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Friendship and reciprocity as motivators in CSCL

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Motivation is an important topic among language teachers in Japan. Collins and Hunt (2011) observed increases in Japanese university student's motivation as a result of collaborative learning and cooperative learning programs. This paper continues in this line of inquiry through a quantitative study of motivation in the context of computer supported collaborative learning (CSCL). Results of this study confirm the motivational profiles of successful collaborative learners and reveal friendship and reciprocity as important social dynamics affecting Japanese collaborators.

Keywords: computer supported collaborative learning (CSCL), learner motivation, Google Apps suite, social pressure factor

Introduction

Motivation continues to be an important topic among language teachers in Japan (e.g., Ryan, 2009; Yashima, 2000). During a three year study at Nagasaki University (Collins & Hunt, 2011) it was noted that motivation increased through interaction with peers in collaborative learning and cooperative learning programs. These results were determined through qualitative analysis of student feedback collected over a three year period. This present study explores further into motivation by examining its role in computer supported collaborative learning (CSCL). The Google Apps suite was used in this study to support collaboration. Motivation was measured in this study using the Collaborative Inquiry-based Project Questionnaire developed by Chow and Law (2005).

Regular Paper

Literature review

Collaborative learning

Collaborative learning (CL) is the interdependent development of knowledge among members of a transitional community (Bruffee, 1999). Bruffee described the transitional community as a group of individuals who are in the process of transitioning from one knowledge community to another knowledge community; for example, university students are members of a community transitioning from the various knowledge communities associated with high school students (such as basketball players, wind ensemble members, and school newspaper journalists) into the various knowledge communities of professionals they will join after graduation from university (such as doctors, social workers, and company employees). Bruffee (1999) summarizes the value of CL as follows:

> Collaborative learning marshals the power of interdependence among peers. […] In the short run, collaborative learning demonstrably helps students learn better – more thoroughly, more deeply, more efficiently – than learning alone […]. In the long run, collaborative learning teaches students to work together effectively when the stakes are relatively low, so that they can work together effectively when the stakes are high. With collaborative learning they learn to construct knowledge as it is constructed in the knowledge communities they hope to join after attending colleges and universities […]. With no loss of respect for the value of expertise, they learn to depend on one another rather than depending exclusively on the authority of experts and teachers. (p. xii–xiii)

CL has been explored in a variety of contexts including language learning (Murphey, 2003; Nunan, 1992; Oxford, 1997). Of the early Japan based studies of collaborative learning, Murphey (1996, 2003) was seminal in arguing for its use. Most of Murphey's work deals with the concept of "near peer" role models. In some cases, he even suggested that teachers could take the role of learner alongside students (Murphey, 2003). While some might consider this difficult from a classroom managerial perspective, there are many situations where this can actually be quite practical. As an example, take English for Specific Purposes (ESP) education. In ESP education, technical English is being taught for use in a specialized field; however, the English teacher may not be an expert in the field of study for which the technical English is being taught. In this case, students could lecture on topics relevant to their specialized field in front of their peers, while their teacher takes the role of English tutor helping them prepare for their lectures.

As Bruffee (1999) noted, CL can also provide a way for students to learn more efficiently. This is especially important when teaching complex learning materials or when classes have large numbers of students. For example, in one Japan based study (Flowers, 2014a), collaborative learning strategies were used in a class with 83 university students to increase opportunity for authentic language use. This was done through documentary filmmaking projects which required contact with the international community. During class the instructor focused on building up the student's conversational English skills, and was only able to provide minimal instruction in the art of documentary filmmaking itself; the students, rather, were required to manage project details entirely on their own in filmmaking teams (and mostly outside of the classroom). The result of at least one of those team's documentaries was quite impressive, especially when one considers the circumstances (p. 33).

Computer supported collaborative learning (CSCL). CSCL is a fairly self-explanatory extension of collaborative learning, though it comes with its own unique history and problems to overcome (Stahl, Koschmann, & Suthers, 2006). Bruffee (1999) foresaw this transition from CL to CSCL, but noted that for collaborative learning to be truly supportable through technology, a fundamental change in the design of computer software would be necessary (p. 122).

