ARTICLE

Integrating the United Nations' Sustainable Development Goals: Developing content for virtual exchanges

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Abstract

The United Nations' Sustainable Development Goals (SDGs), which were adopted in 2015 as part of the 2030 Agenda for Sustainable Development, "provide a shared blueprint for peace and prosperity for people and the planet" (United Nations, 2020a). The SDGs, which include gender equality, quality education, and ending poverty, are those objectives that must be met by all countries "in a global partnership" (United Nations, 2020a). With the 2030 Agenda in mind, this Virtual Exchange (VE) study reveals learners in different geographical locations who are partnered with one another via technology can benefit from the embedding of SDG content into their VE (Dooly, 2017; Forward et al., 2020). This article focuses on two parallel, but separate, Synchronous Computer-Mediated Communication (SCMC) six-week VEs. Teacher trainees from a university in the United States were partnered with other teacher trainees from a university in Poland and/or Colombia. In another cohort, second language (L2) learners of Spanish from a university in the United States were partnered with those from a university in Poland. In each of these groupings, participants completed SCMC sessions via Zoom and discussed the SDGs. Qualitative and quantitative data reveal that awareness of these universal objectives increased and afforded them new perspectives. By using a culturally sensitive lens, teacher trainees developed teaching strategies and L2 learners increased their intercultural competence. These results suggest that integrating SDG content into virtual exchange can support the United Nations' 2030 Agenda and can make a contribution to the field of VE.

Keywords: *Virtual Exchange, Sustainable Development Goals, United Nations, Videoconferencing*

Language(s) Learned in This Study: *English, Spanish*

Introduction

The digital transformation of education has changed the ways in which students and teachers obtain knowledge (Adams Becker et al., 2017). Because of this, equipping students with language and intercultural skills (Partnership for 21st Century Skills, 2011) is crucial for preparing them to be 21st century learners (Rubin & Guth, 2015). In and out of the classroom, value-added technology applications (Lenkaitis, 2019a, 2020a) can support learning and teaching (Lenkaitis, 2019b).

Through Virtual Exchange (VE), parallel learners in different geographical locations and cultural contexts are partnered with one another via technology (Belz, 2003; Dooly, 2017; O'Dowd, 2018). Learners can be connected through asynchronous (non-real-time) and Synchronous (real-time) Computer-Mediated Communication (SCMC). Originally coined as telecollaboration by Warschauer (1996), and also known as Online Intercultural Exchanges (OIE) and teletandem (O'Dowd, 2018), VE has shown that when learners interact with an international partner, it provides many affordances: learner autonomy (Fuchs et al., 2012; Guth & Helm, 2010), global awareness development (Lenkaitis et al., 2019c), and language and culture skill development (Guarda, 2013; Helm & Guth, 2010; Helm et al., 2012). Although Computer Assisted Language Learning (CALL) has supported rich interaction amongst learners and utilized a variety of foci,

from daily life (El-Hariri, 2016), such as food, to macro topics (Lenkaitis & Loranc-Paszylk, 2019b) such as natural disasters, the purpose of this article is to show that VE should include the topics from the United Nations' Sustainable Development Goals (SDGs).

This article centers on two parallel, but separated, SDG-focused SCMC-based VEs that partnered second language (L2) and teacher trainee participants for six weeks. A systematic alignment of VE with the SDGs could prepare students to address world challenges in the future. In addition, it also fills a gap in existing VE research, since the integration of SDGs in VE is limited (Bruun, 2018; Fors & Lennerfors, 2020; Forward et al., 2020; Garcia-Esteban, 2020) at the time of writing this piece (2020). By examining the ways that SDGs can ignite conversations for participants in VE, this study argues that having an SDG-focused VE can offer opportunities to develop a critically sensitive lens to examine issues such as climate change, gender equality, and poverty. In the next section, the literature relating to the SDGs and VE will be discussed.

Literature Review

United Nations' Sustainable Development Goals

The United Nations' Sustainable Development Goals (SDGs) were adopted by its Member States in 2015 as part of the 2030 Agenda for Sustainable Development. This agenda provides "a blueprint for shared prosperity in a sustainable world – a world where all people can live productive, vibrant, and peaceful lives on a healthy planet" (United Nations, 2019, p. 2). The SDGs are the objectives that should be met by every country so that the world can be transformed and the conditions for all humankind can be improved. "More important than ever, the goals provide a critical framework for COVID-19 recovery" (United Nations, 2020b, para. 1). There are 17 SDGs in total, which include but are not limited to ending poverty, gender equality, and quality education. See Figure 1 for all SDGs.

