Developing Cultural Intelligence (CQ):
Designs for Blended Learning

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Building on earlier efforts to develop cultural intelligence (CQ), the current study reports on the expansion of a framework to utilize instructional design (ID) theory and experiential learning in a blended learning environment. Japanese university students' intercultural learning engagement with topical online content and media, an asynchronous exchange with international counterparts and multi-cultural workshop were tracked across one semester. CQ measures were obtained pre-/post-course, while experience-based, in-class activities were extended with online learning reflection. Course goals included critical thinking, supporting intercultural skills in English and building digital literacy. Results indicate the multi-disciplinary framework's compatibility with blended learning, and students' intercultural learning engagement patterns in terms of CQ were positive, supporting further course development despite not being statistically significant. Implications for intercultural learning, the design of instruction for blended learning, learning engagement patterns and the potential of adaptive learning are discussed against the backdrop of continued course refinement.

Keywords: cultural intelligence (CQ); experiential and blended learning; Japanese university; instructional design

The globalization of employment and the steady incursion of technology in education and training are obliging institutions worldwide to incorporate some form of learning technology to educate and train employees, management and students. Since 2009, the Japanese Ministry of Education, Culture, Sports, Science, and Technology (MEXT) has aimed to internationalize Japanese university environments through a project called the *Global* 30, partially geared towards the cultivation of 'global citizens' (MEXT, 2018). In previous reports (Roux & Suzuki, 2016, 2017a; 2017b; 2017c), we drew attention to the neglect of incorporating culturally sensitive methods and materials into designs for online learning (Parrish & Linder-Vanberschot, 2010; Henderson, 2007; Clem, 2004). In a preliminary attempt to start addressing some of these noted shortcomings, we developed a multi-disciplinary conceptual framework (Roux & Suzuki, 2016, 2017a), as a foundation for an intercultural workshop that focused on the development of cultural intelligence (CQ). The framework incorporated instructional design (ID) theory, cultural intelligence (CQ) theory (Early & Ang, 2003; Ang, VanDyne & Tan, 2011) and experiential learning theory (Kolb, 1984). It was envisaged as the initial step in our broader project, which seeks to develop the CQ, intercultural skill-set, or 'global citizenship' of Japanese university students through an application of ID and supportive educational technologies.

Findings from this initial step indicated that our framework effectively supported intercultural, experiential learning activities (Roux & Suzuki, 2016, 2017a), which gave preliminary support for expanding our investigation. The CQ model offers a practical understanding of cultural learning and the development of intercultural skills, which has been linked to the notion of a 'global mindset' (Roux, 2018; Lovvorn & Chen, 2010). CQ refers to an individual's capacity to function effectively in situations characterized by cultural diversity (Ang, Van Dyne & Tan, 2011). Conceptually, CQ has roots in intelligence theory and can be described as an individual's capacity to adapt to unfamiliar cultural environments through an application of four intelligent capacities: (1) cognition, (2) motivation, (3) behavior and (4) strategy (Early & Ang, 2003). CQ is now considered an essential skill for the modern workforce and has gained additional popularity through adaptations in university courses (Barnes, Smith & Hernández-Pozas, 2017; Fischer, 2011), organizational development (Ang, Van Dyne & Tan, 2011), and internationalized training (Livermore, 2011; Lovvorn & Chen, 2011).

Given the relative novelty of the CQ model however, educational and/or instructional models for the development of CQ are scarce (MacNab, Brislin & Worthley, 2012). Research studies using the CQ construct has indicated its application potential to university participants (MacNab et. al., 2012; Fischer, 2011), while the experiential learning approach for CQ development have shown particular effectiveness (Ng, Van Dyne & Ang, 2009). Considering the reported need for a renewed cognizance of culture's pervasive influence in the design of instruction (Parrish & Linder-Vanberschot, 2010; Clem, 2004), and given earlier successes with incorporating some online media and surveys with our learner audience (Roux & Suzuki, 2016, 2017a), it seemed logical for our investigation to continue using technology more comprehensively in exploring CQ development. Training and structured learning as components in the development of intercultural skill and using educational technology to augment such intercultural learning are therefore central to the present investigation.

Increasing the use of technology as an educational tool implied a consideration of suitable models for course design and application. Computer-assisted learning and the Internet has radically changed the teaching paradigm (Alonso, López, Manrique & Viñes, 2005) and higher education is struggling with incorporation and adaptation of the appropriate pedagogical principles. With this consideration in mind, Watson (2008) suggests that blended learning shows significant potential, and quoting Dziuban, Hartman and Moskal (2004), he describes it as "… a pedagogical approach that combines the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment". Figure 1 below depicts the blended learning continuum, as described by Watson (2004). Our course is matched by the description as highlighted.

