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Facilitating intercultural competence development in virtual exchange: The student-generated survey

Andrew Johnson, Hülya Tuncer

Abstract: Virtual exchange (VE) has gained prominence as a means to improve students' intercultural competence and foreign language abilities through forums and other supplemental activities. This study examines a supplemental activity referred to as the student-generated survey (SGS) implemented in the IVEProject, a large-scale VE with, at the time of this research, over 3000 contributing EFL students per exchange. Stemming from a sociocultural perspective with an aim to promote student agency, curiosity and discussion, the SGS allows students to participate in a survey composed of questions generated by themselves and/or their peers. Aiming to investigate how the SGS affects IVEProject participants' intercultural competence, this cross-sectional study focuses on data collected from 768 participants from 10 countries during the May-July 2021 exchange. Quantitative analysis of nine six-point Likert scale items showed that students who took the SGS and discussed its results had statistically significant increases in multiple items related to components of Deardorff's Pyramid Model of IC compared with students who did not. Furthermore, these gains were more noticeable among students who additionally took part in the question-generation process of the SGS. Thematic analysis of an open-ended question found 96% of student comments to be positive, falling under the themes 'intercultural development' and 'enjoyment and contentment.' The findings from quantitative and qualitative data shed light on the positive effect of the SGS on IC development, offering a beneficial reference point for international VE contexts.

Keywords: virtual exchange, IVEProject (International Virtual Exchange Project), student-generated survey (SGS), intercultural competence, student perceptions.

Highlights

What is already known about this topic:

- Virtual exchange (VE) programs provide venues for intercultural competence (IC) and foreign language development.
- Students find opportunities to interact with their peers from many different countries and cultures via VE.

What this paper contributes:

- The study demonstrates how the student-generated survey (SGS) assists IC development within a virtual exchange program.
- The paper documents the positive perceptions of VE participants for the SGS.

Implications for theory, practice and/or policy:

- The findings support supplementing VE written forums with complementary activities, the SGS in this case, to help students develop IC.
- The SGS fosters curiosity, enjoyment and and learner agency in VE participants.
- Discussion of the SGS plays a key role in promoting IC development.

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Introduction

As the internet has transformed from an information dispensary format to a user-empowering knowledge-building format, teachers can utilize these changes to create dynamic learning opportunities (Dooly, 2010). One such opportunity is virtual exchange (VE), and while it may go under various names (e.g. online intercultural exchange, telecollaboration, COIL) (Hagley, 2020; Stevens Initiative, 2021), the general purpose is consistent: to promote negotiation of meaning and learning among geographically-separated participants from different cultures and backgrounds through sustained intercultural dialogue under the guidance of facilitators (Helm, 2014; O'Dowd, 2018; O'Dowd, 2020). While doing so, participants may also foster foreign language abilities, communicative competence, awareness of their own and others' cultures, and global citizenship (Godwin-Jones, 2019; O'Dowd, 2020; Schenker, 2012). Circumventing hurdles such as financial constraints or health concerns, it has been said that VE may be the closest "a learner can come to experiencing intercultural communication within the supportive environment of the classroom" (O'Dowd, 2020, p. 353). Furthermore, others have said that due to its effectiveness in facilitating intercultural communication competence and second language learning that it should be a regular part of foreign language courses (Guth, 2016).

This paper focuses on a supplemental activity used in a large-scale free virtual exchange known as the IVEProject (2023). While the IVEProject began in the early 2000s, it was in 2015 that it began to take on a larger scale thanks to a grant from the Japanese government (Hagley, 2022). In 2021, over 7000 tertiary students from 23 countries took part in at least one of the two annual eight-week exchanges. Using English as a lingua franca, students primarily use forums to communicate on a variety of topics but other activities are also available to foster connection between participants. This paper pertains to one of these: the student-generated survey (SGS). Started in 2018 with the aim of promoting student agency and curiosity, this voluntary activity allows students to submit questions on themes of their choosing to be included in a survey that all IVEProject participants can take and then discuss the results.

Literature Review

A plethora of definitions of intercultural competence (IC) can be found in the literature (Deardorff, 2006; Schenker, 2012). In exploring the various definitions, the authors' have adopted the following definition of IC: the ability to effectively interact and function with people from different cultures in intercultural situations. Numerous models related to IC have been made (Spitzberg & Changnon, 2009). Based on data gathered through the Delphi technique, Deardorff (2006) synthesized the Pyramid Model and the Process Model of Intercultural Competence. Spitzberg and Changnon (2009) classify the Pyramid Model as a compositional model and the Process Model as a causal path model. Both models consist of the same four stages: Requisite Attitudes, 'Comprehension and Knowledge / Skills', Desired Internal Outcome, and Desired External Outcome. In the Pyramid Model, Requisite Attitudes is the foundation from which one is able to develop IC, and consists of respect, openness and curiosity (Deardorff, 2006). Building upon this, learners are able to increase their knowledge of culturally different others which in turn can lead to IC-related individual internal and external shifts. In the Process Model, instead of the pyramid formation, intercultural competence development takes the form of a cyclical process with Attitudes being a natural starting point and ending with External Outcomes, which leads into a new turn of the cycle starting with increased openness, respect and curiosity. This cyclical process emphasizes the dynamic nature of IC development. While Deardorff states it is possible to go directly from attitudes to external outcomes, it may not be nearly as effective nor appropriate to do so (Deardorff, 2006).

While activities such as participating in an eight-week VE will not make someone fully interculturally competent, such participation can act as an important stepping stone in one's journey to becoming a more interculturally competent person. Through interaction in VE, participants have opportunities to notice gaps in their knowledge of people from other cultures. This noticing can create curiosity (Pluck & Johnson, 2011), a central element for education (Schmitt & Lahroodi, 2008), which naturally leads to asking questions and that has been shown to lead to higher retention of material (Colbert et al., 2007;

Song, 2016). Given this, it is no surprise that having students generate questions is a metacognitive technique used by instructors in a variety of fields including biology (Colbert et al., 2007), medicine (Shakurnia et al., 2018), physics (Bates et al., 2014), and computer security (Hutchinson & Wells, 2013). Generating meaningful questions is a demanding metacognitive act which requires the learner to consider new information, compare it with their existing schemata, and notice any gaps that may prevent assimilation (Miyake & Norman, 1979). In other words, students need to decide what they need to learn (Van Blerkom et al., 2006). Furthermore, such student-driven tasks, compared with teacher-driven tasks, can foster motivation (Lin, 2013) and the questions students generate also provide useful information to teachers about how well their students comprehend the material (Etkina, 2000; Harper et al., 2003) by acting as a "window into their minds" (Shakurnia et al., 2018, p. 71).

Within this frame, the authors envisaged that students would enjoy the agency offered by the SGS and that enjoyment would lead to an increase in willingness to communicate (Dewaele & Dewaele, 2018), which will positively affect their intercultural competence development. Nevertheless, in their review of the literature, the authors did not find any studies in which student-generated surveys were used in a VE context, so this study aims to fill that gap in the literature.

Methodology

The Student-Generated Survey Procedure

The SGS aims to provide students with an opportunity to ask all IVEProject participants various questions (typically multiple choice) that they generate (Figure 1). The whole process of creating the SGS involves four phases (Figure 2). Questions are generated in Phase 1, the survey is created in Phase 2, the survey is open for students to take in Phase 3, and finally students are encouraged to analyze and discuss the results in Phase 4. Through this process, the pedagogical practices of various classrooms merge into the reification of the student-generated survey artifact, which is then taken by numerous IVEProject participants and the results of which are then used to enhance further engagement and deepen intercultural understanding among the IVEProject community.