Figure 1

United Nations' Sustainable Development Goals (SDGs) [1]

As previously mentioned, at the time of writing this piece (2020), there was a limited number of published studies on VEs with an SDG focus (Bruun, 2018; Fors & Lennerfors, 2020; Garcia-Esteban, 2020). Bruun's (2018) 7-week VE centered around SDG #14, where students in Tanzania and Sweden discussed and proposed solutions for how to reduce the amount of plastic pollution. In Fors and Lennerfors (2020), the authors' discuss the need to focus on global issues in VE. According to Garcia-Esteban (2020), working

with SDGs in telecollaboration increased teacher trainee participants' civic competence, since working with the SDGs allowed participants to achieve "a better understanding of world views, norms and values" (p. 59). There is also a foundation for VE projects using SDG goals, such as the one discussed at the 2020 International Virtual Exchange Conference (IVEC). In this IVEC presentation, participants were partnered with non-governmental organizations and focused on SDGs and worked together to take SDG-related action (Forward et al., 2020).

Virtual Exchange (VE)

According to Dooly and O'Dowd (2018), telecollaboration, now commonly referred to as VE, has been part of education "for at least a century, if not more (depending on how you categorize it)" (p. 11). For instance, partnering students with an international pen pal has existed since the 1920s and collaboration between classes in geographically different locations took place "as far back as the late 1800s and early 1900s" (Dooly & O'Dowd, 2018, p. 12). However, these exchanges evolved with the ability to utilize computers in the 1990s. It was in this decade, when pioneers such as Kern (1996), Brammerts (1996), Johnson (1996), and Warschauer (1996), began utilzing telecollaboration. Although the term telecollaboration has evolved since the 1990s to VE, VE can also be referred in other ways, including Collaborative Online International Learning (COIL) (Rubin, 2016), Online Intercultural Exchange (OIE) (O'Dowd, 2007), and teletandem (O'Dowd, 2018).

Synchronous Computer-Mediated Communication (SCMC) Virtual Exchange (VE)

VE can occur in a variety of contexts. SCMC VEs have been realized through videoconferencing tools such as Skype (Terhune, 2016) and Zoom (Lenkaitis, 2020b). Regardless of the tools used, VE has proven to deepen participants' understanding of language and culture (Belz, 2003; Helm & Guth, 2010). In many cases, light topics such as school and food were initially the foci of VE. However, recently the direction of VE has been evolving to focus on richer topics such as SDGs (Bruun, 2018; Forward et al., 2020; Fors & Lennerfors, 2020; Garcia-Esteban, 2020) and "cultural, societal, and academic topics" (Lenkaitis, 2020e, p. 76). By integrating cross-cultural interaction through VE, learners were able to explore cultural, societal, and academic topics for the 21st century (Partnership for 21st Century Skills, 2011).

SCMC, which utilizes videoconferencing (Develotte et al., 2008; Guichon, 2017), has allowed for exchanges to take place that closely resemble face-to-face (F2F) communication where learners have become "agents" (Lantolf & Pavlenko, 2000, p. 162) of their learning as a "virtual co-presence" (de Fornel, 1996, p. 50) is created. Technology has afforded collaborative opportunities for a variety of subject areas, including L2 (Lenkaitis, 2020d) and teacher preparation (Lenkaitis, 2020b) in SCMC VEs. Not only has utilizing technology been beneficial to L2 learner proficiency (Lenkaitis, 2020d), but it has also allowed teacher trainees to bridge theory into practice (Turunen & Tuovila, 2012; Yuan, 2018) when they reflect on their VE (Lenkaitis, 2020c).

A common thread in research on VE for teacher preparation has shown that teacher trainees have developed the ability to link theory and practice, and in turn, develop strategies for their classrooms. Therefore, teacher cognition, "what teachers know, believe, and think" (Borg, 2003, p. 81), goes hand-in-hand with teacher reflection and can be used synonymously. Although cognition is linked to reflection, in this article, just as in Lenkaitis (2020c), reflection will be defined as "a self-critical, exploratory process through which teachers 'consider the effect of their pedagogical decisions on their situated practice with the aim of improving those practices'" (Tripp & Rich, 2012, as cited in Walshe & Driver, 2019, p. 678). Reflection is beneficial to self- and professional development (Maaranen & Stenberg, 2017). Because the "practicum", or student teaching, is considered the most crucial part of teacher preparation programs (Clarke et al., 2014), it is important to consider opportunities (Nelson et al., 2016) where teacher trainees can bridge theory into practice through VE.

Integrating technology-mediated activities into the L2 learning and teaching processes, SCMC has facilitated a collaborative and autonomous learning environment (Lewis et al., 2017; Reinders & White, 2016), which has connected students and allowed them to practice their L2 skills. Through VE, teacher

trainees have worked together to co-produce teaching materials (Dooly & Sadler, 2013) and reflect on learning and teaching in relation to technology (Zhang et al., 2016). Language teacher trainees have also worked with learners of their content area via VE (Lenkaitis, 2020c). In Lenkaitis (2020c), by watching recorded SCMC VE sessions, teacher trainees were able to reflect on the errors of their learners and on their (the trainees') teaching techniques in order to develop their teaching approaches.

Regardless of the subject area, integrating structured and open-ended activities (Lee, 2016) into SCMC VE supports VE participants while they navigate the unknown virtual environment (Hauck, 2018; Thorne et al., 2015). The next section will discuss VE task design.