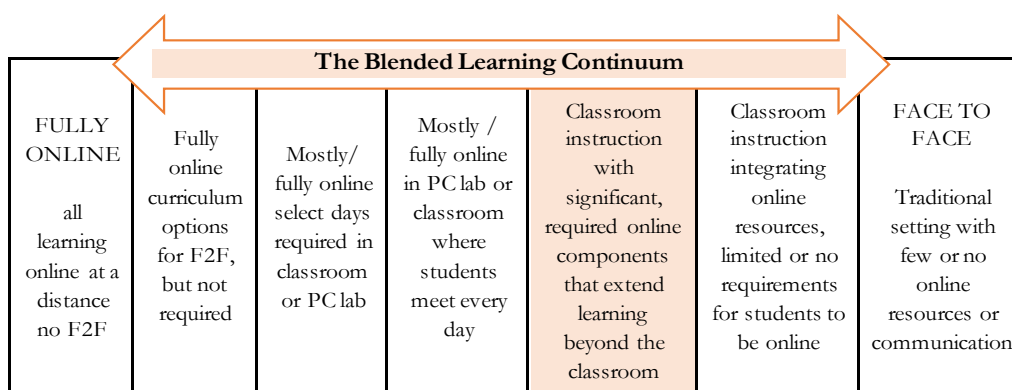|						
The Blended Learning Continuum						
FULLY ONLINE all learning online at a distance no F2F	Fully online curriculum options for F2F, but not required	Mostly/ fully online select days required in classroom or PC lab	Mostly / fully online in PC lab or classroom where students meet every day	Classroom instruction with significant, required online components that extend learning beyond the classroom	Classroom instruction integrating online resources, limited or no requirements for students to be online	FACE TO FACE Traditional setting with few or no online resources or communication

Figure 1. The Blended Learning Continuum (Adapted from Watson, 2004)

This type of learning is thus a fundamental redesign of the instructional model in that it mixes various event- or experience-based activities, including live e-learning (synchronous), self-paced learning (asynchronous) and face-to-face (F2F) classrooms (Alonso et al., 2005). Moreover, the introduction and blending of key instructional procedures with technological aids are creating profound shifts in the learner-instructor relationship, with obvious effects on the individual learning process. This impact is broadly seen as follows: (1) it constitutes a shift from lecture- to student-centered instruction in that students become active and interactive learners; (2) it increases interaction between students and instructor, between the students, and between students and content (inside or outside of the course), and (3) it integrates formative and summative assessment mechanisms for students and instructor (Watson, 2008).

Given that our project continues to refine an instructional model for the development of CQ, the qualitative aspects of the BL approach, in terms of its potential impact on learning, appeared very suitable for our stated goals. Our current study thus reports how the BL method was utilized in the design of instruction, and how it served as an application of ID to cultivate and develop CQ. We provide a discussion of the course design and development, implementation methods and present results from students' learning engagement and response patterns as well as selected student feedback.

Research Design, Methods and Procedures

Expanding an earlier framework aimed at encouraging intercultural learning (Roux & Suzuki, 2016, 2017a), we designed and implemented a 15-week intercultural communication course that combined: 1) traditional F2F short lectures; 2) experiential learning activities in a facilitated face-to-face format with groups; 3) one multi-cultural workshop; 4) online media, quizzes and feedback to enhance learning; and 5) an asynchronous online discussion forum with international counterparts. CQ measures were obtained pre- and post-course and used as a self-rated indication of intercultural competence development. Fourteen undergraduate (2nd year) Japanese students enrolled in a 15-week

course as part of an international study abroad (ISAC) preparation program (Hayase, 2017; Roux & Angove, 2017). The average age was 19 with gender balance almost equal. An audience analysis, conducted at the inception of the project (Roux & Suzuki, 2016, 2017a, 2017b), indicated a highly motivated, predominantly Asian group of mostly intermediate to advanced English second language learners. The ISAC program provides higher-level, additional English-based content classes over 3 years which can include a short or longer sojourn abroad. Students met weekly for a 90-minute, F2F class in a PC lab with Wi-Fi and audio-visual equipment.

Course designs for CQ

In line with our project goals, and cognizant of Fischer's (2011) contention that intercultural training needs a pedagogy that can support the development of CQ, we designed a course that would reflect this goal in content, depth and scope. We incorporated ID principles that would ensure the effective dissemination of learning, track and evaluate the learning process itself and deliver research data for a learning analysis. This complex set of goals, with the accompanying rationale and content examples are displayed in Table 1. Three broad areas of the course are covered: 1) learning content, 2) assessment and evaluation and 3) research. Each of these domains are then broken down into summarized segments, indicating the relevant learning considerations and rationale in relation to CQ development.