Daniels (2008) argued that for the next generation of Learning Management Systems to be relevant in Japan, the software needed to support collaborative learning. Google Drive and its related web apps: Docs, Slides, Forms, and Sheets, seem to be tailored for collaborative learning. As an example of this, Google Docs is a web based word processor which allows multiple users to edit a single text document simultaneously (or asynchronously) from separate consoles. These collaborators can share comments and suggestions about the document, track editing changes and invite others to review their work upon completion. This fundamental shift in the way we manage information opens up new possibilities for collaborative learning and even supports multimedia collaboration. Learners can now co-construct digital artifacts which quite often exceed the quality of those they could have constructed as individuals. In addition, these digital artifacts can easily be shared with a much wider audience than was previously possible.

Students in Japan have responded positively to computer-supported collaboration (Flowers, 2014b; Forsythe, 2014; Miyazoe & Anderson, 2009). In a study of online writing tasks conducted in part at Tokyo Denki University, Miyazoe and Anderson (2009) discovered that of the three online writing tasks students participated in, forums, blogs, and wikis, students preferred the wiki writing tasks and felt they were the most useful. This is important as of the three writing tasks investigated in their study, the wiki writing task is by far the most collaborative in nature. In another study (Flowers, 2014b), project groups were introduced to Google Slides, but then allowed to choose their presentation media. The majority of the project groups chose to use Google Slides over the more well-known presentation media of PowerPoint. Their reasoning can best be summarized by one of the students:

> I thought it was really useful! Before, whenever I had a presentation in a group someone had to make the PowerPoint on their own for the group. But, if we use Google Slides all the group members can work together as a team. (para. 2)

Motivation in collaborative learning

Motivation has been an important topic among language teachers in Japan for well over two decades. (Kimura, Nakamata, Okamura, 2001; Konishi, 1990; Ryan, 2009; Yashima, 2000). Motivation has also been studied in relation to collaborative learning (Collins & Hunt, 2011). Collins and Hunt (2011) discovered a connection between collaborative learning and motivation; they concluded that students were motivated to improve their own speaking when they saw their peers speaking well. This type of observational learning was discussed by Bandura (1977) as one of the ways to develop self-efficacy.

Chow and Law (2005) designed the Collaborative Inquiry-based Project Questionnaire (CIPQ) specifically to measure motivation in the complex environment of collaborative learning. They took ideas from various self-theories and self-determination theories and identified three dimensions shared among them; *self*, *task*, and *reinforcement* (Chow & Law, 2005). However, they were unable to find instruments which also took into account the

variations presented in collaborative learning contexts. In addition, Chow and Law (2005) were concerned whether the self-dimension was truly relevant to the interdependent environment of social learning. Through their research they were able to identify two additional factors of motivation – the project work factor and the social pressure factor. They also questioned the relevance of the self-dimension in collaborative learning contexts. As the self-dimension deals with learners' perceptions of their own competence as individuals, Chow and Law (2005) thought it more relevant to examine learners' perceptions of their group's competence. This led to the social learning factor. As a result, they were able to develop their 20-item self-report instrument, the CIPQ, which measures the following motivational factors: (1) social learning; (2) task; (3) project work; (4) reinforcement; and (5) social pressure. Their own analysis of the instrument proved statistically reliable across the five motivational factors.

Chow and Law (2005) compared the results of the CIPQ questionnaire with observed behavior. They investigated the motivational profiles of groups of secondary students in Hong Kong who were given 6–8 week cooperative learning projects. The students were given awards for their projects based on a list of pedagogically motivated criteria which included social aspects of knowledge building, quality of inquiry, and good use of CSCL technology. They discovered a connection between those who won awards and those who had higher scores in the social learning, task, and project work factors of motivation. In another study conducted in Hong Kong (Lam, 2009), it was reported that students who participated in a collaborative learning program experienced increases in the social learning, task, and project work factors of motivation. This seems relevant as these three factors are associated with intrinsic motivation (Chow & Law, 2005) and intrinsic motivation has traditionally been valued over extrinsic motivation, especially in the educational setting (Ryan & Deci, 2000).

In the three year study conducted by Collins and Hunt (2011), motivation was studied through interviews with students. However, there were never any quantitative measurements taken of the motivational effect CL had on these students. This study, then, continues in Collins and Hunt's line of inquiry and seeks to provide more insight into motivation within the context of collaborative learning among university students in Japan. As course design is key to understanding motivation in this case, this paper will give a detailed account of the learning context which surrounded this study. The CIPQ was chosen to measure motivation in this study because it was specifically designed for and tested in social learning contexts.

