion focus on geography with sample prompts: <i>What is special about where I live? What activities are popular in my area due to the environment and climate?</i>
Week 5	Discussion focus on environmental issues with sample prompts: <i>What are contemporary environmental concerns in my coastal area? What are people doing to solve these issues?</i>
Weeks 6-8	Student inquiries begin on the specific issue of single-use, disposable bags. Students posted their beginning research on plastic production, consumption, and disposal.
Week 9	Inquiry culminates as students decide how they can “take action.”
Week 10	Online post-assessment of how participation in an international, online collaborative research projects impacted students’ understanding of global issues and human cultures.

Data Analysis

Students' open-ended responses were coded through categorical analysis. In the categorical analysis process, we used the comparative analysis step-by-step procedure to code the collected data. We compiled students' written responses and used a unit of analysis consisting of a whole thought so the data will be categorized as they emerge from the actual analysis of the written responses. This process permitted the identification of similarities and differences among the data collected.

Results and Discussion

The data generated are presented and discussed in three sections, approximating the study's research questions: first, participant PSTs' perceptions of their respective countries and cultures, second, the efficacy of participating in international, online collaborative research projects on PSTs' understanding of global issues and human cultures is presented, and finally the opportunities and challenges that surfaced during this e-learning project are considered.

Participants' Perceptions of Culture

Responses to the prompt question, *What do you know about your partner country's cultural/human features, geography/natural features and history/politics?* raised a number of ideas and thoughts. What follows is a small cross section of many diverse responses.

Cultural/human features. Reference to the languages spoken in the partner country came from both groups of students. The US students referred to many languages, including English, spoken in South Africa, whereas the SA students perceived English as the main language spoken in the US. US students saw SA as the "richest and most Americanised country in Africa," with both dark-skinned and white people who are big soccer fans. Lending possible credence to the US students' perception of SA as being Americanised, the SA participants tended to base their perceptions on American films and TV, e.g. "Hollywood is really important to Americans," "Teenagers from the US appear to be spoilt and yet more mature."

Geographic/natural features. US students perceived South Africa as a large country with "big areas of forests and large gaps between cities." There was also reference to diversity of flora, fauna and safaris. Interestingly was the reference to limited resources (e.g., "not everyone has clean water"). The SA students' perceptions of US geography were rather limited, revolving around the weather ("not moderate throughout the country") and the Grand Canyon.

History/politics, and current events. Not surprisingly, US students' perceptions of SA history, politics, and current events focused on Apartheid, Nelson Mandela, and HIV and AIDS. Poverty was another theme, with a perception of a "big gap between the 'haves' and 'have nots' based on race." The SA students' perceptions of the US were also dominated by specific events, likely influenced by the media, such as 9/11, "a lot of debt," the death penalty, and "is heavily involved in wars."

One US student, in talking about culture, summed up what appeared to be a theme running through many participants' posts to the question of "*What is culture?*" This student wrote:

What describes the important elements of my culture? I thought about this question long and hard before I started to write. I feel that because everyone is diverse and different, every culture will reflect upon those differences, but in the same aspects share similarities. I believe that health, education, faith, and religion and security and love are common aspects of any culture. I feel that education, family, and love are important elements of my culture. In my culture family is by far the most important element. I feel that family is the rock we stand on.

This theme of family, love, and faith appeared in posts of many US and SA participants. It might be insightful here to remember all the participants were taking courses to prepare them to be teachers of young children, so it might not be surprising they appeared to base their views of culture on values, and on these particular humanizing values.

In addition to open-ended questions, we asked students to identify what sources or experiences informed their perceptions of their partner country (Table 3).

Table 3: Survey 1 response summary. What informed your understanding of your partnership country?