Table 1
An intercultural learning course to develop CQ, using a blended learning approach

	Course Element	Content and Rationale
Learning content	▪ Textbook (8 chapters)	Title: 'Culture and Conflict: Changing the World for the Better' Developing cultural understanding - CQ knowledge/behaviour.
	▪ Classroom worksheets	Instructor-developed, topical experience- and/or content-based worksheets to enhance the text. Focused on personal CQ development and linguistic support.
	▪ Mini-lectures (8)	Short topical lectures developed to enhance the text.
	▪ Experience-centred learning activities	Topical activities (brainstorm, group & pair discussions, mini-presentations, 'show-and-tell' activities, etc.) to enhance conceptual understanding and peer-interaction.
	▪ Multi-cultural workshop (1)	Title: 'Does race matter?' Voluntary attendance to an open workshop. Mixed audience with local and international students.
	▪ Online media	Topical videos, talks provided by teacher and/or students. Eg: YouTube & TED Talks. Subtitles provided where possible.
	▪ IVE Project (4 topics/8 weeks)	Moodle based, asynchronous online discussion exchange with international counterparts to develop linguistic skills (English as a 2nd language) and intercultural competence.
	▪ Homework	Reading for comprehension, listening, vocabulary study and answering topical questions in relation to the content.
Assessment & Evaluation	▪ Online review quizzes (4)	Summative quizzes for learning assessment purposes
	▪ Online feedback surveys (13)	Formative evaluation for a qualitative understanding of learning progress and problems.
	▪ IVE Project	Qualitative evaluation of online discussions to gage levels of interaction, issues, topics and potential problems.
Research	▪ CQ Scale	Surveyed pre/post course to establish a self-measurement of cultural intelligence and the postulated development thereof.
	▪ Online surveys (weekly)	Formative/summative evaluations and feedback were combined in one survey-type quiz to provide a sense of learning progress.
	▪ IVE Project	Analysis of online discussions to obtain a quantitative and qualitative sense of engagement and learning patterns.

Textbook study consisted of academic-type readings with comprehension activities, Japanese translations of vocabulary and downloadable materials. Classroom work typically consisted of facilitated group- and/or pair work, engagement with online media, short lectures, online (asynchronous) discussion with international and local counterparts, and weekly learning reflections, utilizing online feedback/evaluation formats developed by the instructor. The course further utilized four (summative, quiz-type format) evaluations for grading purposes that also included formative evaluation sections for continued course design purposes. The online discussion forum (Moodle-based), entitled 'International Virtual Exchange project' (IVE) (see https://iveproject.org/) is hosted at the Muroran Institute of Technology and maintained through a Japanese government funding grant. The program connects local and

international colleges and currently incorporates 9 countries. The asynchronous forum relies on *English as a lingua franca (ELF)* and we were teamed with colleges in Tokyo and Colombia. A multi-cultural workshop (Roux & Suzuki, 2016, 2017a) was embedded as an additional intercultural learning experience within the larger course framework. As an indicator of intercultural education and its influence on the development of CQ, we surveyed participants pre- and post-course with the Cultural Intelligence Scale (CQS) using a 7-point Likert type scale. The CQS captures a self-rated ability to perform and adapt in diverse environments and can be used as a diagnostic tool for intercultural success (Ang et al., 2011; Fischer, 2011).

Course implementation

The 15-week course plan with weekly lesson contents is shown below (Table 2) with the concomitant learning elements and research dimensions.

Table 2
An intercultural learning course to develop CQ

	Lesson contents	Learning elements	Research elements
1	▪ Introduction ▪ CQ Scale	▪ Content orientation & overview	▪ CQ Scale: Time 1
2	▪ Chapter 1: Thinking about Culture	▪ Mini-lecture & activities to address CQ development ▪ Learning reflection 1 (online)	▪ Formative feedback 1 (online)
3	▪ Explanation and enrolment: IVE Project – Unit 1: Introduction	▪ Asynchronous online discussion for linguistic & CQ development	▪ Qualitative analysis of online discussions
4	▪ Chapter 2: Hidden Culture & Differences	▪ Mini-lecture & activities to address CQ development ▪ Learning reflection 2 (online)	▪ Formative feedback 2 (online)
5	▪ Review 1: Chapters 1&2 ▪ IVE Project – Unit 2: My Place	▪ Online Quiz 1: Summative evaluation ▪ Learning reflection 3 (online)	▪ Formative feedback 3 (online)
6	▪ Chapter 3: Conflict	▪ Mini-lecture & activities to address CQ development ▪ Learning reflection 4 (online)	▪ Formative feedback 4 (online)
7	▪ Chapter 4: Identifying Conflicts	▪ Mini-lecture & activities to address CQ development ▪ Learning reflection 5 (online)	▪ Formative feedback 5 (online)
8	▪ Review 2: Chapters 3&4 ▪ IVE Project – Unit 3: Events in our lives	▪ Online Quiz 2: Summative evaluation ▪ Learning reflection 6 (online)	▪ Formative feedback 6 (online)
9	▪ Chapter 5: Values and Belief Systems	▪ Mini-lecture & activities to address CQ development ▪ Learning reflection 7 (online)	▪ Formative feedback 7 (online)
	▪ Workshop: 'Does race matter?'	▪ Multi-cultural workshop ▪ Learning reflection	▪ Analysis of audience feedback
10	▪ Chapter 6: The role of Values in Intercultural Conflict	▪ Mini-lecture & activities to address CQ development ▪ Learning reflection 8 (online)	▪ Formative feedback 8 (online)
11	▪ Review 3: Chapters 5&6 ▪ IVE Project – Unit 4 (final): Plans for the future	▪ Online Quiz 3: Summative evaluation ▪ Learning reflection 9 (online)	▪ Formative feedback 9 (online)
12	▪ Chapter 7: Perceptions	▪ Mini-lecture & activities to address CQ development ▪ Learning reflection 10 (online)	▪ Formative feedback 10 (online)
13	▪ Chapter 8: Stereotypes	▪ Mini-lecture & activities to address CQ development ▪ Learning reflection 11 (online)	▪ Formative feedback 11 (online)
14	▪ Review 4: Chapters 7&8	▪ Online Quiz 4: Summative evaluation ▪ Learning reflection 12 (online)	▪ Formative feedback 12 (online)
15	▪ Consolidation & reflection ▪ Conduct CQ Scale	▪ Learning reflection 13 (online)	▪ Formative feedback 13 (online) ▪ CQ Scale: Time 2

