

students' competencies for the global era, along with an OECD project called the "Future of Education and Skills: Education 2030" (ISN, n.d.; OECD, n.d.). During their GC-PBL experiences, students addressed various problems in their local communities as well as participating in online communications with partner schools outside of Japan.

This study investigated how students perceived their growth in global competencies through GC-PBL, the degree to which GC-PBL activated their communication with students from partner schools, and whether any relationship existed between the students' experiences of intercultural communication and their perception of their global competencies. To answer these research questions, we asked the students to respond to an online survey to review their growth.

Background

Because we live in volatile, uncertain, complex, and ambiguous (VUCA) globalized societies, we face diversity in cultures, religions, value sets, and so on. In these kinds of societies, it is vital to try to find the best possible solutions while respecting those with different opinions; we should also understand that more than one solution may often exist. ISN and the OECD (2016 a, b) have common agendas on this point; the improvement of students' global competencies is a high-interest topic for both organizations. The ISN 2030 project was conducted in over fifty schools in nine countries to promote a vision of global collaboration. GC-PBL was widely expected to foster the global competencies of the students in this project; as such, we wished to assess the growth of the students' global competencies. While it is difficult to assess such competencies directly, we can assess students' confidence in their own competencies. We thus created a survey with the intention of measuring just that. Although this is a pilot study, we expect the results of this survey to contribute to discussions of learning for global competencies.

Theoretical Framework

Global competencies include a variety of elements. According to the OECD (2016 a, c), global competencies have four dimensions: 1) knowledge and understanding, 2) skills, 3) attitudes, and 4) values (Figure 1). We focused on "skills" and "attitudes" dimensions for our survey while "knowledge and understanding" and "values" dimensions

were excluded. Given the variety of student learning, we could not assume common knowledge that students should learn. Hence, the "knowledge and understanding" dimension was excluded. Because the "values" construct also tends to show change over a much longer term than the three-year period of these ISN activities, this dimension was excluded from the survey that would be used in the ISN project.

The items that corresponded to "skills" and "attitudes" consist of constructs related to coping with tensions, dilemmas, trade-offs, and contradictions. These constructs were particularly relevant in this project (which was most of the students' first experiences with global collaborative projects), since such projects appear to present students with various frictions and difficulties because of cultural differences. In addition, collaboratively solving questions that have no clear answer is critical within current educational-reform efforts in Japan (Chuo Kyoiku Shingikai [Central Council for Education], 2016). It is essential for the next generation to collaborate with others under uncertain or challenging circumstances—and with persistent and tolerant mind-sets—in order to solve society's problems. We therefore adapted our survey items from modules and constructs highlighted in sample OECD student questionnaire items (2016 a).

Literature Review

Practical studies of global competencies have primarily been conducted in the field of higher education because of the widespread recognition of the need for human-resource development in global societies. Most previous studies have suggested that cross-cultural experience is critical for global competency. Li and Xu (2016), for example, investigated undergraduates in China and concluded that cross-cultural experiences were essential for enhancing students' global competency, while Murphy, Sahakyan, Yon-Yi, and Magnan (2014) revealed the long-term effects of study-abroad programs on global engagement using a large-scale survey. A few studies of global competency development in primary and secondary education have also been conducted, although these studies are fewer in number than those on higher education. Mathews (2016) demonstrated, through interviews and observations, that a program for "glocal" study fostered students' awareness of global and local issues. Though that report is certainly valuable, the number of participants was limited ($n < 30$). An examination of