Purpose of the present study

This study uses the CIPQ to study motivation among Japanese university students. It seeks to answer the following questions:

1. How will the motivational profiles of the students reflect their engagement with CSCL?
2. Can CSCL methodology produce measurable increases in learner motivation among Japanese university students?
3. Which motivational factors are most influential in support of collaborative project completion among Japanese university students?

Methodology

Research instrument and procedure

Translation of the instrument. The CIPQ (Chow & Law, 2005) was used to measure motivation in this study. Chow and Law (2005) tested the CIPQ extensively in the tertiary setting. In testing their instrument for statistical reliability, they first utilized exploratory factor analysis and then sequential confirmatory factor analysis; they then tested each of the identified factors again for reliability in four separate large scale tests. Due to the extensive testing done to develop the CIPQ, it was determined to be reliable for use in this study as long as it could be accurately translated into Japanese. For use in this present study, the questionnaire was translated into Japanese by a professional translator and then translated back into English to check for accuracy (see Appendix A and B). The translated test items were left in the same random order as used in Chow and Law's 2005 study, and placed into digital form for distribution. Responses to the instrument were given using a 5-point Likert scale with the Japanese equivalent of: (1) Strongly Disagree; (2) Disagree; (3) Neutral; (4) Agree, (5) Strongly Agree.

Confirming the reliability of the instrument. The Japanese version of the CIPQ was administered to 243 Japanese university students in preparation for a test of reliability. The Real Statistics resource pack (Zaiontz, 2015) was used in this test, and the results were relayed in the form of Cronbach's alpha. The results were similar to those found by Chow and Law (2005) in their analysis of the instrument. Kline (2000) states that factor reliability is generally accepted at a Cronbach's alpha of .60 and above (see Table 1).

Table 1: Results of Reliability Test on Japanese CIPQ (n = 243)

Factor	Cronbach's α
Social Learning	.79
Task	.62
Project Work	.80
Reinforcement	.61
Social Pressure	.85

Data collection procedure for the present study. In quasi experimental fashion, the CIPQ questionnaire was administered to the 54 subjects of this present study in pretest-posttest fashion (once in September 2014 and once again in January 2015). The questionnaire was administered during class. Responses were collected anonymously using Google Forms.

Subjects

The test subjects for this present study were 54 first and second-year students from Aoyama Gakuin University. The study took place from September 2014 to January 2015. The total subjects in this study (n = 54) were comprised of two groups of students. One group (n = 20) consisted of first-year international communications majors from the School of International Politics, Economics & Communication (SIPEC) and the other group (n = 34)

consisted of second-year engineering majors from the College of Science and Engineering (CSE). These two groups were initially selected simply for their availability. However, as this instructor had taught students from these two programs previously, a sense of the student's general attitudes toward English study had already been established. From a purely subjective sense, SIPEC students seemed much more motivated to study English when compared with CSE students, as determined by classroom behavior. From a more objective perspective, the fact that the SIPEC program is an international studies program suggests that SIPEC students have an innate desire to study English for authentic communication and in support of their future career goals. Therefore, in addition to a study of motivational change, the use of these two groups offered the possibility of examining differences between the SIPEC and CSE students.

Software used to support collaborative learning

Google Apps were used to support a collaborative learning environment in this study. After the initial set up of a Google Account, students could access a large variety of productivity software which supported collaborative learning. The Google Apps used in this study included Drive, Docs, Forms, Slides, Sheets, Hangouts, and Google+. The SIPEC students also used a QR creator, the Google Scholar search engine, and the LINE mobile communication app. In order to help gage the usefulness of the software, the students were given a simple self-report questionnaire at the end of the course (please see Figure 7 for the results).