Our framework (Roux & Suzuki, 2016, 2017a) supported an integration with the BL model (Fig. 1), and intercultural learning contents to develop CQ (Table 2) could thus be adapted in such a way as to combine F2F instruction with online elements. The final design thus incorporated all the elements as described thus far, with relevant components

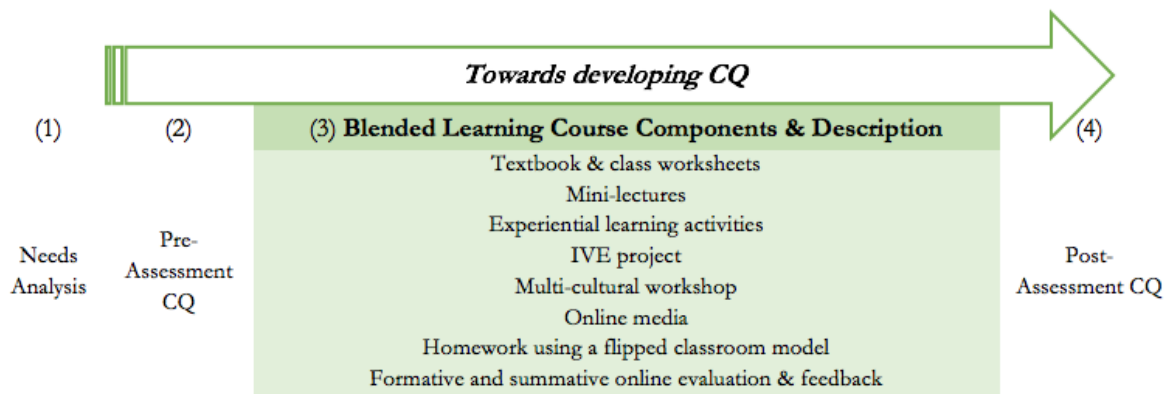for data collection. Steps 1-4 in the project are visualized in Figure 2.

Figure 2. Outline of steps in the investigation

To assess and track student progress in relation to our intercultural education course and its influence on CQ development, we surveyed participants pre- and post-course with the Cultural Intelligence Scale (CQS) using a 7-point Likert type scale. The CQS captures a self-rated ability to perform and adapt in environments characterized by diversity and has been used for research purposes as a diagnostic tool to measure intercultural competence (Ang, Van Dyne & Tan, 2011; Fischer, 2011). To track learning progress, summative and formative evaluations (see Table 2) took place at 4 intervals, providing a sense of learner engagement and performance, used as feedback to guide instruction. Learner responses were captured using online survey forms (via Google). These provided a useful and ongoing means of tracking learning engagement, adding an adaptive dimension to the design of instruction as the course progressed. The visual below depicts all the theoretical and practical elements for this investigation.
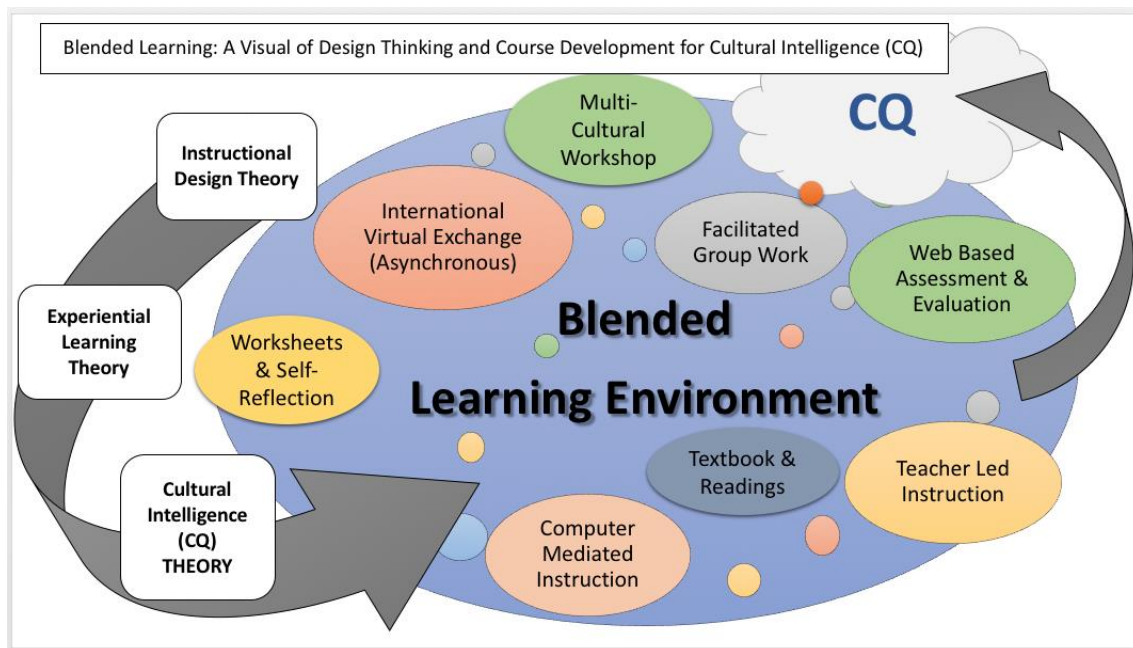