Virtual Exchange (VE) Task Design

Traditionally used as a VE framework, Task-Based Language Teaching (TBLT) (González-Lloret & Ortega, 2014) holds the task as the central unit (Dooly, 2017). There is a total of twelve different task types in VEs (O'Dowd and Ware, 2009), which can be categorized into one of three groups: (a) information exchange tasks, (b) comparison and analysis tasks, or (c) collaborative tasks. As the name denotes, information exchange tasks require the exchange of information, while partners compare and analyze cultural artifacts in comparison and analysis tasks. Collaborative tasks require partners to work together to complete a final project and prepare for this collaboration by working through information exchange and comparison and analysis tasks first.

In addition to the three task categories, each task can be sequenced into three stages (Belz, 2002; Müller-Hartmann, 2007; O'Dowd & Ware, 2009): introductory, comparative, and negotiated. Each of which can be broken down into "a 3-step cycle: pre-task, task, post-task" (Helm & Guth, 2010, p. 22). Learners get to know their partners by means of a cultural artifact in the introductory stage. In the comparative stage, learners make comparisons between their culture and/or language and those of their partners, while in the negotiated stage, learners create an individual or group reflective project based on what was negotiated.

For instance, the VE task design in Lenkaitis (2020e) provided "'a cultural and language learning experience'" (p.75) as L2 learners deepened their insight into cultures other than their own and observed "'different perspectives about current themes'" (Lenkaitis, 2020e, p. 76). Participants developed their intercultural competence, that is, they were able to improve how to appropriately interact with another person from another country (Bennett & Bennett, 2004; Byram, 1997). There are a variety of intercultural competence frameworks (Schulz, 2007; Stemler et al., 2014). The most influential is that of Byram (1997). In his seminal work, he noted the following five components: (a) Knowledge, (b) Skills to interpret and relate, (c) Education, (d) Skills to discover and interact, and (e) Attitudes, which provided the basis of the most agreed upon definition of intercultural competence (Deardorff, 2006). This definition states that intercultural competence is "knowledge of others; knowledge of self, skills to interpret and relate; skills to discover and/or to interact; valuing other's values, beliefs, and behaviors; and relativizing one's self. Linguistic competence plays a key role" (Byram, 1997, p. 34).[2]

Research Questions

Due to the lack of research on utilizing SDGs in VE, this study explores ways in which L2 learner and teacher trainee participants are able to develop a critically sensitive lens, utilizing the SDGS to reflect on global issues, when participating in a VE that integrated the United Nations' SDGs. Therefore, this study will answer the following research questions (RQs):

RQ1 - How does participating in a SDG-focused SCMC-based VE affect participants' awareness of the SDGs?

RQ2 - How does participating in a SDG-focused SCMC-based VE provide participants the opportunity to create a critically sensitive lens in order to look at global issues?

Methods

Participants

The focus of this study are two parallel but separate VEs. Each VE was a required part of the coursework. The 55 participants of this study, who made up 24 groups, consented to have their data shared and be involved in this study. The teacher from the university in the United States for both the L2 and teacher trainee VEs was the author of this article.

One VE partnered teacher trainees from a university in the United States with at least an intermediate level of English proficiency with those from a university in Poland and/or Colombia. In this teacher trainee VE, there was a total of 18 students, all of whom were preparing to be L2 teachers. The average age of these teacher trainee participants was 23.39 years ($SD = 6.49$).

The other VE partnered intermediate L2 learners of Spanish from a university in the United States with those from a university in Poland and/or Colombia.[3] In this L2 VE, there were 37 students, all of whom were majoring in various disciplines. The average age of these L2 participants was 21.62 years ($SD = 5.14$).

Procedures

The language used for the VEs was based on the language of instruction. Since the teacher trainee courses were carried out in English, all VE activities for teacher trainees were completed in English. For the L2 learners, the course was taught in Spanish, so all VE activities were completed in Spanish.

Participants video conferenced via Zoom with their partner(s) for at least 15 minutes weekly for six weeks. During Weeks 1–6, participants were given instructions of what to accomplish with their partner(s) during the SCMC sessions, which was grounded in TBLT (González-Lloret & Ortega, 2014) and included tasks from each category type (O'Dowd & Ware, 2009). Table 1 outlines VE weekly procedures as related to O'Dowd and Ware (2009).

In addition to reviewing Zoom sessions to ensure that participants followed the instructions of the VE, participants completed surveys both before and after the VE. These surveys included the following Likert-scale questions:

1) Using the scale below, how relevant are the SDGs to your culture?

   1 - 0%; 2 - 25%; 3 - 50%; 4 - 75%, 5 - 100%

2) Using the scale below, how relevant are the SDGs to your learning?

   1 - 0%; 2 - 25%; 3 - 50%; 4 - 75%, 5 - 100%

3) Using the scale below, in your opinion, what is your knowledge about the SDGs?

   1 - 0%; 2 - 25%; 3 - 50%; 4 - 75%, 5 - 100%

Finally, the post-survey also included the following open-ended question: Please explain the general relevance and importance of the SDGs to you.