	American Participants	South African Participants
General public 'spaces' e.g. read books, web links, TV programs, movies, visited museums or cultural centers.	59% (n=17)	84% (n=37)
Interacted personally with a citizen of the partner country.	45% (n=13)	41% (n=18)
Interacted by other means (e.g. online) with a citizen of the partner country.	0% (n=0)	9% (n=4)
Taken academic courses on the other country.	0% (n=0)	5% (n=2)
Travelled to the partner country.	0% (n=0)	7% (n=3)

The Efficacy of International e-Learning Collaboration on Understanding Culture and Global Issues

One opportunity a study like this provided was that students were able to engage in a dialogue of sorts, and in the process had a couple of "ah ha" moments. The following snippet of an exchange between a SA and US student is given as an example.

SA Student: Well in South Africa, I form part of a racial group known as 'coloured'. Unlike in the States, this is not a derogatory term, it is merely a racial classification...I describe myself as a South African. One who is not only colourful, but accepting of everyone. One who does not discriminate. One who loves this country and being who I am in it! I love this Rainbow Nation.

US student: Your post was very enlightening to me and it appears that South Africa is extremely culturally rich and values that culture highly. I really like what you said about being colored and how it is not a derogatory word over there. I really wish it was the same way in America but sadly I feel like a lot of people in

American cannot get over the past and continue to let the color of their skin dictate how they see themselves and others. Hopefully, Americans will one day get to where it sounds like South Africans already are.

SA student: Don't get me wrong, there are many people in South Africa who also cannot get over issues of the past, but there are so many positive optimistic people who are making this country great. It's so funny reading about you, because I am 27, also engaged trying to plan a wedding, and also tutoring a little boy 4 days a week, then working part time on the weekends at a Beauty Store to pay for my needs. Wow, what similarities.

The choice of environmental problem in this study was fairly arbitrary, the paper versus plastic bag debate, and while the students' comments on addressing this issue using the Murdoch Inquiry Cycle (2010) is interesting, we focus here on participants comments with respect to the process of the online learning exercise itself. Responses to the prompt question (what the participants wanted to learn) raised a number of questions indicating students might be able to access answers from their partners, e.g. *"Why don't people in the USA pay for plastic bags and why doesn't SA use brown bags rather?" "Has this idea been brought up in SA?"* In response to the prompt question about what they had learned, common responses were similar to *"Every country has its own environmental issues"; "I learnt that people in other parts of the world struggle with the same problems as we do in South Africa."*

Taking part in this study dispelled some participants' initial perceptions. Two US participants commented:

Student A: As narrow-minded as this sounds, I never thought of South African students when picturing different teachers around the world. I've always seen American teachers, the stereotypical intelligent Asian teacher, European teachers (which I pictured exactly like American teachers), etc. but I'd never thought about students just like me living in South Africa.

Student B: I had such a wrong image in my head of what South African people were like. There was only one girl who regularly posted in the Ning group I was in, but just by hearing from her, I was able to see that my pre-perceptions were completely off and we were much more alike than different.

Opportunities and Challenges Presented by International e-Learning Collaboration

This study is dependent on online participation and any reticence on the part of participants to participate begs the question as to their reasons for non-participation. Table 4 shows the participation rates in the two initial surveys as well as the data concerning the number of days enrolled on the Ning site.

Table 4: Participation on Ning

	US Participants	South African Participants
Completion rate Survey 1 (prior knowledge and perceptions of their partner country).	100% (n=29)	61% (n=44)
Completion rate Survey 2 (prior knowledge and perceptions of the environmental issues).	100% (n=29)	50% (n=36)
Number of days elapsed between first and last and last visit to the Ning site		
Never joined the Ning site	0% (n=0)	17% (n=12)
One day only (of those that joined the site)	0% (n=0)	25% (n=15)
Max number of days	75 days	55 days
Average number of days for those who did join from a country	52 days	14 days
Median number of days	54 days	11 days

Participants' post-survey responses suggest the two groups had contrasting views of the user-friendliness of the Ning site. The US students did not report any frustration with the platform itself, whereas several SA students expressed difficulty logging in and navigating the site (which may account for their lower level of involvement in contrast to the US group). Access to Internet would appear to be one of the issues limiting SA students in this type of online collaboration, as a problem also noted by Lichy (2012) and in Buchanan, Wilson, and Gopal's (2008) study of using a virtual learning environment with UK, USA and SA participants. Research of Internet behavior suggests different cultures perceive websites differently, often resulting in confusion and misinterpretation (Würtz, 2004).