Figure 3. A blended learning model for developing CQ (Adapted from Roux & Suzuki, 2017b, c).

Results

We present the results as follows: (1) summative assessment (4 online quiz-type reviews) to show student learning and performance; (2) a sample of learner feedback to accompany the summative assessment across the 4 quizzes; (3) a statistical analysis of the pre- and post-course CQ surveys to determine if there was a significant change in these self-rated scores; (4) learner feedback regarding the IVE to enhance understanding of intercultural learning; (5) a summary of learning feedback gathered as part of the formative reviews conducted throughout the course, specifically in

relation to intercultural skill development and CQ. Results for the multicultural workshop will be reported elsewhere to continue earlier reports (Roux & Suzuki, 2017a) on its development.

Student learning and performance

Results from the summative assessment from scores obtained across the 4 quizzes show a class average performance of 88% for this learning assessment component (Table 3). The high average performance could perhaps be explained by the fact that we used an open-book test format to gain maximum engagement with the learning material, and that each quiz covered only two textbook chapters with 10 multiple-choice questions for each chapter. Pointedly, and as part of a formative assessment, students responded to specific learning moments or issues which are included here to show learner response but will be analyzed at a later stage. A further content-related written task was included in each quiz to check comprehension and pick up on issues with the learning content; however, this task was not formally assessed as part of the student grade.

Table 3

Contrasting summative and formative feedback across four course reviews

Summative Feedback		Results (sample): Formative Feedback
Methods & Tools	**Average score**	Samples from the free comment section of reviews
Review Quiz 1	90%	**S1:** *I can learn some ideas of culture in this class; this is valuable time.* **S2:** *I didn't prepare by reading so the class was a little difficult.* **S3:** *I have never think about culture deeply… this time I could learn about culture. In addition, I could learn that culture can divided into 3 parts. Before this lecture, I think culture depend on each country or community. But now I think culture have more deep meaning. For example, visible culture, hidden culture and cultural roots. Visible culture can change easily, however hidden culture is difficult to change. Hidden culture and cultural roots are difficult to understand, so sometimes cause conflict. I understood why conflicts happen between communities. Chapter 1 and 2 are good contents to think about culture which surround us.* **S4:** *I had a good study about culture through the lessons. I want to use the knowledge which I learned when I interact with international people.*
Review Quiz 2	90%	**S1:** *I could learn about conflicts. I was surprised because conflicts have positive synergy and negative aspects.* **S2:** *People are different; we should try to understand others.* **S3:** *It was difficult for me to learn about conflict because there were many kinds in conflict.* **S4:** *Lesson about chapter 3 and 4 was very interesting especially, there are negative conflict and positive conflict.*
Review Quiz 3	85%	**S1:** *When I compare my answer with my partner, I found differences in ranking… each person has own values and opinions.* **S2:** *This chapter was difficult for me.* **S3:** *I found it difficult to think of my important personal or cultural values. Through this chapter, I could know what the belief and value for me is deeply. Moreover, I realized I am happy now.* **S4:** *I want to make a habit of learning or something such as learning other language or practice sports. Do you know good way to continue to something?*
Review Quiz 4	90%	**S1:** *I wanted to study about textbook's passage. I didn't understand the chapters deeply. The way of active learning was good. However, I would like to study or get to know further about conflict and culture.* **S2:** *I learned many things from this class, for example it is important to take another perception when you encounter some difficulties. The class is good time for me.* **S3:** *It is difficult for me to understand this chapter. However, through read this chapter more deeply, I found that it is interesting and important for me to understand another person.* **S4:** *This class was very interesting because there are a few chances that I can learn and discuss cultural conflict and working with a group. Thank you very much for teaching this class.*

Learner feedback

Table 3 further provides selected samples from the learning feedback we collected as part of the review quizzes. These show a variety of responses that we will analyze in full and report elsewhere; for present purposes, we summarize observations into three broad themes: (1) specific learning content-related thoughts, opinions and questions; (2) general learning observations regarding both the contents and process of learning; and (3) student reflections that signified a very personal engagement with the class/learning contents, such as thought-provoking/challenging questions and/or particularly emotional responses. Methods that bring together learners' previous experiences, link conceptual foundations with practice and encourage reflection are pivotal to learning (Lewis & Williams, 1994) and are the hallmarks of experiential learning, one of the core principles embedded in our framework (Roux & Suzuki, 2017a). In reading these student learning reflections, we were impressed with the level of engagement and depth of consideration displayed. The depth and variety of reflection support the contention that learning is not only a very personal process, but also that this process can be tracked and captured via technological means and analyzed to improve teaching and learning. It appears that our framework, which incorporated the online feedback surveys, in combination with the BL approach managed to capture these learning processes very well.