Table 1

VE Weekly Tasks as per O'Dowd & Ware (2009)

Week(s)	Procedure	Task Type
1	After completing introductions, participants needed to exchange information on the SDGs to agree upon their top four SDGs out of the seventeen with their partner(s) during their Zoom session.	Information task
2–5	Each of the agreed upon top four SDGs were the weekly topics for these four weeks. During each of their Zoom sessions, participants needed to discuss the week's SDG, make comparisons between how each participant viewed the importance of the SDG, and analyze how they could be realized.	Comparison and analysis task
6	Participants needed to collaborate on a final activity in their group during their Zoom session on Google Slides. In this activity, the group needed to discuss the chosen top four SDGs. More specifically, the group needed to create a list of short- and long-term actionable items that they could do to reach the SDGs. Finally, they were to reflect on their SDG-focused SCMC-based VE experience.	Collaborative task

Data Analysis

Quantitative Data

Statistical analyses were completed using IBM SPSS Statistics 27.0 for quantitative data. Descriptive statistics were run on Likert-scale questions as well as paired sample t-tests on pre- and post-survey Likert scale questions to compare means.

Qualitative Data

Word frequencies were completed to determine the most frequent words used in qualitative data (open-ended participant responses). From these frequencies, coding categories emerged. All qualitative data was

then independently analyzed by the same two coders using NVivo 12. Input was coded into instances of phrase(s) or sentence(s) (Bohinski[4] & Leventhal, 2015) as "development is not quantified by a specific word count" (Lenkaitis et al., 2019a, p. 9). This means that one open-ended response could have been coded using more than one theme as each was mutually exclusive. After data was coded independently, the two coders worked together to reach a 100% agreement and choose the most representative examples to use for reporting purposes. For data collected in Spanish, English translations, which were completed by the author before coding, are given throughout the article. All results will be detailed in the next section.

Results

Top Four SDGs

During Week 1, the 24 groups chose their top four SDGs. Some of the same SDGs were chosen across partnerships. The Appendix details the chosen top four SDGs for groups through a series of bar graphs. Out of the 96 responses across all 24 groups, the four SDGs that were chosen most frequently were: *Quality education*, *No poverty*, *Good health and well-being*, and *Climate action*.

Pre- and Post-surveys

Likert-scale Questions

Results of the questions, which ask the participants to self-rate the relevance of the SDGs to their culture, learning, and knowledge of the SDGS, all showed an increase. After completing paired sample t-tests to compare means from pre- to post-surveys, a significant difference was found for the participants' knowledge of the SDGs ($t(41)$[5] = -6.06, p = 0.000). Furthermore, Cohen's d was used to calculate effect size (d = 1.18) and was found to meet Cohen's (1969) guidelines for a large effect ($d \sim 0.80$). Table 2 details the means and standard deviations for all three Likert-scale questions on the pre- and post-surveys.

Table 2

Means and Standard Deviations for Pre- and Post-survey Likert-scale Questions

Survey	Mean[5]			Standard Deviation		
	Culture	Learning	Knowledge	Culture	Learning	Knowledge
Pre-survey	3.88	4.40	2.79	0.99	0.86	1.12
Post-survey	4.19	4.62	3.95	0.92	0.66	0.83

Open-ended Question

Upon analyzing the open-ended post-survey question and completing word frequencies via NVivo 12 on the open-ended question "Please explain the relevance and importance of the SDGs," the following four themes emerged from participants' responses: (a) Culture, (b) Goals, (c) Knowledge, and (d) Learning. For the open-ended responses, the two coders independently reached a 96.7% agreement (Kappa = 0.73 with p < 0.001) before reaching a 100% agreement. There was a total of 131 coded instances, with the Knowledge theme being the highest coded category. Table 3 details the definitions of each theme for participants and coding breakdown, while Table 4 provides examples.

Table 3

Participants' Themes from Open-ended Post-survey Responses, their Definitions, and Coding Breakdown

Theme and Coding Breakdown	Definition
Culture (8 instances – 6.1% of total)	When the participant made a connection to his/her culture and/or the culture of his/her partner(s).
Goals (44 instances – 33.6% of total)	When the participants wrote about what could be done to realize the SDG(s).
Knowledge (56 instances – 42.7% of total)	When the participants wrote that that he/she became more knowledgeable about the SDG(s).
Learning (23 instances – 17.6% of total)	When the participants made a connection to his/her learning.