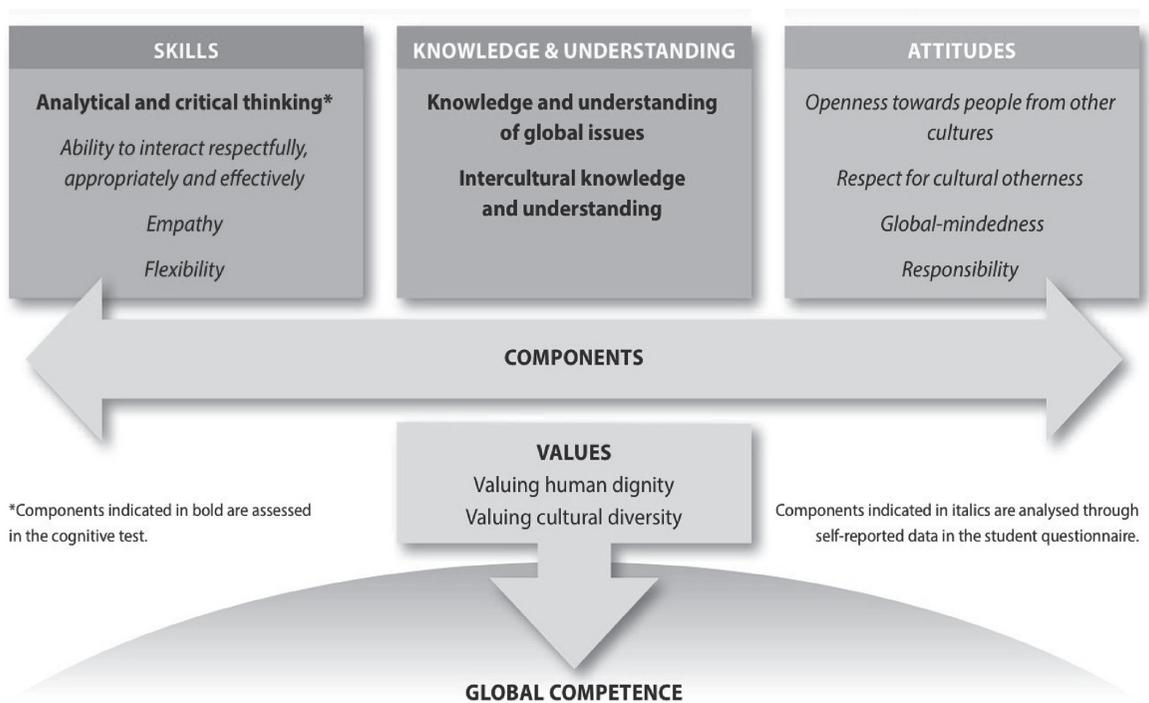


Figure 1. The dimensions of the proposed assessment of Global Competencies (OECD, 2016a, p. 6).

the relationship between program activities and global competencies is thus still necessary.

The main purpose of the present survey was to explore the development of students' self-confidence in their global competencies through GC-PBL programs. This is an urgent issue within the context of Japanese educational reform, which prioritizes the fostering of self-confidence in twenty-first-century skills, including fostering global competencies through active, project-based learning. The results of this survey will contribute to ongoing discussions of educational reform in Japan as well as to empirical studies of global competencies worldwide.

Method

Participants

All students who completed the survey had previous experience with GC-PBL at ISN. We contacted 141 students through their schools' teachers, and 101 students responded to the survey, which was a 71.4% response rate. All participants belonged to junior (grades 7–9) and senior (grades 10–12) public high schools located in both urban and rural areas of Japan. The questionnaire (see Appendix)

was available from 11 July to 1 August 2017. Instructions and informed consent were given by teachers according to the documentation we provided.

Materials

The survey was administered as a web-based questionnaire. Its cover page asks for students' affiliations and duration of GC-PBL experiences. The next two sections were: 1) Assessment of global competencies; and 2) Communication. The ten items in the first section assessed "skills" and "attitudes".

The first dimension of "skills" contained the sub-dimensions of *communication* and *flexibility*, flexible communication and actions are important for devising better solutions with multi-cultured people. *Openness towards people from other cultures* and *courage & curiosity* were sub-dimensions of "attitudes", because open attitudes towards different cultures and challenges are essential for GC-PBL. General constructs like *creating new value* or *taking responsibility* were excluded to save survey time in this study.

The assessment used in this study was a self-evaluation by the students, so it is important to bear in mind that it

was not an objective evaluation of their improvement in global competencies. Nonetheless, the assessment could show how students subjectively felt or thought about their improvements. We can use the assessment to understand the relationships between students' self-confidence and their experiences of global communication.

Constructs

Items in the questionnaire are linked to the ten constructs below as showed in Table 1.