CQ development

Results from the analysis of the pre-/post-course CQ surveys were a central indicator for the development of intercultural competence in this course and we applied it here to augment the formative feedback we collected. We used the Wilcoxon signed-rank test to compare the two matched samples (treatment 1 – pre-, and treatment 2 – post-course) to assess whether the mean ranks of our group differ. This test was chosen because of the low N size (13) and provide the results in Table 4. The Z-value is -1.74 and the p value is 0.08; therefore, the result is *not* significant at $p \leq 0.05$. The W-value is 20.5 and the critical value for $N = 13$ at $p \leq 0.05$ is 17. Therefore, the result is also *not* significant at $p \leq 0.05$. Given the very small group size (N=13), we expected that it would be statistically difficult to show significant changes on the CQS for the course.

Table 4
Results from the CQ surveys pre- & post-course

Treatment 1	Treatment 2	Sign	Abs	R	Sign R	Result Details
74	82	-1	8	5.5	-5.5	
78	91	-1	13	9	-9	**W-value:** 20.5
111	105	1	6	2.5	2.5	**Mean Difference:** -9.15
63	100	-1	37	12	-12	**Sum of pos. ranks:** 20.5
74	64	1	10	8	8	**Sum of neg. ranks:** 70.5
76	84	-1	8	5.5	-5.5	
54	109	-1	55	13	-13	
102	110	-1	8	5.5	-5.5	**Z-value:** -1.7471
92	98	-1	6	2.5	-2.5	**Mean (W):** 45.5
63	87	-1	24	11	-11	**Standard Deviation (W):** 14.31
96	104	-1	8	5.5	-5.5	
87	72	1	15	10	10	
94	99	-1	5	1	-1	**Sample Size (N):** 13

Learner feedback from the International Virtual Exchange

Results from the learner feedback regarding the International Virtual Exchange (IVE) are shown below in Figure 4. These responses encapsulate a central question related to learners' qualitative estimation of the cultural learning they experienced during their participation in this online, asynchronous forum. We reasoned that these could be usefully added to the previous CQ survey data, together with other formative feedback to provide additional depth to understanding their learning development in the area of intercultural competence. It is noteworthy that across the 4 topic areas covered by the IVE, constituting almost 8 weeks of participation, students self-reported writing between 80-100 comments (in total), while receiving a similar total amount of responses in return. This is not a very high number considering the period of time and suggests that there was a limited engagement within the forum that might have been influenced by the fact that there was limited class-time made available, its asynchronous format and the fact that it was not 'instructor-driven', i.e. participation carried no reward except the potential benefit coming from the mutual personal investment of engaging with foreign peers. Nevertheless, as the graph below shows, a number of positive observations can be drawn from student reflections.
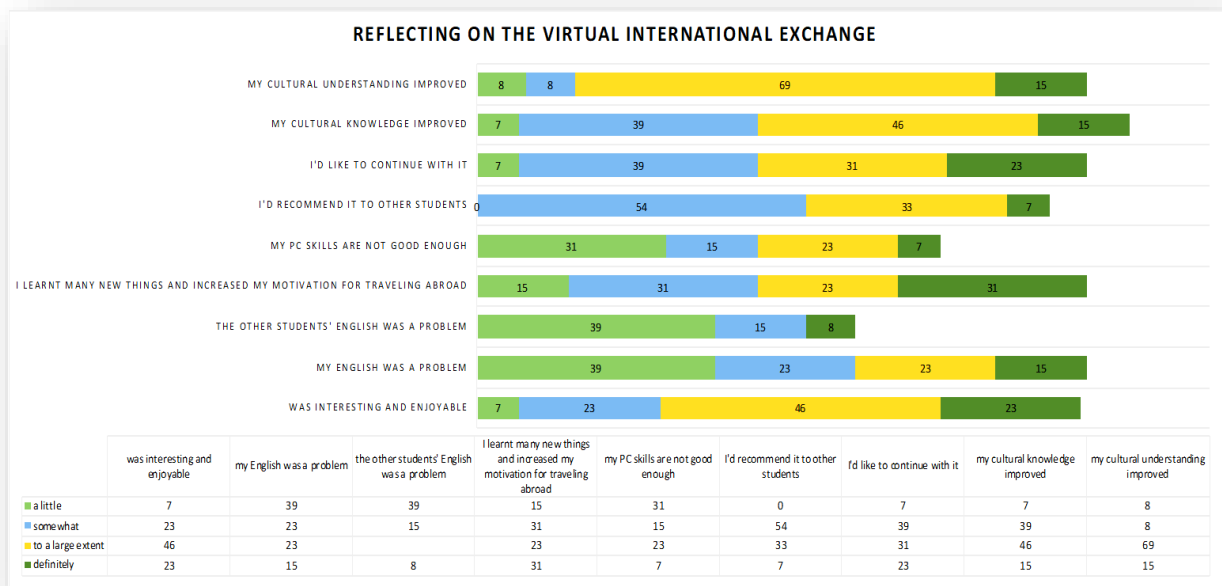
Figure 4. Learner reflections from the International Virtual Exchange (IVE)