Figure 1. Example Questions Generated by Students for the SGS

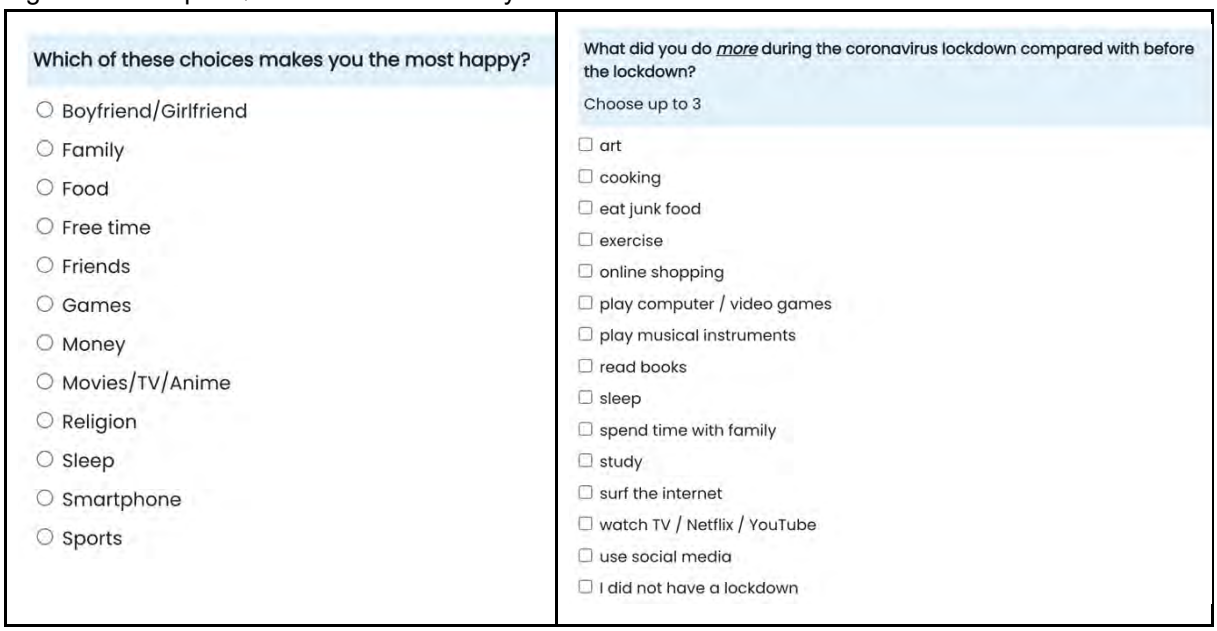
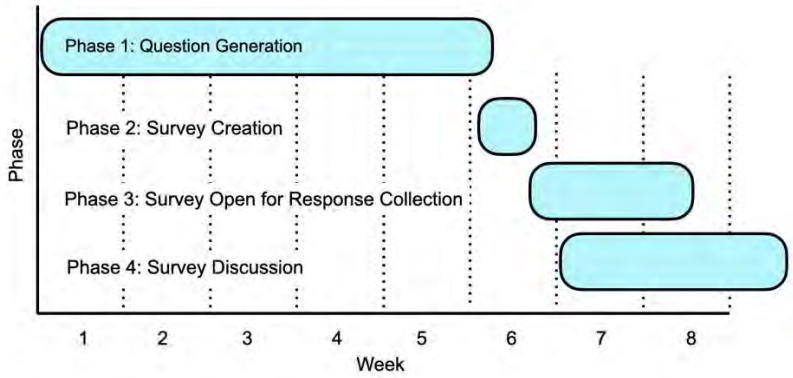


Figure 2. The Four Phases of the Student-Generated Survey



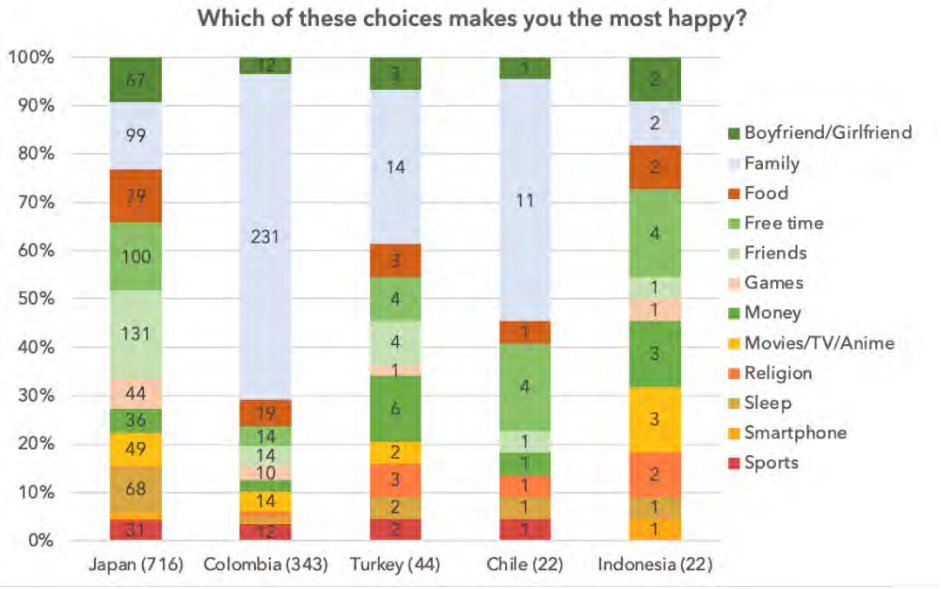
Phase 1: This first phase includes informing teachers and students of the voluntary activity and how they submit questions. Two sections containing pertinent information regarding the SGS - one for students and one for teachers - are available from the beginning of each exchange. Students submit questions they generate to their teachers, who in turn submit them to the IVEProject. This is done to provide an initial screening of the questions for English clarity and content appropriateness before being received by the SGS administrators. Questions are submitted online to the Moodle LMS (learning management system).

Phase 2: Often more than one hundred questions are submitted each exchange and as a result one of the largest tasks in creating the survey involves selecting which questions to include. For each SGS, the survey administrators aim to select questions that result in a survey that students find appealing, is culturally sensitive, and covers a diversity of themes. Knowing the importance of simple and clear language for successful surveys (Charbonneau, 2007; Converse & Presser, 1986; Mathers et al., 2007), the authors make some edits as needed to clarify meaning and to ensure that each respondent has at least one selectable option.

Phase 3: Once created, the survey is open for approximately two weeks.

Phase 4: The culmination of the activity is a reflection or discussion of the results. This phase was influenced by the work of Mayer and Moreno (2003) and Weinstein (2018). It aims to present the survey results in a way that provides students with opportunities to discuss the information, either verbally in the classroom or using text in the forum discussions, and integrate the material with their prior knowledge, all while trying to minimize cognitive overload. Several resources are made available to assist teachers in accomplishing this endeavor. First, Summary Graphs (Figure 3) are created to allow students to easily view the similarities and differences among respondents by culture. Second, a pinned forum discussion is created for students to discuss the results of the SGS (Appendix A). Third, teachers are provided with a list of five classroom ideas for promoting discussion in the classroom using the SGS results (Appendix B).

Figure 3. An Example from the Summary Graphs



Research Design

A cross-sectional study using both quantitative and qualitative data analysis was undertaken. Cross-sectional designs aim to gather information from a sample at one particular point in time and has the intention of comparing two or more groups (Creswell, 2004; Ruel et al., 2016), and here in this study the data was gathered from the May-July 2021 exchange with the aim of comparing the intercultural competence development between groups having varying degrees of SGS involvement.

The purpose of this study was to understand what effect, if any, participation in the SGS had on students' attitudes and understanding toward their own and others' cultures, and to learn students' perceptions toward the SGS. Accordingly, two research questions were formulated:

1. How does the student-generated survey contribute to the IVEProject students' intercultural competence?
2. How do the IVEProject students perceive the student-generated survey?

The authors were interested in describing how participants used the SGS. No attempts by the authors were made to control whether individual students participated or whether individual teachers required their students to participate in the SGS. As such, the findings are not meant to be generalized. In the final week of the exchange, students were asked to participate in a second survey, referred to as the IVE Survey and described below. Quantitative survey results from the groups, those who participated in the SGS and those who did not, were compared to better understand how the SGS affected students' intercultural competences as viewed by components found in Deardorff's Pyramid Model of Intercultural Competence. Students who took the SGS were further divided into those who participated in the question-generation process and those who did not. Furthermore, a thematic analysis, following Braun and Clarke's 6-step procedure (2012, 2021), was performed on an open-ended survey question ("Please write any comments you have about the student-generated survey") from students who participated in the SGS to better understand their attitudes toward it.