Table 4

Examples of Participants' Themes Open-ended Post-survey Responses

Theme	Examples
Culture	They are very important for the development of our culture. (Participant 5)
	In general, those SDGs work together to create a better world for everyone, which is important for the majority of all cultures. (Participant 10)
Goals	As a future educator, I want my students to have the best circumstances possible. We can improve the educational conditions of the US. (Participant 45)
	I feel that I learned a lot about the SDGs; however, I think that I have more to learn, such as more ways to take action. (Participant 15)
Knowledge	I certainly know a lot more about the SDGs after this experience. I am even more aware of their importance. (Participant 44)
	These are worldwide problems and each country has this problem. (Participant 12)
Learning	I believe that the SDGs are extremely relevant to education because learning about them will make students better global citizens. The more informed they are about the SDGs, the more they can help make a positive impact. (Participant 20)
	Education truly connects to everything in the world. People need good education for opportunities in life and in the world. If we do not have gender equality, sustainable consumption, or are conscious of our plastic use, then we will not have a planet to live in, nor will the future generations. (Participant 38)

Final Collaborative Tasks

Upon completing word frequencies via NVivo on the text included in the Google Slides in relation to the final collaborative tasks, the following four themes emerged: (a) Content area connection, (b) Intercultural competence, (c) Long-term actionable items, and (d) Short-term actionable items. For these slides, the two coders independently reached a 94.5% agreement (Kappa = 0.61 with $p < 0.001$) before reaching a 100% agreement. There was a total of 282 coded instances, with the Knowledge theme being the highest coded category. Table 5 details the definitions of each theme for participants and coding breakdown, while Table 6 illustrates examples. See Figure 2 for Google Slides examples.

Table 5

Participants' Themes from Final Collaborative Tasks, their Definitions, and Coding Breakdown

Theme and Coding Breakdown	Definition
Content area connection (42 instances – 14.9% of total)	When the group made a connection to the content of the course being studied in the VE (teacher preparation or L2).
Intercultural competence (46 instances – 16.3% of total)	When the group noted that the VE supported them to appropriately communicate with others from a country and culture other than their own.
Long-term action items (96 instances – 34.0% of total)	When the group noted a long-term action to realize the SDG(s).
Short-term action items (98 instances – 34.8% of total)	When the group noted a short-term action to realize the SDGs.

Table 6

Examples of Participants' Themes in Final Collaborative Tasks

| Theme	Examples
Content area connection	A good idea for education is to teach others another language. (Group 3) Providing quality education is so crucial. The children that we are teaching are going to be the next generation that is going to change the world. They are the future, and if we do not provide them quality education, they will have fewer opportunities to succeed and thrive in life. (Group 5)
Intercultural competence	There are culture differences that are important to recognize. To be exposed to multiple cultures makes you more tolerant. (Group 20) In general, each SDG is important for our two countries. (Group 11)
Long-term actionable items	Education: at a larger level, we could increase funding to schools, especially under-served or high-need schools. (Group 15) Create programs that help with the conditions of life. (Group 9)
Short-term action items	We only have one planet, and most people treat this world as if we have a back up one next door. Mankind, as people in society, we need to be more conscious and aware of the choices we make and how that affects us, others, the environment, as well as the long-term effects it will have on the world. If don't have a planet, then kids can't go to school! (Group 13) Encourage small actions that may not seem to matter on a small scale, but when considered on a larger scale, they make a difference, i.e. recycling, reusable water and food containers, buying local, taking public transportation, etc. (Group 2)

Three Google Slides Examples
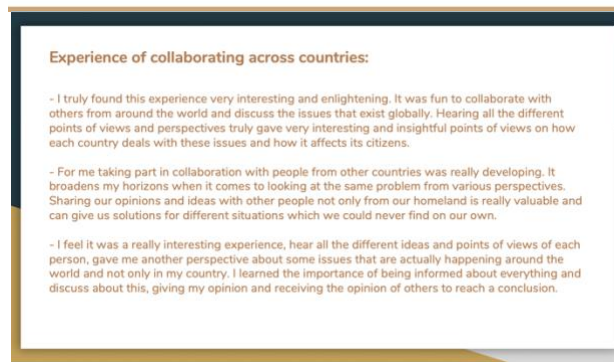
In this next section, the results will be discussed in light of the study's research questions.

Discussion

Throughout the 6-week VE, the 55 participants across 24 groups met to discuss SDGs. The pre- and post-surveys and final collaborative tasks allowed the author to answer this study's research questions: *How does participating in a SDG-focused SCMC-based VE affect participants' awareness of the SDGs?* and *How does participating in a SDG-focused SCMC-based VE provide participants the opportunity to create a critically sensitive lens in order to look at global issues?*.

The two parallel, but separate VEs that partnered teacher trainees together and L2 Spanish learners together allowed all participants to form global partnerships and create a "shared blueprint" (United Nations, 2020a) while discussing the SDGs. Of the seventeen SDGs that participants chose to be their top four, it was evident that the majority believed that *Quality education*, *No poverty*, *Good health and well-being*, and *Climate action* were the goals that should be given the utmost importance. Regardless of the SDGs chosen, it was also clear that participants recognized these objectives as relevant to culture (Likert-scale question #1) and

learning (Likert-scale question #2), but they were not very knowledgeable about the SDGs themselves (Likert-scale question #3). However, after meeting with their partner(s) for six weeks, results showed that the interaction in their VE increased their self-ratings of cultural and learning relevance and SDG knowledge. The significant difference found ($t(41) = -6.06$, $p = 0.00$) with large effect size ($d = 1.18$) after completing a paired sample t-test to compare means from pre- to post-survey answered RQ1. These results indicate that participating in a SDG-focused SCMC-based VE increase participants' awareness of the SDGs.