Self-expression (*Communication-Skills*)

When you cope with dilemmas and tensions, you will face objections. You assert your opinion as the starting point of discussions even if there is opposition.

Incorporation of different opinions (*Communication-Skills*)

Fruitful discussion requires a variety of opinions.

Respecting every opinion is a fundamental skill for making a project powerful.

Teamwork skills (*Communication-Skills*)

Projects are accomplished with teamwork. Each member of a project team is expected to contribute her/his best in the collaboration.

“Active” listening (*Communication-Skills*)

To show respect for your peers' opinions, despite the fact that you may sometimes find it difficult to understand what they mean, you need to inquire about the logic and context of the opinion.

Inclusion (*Flexibility-Skills*)

Projects are more productive when they reflect diverse ideas. It is a critical skill to respect and include various opinions; this ensures a quality project.

Multidimensional perspective (*Flexibility-Skills*)

A project in the VUCA era demands flexible thinking.

Table 1 Design of Constructs in the Questionnaire

Dimensions	Sub dimensions	Constructs	Items
Skills スキル	Communication コミュニケーション	Self-expression 意見の表明	I don't hesitate to express my opinions even if different disagree with me. 自分の意見に反対する人の前でも、自分の意見を言うことができる。
Skills スキル	Communication コミュニケーション	Incorporation of different opinions 他者意見の尊重	Working on a team, I remember to and respect different' opinions and work together to achieve the overall objectives of the team. 議論の目的を達成するため、他者の意見を尊重することができる。
Skills スキル	Communication コミュニケーション	Teamwork skills 役割とチーム貢献	In group work, I voice my opinion while keeping my role and responsibility in mind; at the same time, I try to contribute to the team effort. グループワークでは、チームとしての成果を出すために、自分の役割を意識して発言できる。
Skills スキル	Communication コミュニケーション	“Active” listening 背景の探究	While having a discussion, I can usually understand the intent of the speaker, even if he or she isn't good at expressing it. 話し合いのとき、相手の発言の意図はなになのかを考えることができる。
Skills スキル	Flexibility 柔軟性	Inclusion インクルージョン	When summarizing the group discussion, I try to include opposing ideas and reflect them in the results of the discussion. 意見をまとめるときは、なるべく反対意見を尊重して、結論に反映できないか考えることができる。
Skills スキル	Flexibility 柔軟性	Multidimensional perspectives 多角的思考	I see the problem from multiple perspectives in order to get a “big picture”. 物事の全体像をつかむために、多面的に見ることができる。
Attitudes 態度	Openness towards people from other cultures 異文化に対する開放性	Openness toward cultural diversity 異文化理解志向	I want to take advantage of any (or an) opportunity where I can interact with people from diverse ethno-cultural backgrounds. 様々な文化圏の人々とコミュニケーションをとれる機会があれば出席したい。
Attitudes 態度	Openness towards people from other cultures 異文化に対する開放性	Open-mindedness / Non-judgmental 偏見排除志向	I want to experience a new culture even if it's utterly unfamiliar. なじみのない文化に接したときでも、まずは体験してみたい。
Attitudes 態度	Courage & Curiosity 勇気と好奇心	Interest in novelty 新規性への関心	I am willing to try new and unfamiliar things. 新しいことをどんどん試していきたい。
Attitudes 態度	Courage & Curiosity 勇気と好奇心	Perseverant /Tenacious 挑戦心	When faced with challenges and difficulties, I strive continually to overcome them. 困難に直面したとき、問題について粘り強く考え続けたい。

Examining a problem from differing perspectives leads to better solutions.

Openness toward cultural diversity (*Openness toward people from other cultures*–Attitudes)

There are so many cultures in the world. Openness toward cultural diversity is a basic necessary attitude for working in a global context.

Open-mindedness / Non-judgment (*Openness toward people from other cultures*–Attitudes)

When you collaborate with persons who come from other cultures, you need to be careful to avoid prejudice. Open-mindedness provides you with rich collaborations.

Interest in novelty (*Courage & Curiosity*–Attitudes)

Good ideas often come from novel fields. A spirit of challenge is an essential attitude for global project work.