Participants

Data in this study is based on the May-July 2021 IVEProject exchange, in which 3697 students added at least one post to the IVEProject forums, 1199 students took the SGS, and 15 teachers from three countries submitted a total of 98 questions. This study focused on 768 EFL students who took the IVE

Survey, the majority (90%) of which were from either Japan or Colombia. All students in the IVEProject were in some form of tertiary education, from a range of predominantly non-WEIRD (Western, educated, industrialized, rich and democratic) countries and sociocultural backgrounds. The vast majority of them entered university or college after high school, but some returned to continue their education after an extended absence. The fields of study of the participants also varied widely as well as motivations toward participating in the IVEProject; for many, it was part of a mandatory foreign language education course. While instructors could individually set goals related to the amount of participation in all activities on the IVEProject for their students, all participants had equal opportunity to utilize the activities offered on the site.

Data Collection Instruments

Assessment tools must match the objectives of the project (Deardorff, 2015). While numerous validated scales exist for measuring various aspects of intercultural competence (Fantini, 2009), the IVEProject administrators did not deem any of them to fit the overall assessment goals of the IVEProject and therefore created an end-of-exchange survey, referred to as the IVE Survey, to gauge students' perception of various technical, linguistic and cultural aspects they would encounter. For this study, the authors utilized questions in this pre-existing, non-validated survey that pertained to culture. The IVEProject administrators also permitted the authors to supplement the IVE Survey with several questions related to SGS usage.

This IVE Survey was available to all participating students beginning ten days prior to the official end of the 2021 May-July exchange. It was available in three non-English languages (Chinese, Japanese, and Spanish) to reduce misinterpretation by students of the items due to language ability. Ninety three percent of the students took one of the three versions; the remaining 7% took an English version of the survey. Additionally, log data (which provides records of students' actions such as taking a survey or viewing a forum) from the Moodle LMS was used to verify that students took the SGS if self-reported doing so in the IVE Survey. Data regarding age and gender was not collected and the data was anonymized before analysis.

The first question in the IVE Survey contained a series of 20 six-point Likert scale items, nine of which related to cultural aspects (shown in Table 3). The remaining eleven items pertained to other objectives of the IVEProject and were not in the scope of this study. In addition to those 20 items, there was a section dedicated to the SGS including questions pertaining to student level of involvement in the SGS (e.g., whether they generated questions, whether they took the SGS, and whether they discussed the results) and an open-ended question in which students could respond in their first language (Appendix C).

Data Analysis

Data for this study comes from the IVE Survey given to participating students at the end of the exchange. For the quantitative analysis, researchers analyzed nine six-point Likert scale items (focusing on intercultural competence) together with four questions regarding their degree of participation in the SGS. For the qualitative part of the study, one open-ended question on students' perceptions of the SGS was analyzed. Non-English responses were first translated into English using DeepL and then checked for correctness. When necessary, additional guidance was sought to clarify incomprehensible answers and the English translation was adjusted when deemed appropriate.

Quantitative Analysis

Of the 3697 students in the 2021 May-July exchange, the IVE Survey was voluntarily taken by 768 (21%) consenting participants (Table 1). Of the 768, there was roughly an even split of those who did not take the SGS (n = 388) and those who did (n = 380). While the IVE Survey respondents were from

ten countries, the majority were from Colombia (n = 279; 36.3%) and Japan (n = 416; 54.5%). Of those who did both the IVE Survey and the SGS, there was roughly an equal percentage from Colombia (n = 165; 43.4%) and Japan (n = 162; 42.6%). However, when looking at the number of students who answered the open-ended question in the IVE Survey, this ratio between Colombia (n = 97; 63.4%) and Japan (n = 18; 11.8%) is not proportionate.

Table 1. Number and Country of Respondents for the IVE Survey

Country	respondents		respondents taking SGS		respondents taking SGS and answering open-ended question	
	n	%	n	%	n	%
Brazil	1	0.1	1	0.2	1	0.7
Chile	14	1.8	11	2.8	7	4.6
China	5	0.7	2	0.5	0	0
Colombia	279	36.3	165	43.4	97	63.4
Indonesia	13	1.7	5	1.3	5	3.3
Japan	416	54.5	162	42.6	18	11.8
Jordan	1	0.1	1	0.2	1	0.2
Mexico	4	0.5	0	0	0	0
Türkiye	29	3.5	27	7.1	19	12.4
UAE	6	0.8	6	1.6	5	3.3
TOTAL	**768**	**100**	**380**	**100**	**153**	**100**

Table 2 presents the number of IVE Survey respondents in three Groupings: students not participating in the SGS (Grouping A), students not generating SGS questions (Grouping B), and students generating SGS questions (Grouping C). Groupings B (rows B-D) and C (rows E-G) were further subdivided into subgroupings based upon their level of participation with the SGS: subgrouping 1 only took the survey, subgrouping 2 viewed the survey results, and subgrouping 3 discussed the survey results. These subgroupings allowed the authors to better understand how students participated in the SGS. For example, Rows C and G show that the majority of students who did not generate questions only took and viewed the results (53%), while the majority of students who generated questions also discussed the results (59%). Similarly, a comparison of rows B and E indicates students who did not participate in the question-generation process were more likely to *only* take the survey (i.e., not view the results or discuss them) compared with students who did (25% vs 12%) and a comparison of rows D and G indicates that students who participated in the question-generation process were more likely to discuss the results (59% vs 22%).

Table 2. Groupings of IVE Survey Respondents

Row	Grouping	n	% of respondents in Grouping	Took SGS	Viewed SGS Results	Discussed SGS Results	Generated SGS Questions
Grouping A: Students not participating in the SGS							
A		388	-	✖	✖	✖	✖
Grouping B: Students not generating SGS questions (n = 259)							
B	B_1: Survey Takers	66	25	✔	✖	✖	✖
C	B_2: Survey Results Viewers	136	53	✔	✔	✖	✖
D	B_3: Survey Discussers	57	22	✔	✔	✔	✖
Grouping C: Students generating SGS questions (n = 121)							
E	C_1: Survey Takers	15	12	✔	✖	✖	✔
F	C_2: Survey Results Viewers	35	29	✔	✔	✖	✔
G	C_3: Survey Discussers	71	59	✔	✔	✔	✔

For the exchange in this study, teachers submitted 98 student questions; 18 (18%) of which ended up in the final SGS. Some teachers submitted all questions their students generated; other teachers submitted only select questions (i.e., students voted on which to submit). Also, some students generated questions individually, others in groups. As a result of these different systems, the number of students involved in the question-generation process is actually larger than the number of questions submitted.

To explore how the SGS contributed to IC (research question 1), two comparisons of nine Likert scale items in the IVE Survey were made between SGS takers and non-takers. The first comparison was between participants who did not take the SGS (Grouping A: n = 388) and those who took the SGS but did not participate in question creation (Grouping B: n = 259). The second was between participants who did not take the SGS (Grouping A: n = 388) and those who both took the SGS and participated in question creation (Grouping C: n = 121). As the data did not satisfy tests of normality (Shapiro-Wilk) or equality of variances (Levene test). R Studio and JASP were used to run a Mann-Whitney U test with independent samples with the commonly accepted significance value of 0.05. Although not reported here, the authors also ran corresponding t-tests with similar results.

Qualitative Analysis

Qualitative data gathered from a non-compulsory open-ended question of the IVE Survey was used to gather students' positive and negative perceptions of the SGS in order to help answer our second research question. This data, written in response to "Please write any comments you have about the student-generated survey," was analyzed by means of Thematic Analysis (TA). TA is "a flexible analytical method that enables the researcher to construct themes—meaning-based patterns— to report their interpretation of a qualitative data set" (Terry & Hayfield, 2021, p. 3). The authors followed the 6-phase process outlined by Braun and Clarke (2012, 2021):

Phase 1: familiarization with data
Phase 2: generating initial codes
Phase 3: searching for themes
Phase 4: reviewing themes
Phase 5: defining and naming themes
Phase 6: producing the report

The authors did not commence this iterative process with a specific agenda but rather with a data-driven inductive approach to generating codes and themes. After each author familiarized themselves with the data, initial codes and probable themes were developed (Phases 1, 2 and 3). Then, over a series of Zoom meetings spanning multiple months, the authors discussed their initial themes, and collaboratively developed and finalized them (Phases 4, 5 and 6). To illustrate this process, the theme “clear questions” was included under “content of the questions” for the first round of discussions, yet through further reflection both researchers felt that they should be separated, and "clear questions" was renamed as "clarity of the questions." There was a high level of agreement (greater than 90%) between the two researchers and in the case of disagreements, discussions continued until a consensus over all themes was reached. After these steps, both researchers went over the data once again with the aim of checking that the finalized themes produced an accurate report of the data. Positive and negative perceptions of the students - each with two themes and related sub-themes - can be seen in Table 3.