Apart from the quantitative data, the qualitative data also helped to answer this study's research questions. This SCMC-based VE, which utilized topics apart from daily life (El-Hariri, 2016) such as the SDGs, provided teacher trainee and L2 learner participants the opportunity to create a critically sensitive lens. As Marcel Proust (1923 as cited in Ratcliffe, 2016) wrote, "The real voyage of discovery…consists not in seeking new landscapes, but in having new eyes." During their VE experience, participants got "new eyes" as they embarked on a journey with their international partner(s). It was no surprise that the coding categories of the open-ended responses included (a) Culture, (b) Goals, (c) Knowledge, and (d) Learning. These results were due to the fact that the Likert-scale questions focused on culture, learning, and knowledge and the final task centered on creating a list of actionable items that could be completed to realize the SDGs. Similarly, because the instructions of the final collaborative task focused on action items and reflecting on the exchange, the coding categories included, as expected: (a) Content area connection, (b) Intercultural competence, (c) Long-term actionable items, and (d) Short-term actionable items.

Regardless of the coding categories, the VE task design grounded in TBLT (González-Lloret & Ortega, 2014) gave participants the opportunity to engage in (a) information exchange tasks, (b) comparison and analysis tasks, and (c) collaborative tasks (O'Dowd & Ware, 2009). As evidenced by the qualitative coding, the participants' newly-developed critically sensitive lenses allowed them to realize that the SDGS were part of a larger plan. Instead of discussing distinct culture differences, participants noted that the "SDGs work together to create a better world for everyone, which is important for the majority of all cultures" (Participant 10, post-survey). The data suggest that participants recognized that SDGs weren't specific to just one country or culture but were "very important for the development of our culture [as a whole]" (Participant 5, post-survey).

By making this connection and garnering knowledge about the SDGs, participants were able to consider these global issues as teacher trainees and L2 learners. Reflection is beneficial to self and professional development (Maaranen & Stenberg, 2017). Participants reflected and not only improved on an individual level, but also a professional level since connections were made to their content. For example, teacher trainees bridged theory into practice (Bullough, 1997; Tom, 1997) and L2 learners developed their language skills (Lenkaitis, 2020d) through SDG-focused conversations. In addition to the connections to content, participants also developed their intercultural competence (Byram, 1997; Deardorff, 2006). Through the interactions with their partner(s), participants became aware of the SDGs, and in turn, interpreted and related them to their individual lives and the lives of their partner(s). Just as in Lenkaitis (2020e), this SDG-focused SCMC-based VE provided a rich language learning opportunity where cross-cultural interaction occurred for these 21st century learners (Partnership for 21st Century Skills, 2011).

Through value-added technology applications (Lenkaitis, 2019a, 2020a), this SCMC VE allowed participants to discuss short- and long-term actionable items to realize the SDGs. By doing so, participants listed their own "blueprint for shared prosperity in a sustainable world – a world where all people can live productive, vibrant, and peaceful lives on a healthy planet" (United Nations, 2019, p. 2). Some groups noted how the SDGs were connected to COVID-19 (United Nations, 2020b). No matter what plan each group discussed, there was a common thread: Small actions can make great impacts. For example, in their final collaborative task, Group 13 noted "We need to be more conscious and aware of the choices we make and how that affects us, others, the environment, as well as the long-term effects it will have on the world." Because of this, it is crucial to "Encourage small actions that may not seem to matter on a small scale, but when considered on a larger scale, they make a difference" (Group 2, final collaborative task). These small

actions can include: "recycling, reusable water and food containers, buying local, taking public transportation, etc." (Group 2, final collaborative task). Even though the participants learned much about the SDGs, the participants acknowledged that they still had more to find out. This suggests that the SDG content needs to be systemically integrated into even more SCMC-based VE so that participants can develop more critically sensitive lenses.

Study Limitations and Future Directions

Implementing a VE consisting of more than six weeks of synchronous sessions would be helpful. With this additional time, participants would have further time to discuss all SDGS. By having conversations on all SDGS and not just their top four SDGs, participations would be able to explore "more ways to take action" (Participant 15, post-survey). In addition, although this study was a mixed methods study, because most of the data were self-reported, some participants may have not wanted to express all of their ideas as related to SDGs. Nonetheless, coding was completed to find commonalities.