Perseverant / Tenacious (*Courage & Curiosity*–Attitudes)

There are many hurdles along the way to reaching best solution in a project. Toughness in the face of difficulties is key to success in a project.

values within each sub-dimension (which ranged from .654 to .447) demonstrated that these constructs were reasonably reliable. For cross-dimensional relationships, the correlation between “team work skills” and “inclusion” ($r = .651$) was relatively high; the correlation between “incorporation of different opinions” and “perseverant / tenacious” ($r = .604$) was also high.

Figure 2 shows the competencies in which students felt most confident as well as the mean scores for each item for the question, “Are there any changes/improvements in your skills or attitudes because of this activity?” The scores ranged from 5 (significant changes reported) to 1 (no change reported). The students were most confident in “interest in novelty,” followed by “openness toward cultural diversity.” The mean scores of both items ($M = 4.34$ and 4.14 , respectively) were relatively high and were higher than the third (teamwork skills: $M = 3.93$), fourth (self-expression: $M = 3.93$), and fifth (multidimensional perspective: $M = 3.88$) items. The top two items belonged to the “attitudes” dimension, while the next three belonged to the “skills” dimension.

They were most confident in “interest in novelty”, and secondarily, “openness toward cultural diversity”. The mean scores of both of these items ($M = 4.34$ and 4.14) are relatively high, and higher than the third (teamwork skills: $M = 3.93$), the fourth (self-expression: $M = 3.93$), and the fifth (multidimensional perspective: $M = 3.88$). The top two belong to the “attitudes” dimension while the next three

Results

Result 1

Table 2 shows the intercorrelations among ten items in section 1 of the questionnaire. The value of the Cronbach’s alpha of these items ($\alpha = .899$) demonstrated that the data had internal reliability. In addition, the intercorrelation

Table 2 Self-recognition of Global Competencies: Correlations (n=101)

Dimensions	Sub-dimensions	1	2	3	4	5	6	7	8	9	10
1	Communication										
	Self-expression	–									
2	Incorporation of different opinions	.640	–								
3	Teamwork skills	.624	.654	–							
4	“Active” listening	.447	.466	.627	–						
5	Flexibility										
	Inclusion	.464	.538	.598	.613	–					
6	Multidimensional perspective	.500	.461	.651	.577	.550	–				
7	Openness towards people from other cultures	.158	.382	.426	.345	.297	.402	–			
8	Open-mindedness / Non-judgmental	.251	.449	.416	.457	.293	.466	.657	–		
9	Courage & Curiosity										
	Interest in novelty	.328	.472	.455	.308	.199	.461	.532	.570	–	
10	Perseverant / Tenacious	.509	.604	.578	.467	.376	.560	.466	.599	.527	–

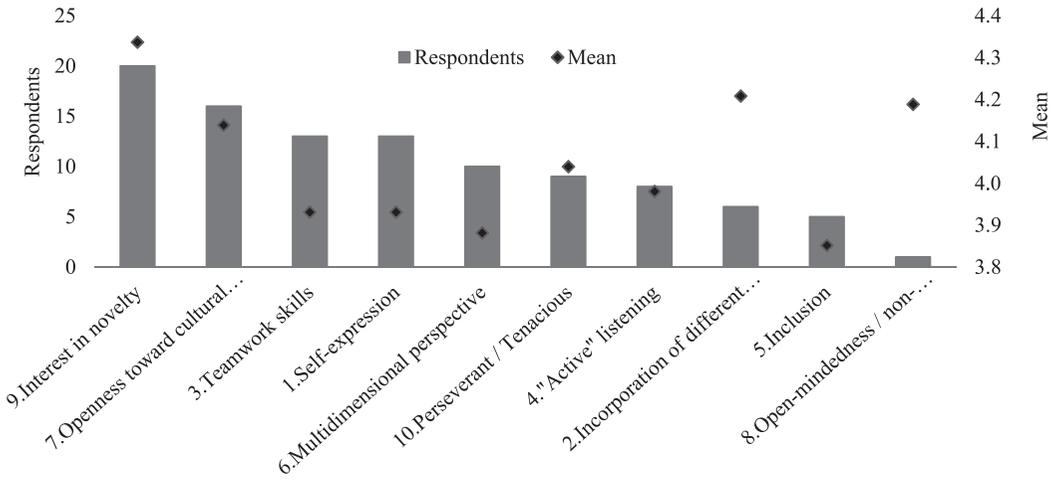


Figure 2. Frequency of responses to the question, “Which item above has been changed the most? Select from items 1–10,” as well as mean scores for each item on the question, “Are there any changes/improvements in your skills or attitudes because of this activity?” 5 = significant changes; 1 = no change.