Table 3. Positive and Negative Perceptions of the Students on Student-Generated Survey (n = 153)

	Themes	Sub-themes
Positive (96%)	1- Intercultural understanding	Content of the questions
		Results of the survey
	2- Enjoyment and contentment	Expressions of gratitude
		Clarity of the questions
		Ownership of the questions
Negative (4%)	1- Suggestions for improvement	Inclusion of more countries
		Inclusion of more questions
	2- Technical issues	Problem in changing the responses
		Problem in opening the SGS results

Findings and Discussion

The findings of the study are discussed in relation to the two research questions in the following subsections.

Research Question One

The first research question was “How does the student-generated survey contribute to the IVEProject students’ intercultural competence?” Intercultural competence is a complex construct with numerous models attempting to make sense of it. In this study, the nine Likert scale items related to culture were used as a proxy for the following components found in Deardorff’s Pyramid Model of Intercultural Competence: Requisite Attitudes (specifically, curiosity and openness), Knowledge and Comprehension, and Desired Internal Outcome. These same components are found in Deardorff’s Process Model but given the relatively short eight-week time period of a single IVEProject exchange, the students participating in this study did not have time to sufficiently go through a complete cycle of the Process Model and therefore the Pyramid Model, with its focus on the development of IC through foundational stages, was deemed more appropriate for this study. Quantitative data (Table 4, Appendices D-F) is supplemented with qualitative data, in particular the theme “intercultural understanding,” to provide corroborating support.

As previously described in Table 2, Grouping A refers to students who did not participate in the SGS, Grouping B refers to students who took the SGS but did not participate in the question-generation process, and Grouping C refers to students who took the SGS and the question-generation process. Table 4 presents the mean, median and standard deviation for each of the 3 groupings (A, B, C), and the rows showing Groupings B and C show the Mann-Whitney U test results for the Grouping A vs. B and Grouping A vs. C comparisons, respectively. For the Grouping A vs. B comparison, of the nine Likert items, three (items 1, 3 and 9) were found to be statistically significant. However, when Grouping

A was compared to Grouping C, statistically significant differences were found for seven of the nine items (all except for items 5 and 7). This indicates that the question-generation process had a positive impact on students' intercultural development. Furthermore, Appendix D presents the Mann-Whitney test data comparing Groupings B and C. There were significant differences between seven of the nine items further indicating that the question-generation process contributes to IC development. However, as will be discussed next, question generation is not the only factor at play.

Table 4. Results of Likert Items for the Three Groupings with Groupings B and C each being compared to Grouping A using a Mann-Whitney U test

Statement	n	mean	median	SD	U	p	Effect size**
1. I didn't learn anything about the other country(ies).*							
Grouping A	388	2.21	2	1.38	-	-	-
Grouping B	259	2.00	1	1.33	45175	**0.021**	0.101
Grouping C	121	2.03	1	1.48	20638.5	**0.034**	0.121
2. As a result of participating in the IVE, I feel differently about myself.							
Grouping A	388	3.60	4	1.48	-	-	-
Grouping B	259	3.65	4	1.46	48960.5	0.573	0.026
Grouping C	121	4.06	4	1.50	18829.5	**<0.001**	0.198
3. My participation helped students in other countries understand my culture.							
Grouping A	388	4.27	4	1.29	-	-	-
Grouping B	259	4.52	5	1.16	45266	**0.028**	0.099
Grouping C	121	4.87	5	1.18	16995.5	**<0.001**	0.276
4. I'm more interested in the other country(ies) now because of the IVE.							
Grouping A	388	4.43	5	1.34	-	-	-
Grouping B	259	4.58	5	1.29	47250.5	0.185	0.060
Grouping C	121	4.80	5	1.38	19210	**0.002**	0.182
5. As a result of participating in the IVE, I feel differently about people in other countries.							
Grouping A	388	4.23	4	1.31	-	-	-
Grouping B	259	4.00	4	1.41	45958.5	0.059	0.085
Grouping C	121	4.39	5	1.45	21227	0.103	0.096
6. Culture is more important to me now than before doing the exchange.							
Grouping A	388	4.33	4	1.28	-	-	-
Grouping B	259	4.21	4	1.38	48614	0.472	0.032
Grouping C	121	4.57	5	1.28	20661	**0.041**	0.120
7. As a result of participating in the IVE, I see my own country's culture differently.							
Grouping A	388	4.14	4	1.40	-	-	-
Grouping B	259	4.14	4	1.45	49530.5	0.754	0.014
Grouping C	121	4.33	5	1.51	21212.5	0.102	0.096
8. I feel like I started to understand the lives of the people in other countries in this exchange.							
Grouping A	388	4.36	4	1.25	-	-	-
Grouping B	259	4.50	5	1.25	46798	0.127	0.069
Grouping C	121	4.77	5	1.25	18712	**<0.001**	0.203
9. I feel I am more open-minded to people from other cultures as a result of participating in the IVE.							
Grouping A	388	4.42	4	1.27	-	-	-
Grouping B	259	4.62	5	1.29	45223.5	**0.026**	0.100
Grouping C	121	4.94	5	1.07	17999.5	**<0.001**	0.233

*Reverse coding

**Rank-Biserial Correlation

Appendix E is similar to Table 4, but it reports data for the three B subgroupings (B_1: only took survey; B_2: took survey and viewed results; and B_3: took survey, viewed and discussed results). As shown, the degree of involvement can have an effect. None of the comparisons between Grouping A and Grouping B_1 had a significant difference indicating that simply taking the SGS is insufficient. This intuitively makes sense. Similar results can be seen when Grouping A is compared with Grouping B_2 (only item 1 was significantly different), indicating that reviewing the results is also insufficient. However, when Grouping A is compared with Grouping B_3, five of the nine items (items 2, 3, 4, 8 and 9) had significant differences indicating that discussion of the results is an important element. Appendix F shows the corresponding tests comparing Grouping A with Groupings C_1, C_2 and C_3. Similar to Appendix E, more statistically significant differences were found when students discussed the results after taking the survey. This indicates that discussion and the negotiation of meaning plays a role in developing IC.

Table 5 shows the components of IC development found in the levels of Deardorff's Pyramid Model, and the checked items denote the ones that SGS promoted. The first level of her model is Requisite Attitudes which is composed of respect, curiosity and openness, and considered to be the most critical (Deardorff, 2006). Item 6 of the IVE Survey was related to this component in an overall sense: "Culture is more important to me now than before doing the exchange." As reported in Table 4, a Mann-Whitney U test ($U = 48614$, $p = 0.472$) did not find a significant difference between Grouping A (Mdn = 4) and Grouping B (Mdn = 4). However, a significant difference ($U = 20661$, $p = 0.041$) was found between Grouping A and Grouping C (Mdn = 5). This indicates that generating questions is an important aspect of the SGS. The following paragraphs offer the authors' explanations for why this is the case.

Table 5. How the SGS Relates to Deardorff's Pyramid Model

	Question-Generation Process	Viewing Results	Discussion of Results
Desired External Outcome: Due to the short time period of the exchange, this level is beyond the scope of the study; nevertheless, it is hoped that development in the bottom three levels might act as a stimulator for facilitating desired external outcome.			
Desired Internal Outcome: Inconclusive quantitative evidence was found for a shift in internal outcomes. However, there are some quotations indicating the evidence for internal shifts.			
Knowledge and Comprehension / Skills			
• Cultural self-awareness		☑	☑
• Deep understanding and knowledge of culture		☑	☑
• Culture-specific information		☑	☑
• Sociocultural information	☑	☑	☑
• To listen, observe and interpret		☑	☑
• To analyze, evaluate, and relate		☑	☑
Requisite Attitudes			
• Respect	☑	☑	☑
• Curiosity	☑	☑	☑
• Openness	☑	☑	☑

Curiosity is not a dichotomy; it exists on a spectrum. Many may be curious about something but lack the willpower or opportunity to explore it. When individuals become aware of gaps in their knowledge, such as when creating questions for the SGS, a desire to fill these gaps can arise (Pluck & Johnson, 2011). Two quantitative data points indicate that students in Grouping C increased in curiosity. In the IVE Survey, item 4 was related to curiosity: "I'm more interested in the other country(ies) now because of the IVE." For students in Grouping C (Mdn = 5), there was a significant difference ($U = 19210$; $p = 0.002$)

compared to those in Grouping A (Mdn = 5) (Table 4). However, a significant difference (U = 47250.5; p = 0.185) was not found between Grouping A (Mdn = 5) and Grouping B (Mdn = 5). A significant difference between Groupings B and C (U = 13621.5; p = 0.033) further corroborates this finding (Appendix D). Additionally, among those who took the SGS, students in Grouping C were more likely (59% vs 22%) to discuss the results than those in Grouping B (Table 2). These differences between Grouping B and Grouping C suggest that the question-generation process is important for the development of curiosity.