CSCL course design

Both subject groups (SIPEC & CSE) participated in courses with a similar structure. The courses were both required English oral communication courses which focused on research presentation skills. Both courses were held in CALL classrooms. In both courses students were given two research projects throughout the term. In both courses, students worked in small project groups of three to four members each. In the SIPEC course, the project groups were selected at random. In the CSE course, students were allowed to select their own project groups; however, most of the CSE students seemed to have trouble joining a group on their own and were assigned to groups at random. Therefore, well over half of the project group members were assigned to their project groups at random. The students in both courses completed two research presentation projects during the 15-week course. The major differences in the English content of the two courses were that the SIPEC students focused on social issues and international issues, while the CSE students focused on scientific vocabulary and explanations of scientific concepts. The SIPEC students were also given more difficult research projects due to their higher level of English ability and the rigorous nature of the SIPEC English program.

Learning management. In order to balance institutional requirements with the CSCL component, learning management was shared between the instructor and students. Design of the courses was done in accordance with institutionally set learning goals, while student projects were used to guide the learning. Google+ was used as a central hub for communication both inside and outside of the classroom. Students accessed Hangouts from Google+ to engage in live audio chat with other project group members, and the instructor used a

Google+ Community to share schedule updates, provide links to resources, and send individual feedback.

Social cognitive theory, of which CL was influenced, emphasizes observational learning as part of developing self-efficacy in learners (Bandura, 1977). Increasing opportunity for observational learning is therefore important in a collaborative learning program. Google Sheets was used to increase opportunities for observational learning in this study (see Figure 1). Google Sheets supported observational learning by allowing students to view each other's research plans before they began their research. Google sheets allows for read/write permissions to be set for individual cells of a spreadsheet, so groups could view each other's sections but only edit their own.

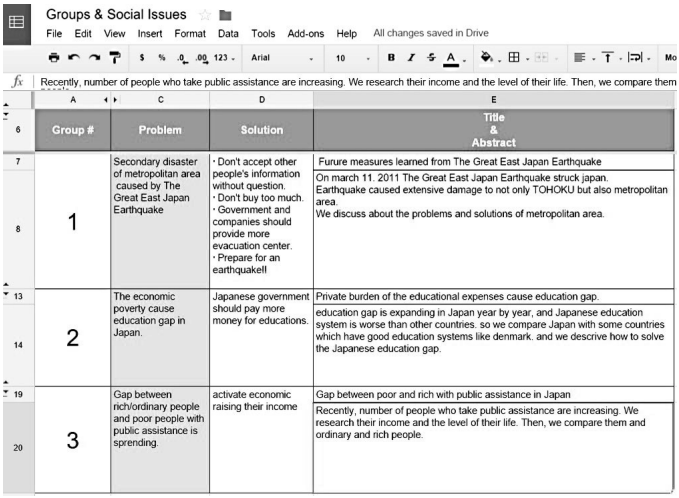

Figure 1. SIPEC student's research plans shared in a Google spreadsheet.

The first CSCL project. For the first research project, SIPEC students created an original questionnaire using Google Forms. They distributed their questionnaire digitally using QR coded web links. They then analyzed the results in Google Sheets, and presented their findings to the rest of the class using Google Slides (see Figure 2). For this project SIPEC students were introduced to Likert style question items and given a tutorial on how they could analyze the results and display them in visual format using a variety of chart styles. The projects were formally assessed using a grading rubric which was shared ahead of time through their Google+ Community page. The SIPEC students also completed self-assessment questionnaires (see Appendix C).

For the first presentation project, the CSE students created presentations in Google Slides based on model presentations from their textbook, *Presenting Science* (Kiggell, Cleary, Hitomi, Yoshida & Yubune, 2008). The CSE student's presentations focused more on the delivery of accurate scientific content in English, rather than on the formal skills of public speaking. During the first project, each group presented on a different unit from their textbook. The textbook has model presentations, and most groups simply created slideshows identical in content to those in the model presentations. They showed little interest

in expanding beyond what was minimally required to complete the task. After each day of presentations, all of the CSE students were given online quizzes covering the scientific vocabulary and content from the units of the textbook covered that day. This was done in accordance with the ESP nature of the CSE course. Having CSE students teach the units from their textbook, and then giving the entire class quizzes based on those units, provided a collaborative learning environment whereby students shared in the responsibility of learning management.