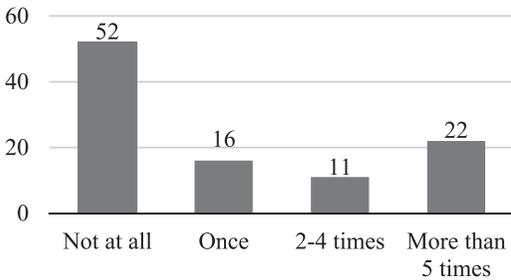


Figure 3. Number of times students wrote/sent emails to students from partner schools during projects.

belong to the “skills” dimension.

Result 2

Figure 3 shows the results for how often the students communicated with students in partner schools by email in part 2 of the questionnaire. While half the students did not write emails during their projects, more than a fifth sent emails to their overseas partners.

Figure 4, which shows the number of students who participated in online meetings, reveals that most of the students could not attend online meetings, while nearly half of all students communicated with their partner students via

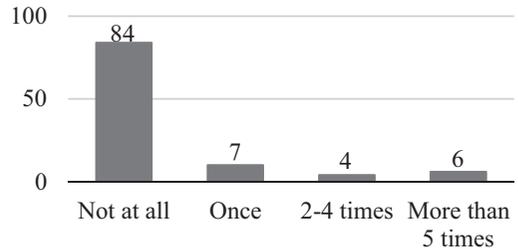


Figure 4. Frequency of students’ online meetings with partner schools.

SNS (Figure 5).

These figures show that it is necessary for schools and researchers to consider students’ abilities when introducing media, since global collaboration depends on the students’ experiences and daily communications lifestyles.

Result 3

We compared the average scores on the ten items on perceptions of global competencies between those students who participated in GC-PBL for up to 6 months and those who participated in GC-PBL for more than 6 months. These results are shown in Figure 6.

Five items were significantly different between the two

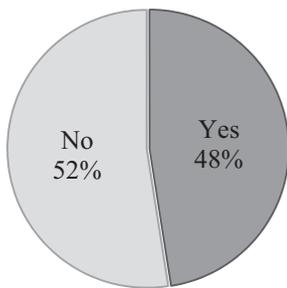


Figure 5. Relative frequencies of students' interaction with partner school students overseas via SNS

groups. The scores of three items, including the category "communication in groups" in the "up to 6 months" group, were higher than the scores in the 6-or-more-month group.

Discussion

In this study, we implemented a web-based questionnaire to learn how students recognized their growth in global competence through GC-PBL and how often they communicated with students from partner schools. The results describe the actual conditions of GC-PBL and suggest the students' learning process.

The results show, first, that the students felt confident in their global-competencies growth, particularly in terms of interest in novelty and openness toward cultural diversity. Although many people often emphasize the importance of

communication skills and knowledge of different cultures, these results demonstrate the importance of having an open-minded attitude and being interested in sharing common issues at the beginning stage of global collaboration. At this phase, the issues that students inquire about are a key consideration. In this report, because we could not analyze the relations between contents and processes of global collaboration projects, students' involvement in these projects, and the growth of global competencies, we had to identify which factors influenced students' self-perception through their reflection reports on their experiences.

Second, while the students could participate in written communication to some extent, most felt they could not participate in speaking and listening communication; this result shows that the effectiveness of global collaboration will differ depending on communication modes and styles. Researchers thus should reflect on the communication media that people use by the expertise of the collaborators.