Further, cultural features, such as high uncertainty avoidance and high power distance are correlated with low usage and adoption of ICT (Swierczek & Bechter, 2010). The nature of many of the prompts in this study were open-ended, which may have resulted in lack of participation by some SA students. As suggested by Swierczek and Bechter (2010), "open-ended participative approaches don't work well in cultures with high uncertainty avoidance" (p. 294).

High power distance could be linked to the instructor (responsible faculty member or lecturer). Ascription or status-orientated cultures expect more instructor or authority-based learning approaches. Feedback for individual achievement is required to be direct, neutral and fact based. For community-orientated cultures, the feedback is likely to be indirect and emotional (Edmundson, 2007).

Student Feedback on the Shared Experience

Participants were asked to reflect on the project. This was a time of self-reflection for us not only as managers, but also as 'participants' in the study. Dale and Lane (cited in Mogus, Djurdjevic, & Suvak, 2012) suggest students' use of online discussion forums are enhanced by positive and constructive feedback through the lecturer. Both student groups suggested having synchronous interactions (e.g., via Skype) would have added value; however, they did acknowledge the limitations of available technology (SA side) and time-zone difference. It was also suggested the topic of interest might have been decided upon by the participants themselves as they needed to 'see' how it fitted into their courses. Students also suggested the experience should be mandatory and weighted more heavily with respect to grades. One SA student remarked, "*There was no flaw in the design, but rather execution, as people did not have a vested interest in it, as the mark allocation was minimal.*" Having said this about the design, there was also a strong sense the prompt questions should have been there to promote shorter and less extensive responses and thus promoting a more conversational style. Some suggestions were made for more lecturer input and interactions on the Ning site.

The SA lecturer, who might be considered a digital immigrant (Prensky, 2001) played peripheral role in interacting on the Ning site, whereas the US faculty, who might be considered as more of a digital native, drove the process and provided substantial comment and feedback on the Ning site. Lecturers need constantly to get involved in the online site, as this might well improve the students' learning experience and consequently the quality of the interaction. The SA students, in their evaluation of project, commented this section of their course was weighted too low; had it counted more toward their overall course average, they might have put in more effort and increased their participation.

Conclusions

Lichy (2012) reminds us that Internet user behavior is constantly evolving: "As soon as research is published, the findings are often out of date, owing to the dynamic speed of change in technology and the way in which people use the technology" (p. 105). In this study we made assumptions about the students' online behavior and if we could have understood this better, we might have designed the activities a bit differently. For instance, we may have taken their preferences into account, as how one designs virtual learning environments impacts the nature and quality of learning (Mogus et al., 2012). Like face-to-face instruction, e-learning experiences require an alignment of objectives to learning activities that consider students' interests and needs (Stavredes & Herder, 2013). Finally, because intercultural competence occurs developmentally over time, effective intercultural learning experiences must be designed within the students' broader higher education programs in stage-appropriate ways (Cushner, 2014). While one experience, be it a semester study abroad or a technology-based collaboration, will not radically develop an individual's intercultural competence, we agree with the potential and power of relationship-based learning. As Cushner (2014) so aptly stated:

My own experience suggests that teacher education students, the majority of whom come into the field having limited experiences in cultural contexts different from their own and usually an unexamined understanding of the power

differentials in modern society, can become inspired, enriched, motivated, and capable of engaging in meaningful educational endeavors with a variety of children, families, and communities after participating in an array of strategic, structured, and focused experiences that allow time for developing a sense of comfort, trust, and rapport-building with others. (p. 160)