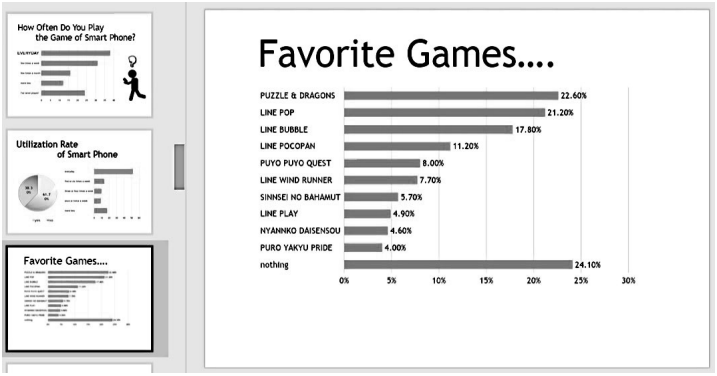

Figure 2. SIPEC slideshow displaying the results of primary research.

The second CSCL project. For the second project, SIPEC students were given a list of social concerns listed by older members of the Japanese community (a small group of adult learners this instructor/researcher also happened to be teaching at the time). These learners were all females between 40 and 70 years of age. They had a high level of English ability and were enrolled in an advanced English conversation course at Tamagawa University's Center for Continuing Learning (TUCL). These women were well educated and had extensive international experience. Due to their knowledge and expertise in both domestic and international issues, the TUCL women were asked to come up with a list of social problems for the SIPEC students to investigate. Each of the SIPEC student project groups then selected one of the problems to research a solution to. The TUCL women were also invited to attend the SIPEC student's presentations and one of them graciously donated her time. The SIPEC students were initially very nervous about having a visitor, but later encouraged by her positive feedback concerning their work. The TUCL visitor was able to connect with the students through her stories of international travel as a 25-year employee for Japan Airlines and her work as the operator of an NPO. Thanks to the TUCL women, the collaborative nature of this project was extended well beyond the classroom.

For the second research project, the CSE students were given the task of presenting on a topic relevant to the scientific community. In their case, they were given a broad list of possible research topics based on categories found in their textbook. The CSE students were required to research either a famous scientist, an electrical / optical / mechanical system, an important discovery, or to report on an original experiment. In the case of the CSE students, their presentations gave them an opportunity to use their scientific interest and background, and to discover the vocabulary necessary to communicate scientific concepts

in English (see Figure 3). For the second research project, many of the CSE groups gave interesting and well prepared presentations, however, some of the groups still seemed to do the bare minimum required of them.

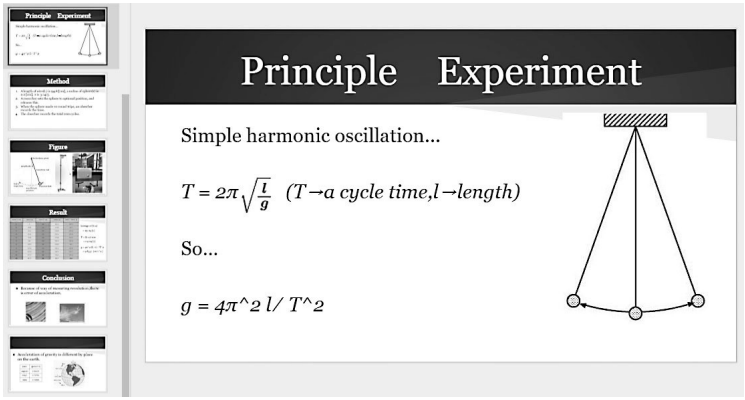

Figure 3. CSE slideshow explaining the measurement of gravity.

A note on assessment. Assessment was conducted through a variety of means such as self-assessment, peer-assessment, instructor-assessment, and, in the case of the CSE students, unit tests of vocabulary taught during student presentations; each of these assessment instruments served a different purpose. For example, during the second research project, both individually based peer-assessments and group-based instructor-assessments were used (see Appendix D and E). Peer-assessment was used to evaluate individual presenters on their public speaking skills (see Figure 4), while the instructor assessed the group as a whole concerning the content of their presentations. This method of sharing the assessment responsibility with the classroom allowed for a large amount of feedback to be given. In addition, cases of individuals who did not participate much in their group project became easily apparent. For example, one student did not speak at all during the group presentation, and so could not be assessed by his peers.