Finally, we examined the correlation between the experience of GC-PBL and students' growth in global competencies. The result of the analysis indicates that longer-term experiences generally lead to the growth of competency, especially in attitudes and skills. While the growth of attitudes (such as openness toward different cultures) can be realized even in the short term, discussion skills (such as self-expression and the incorporation of different opinions) require long-term experience as well as a persistent attitude to grow, both of which are critical for

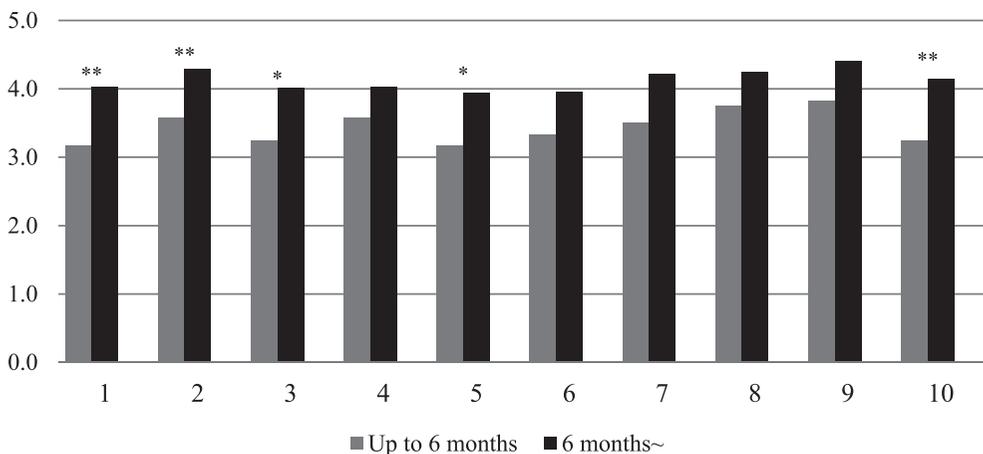


Figure 6. Comparison of global competencies self-perception scores between students who participated in GC-PBL for up to 6 months (n = 12) and more than 6 months (n = 89); *p < .05; **p < .01.

engaging in constructive discussions.

The present work was our first trial of GC-PBL; the data was collected shortly after global collaboration. We will follow the long-term effects of GC-PBL both quantitatively and qualitatively. Even if students have impressive experiences, these experiences will not be directly reflected in their scores of these items. We analyzed the data by item, and the GC-PBL was based on collaborative group activities, so it will be necessary to analyze the data by collaborative groups and clusters by ISN. In the future, it will be necessary to examine how the teachers and various stakeholders who engage in this project evaluate the growth of the students and to determine the outcome of the present study in combination with other external (i.e., objective evaluation) indicators.

Acknowledgments

The authors are grateful to all the students and teachers who participated in the survey. We wish to thank the OECD Education 2030 team for its valuable support, specifically Dr. Esther Carvalhaes for her helpful suggestions. We wish to thank Dr. Kayo Inoue and Mr. Yasuaki Kameoka for their advice on developing the survey items. We also wish to thank Ms. Kana Cornett for her data-analysis assistance. This study is part of the Japan Innovative Schools Network, supported by OECD, and was made possible by grants from the Foundation for the Acknowledgement of Juvenile Education in Japan (FAJE) 2016 and 2017.

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Appendix

Assessment for Global Competence

*必須

所属する学校を選択してください。Please select your school. *

選択

氏名/ Name 【ex: First(名).Last(姓)】 ※日本語の方は漢字とローマ字で記入してください

回答を入力

Project Based Learning(地方創生イノベーションスクール)に参加している期間を教えてください。How long have you participated in PBL activities? *

選択

Section1 : Skills / Attitudes

この活動を通して、みなさんの考え方や態度にはどの程度の変化がありましたか。次の1-10について、どのくらい変化があったか/なかったかについて、あてはまるものにチェックしてください。(1:全く変化しなかった<->3:変化はあった<->5:非常に大きく変化した) Are there any changes/ improvements on your skill or attitudes through this activity? Read below 10 questions and check the most appropriate answer. (1: there is no change <-> 3: there are some changes <-> 5: there are significant changes)