Also part of the attitudinal component of Deardorff's model is openness. Item 9 of the IVE Survey pertains specifically to this: "I feel I am more open-minded to people from other cultures as a result of participating in the IVE." As Table 3 shows, students in Grouping B (Mdn = 5) reported significant (U = 45223.5; p = 0.026) improvements for this item compared to those in Grouping A (Mdn = 4). Similar significant results (U = 17999.5; p <0.001) were found when comparing those who made questions as part of the SGS (Grouping C; Mdn = 5). The authors are of the opinion that one reason for this change in openness pertains to the fact that the Summary Graphs presented students an opportunity to confront their existing assumptions or biases of other cultures and perhaps their own. If information presented in the Summary Graphs is new and students are open to it, they gain new knowledge from the results. If what students learn aligns with their previous notion, the results are assimilated, strengthening the mental connection. However, accommodation may be required if the results go against a student's preconceived biases, potentially leading them to challenge their cognitive dissonance. In each of these scenarios, students need to be open to new knowledge of other cultures (Bennett, 2013) and the quantitative results from item 9 indicates that they are.

The SGS questions are not intended to elicit a single correct answer, but rather a range of responses. By utilizing the Summary Graphs (Figure 3), students are able to see the variation within cultures, creating an opportunity for them to reflect upon the similarities and differences among people both in their own country and abroad. For example, the Summary Graphs show both diversity within quotidian activities such as smartphone or social media use to more introspective or thought-provoking themes such as participants' representation of happiness. When students have preconceived stereotypes, they are likely to assume all members of a group follow the same patterns. However, showing diversity within groups can help break this assumption. Comments such as the following provide further indications that students are open to new knowledge:

> ID25 (Colombia): *I found* [the SGS] *very interesting and I was surprised by the results, since it became evident that we all have different points of view.*

> ID378 (Türkiye): *I am surprised to see that much variety in the results. Also I was expecting the results of my country like my answers.*

The level above Requisite Attitudes in Deardorff's Pyramid Model consists of two components: 'Knowledge and Comprehension/ Skills.' Quantitative and qualitative data indicates that students perceived that their knowledge increased as a result of participating in the SGS. Item 1 was "I didn't learn anything about the other country(ies)." As shown in Table 4, significant differences were found between Grouping A (Mdn = 2) and Grouping B (Mdn = 1) (U = 45175; p = 0.021), as well as between Grouping A (Mdn = 2) and Grouping C (Mdn = 1) (U = 20638.5; p = 0.034), indicating students who participated in the SGS perceived more knowledge gains that those who did not participate. As qualitative feedback from students indicated, viewing the SGS results allowed them to analyze the similarities and differences between countries in a way that wasn't always apparent from reading the forums. Comments such as the following indicate that students used the SGS results to reflect upon what they had learned in the forums:

> ID721 (Colombia): *... I was able to learn and improve my knowledge, as I could also solve my doubts that came up when communicating with people who are not from my own country.*

Item 8 from the IVE Survey also pertained to knowledge: “I feel like I started to understand the lives of the people in other countries in this exchange.” The results of this item are interesting when looking at the subgroupings for both Grouping B and C. As mentioned earlier, participants in subgroupings 1 and 2 did not discuss the results while those in subgrouping 3 did. As shown in Appendices E and F, participants in both Grouping B_1 (Mdn = 4; U = 12098.5; p =0.460) and C_1 (Mdn = 5) (U = 2281.5; p =0.144), who only took the survey, were found to have insignificant differences compared to Grouping A (Mdn = 4). However, participants in Groupings B_3 (Mdn = 5; U = 8739.5; p =0.008) and C_3 (Mdn = 5; U = 11081; p =0.007), who discussed the results, each had significant differences when compared to Grouping A (Mdn = 4). This fits with a constructivist perspective of learning where students co-construct knowledge together and this interaction among learners is deemed crucial for negotiating meaning (Williams et al, 2016). The data suggests that integrating discussion into the final phase of the SGS fosters IC development in students.

An additional explanation for this reported increase in knowledge for those who participated in the SGS was that results were provided in multiple modalities, making it easier for students to process and discuss the content (Mayer & Moreno, 2003; Weinstein, 2018). Through the forums, students are primarily engaged with content in a text form, sometimes with supplemental images and videos. With the SGS, students first see the survey in text form. Immediately after they take the survey, the current results are presented in tabular form. Shortly thereafter, the results are displayed in graphical form when the Summary Graphs are published. As the IVEProject also encourages teachers to promote classroom discussions of the results, some also receive the content in a combination of verbal and graphical form. Through a blend of multiple modalities (text, tables, graphs and verbal discussions), the students are more likely to absorb and assimilate the content into their existing schemata, increasing their knowledge of different cultures.

It is also interesting to note that in addition to learning about other cultures, students felt they were contributing to the knowledge of students in other countries. This was indicated by item 3, “My participation helped students in other countries understand my culture,” in which both Grouping B (U = 45266; p = 0.028) and Grouping C (U = 16995.5; p < 0.001) had significant differences when compared with Grouping A. As Appendix D shows, there was also a significant difference between the means of Groupings B (Mdn = 5) and C (Mdn = 5) (U = 12659.5; p = 0.002), indicating discussion is an important element here.

The level above Knowledge and Comprehension in Deardorff’s Pyramid Model is Desired Internal Outcome. Quantitative evidence here was mixed. The item from the IVE Survey which best represents this concept is item 5: “As a result of participating in the IVE, I feel differently about people in other countries.” Results here comparing both Grouping A (Mdn = 4) with Grouping B (Mdn = 4) (U = 45958.5; p = 0.059) and Grouping A (Mdn = 4) with Grouping C (Mdn = 5) (U = 21227; p = 0.103) were not significant (Table 4). Insignificant findings were also found for item 7: “As a result of participating in the IVE, I see my own country’s culture differently.” Item 2 from the IVE Survey was “As a result of participating in the IVE, I feel differently about myself.” This was found to be significantly different for Grouping C (Mdn = 4) compared with Grouping A (U = 18829.5; p < 0.001), but not for Grouping B (U = 48960.5; p = 0.573) (Table 4). However, when looking at the subgroupings (Appendices E and F), both subgroupings B_3 (Mdn = 4) (U = 9240; p = 0.041) and C_3 (Mdn = 4) (U = 10719.5; p = 0.002) were significantly different from Grouping A (Mdn = 4), indicating discussion played a role here. Considering the relatively short time of one IVEProject exchange (eight weeks) and the time one would expect for an internal shift to occur, it is understandable that inconclusive quantitative evidence was found for a shift in internal outcomes. However, the following quotations from the qualitative data indicate that internal shifts were burgeoning, which indicates a positive trajectory along IC development:

> ID462 (Colombia): *The survey was great because even though we are far apart we learned a little more about ourselves.*

> ID549 (Colombia): *I found the survey very well structured, it helped me to see that some things we are very different from them and vice versa, but I also think it helped us to connect with everything that revolves around us and that not everything is so alien.*

While exploring how the SGS affected the fourth level of the Pyramid Model, Desired External Outcome, is beyond the scope of this study, this section has discussed how participating in the SGS has helped students develop in the attitudinal and knowledge components, and provided indications that some students are beginning to experience internal shifts. IC development can be a lifelong process and data indicates that participating in this eight-week exchange has been an encouraging 'push' forward. It is hoped that the curiosity aroused through interacting in the forums and creating questions for the SGS, as well as discussions with peers, will provide momentum for some students to continue along this IC journey.