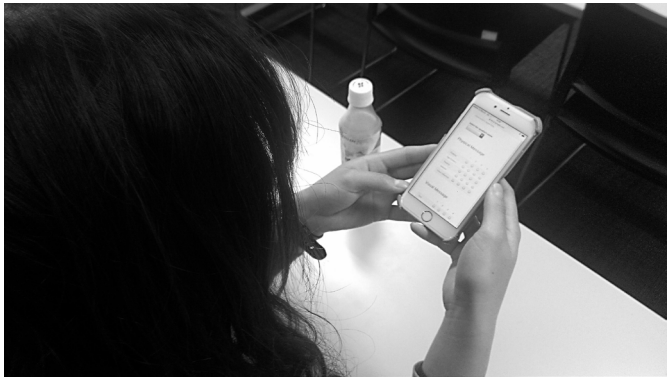

Figure 4. Peer-assessment supported by Google Forms.

Statistical analysis of CIPQ results

Changes in motivation were determined in this study by comparing pretest and posttest samples of the CIPQ questionnaire. Calculations were made to determine both probability (*p*) and effect size (*d*). Statistical significance in this study was determined by a *p*-value below .05. Effect size in this study was calculated as a measure of Cohen's *d* where a value of 0.2 indicates a small effect, a value of 0.5 indicates a medium effect, and a value of 0.8 indicates a large effect (Cohen, 1988; Lakens, 2013). Results were calculated such that positive *d*-values indicated a positive effect while negative *d*-values indicated a negative effect.

Results

Motivational profiles

The pretest and posttest results of the CIPQ were combined to create motivational profiles for the SIPEC students and the CSE students. Table 2 presents a summary of those findings, and Figure 6 provides a visual representation of their profiles.

Table 2: Mean CIPQ scores comparing the SIPEC and CSE Students

Motivational factor	Group	*M*	*SD*	*p*	*d*
Social Learning	CSE	3.63	0.95		
	SIPEC	3.95	0.60	< .05	0.4
Task	CSE	3.56	0.69		
	SIPEC	4.04	0.61	< .001	0.7
Project Work	CSE	3.61	0.92		
	SIPEC	4.15	0.53	< .001	0.7
Reinforcement	CSE	3.18	0.93		
	SIPEC	3.06	0.60	.43	–0.1
Social Pressure	CSE	3.27	0.94		
	SIPEC	2.77	0.95	< .01	–0.5

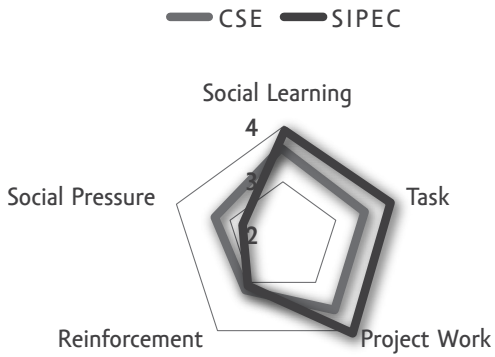

Figure 6. Motivational profiles of the SIPEC and CSE students.

Effects of CSCL on motivational factors

An overview of the effect of CSCL on motivational factors can be found in Table 3. Analysis revealed a large statistically significant increase in the social pressure factor of motivation at the end of the fifteen-week term (t (103) = 4.02, p < .001, d = 0.8). Detailed analysis of the CIPQ items used to determine the social pressure factor can be found in Table 4.

Table 3: Results of t-tests: Week 1 (n = 54) vs. Week 15 (n = 52) by motivational factor

Motivational factor	**Week**	***M***	***SD***	***t***	***p***	***d***
Social Learning	1	3.81	0.85			
	15	3.69	0.85	–0.72	.48	–0.1
Task	1	3.80	0.68			
	15	3.68	0.72	–0.87	.39	–0.2
Project Work	1	3.85	0.84			
	15	3.79	0.83	–0.38	.72	–0.1
Reinforcement	1	3.04	0.78			
	15	3.23	0.86	1.24	.25	0.2
Social Pressure	1	2.73	0.90			
	15	3.44	0.92	4.02	< .001	0.8

Note. *df* = 103. Statistical significance given to *p*-values below < .05.