(1)自分の意見に反対する人の前でも、自分の意見を言うことができる。I don't hesitate to express my opinions even if different disagree with me. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(2)議論の目的を達成するため、他者の意見を尊重することができる。Working on a team, I remember to and respect different opinions and work together to achieve the overall objectives of the team. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(3)グループワークでは、チームとしての成果を出すために、自分の役割を意識して発言できる。In group work, I voice my opinion while keeping my role and responsibility in mind; at the same time, I try to contribute to the team effort. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(4)話し合いのとき、相手の発言の意図はなになのかを考えることができる。While having a discussion, I can usually understand the intent of the speaker, even if he or she isn't good at expressing it. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(5)意見をまとめるときは、なるべく反対意見を尊重して、結論に反映できないか考えることができる。When summarizing the group discussion, I try to include opposing ideas and reflect them in the results of the discussion. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(6)物事の全体像をつかむために、多面的に見ることができる。I see the problem from multiple perspectives in order to get a "big picture." *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(7)様々な文化圏の人々とコミュニケーションをとれる機会があれば出席したい。I want to take advantage of any (or an) opportunity where I can interact with people from diverse ethno-cultural backgrounds. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(8)なじみのない文化に接したときでも、まずは体験してみたい。I want to experience a new cultures even if it's utterly unfamiliar. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(9)新しいことをどんどん試していきたい。I am willing to try new and unfamiliar things. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

(10)困難に直面したとき、問題について粘り強く考え続けた。When faced with challenges and difficulties, I strive continually to overcome them. *

	1	2	3	4	5	
全く変化しなかった / There is no change	<input type="radio"/>	非常に大きく変化した / There are significant changes				

上の1-10の中で、自分がこの活動を通して最も大きく変化したものはどれだと感じますか。1-10の数字を選び、なぜそのように変化したのか、エピソード交えて書いてください。Which item above has been changed the most? Select from question (1-10) and tell us the reason by describing your episode. *

選択

エピソード/Episode *

回答を入力

Section 2: Communication

Section 2: Communication

この活動を通して、どのようなコミュニケーションを実施しましたか？以下の質問の最もあてはまるものにチェックしてください。What kind of communication did you have through this activity? Read below questions and check the most appropriate answer.

本活動で海外のパートナー校の生徒または先生にメールを書いた回数（1：0回、2：1回、3：2～4回、4：5回以上）How often have you written/sent emails to students or teachers who belong to the partnership school through this activities? (1: not at all, 2: once, 3: 2-4 times, 4: more than 5 times)*

	1	2	3	4	
全く書かなかった/Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5回以上/ more than 5 times

海外のパートナー校とSNSでやりとりしたことがある。I have communicated with partner students in overseas via SNS.*

選択 ▼

本活動で、海外のパートナー校とのスカイプなどオンライン会議に参加した回数（1：0回、2：1回、3：2～4回、4：5回以上）How often have you joined online meeting with overseas partners through this activities? (1: not at all, 2: once, 3: 2-4 times, 4: more than 5 times)*

	1	2	3	4	
0回 / not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5回以上/ more than 5 times

本活動で、海外のパートナー校とのスカイプなどオンライン会議に参加して発言した回数（1：0回、2：1回、3：2～4回、4：5回以上）How often have you made remarks in online meeting with overseas partners through this activities? (1: not at all, 2: once, 3: 2-4 times, 4: more than 5 times)*

	1	2	3	4	
0回 / not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5回以上/ more than 5 times

本活動で、地域の人々にインタビューするなど話した回数（1：0回、2：1回、3：2～4回、4：5回以上）How often have you contacted or interviewed with people in your community through this activities? (1: not at all, 2: once, 3: 2-4 times, 4: more than 5 times)*

	1	2	3	4	
0回 / not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5回以上/ more than 5 times

海外のパートナー校を訪問したこと（海外でパートナー校と同じプログラムに参加することも含む）がある。I have visited partners in overseas or participated in same program with them.*

選択 ▼

フォーラムに向けたオンライン準備会議（ICC）に参加した回数（1：0回、2：1回、3：2～4回、4：5回以上）How often have you participated in online-preparation meeting(ICC) of Fourm? (1: not at all, 2: once, 3: 2-4 times, 4: more than 5 times)*

	1	2	3	4	
0回 / not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5回以上/ more than 5 times

戻る

送信

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