Conclusion

This article centered on SDG-focused SCMC-based VE in L2 and teacher education coursework. This study showed that the systematic alignment of a SCMC-based VE with the SDGs is one way to explore rich content. By exploring SDGs, participants were able to have meaningful discussions in English and Spanish and develop a critically sensitive lens to look at global issues. By having a perspective through the lens of the SDGs, participants utilized their "new eyes," increased their intercultural competence, and made connections to their subject areas while creating action plans for "a world where all people can live productive, vibrant, and peaceful lives on a healthy planet" (United Nations, 2019, p. 2). In this SCMC-based VE, the SDGs were the lens through which participants were able to reflect. The opportunity to create "a global partnership" (United Nations, 2020a) via a SCMC-based VE allowed participants to support the United Nations' 2030 Agenda and contribute to the field of VE. Since utilizing SDGs in VE is limited (Bruun, 2018; Fors & Lennerfors, 2020; Forward et al., 2020; Garcia-Esteban, 2020), this gap in existing VE research needs to be filled. In order to further explore all of the possibilities that this subject matter holds, integrating SDG content into additional SCMC-based VEs is recommended in all content areas, especially in L2 and teacher education coursework.

Acknowledgements

Notes

1.	This image is taken from https://www.un.org/sustainabledevelopment/. As per the United Nations' SDG Permissions: "The content of this publication has not been approved by the United Nations and does not reflect the views of the United Nations or its officials or Member States."

2.	Intercultural Competence (IC) and Intercultural Communicative Competence (ICC) often are used interchangeably. If there is an intercultural speaker, the speaker needs to have intercultural competence "to interact with 'others' (Byram, et al., 2001, p. 6). In order to communicate with others, the speaker needs to have intercultural communicative competence. Of course there is a bit debate about what is IC and what is ICC, so it might be useful to mention it here.

3.	Group changes were made at the start of the VE based on participant schedules. Because of this, two groups in the teacher trainee VE solely consisted of teacher trainees from the university in the United

States.