Table 4: Detailed Analysis of Changes to the Social Pressure Factor (n = 52)

Why do I participate in project work?	**Week**	***M***	***SD***	***t***	***p***	***d***
12. "Because if I don't participate, the relationship between my friends and I will be affected negatively."	1	2.46	1.09			
	15	3.25	1.10	3.69	< .001	0.7
15. "Because if I don't participate, my group mates will blame me."	1	2.44	1.14			
	15	3.27	1.21	3.61	< .001	0.7
17. "Because I don't want to be perceived as a burden to my group mates."	1	2.96	1.13			
	15	3.69	1.02	3.49	< .001	0.7
20. "Because if I don't participate, my reputation will be affected badly."	1	3.04	1.21			
	15	3.54	1.06	2.27	.02	0.4

Note. *df* = 103. Items taken from Chow and Law (2005).
Statistical significance given to *p*-values below < .05.

Usefulness of the software

Figure 7 illustrates the SIPEC student's impressions of the usefulness of the software used in this study. They reported that the Google+ Community was most useful. The QR creator and Google Forms were also seen as highly useful. While none of the applications used were seen as useless, Google Slides received the most neutral response. The fact that Google Sheets was not included in the questionnaire was an oversight.

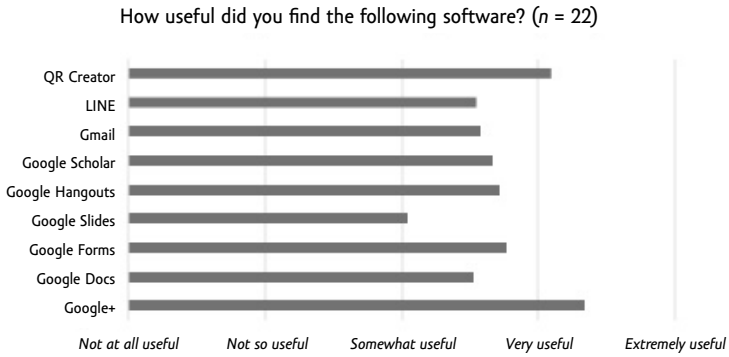

Figure 7. The SIPEC students' impressions of the software.

Discussion

Motivational profiles

As previously noted, the SIPEC students engaged in much more rigorous research tasks than the CSE students, even conducting their own primary research as part of the course. Analysis of the motivational profiles of both groups presented in Table 2 and Figure 6 revealed significantly higher levels of motivation in the social learning, task, and project work factors among the SIPEC students. These results concur with the findings of Chow and Law (2005) which equate higher scores in these factors with higher quality work in CSCL projects. However, even among the CSE students the social learning, task, and project work factors were their largest motivational concerns. This suggests that the work itself and what students can potentially learn from each other may still be the most important issues of motivation, even among seemingly poorly motivated students. This supports the collaborative learning practice of sharing the burden of learning management with the transitional community. Indeed, when the CSE students were given more freedom over their presentation content (as in the second project) many of them prepared very detailed presentations explaining difficult scientific content.

Friendship and reciprocity in the Japanese tertiary setting

The most significant finding in this study is the large increase in the social pressure factor of motivation ($t(103) = 4.02$, $p < .001$, $d = 0.8$). This was the only statistically significant effect reported (see Table 3). This was not expected as it was not reported in previous studies using the CIPQ. A detailed analysis of the social pressure factor (see Table 4) reveals that items 12, 15, and 17 were most representative of the student's feelings concerning this factor.

While the social pressure factor is an extrinsic factor, and extrinsic factors are generally considered inferior in an educational setting, Ryan and Deci (2000) note that there are actually two forms of extrinsic motivation. One form causes negative feelings and is associated with being prodded along by external pressures, and the other form is based on an internally accepted value placed on an extrinsic factor. They state "in the former case – the classic

case of extrinsic motivation – one feels externally propelled into action; in the latter case, the extrinsic goal is self-endorsed and thus adopted with a sense of volition" (Ryan & Deci, 2000, p. 55). In the present study, items 12, 15, and 17 (see table 4) all deal with the concept of maintaining positive relationships with group members and seem self-endorsed, whereas item 20, which was less affected, deals with the fear of receiving a personally negative result and therefore would be more associated with the negative type of extrinsic motivation as described by Ryan and Deci (2000). These results indicate that the test subjects developed friendships during their collaborations, and that these new friendships became valuable to them – valuable enough to motivate participation in project work.