As for the IVE impacting on the improvement of cultural understanding and knowledge, as well as the motivation for exploring this area further, the majority of students self-rated very positively, indicating interest, enjoyment and a wish to continue themselves and/or offering it as a recommendation to peers. A smaller but significant group indicated that their PC skills, in their own estimation, were not sufficient. Observations from the F2F situation supported this contention, as the instructor were often occupied with student queries regarding the use of the Moodle platform for uploading pictures, and/or other media, as well as fairly simple procedures in replying to comments. This finding deserves more investigation considering that these students all use smartphones for communicative purposes. A final observation relates to their fairly low rating of confidence/skill using English with other English 2nd language users, and indications that it might have been perceived as a pervasive problem that could have affected the low number of exchanges reported earlier.

Self-estimated cultural learning feedback

Results from learner feedback regarding their self-estimated cultural learning across the course is provided in Figure 5 below. Considering our investigation goals, it was timed to coincide with the learning reviews/quizzes and aimed at capturing a comprehensive sense of the intercultural learning impact students experienced as the course progressed. Questions were designed to incorporate students' self-rated impressions of knowledge gains, interpersonal skill/behavior and strategies, and an attempt to link these to a sense of personal growth/change. These questions mirror broad themes addressed by the course and we reasoned that having these elements as reflective points in the reviews could help retain an interest for the broader project goals in students' minds. Options for feedback range from judging the course as having *little impact* to *gaining new insight/knowledge* and *interpersonal behavior change* with a perspective to the *future* and finally, an impact on *personal growth*. Although results here vary across the four reviews, Review 3 was rated highest, but with all reviews indicating impactful impressions on student minds. This is a positive result with respect to our project goals but will need further investigation both in terms of depth and breadth, which will be obtained through a more comprehensive qualitative analysis.
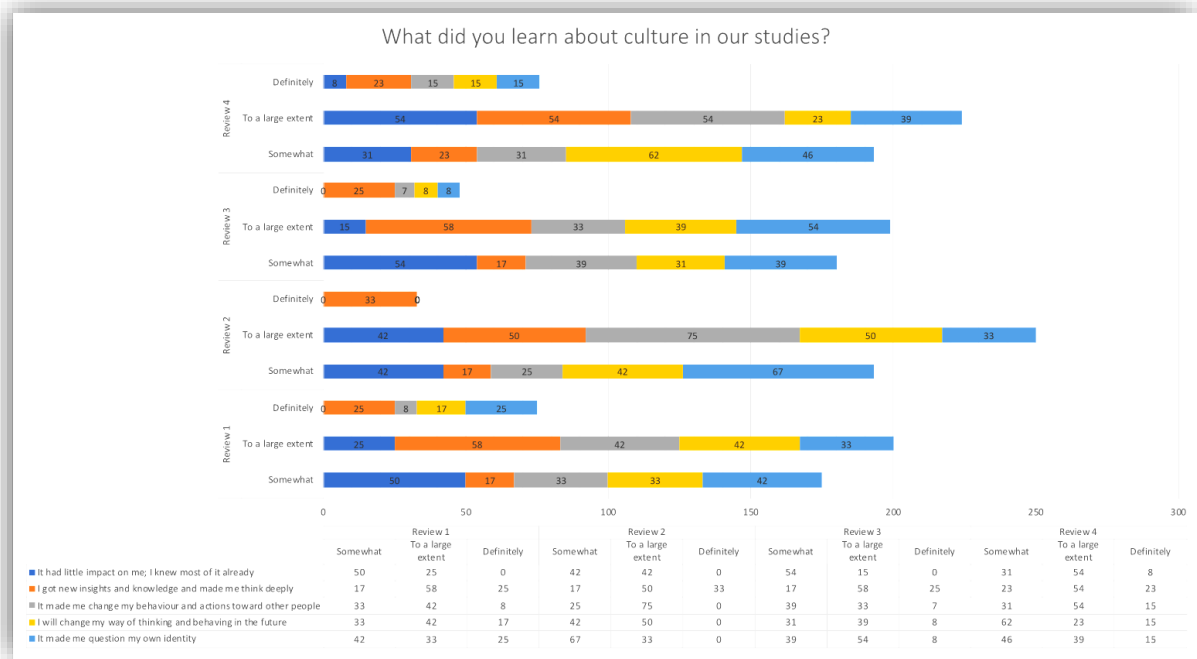
Figure 5. Learner reflections: Impact of the course on intercultural learning