Research Question Two

The second research question was "How do the IVEProject students perceive the student-generated survey?". The themes that emerged from the qualitative data in Table 3 provided clear evidence that positive perceptions on the SGS outweigh the negative ones (96% and 4% respectively). The first theme for positive perception is intercultural understanding; the importance of intercultural understanding as necessary for the 21st century has been documented (Fantini, 2009). Based on the findings here it can be deduced that with its content and results, the SGS provided a window into other students' minds (Shakurnia et al., 2018) and thus helped improve the intercultural understanding of the participants. Evidence to support this is that students stated that through the SGS they understood each other better by seeing their similarities and differences. Not only did they get the chance to learn more about the daily lives of students, but they also analyzed habits of different cultures. Furthermore, the SGS often presented information they had learned in the IVEProject forums but in a new way allowing them to deepen their understanding. All this led to a better understanding of other cultures, which resulted in the facilitation of intercultural understanding. Two example statements are:

> ID508 (Colombia): *I thought it was interesting to answer a survey that people from other countries also answered and also to see the results and see that we are not so different and that in some things we coincide.*

> ID696 (Colombia): *This survey* [SGS] *was an excellent idea because it allowed me to analyze some of the habits of the different cultures and to understand many behaviors and associate them with the current circumstances of the countries.*

This *intercultural understanding* was supported by two sub-themes: *content of the questions* and *results of the survey*. Students found the questions in the SGS very interesting and engaging. They also added those questions were on a variety of topics such as daily lives of the participants which increased their attention. Regarding the results, students stated that the outcome of the SGS is both surprising and accurate. In addition, they are of the opinion that the results reflected in the Summary Graphs succinctly displayed the similarities and differences among cultures:

> ID419 (Chile): *I found it quite interesting the things that other people want to know about another culture.*

> ID593 (Chile): *I consider that the survey conducted was very complete in terms of the 19 questions* [18 student-generated questions and one demographic question] *we had to answer. All of them were adequate and necessary to have a broader and more specific view of the students.*

> ID258 (Chile): *It seemed to me that it covered everyday issues of people very well.*

> ID25 (Colombia): *I really liked this survey, I found it very interesting and I was surprised by the results, since it became evident that we all have different points of view.*
>
> ID260 (Colombia): *The surveys conducted by the students are very important as it makes us see all the differences we have and also, at the same time see what we have in common, it is a great initiative and I am satisfied with this.*

The second theme for positive perception is the *enjoyment and contentment* students felt for the SGS. The feeling of enjoyment takes place "when a person has not only met some prior expectation or satisfied a need or a desire but also gone beyond what he or she has been programmed to do and achieved something unexpected, perhaps something even unimagined before" (Csikszentmihalyi, 2008, p. 46). Enjoyment is a crucial factor in education and especially for foreign language learning. It has also been shown to have a role in increasing learners' willingness to communicate (Dewaele & Dewaele, 2018), and in providing a positive effect on foreign language performance and achievement (Jin & Zhang, 2018). For this theme, general comments with some keywords such as 'interesting,' 'good,' and 'perfect' used for the whole survey without going into specifics were included:

> ID65 (Colombia): *It was very entertaining and I didn't get bored answering it.*
>
> ID126 (Türkiye): *Student generated survey was very enjoyable for me. Because it was fun for me to ask and answer questions by sharing something in common with our peers living in different countries. As soon as I finished the survey, it was very pleasant for me to look at the results of the survey and make comments by speaking with myself. Thanks for everything* :)

The students also shared their positive opinions around the sub-theme of *expressions of gratitude*. Through these, the students conveyed their gratitude for the questions included in the SGS, the chance to contribute and the learning opportunity. Gratitude is "argued to have evolved to motivate and maintain social reciprocity among people, and to be linked to a wide range of positive effects—social, psychological and even physical" (Floyd et al., 2018, p. 1). As an indication of that positive effect, there are statements from students in every participating culture demonstrating gratitude for those who took roles in preparing, implementing, and presenting the outcome of the SGS. Two example statements are:

> ID462 (Colombia): *The survey was great ..... It was a great job, thank you IVE.*
>
> ID697 (Türkiye): *Thank you for giving us that chance. In that way, surveys are more enjoyable.*

Another sub-theme for *enjoyment and contentment* is *clarity of the questions*. Students stated they liked how those questions in the SGS were formulated openly. Using simple and clear language are pivotal elements of successful surveys (Charbonneau, 2007; Converse & Presser, 1986; Mathers et al., 2007) since only with the comprehension of the questions can the response data provide an accurate and reliable reflection of respondents' attitudes, knowledge, and perspectives. Therefore, student-generated questions go through the editing phase twice: first, by the individual teachers before sending them to the IVEProject and then by the survey administrators in the IVEProject if necessary. Before being added to the final SGS artifact, all questions and choices are reviewed to ensure that they are culturally sensitive, choices do not contain ambiguous wording, and all participants have one possible selection. This situation was noticed by the students as they appreciated the *clarity of questions* which emerged as one of the sub-themes supporting positive perceptions. They stated that the questions together with the options were all clear and suitable; there were no incomprehensible questions:

> ID139 (Colombia): *The questions were clear and concise*.
>
> ID378 (Türkiye): *I liked the questions; they were clear and suitable for every person*.

Not only did the students enjoy the *clarity of questions*, but they also liked how they took part in the preparation phase of the SGS by contributing their own questions. This emerged as the last sub-theme: *ownership of the questions*. As the following two comments illustrated, this idea of ownership might be interpreted as one of the reasons why students found the SGS enjoyable:

> ID81 (Japan): *There were many different questions and it was very interesting. I'm glad that the question I asked was answered.*

> ID238 (Türkiye): *It helped us to understand each other better because the ones who were asking the questions were us again. So it was better than the other way because we asked what we wanted to know.*

Regarding ownership of the questions, it can be articulated that while it is not uncommon in many educational settings for teachers to take full control of the content and the tasks students perform, teachers can also play a significant role in creating an educational setting which prioritizes learner agency. In this setting where teachers and learners co-create the education process, learners "acquire a sense of purpose in their education and take ownership of their learning" (OECD, 2019, p. 8). Additionally, while trying to prepare meaningful questions for the SGS, students have an opportunity to compare their existing schemata and notice possible gaps (Miyake & Norman, 1979), and then they can decide what is important to learn (Van Blerkom et al., 2006). Within this frame, it can be articulated that the SGS offered the IVEProject students the freedom to generate questions that satisfied their own curiosity rather than the demands of their instructor, allowing students to negotiate with their instructors how to best communicate their desired questions. Using a negotiated task instead of a fully teacher-assigned task is "meant to better engage learners' intentionality to activate a better motivation" (Lin, 2013, p. 642).

In relation to negative perceptions, the first theme is *suggestions for improvement* and the students recommended some ideas for enhancing the SGS such as *inclusion of more countries*. For example, the Summary Graphs from this exchange only included data from countries with at least 20 respondents which resulted in one student commenting:

> ID151 (Brazil): *I liked how we can compare different countries' answers through it, but I wish we had Brazilian data.*

Based on this feedback, in subsequent exchanges, the Summary Graphs included data from countries with at least 10 respondents allowing more countries to be represented. However, not all suggestions could be practically implemented. For example, appeasing the following comments about *inclusion of more questions* could make the survey overly lengthy:

> ID665 (UAE): *I think they should've included more questions to show more similarities in other countries.*

With respect to the second research question, the discussion in this section indicates that the SGS was positively perceived by almost all the students (96%). When viewed in conjunction with the discussion of research question one, it can be said that the SGS appears to be achieving its aim of creating a system that promotes IC development while simultaneously promoting enjoyment, agency and curiosity in students.

Conclusion

This cross-sectional study examined how students in a large-scale virtual exchange benefited from participating in a supplemental activity known as the student-generated survey. The development of

intercultural competence is a lifelong task. While a wide range of students participate in the IVEProject, many of them likely begin in the early stages of their intercultural competence development and perhaps may not have given much thought to the concept of culture. However, every journey needs to begin somewhere. Through the IVEProject forums, students are able to interact with individuals from other countries and put a human face on them. Students may often feel those individuals are representative of most people from their country, potentially resulting in the creation or reinforcement of stereotypical assumptions. Supplemental activities in VE can help reduce this possibility. The aim of the student-generated survey was first to inspire student agency and curiosity in the students, letting them ask questions that they were interested in to all IVEProject participants and then to create opportunities for them to understand and discuss the similarities and differences between cultures, as well as the diversity within cultures, using the collated responses. While acknowledging the limitations of this study, our results indicate that the SGS was successful in achieving this. Using the components from Deardorff's Pyramid Model to help show how the SGS facilitated IC development, the authors conclude that the SGS was able to do this for three main reasons. First, the data indicates that this initial phase of generating questions creates a ripple effect. Like a stone thrown into a pond, the authors believe generating questions can lead students to become curious and eager enough to view and discuss the survey results, which in turn can lead to increased knowledge, furthering IC development. Second, the data presented in this paper indicates that the act of discussing the results plays a key role in students' IC development. Learning is not an isolated process; students can gain deeper insights through social interaction and negotiation with others. Finally, students appreciate the agency they were afforded by being able to play a larger role in their learning through the question-generation process. Even students who did not participate in this acknowledged that the questions came from a student perspective. As one student put it, "The questions … let us express ourselves in the best way possible" (ID183, Colombia). The present study represents a first attempt to use a student-generated survey to support intercultural competence development in a virtual exchange. As this study demonstrated its benefits, it is hoped that this will pave the way for future studies.