References

- Bennett, J. M. 2008. Transformative training: Designing programs for culture learning. In M. A. Moodian (Ed.), *Contemporary leadership and intercultural competence: Understanding and utilizing cultural diversity to build successful organizations*, pp. 95-110. Thousand Oaks, CA: Sage.
- Blumenfeld, P. C., Kempler, T. M., & Krajcik, J. S. (2006). Motivation and cognitive engagement in learning environments. In K. R. Sawyer (Ed.), *The Cambridge handbook of the learning sciences*. New York, NY: Cambridge University Press.
- Buchanan, J. Wilson, S. T. & Gopal, N. (2008). A cross cultural virtual learning environment for students to explore the issue of racism: A case study involving the UK, USA and SA. *Social Work Education*, 27(6), 671-682.
- Chang, T. T. & Lim J. (2002). Cross-cultural communication and social presence in asynchronous learning processes. *e-Service Journal*, 1(3), 83-105
- Chong, E. K. M. (2015). Global citizenship education and Hong Kong's secondary school curriculum guidelines: From learning about rights and understanding responsibility to challenging inequality. *Asian Education and Development Studies*, 4(2), 221-247.
- Constitution of the Republic of South Africa. (1996). Pretoria: Government Printers.
- The Council of Chief State School Officers (CCSSO). (2006). *Global education policy statement*. Retrieved from http://www.ccsso.org/Documents/2006/Global_Education_Policy_statement_2006.pdf
- Cushner, K., & Mahon, J. (2009). Developing the intercultural competence of educators and their students: Creating the blueprints. In D. D. Deardorff (Ed.), *The SAGE handbook of intercultural competence* (pp. 304-320). Thousand Oaks, CA: SAGE Publications, Inc.
- Cushner, K. (2014). Strategies for enhancing intercultural competence across the teacher education curriculum. In J. Phillion, S. Sharma and J. Rahatzad (Eds.), *Internationalizing teacher education for social justice: Theory, research, and practice* (pp. 139-162). Charlotte, NC: Information Age Publishing, Inc.
- Department of Basic Education DBE, (2011). *Curriculum and assessment policy statement (CAPS): Grades R-3: Life skills*. Pretoria: Government Printers.
- Edmundson, A. (2007). The cultural adaptation process (CAP) model: Designing e-learning for another culture. In A. Edmundson (Ed.), *Global e-learning: Cultural challenges*. Hershey: Information Systems Publishing.
- Hammer, M. R. (2010). *The Intercultural Development Inventory manual*. Berlin, MD: IDI.
- Hammer, M. R. (2012). The Intercultural Development Inventory: A new frontier in assessment and development of intercultural competence. In M. Vande Berg, R.M. Paige, & K.H. Lou (Eds.), *Student learning abroad* (Ch. 5, pp. 115-136). Sterling, VA: Stylus Publishing.
- Izadi, P. (2012). World citizenship as an historical imperative: Should global education be a compulsory element in teacher training? *International Journal of Global Education*, 1(1), 75-82.