Discussion of findings

1) High scores on summative assessment and very positive levels of engagement with formative assessment tasks indicate successful application for the instructional method used in this investigation, i.e. blended learning. Summative assessments have traditionally been used as high-stakes evaluative instruments; however, the shift in the learning paradigm emanating from the blended methods approach is now increasing opportunities for using summative and formative methods as complementary means to understand learning (Looney, 2011). This blending of assessment approaches, together with ready access to learning materials, we believe, added to higher levels of engagement with the content. In addition, since the course was conducted in English, a second language for our students, we reasoned that increasing content exposure would also benefit language learning, even though it was not a directly measured as such. As a result of the online format, students had ready access to their answers and scoring and could approach the teacher easily in the F2F setting. Digital literacy is today identified as one of the four domains of 21st century skills required from students (Kivunja, 2015) and our approach in blending summative and formative assessment in an online format, we believe, exemplifies an approach to learning that allows for maximum engagement with content, simultaneously supporting the development of other academic skills.

2) Learner feedback and learning analysis provided through the online feedback formats indicate activated learning processes, providing support for the combination of experiential- and blended learning formats. Results from the learning feedback that were collected from a formative feedback component that was integrated with every quiz provided very useful insights with regard to student engagement with the learning contents. As indicated previously, this blended form of learning assessment gave opportunities for students to assess their own understanding, going beyond the correct/incorrect dualism typical of summative scores. Importantly for instruction purposes, gathering information and data about learner comprehension helps to build a knowledge base about what is practical and beneficial (both in the content and the manner of presentation) (Looney, 2011). Since course development always continues, this is a crucial capacity to expand and is being usefully accomplished through the online survey formats. We see our current approach as a precursor to utilizing more extensive technological tools and envisage that future developments here could expand into learner analytics and adaptive learning. Essentially, learning analytics is the process of capturing and analyzing all the digital footprints of learners as they engage with an institution of learning to help improve teaching and learning (Sclater, Peasgood & Mullan, 2016). In a review on international practices in this burgeoning field, Sclater et. al., (2016, p. 5) points to four advantages of instituting learner analytics in higher education, stating that it could act as a tool for (1) quality assurance and improvement; (2) boosting retention rates; (3) assessing and acting upon differential outcomes among the student population; and (4) as an enabler for the introduction and enabling of adaptive

learning.

3) Although the pre/post CQ surveys did not indicate statistically significant support for the intercultural skill development aimed at with our course, there are important reasons to consider in understanding this result. These include the small sample size, moderating influences such as personality and the impact of variables not accounted for here. In a study that correlated CQ developments with cultural essentialism beliefs, Fischer (2011) measured the effects of a brief intercultural training intervention as part of a New Zealand university course (N=107) but found no significant effect for the tested hypotheses. Among his findings were the observation that personality factors constituted a powerful moderating effect on results. He contends that intercultural interventions have some effectiveness in increasing intercultural awareness in that such learning is often instigated and developed through participation in such activity. Given CQ's 4-factor model that encapsulates intercultural development on the metacognitive, cognitive, motivational and behavioral levels, we could further analyze results at this level to ascertain effects; however, our small sample size mitigates against proving significance and would perhaps be better followed up in future investigations with larger groups.

4) Broad measures of the course's effectiveness should consider the combined results from the student feedback regarding the IVE, course content and personal reflections. Methods that bring together learners' previous experiences, link conceptual foundations with practice and encourage reflection are pivotal to learning (Lewis & Williams, 1994) and are the hallmarks of experiential learning, one of the core principles embedded in our framework (Roux & Suzuki, 2017a). In reading student learning reflections, we were impressed with the level of engagement and depth of consideration displayed. The depth and variety of reflection support the contention that learning is not only a very personal process, but also that our framework, in conjunction with the BL approach managed to track and capture these developments well.

Conclusion and implications for future research

The pace of application and expansion of technology in modern learning environments continue to create pressures for instructional designers to ensure that principles of learning remain intact. Building on earlier efforts aimed at the development of cultural intelligence (CQ) (Roux & Suzuki, 2017a) through an application of instructional design (ID), the current study reported on the expansion of our framework using a blended learning (BL) approach at a Japanese university. Findings indicate that the BL approach could be successfully integrated with the framework and brought about commendable advantages for the F2F environment. Noted positive developments relate to the expansion of intercultural learning activities through online media, reflective learning experiences captured through online means, a cross-cultural asynchronous virtual exchange and online tools for summative and/or formative evaluation and reflection. Indicators for the development of cultural intelligence (CQ) were statistically not significant, although other forms of evaluation showed effective intercultural learning, in addition to learners' self-reported, increased confidence in areas related to intercultural skill development, critical thinking and digital literacy. Implications from this study point to the utility of integrating our framework with the BL approach and its subsequent potential to provide insights into general, and intercultural learning processes. Additional utility of the framework was observed in the course engagement patterns, which included its capacity to track and provide insights into intercultural learning and -skills development. Findings here indicate a comprehensive capacity of our framework to capture and assist in understanding the necessary elements of learning behaviors. We are cautiously optimistic that with continued refinement our framework and the blended learning method will be further integrated into course design and development in conjunction with possible application in designs for adaptive learning in the area of developing CQ.

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