Limitations

The authors acknowledge the following limitations:

- The May-July 2021 IVEProject contained, in addition to the SGS, one other supplemental activity called "Your Everyday Photos". Participation in this activity was not considered.
- The difference in English language proficiency among the EFL student participants was not considered in this study.
- It is possible that students who were interested in the SGS participated because they were already interested in or more open to intercultural understanding.
- It is possible that the students who generated questions had teachers who encouraged them to be more actively engaged in the IVEProject, resulting in a teacher effect.
- No strict validation of the IVE Survey has been undertaken and these items were not originally intended to serve as proxies for aspects of Deardorff's Pyramid Model of Intercultural Competence.
- The proportions of respondents to the IVE Survey did not correspond with the proportions of respondents to the SGS or the proportions of responses to the optional open-ended question.
- When Groupings B and C were divided into subgroupings, the number of participants decreased and reduced statistical validity. The smallest subgrouping, C_1, contained only 15 participants. The next smallest was 35 and all remaining subgroupings had more than 50 participants.

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Appendix A

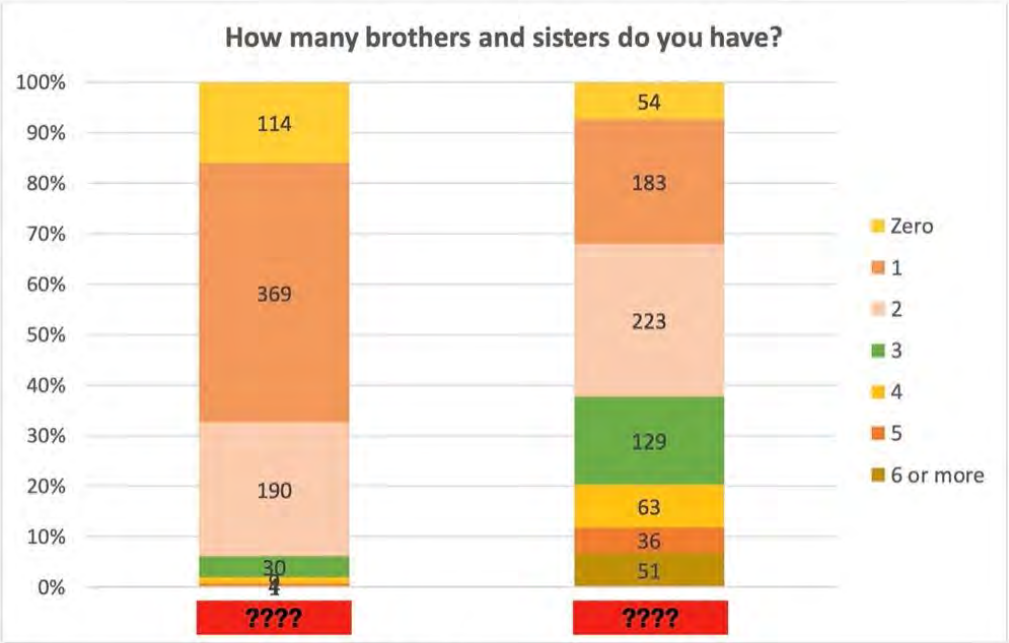
Forum discussion on the results of the SGS

Appendix B

Ideas for teachers to use the Summary Graphs with students

Usually three or four days after students start taking the survey, the Summary Graphs are made available. Students and teachers can use these in various ways.

Idea #1: Hide the country names on the graphs; have the students guess. This makes students think and apply what they have learned about the different countries during the IVEProject exchange.



Which country: Japan or Colombia?

Idea #2: Have students summarize the main ideas in the graph. This could be oral or written.

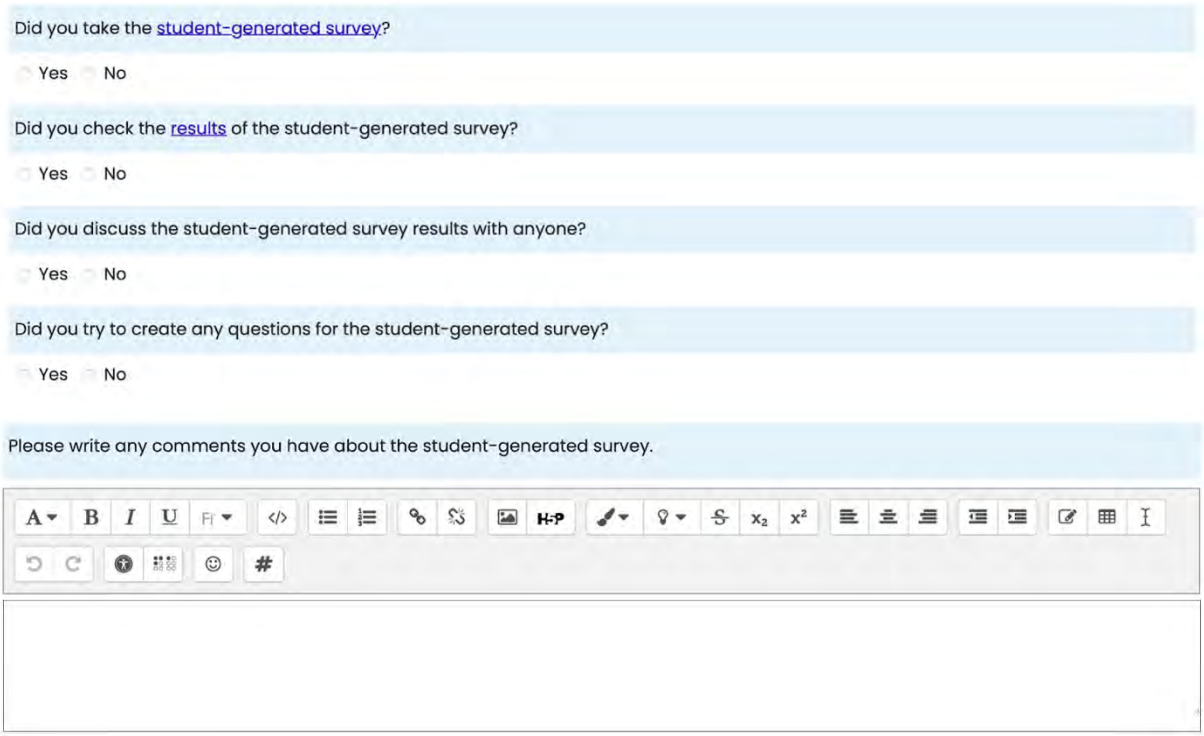
Idea #3: For advanced students, ask them 'Why?' questions and have them try to make educated guesses. For example, if the graph shows that Colombians tend to have more brothers and sisters than Japanese, ask them to explain possible reasons. This can lead to some interesting discussions.

Idea #4: Have students (individually or in groups) report data from the graphs that surprised them. For example, it could be one way their culture is more similar / different to another than they expected.

Idea #5: Teachers could create a worksheet asking students to find specific information from the graphs. For example, you could ask questions like 'Students from which country say more than 15% of them do not have a brother or sister?' *For this activity, teachers should download the summary graph they are using because it does get updated every few days as more students take the survey*.