4.   Prior to a name change due to marriage, the author used her maiden name, Bohinski, for publications.

5.   Paired *t*-tests were run only for those participants who completed both pre- and post-surveys.

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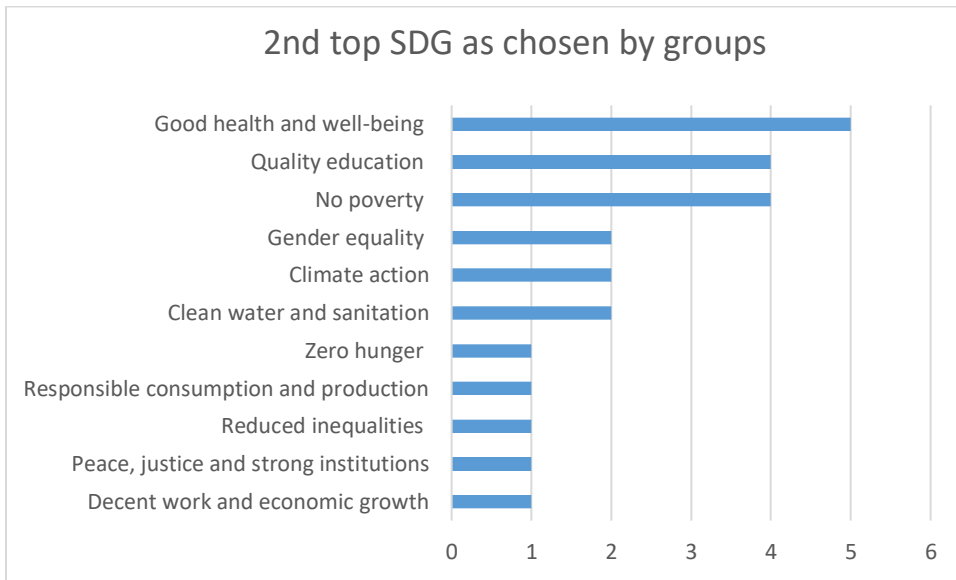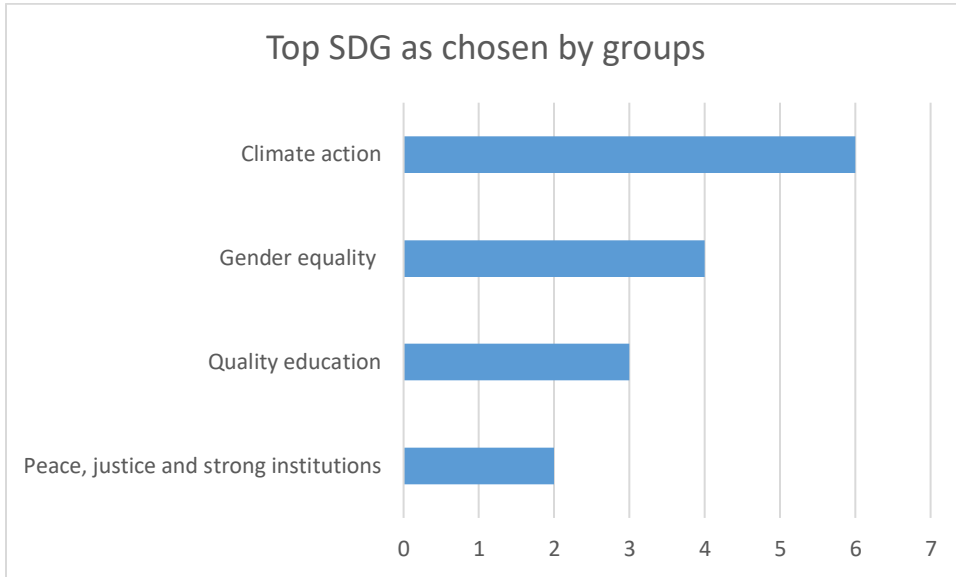
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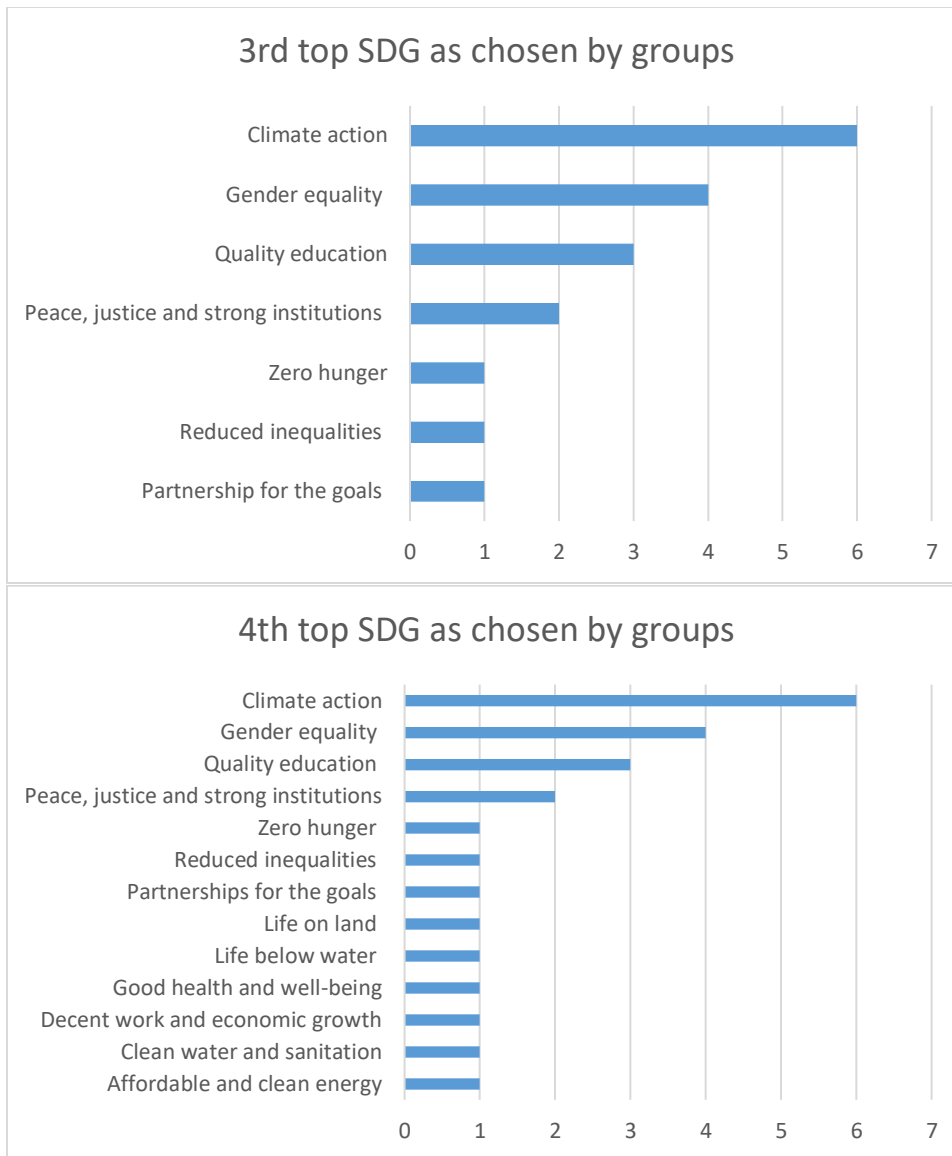
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Appendix. Top Four SDGs for Groups

Top SDG as chosen by groups

SDG	Value
Climate action	6
Gender equality	4
Quality education	3
Peace, justice and strong institutions	2

2nd top SDG as chosen by groups

SDG	Value
Good health and well-being	5
Quality education	4
No poverty	4
Gender equality	2
Climate action	2
Clean water and sanitation	2
Zero hunger	1
Responsible consumption and production	1
Reduced inequalities	1
Peace, justice and strong institutions	1
Decent work and economic growth	1

3rd top SDG as chosen by groups

SDG	Value
Climate action	6
Gender equality	4
Quality education	3
Peace, justice and strong institutions	2
Zero hunger	1
Reduced inequalities	1
Partnership for the goals	1

4th top SDG as chosen by groups

SDG	Value
Climate action	6
Gender equality	4
Quality education	3
Peace, justice and strong institutions	2
Zero hunger	1
Reduced inequalities	1
Partnerships for the goals	1
Life on land	1
Life below water	1
Good health and well-being	1
Decent work and economic growth	1
Clean water and sanitation	1
Affordable and clean energy	1

About the Author

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