- Kerlin, S. C., Carlsen, W. S., Kelly, G. J. & Goehring, E. (2013). Global learning communities: A comparison of online domestic and international science class participation. *Journal of Science Education and Technology*, 22(4), 475-487.
- Kim, S., Choi, S.Y. & Kim, K. (2013). Web-based collaborative global learning from diverse cultural backgrounds. In T. Bastiaens & G. Marks (Eds.), *Proceedings of e-learn 2013: World conference on e-learning in corporate, government, healthcare, and higher Education* (pp. 1965-1970). Las Vegas, NV, USA: Association for the Advancement of Computing in Education (AACE). Retrieved from <https://www.learntechlib.org/primary/p/115167/>.
- Kirchgasler, K. L., & Weeth Feinstein, N. (2015). Sustainability in science education? How the Next Generation Science Standards approach sustainability, and why it matters. *Science Education*, 99(1), 121-144.
- Kissock, C. & Richardson, P. (2010). Calling for action within the teaching profession: It is time to internationalize teacher education. *Teaching Education*, 21(1), 89-101.
- Ladson-Billings, G. (2017). The (R)Evolution will not be standardized: Teacher education, hip hop pedagogy, and culturally relevant pedagogy 2.0. In D. Paris & H.S. Alim, (Eds.), *Culturally Sustaining Pedagogies: Teaching and Learning for Justice in a Changing World* (pp. 141-156). New York; London: Teachers College Press.
- Le Blanc, D. (2015). Towards integration at last? The Sustainable Development Goals as a network of targets. (DESA Working Paper No. 141). Retrieved from the Department of Economic & Social Affairs site: http://www.un.org/esa/desa/papers/2015/wp141_2015.pdf
- Lichy, J. (2012). Towards an international culture: Gen Y students and SNS? *Active Learning in Higher Education*, 13(2), 101–116.
- Longview Foundation. (2008). *Teacher preparation for the global age: The imperative for change*. Silver Spring, MD: Author.
- Mogus, A. M., Djurdjevic, I. & Suvak, N. (2012). The impact of student activity in a virtual learning environment on their final mark. *Active Learning in Higher Education*, 13(3), 177-189.
- Murdoch, K. (2010). Murdoch model for inquiry. Retrieved from <http://www.kathmurdoch.com.au/>
- Muthersbaugh, D., & Kern, A. (2012). Pre-service teachers' use of images in integrating environmental sustainability lessons. *Journal of Teacher Education for Sustainability*, 14, 67-79.
- National Council for the Social Studies. (2012). National curriculum standards for social studies. Retrieved from <http://www.socialstudies.org/standards/strands>
- NGSS Lead States. (2013). *Next Generation Science Standards: For states, by states*. Washington, DC: The National Academies Press.
- Organisation for Economic Co-operation and Development (OECD). 2018. Preparing our youth for an inclusive and sustainable world: The OECD PISA global competence framework. Retrieved from <https://www.oecd.org/education/Global-competency-for-an-inclusive-world.pdf>
- Prensky, M. (2001). Digital natives, digital immigrants Part 1. *On the Horizon*, 9(5), 1-6.
- Reimers, F. M. (2009). Global competency: Educating the world. *Harvard International Review*, 30(4), 24-27.
- Reimers, K., & McLean, L. R. (2009). Conceptual clarity and connections: Global education and teacher candidates. *Canadian Journal of Education*, 32(4), 903-926.
- Stavredes, T., & Herder, T. (2013). *A guide to online course design: Strategies for student success*. San Francisco: John Wiley & Sons.

- Swierczek, F. W., & Bechter, C. (2010). Cultural features of e-learning. In M. Spector, D. Ifenthaler, & Kinshuk (Eds.), *Learning and instruction in the digital age* (pp. 291-308). Springer US.
- United Nations Department of Economic and Social Affairs (UN DESA). (n.d.). Sustainable Development Goals. Retrieved from <https://sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals>
- van Oord, L. & Corn, K. (2013). Learning to 'swallow the world': Engaging with human difference in culturally diverse classrooms. *Journal of Research in Cultural Education*, 12(1), 22-32.
- Würtz, E. (2004). Intercultural communication on websites: An analysis of visual communication of high- and low-context cultures. In Sudweeks & Ess (Eds.), *Proceedings of the Fourth International Conference on Cultural Attitudes towards Technology and Communication*. (pp. 109–122). Murdoch, Western Australia: Murdoch University.
- Zhao, Y. (2010). Preparing globally competent teachers: A new imperative for teacher education. *Journal of Teacher Education*, 61(5), 422–431.