Appendix C

Questions used in this study pertaining to SGS in the IVE Survey



Appendix D

Results of Mann-Whitney U Test comparing Groupings B and C

Statement	n	mean	median	SD	U	p	Effect size**
1. I didn't learn anything about the other country(ies).*							
Grouping B	259	2.00	1	1.33	-	-	-
Grouping C	121	2.03	1	1.48	15273.5	0.666	0.025
2. As a result of participating in the IVE, I feel differently about myself.							
Grouping B	259	3.65	4	1.46	-	-	-
Grouping C	121	4.06	4	1.50	13002.5	**0.006**	0.170
3. My participation helped students in other countries understand my culture.							
Grouping B	259	4.52	5	1.16	-	-	-
Grouping C	121	4.87	5	1.18	12659.5	**0.002**	0.192
4. I'm more interested in the other country(ies) now because of the IVE.							
Grouping B	259	4.58	5	1.29	-	-	-
Grouping C	121	4.80	5	1.38	13621.5	**0.033**	0.131
5. As a result of participating in the IVE, I feel differently about people in other countries.							
Grouping B	259	4.00	4	1.41	-	-	-
Grouping C	121	4.39	5	1.45	12991.5	**0.006**	0.171
6. Culture is more important to me now than before doing the exchange.							
Grouping B	259	4.21	4	1.38	-	-	-
Grouping C	121	4.57	5	1.28	13328.5	**0.016**	0.149
7. As a result of participating in the IVE, I see my own country's culture differently.							
Grouping B	259	4.14	4	1.45	-	-	-
Grouping C	121	4.33	5	1.51	14337.5	0.172	0.085
8. I feel like I started to understand the lives of the people in other countries in this exchange.							
Grouping B	259	4.50	5	1.25	-	-	-
Grouping C	121	4.77	5	1.25	13500	**0.025**	0.138
9. I feel I am more open-minded to people from other cultures as a result of participating in the IVE.							
Grouping B	259	4.62	5	1.29	-	-	-
Grouping C	121	4.94	5	1.07	13640.5	**0.035**	0.129

*Reverse coding

**Rank-Biserial Correlation

Appendix E

Results of Likert items for the three B Subgroupings, each compared with Grouping A, using a Mann-Whitney U test

Statement	n	mean	median	SD	U	p	Effect size**
1. I didn't learn anything about the other country(ies).*							
Grouping B_1	66	2.21	2	1.27	12533	0.773	0.021
Grouping B_2	136	1.90	1	1.32	22437	**0.006**	0.150
Grouping B_3	57	1.98	2	1.38	9663	0.105	0.126
2. As a result of participating in the IVE, I feel differently about myself.							
Grouping B_1	66	3.49	4	1.29	12281.5	0.588	0.041
Grouping B_2	136	3.59	4	1.40	26374	0.995	<0.001
Grouping B_3	57	4.00	4	1.71	9240	**0.041**	0.164
3. My participation helped students in other countries understand my culture.							
Grouping B_1	66	4.42	4	1.18	12087.5	0.455	0.056
Grouping B_2	136	4.48	5	1.15	24252	0.149	0.081
Grouping B_3	57	4.72	5	1.16	8926.5	**0.016**	0.193
4. I'm more interested in the other country(ies) now because of the IVE.							
Grouping B_1	66	4.41	5	1.27	12516.5	0.764	0.022
Grouping B_2	136	4.54	5	1.32	25098	0.384	0.049
Grouping B_3	57	4.84	5	1.21	9061	**0.023**	0.181
5. As a result of participating in the IVE, I feel differently about people in other countries.							
Grouping B_1	66	3.94	4	1.28	11093.5	0.075	0.134
Grouping B_2	136	4.04	4	1.41	24638	0.239	0.066
Grouping B_3	57	3.98	4	1.55	10227	0.348	0.075
6. Culture is more important to me now than before doing the exchange.							
Grouping B_1	66	4.20	4	1.34	12193.5	0.525	0.048
Grouping B_2	136	4.18	4	1.38	25066	0.373	0.050
Grouping B_3	57	4.32	5	1.44	10761.5	0.737	0.027
7. As a result of participating in the IVE, I see my own country's culture differently.							
Grouping B_1	66	4.14	4	1.44	12682.5	0.900	0.009
Grouping B_2	136	4.17	4	1.40	25835.5	0.712	0.021
Grouping B_3	57	4.09	4	1.62	11012.5	0.960	0.004
8. I feel like I started to understand the lives of the people in other countries in this exchange.							
Grouping B_1	66	4.27	4	1.13	12098.5	0.460	0.055
Grouping B_2	136	4.49	5	1.27	24549	0.213	0.070
Grouping B_3	57	4.77	5	1.32	8739.5	**0.008**	0.210
9. I feel I am more open-minded to people from other cultures as a result of participating in the IVE.							
Grouping B_1	66	4.44	4.5	1.22	12764.5	0.967	0.003
Grouping B_2	136	4.57	5	1.33	24136	0.128	0.085
Grouping B_3	57	4.93	5	1.25	8323	**0.002**	0.247

*Reverse coding

**Rank-Biserial Correlation

Appendix F

Results of Likert items for the three C Subgroupings, each compared with Grouping A, using a Mann-Whitney U test

Statement	n	mean	median	SD	U	p	Effect size**
1. I didn't learn anything about the other country(ies).*							
Grouping C_1	15	2.27	2	1.49	2901.5	0.985	0.003
Grouping C_2	35	1.83	1	1.34	5484	**0.047**	0.192
Grouping C_3	71	2.07	2	1.552	12236	0.114	0.112
2. As a result of participating in the IVE, I feel differently about myself.							
Grouping C_1	15	4.00	4	1.65	2377	0.219	0.183
Grouping C_2	35	3.97	4	1.56	5733	0.119	0.156
Grouping C_3	71	4.11	4	1.38	10719.5	**0.002**	0.222
3. My participation helped students in other countries understand my culture.							
Grouping C_1	15	5.00	5	0.93	1978	0.031	0.32
Grouping C_2	35	4.80	5	1.39	5032	**0.009**	0.259
Grouping C_3	71	4.87	5	1.13	9985.5	**<0.001**	0.275
4. I'm more interested in the other country(ies) now because of the IVE.							
Grouping C_1	15	4.73	5	1.22	2564	0.422	0.119
Grouping C_2	35	4.54	5	1.76	5995.5	0.238	0.117
Grouping C_3	71	4.94	5	1.18	10650.5	**0.002**	0.227
5. As a result of participating in the IVE, I feel differently about people in other countries.							
Grouping C_1	15	4.80	5	1.32	2161.5	0.083	0.257
Grouping C_2	35	4.29	5	1.56	6355.5	0.52	0.064
Grouping C_3	71	4.35	5	1.42	12710	0.288	0.077
6. Culture is more important to me now than before doing the exchange.							
Grouping C_1	15	4.87	5	1.30	2100.5	0.060	0.278
Grouping C_2	35	4.34	5	1.53	6546	0.718	0.036
Grouping C_3	71	4.62	5	1.14	12014.5	0.078	0.128
7. As a result of participating in the IVE, I see my own country's culture differently.							
Grouping C_1	15	4.80	5	1.37	2085	0.057	0.284
Grouping C_2	35	4.60	5	1.56	5314	**0.029**	0.217
Grouping C_3	71	4.10	4	1.49	13734.5	0.969	0.003
8. I feel like I started to understand the lives of the people in other countries in this exchange.							
Grouping C_1	15	4.80	5	1.32	2281.5	0.144	0.216
Grouping C_2	35	4.74	5	1.46	5349.5	**0.032**	0.212
Grouping C_3	71	4.78	5	1.16	11081	**0.007**	0.196
9. I feel I am more open-minded to people from other cultures as a result of participating in the IVE.							
Grouping C_1	15	5.07	5	0.96	2070.5	0.051	0.288
Grouping C_2	35	5.06	5	1.16	4769	**0.003**	0.298
Grouping C_3	71	4.86	5	1.05	11160	**0.009**	0.190

*Reverse coding

**Rank-Biserial Correlation

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Ethics Statement

The authors took great care in ensuring ethically appropriate research. When students first join the IVEProject, they must first complete a two-part Consent Form (available in Chinese, English, Japanese, and Spanish) before the forum activities are available. The first part informs students that the IVEProject administrators would like to use participants' data for research purposes. Students may participate with the IVEProject with no negative consequences regardless of their choice here. The second part relates to etiquette that is expected of participants. They are not allowed to use the IVEProject unless they agree to this. The researchers followed and acted according to Ethical Guidelines for Educational Research (British Educational Research Association, 2018) in collecting, analyzing and presenting the data.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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