Social pressure may always be a factor. In an extensive review of research into learner motivation and peer pressure, Bishop (2004) asked "why are 'nerds' unpopular and targeted for harassment?" (p. 38). In his study he looked at trends in American education and discovered that students tended to apply peer pressure towards maintaining a low overall performance so that it was easier for themselves to do well. This was especially prevalent when they were judged relative to one another either formally (as when being graded on a curve) or informally (as when the difficulty of the learning tasks was elastic and based on a teacher's impressions of the class). Among workers in a hierarchical environment, this is known as the rate buster fear (Kendal & Lazear, 1992). This is when individual performance can threaten the job security of others. On the other hand, Kendal and Lazear (1992) note that partnerships result in mutual pressure to perform better. This seems a strong argument for utilizing teamwork in the educational setting, where you both eliminate the rate buster fear, and encourage mutual pressure to perform better.

Another way to look at this social pressure factor is as a measure of the student's sense of reciprocity. Based on a series of social experiments conducted by Kiyonari, Tanida and Yamagishi (2000), reciprocity was discovered to be an important factor in mixed-motive situations. They called this the social exchange heuristic. Since then, others (e.g., Dijkstra, 2012) have sought to formalize their theory. According to Kiyonari et al. (2000), "the social exchange heuristic prompts people to perceive a mixed-motive situation as an assurance game situation in which cooperation is a personally better choice than defection insofar as the partner is cooperating as well" (p. 2). If one applies this to education in Japan, it seems a strong argument for giving students a group assessment, where all members of a project group receive the same score for the project. They either succeed or fail together. While this idea generally comes with the immediate concern of, "What happens if a group member does not participate?" as Kiyonari et al. (2000) state, "the social exchange heuristic 'biases' us to seek mutual cooperation in social exchange, diverting us from attempts to exploit exchange partners" (p. 25).

As Kendal and Lazear (1992) have shown us, partnerships result in mutual pressure to perform better in work environments. As Kiyonari et al. (2000) have shown us, reciprocity is a powerful motivating factor in mixed motive situations. As this study has revealed, collaborative learning leverages friendship building opportunities and leads to a greater sense of reciprocity in group work settings among Japanese university students. However, this bias towards mutual cooperation does not mean that every member will always contribute their fair share during group work. In the case of this study, one group reported a non-participatory member. Other similar types of studies (Flowers, 2014b) have also reported non-participatory members. However, students have report that coping with non-participatory members helped them prepare for entering the workforce (Flowers, 2014c). Therefore, the following points seem relative when considering group work of this kind: (1) reciprocity is

an important dynamic of Japanese society which minimizes unequal distribution of participation in group settings, (2) intragroup dynamics are a normal part of life which students should be prepared to face in their future work environments, (3) combining individual assessment with group assessment can balance out any major discrepancies between individual performance and group performance, (4) there should always be a vehicle for communication in place, such as an open-door policy or a follow up questionnaire, whereby individuals can discuss intragroup dynamics with their teacher in a confidential manner.

Limitations

There were several limitations in this study. First, as no identifying information was collected in the pretest-posttest samples, there was no way to correlate the results with the student's grades or other assessment data. This limited observations concerning the student's performance as it related to their motivational profiles. Second, there was no control group present in this study. While it is clear that the subjects in this study were affected by social pressure in a large and significant way, it is unclear what degree this effect is unique to the learning environment of this particular study. Third, this study only tracks the changes to learners over one term. Collaborative learning is a complex methodology which can take years to acclimate to (Bruffee, 1999). It is possible that motivation will shift at varying stages during the process of acclimating to CL methodology.

Considerations for future research

Increases in the social pressure factor may only be part of the picture. It is possible that increases in social pressure occurs in the early stages of collaborative learning when learners are new to the concept of interdependent learning. Kendal and Lazear (1992) argue that it takes longer for intrinsic social motivators to cultivate (p. 806). If this can be applied to the CIPQ, then perhaps the social pressure factor may show increases before the social learning factor develops. Development of the social learning factor may require more time and more experience within the CL environment. Bruffee (1999) recognized the need for a gradual transition into collaborative learning in order to allow learners to become acclimated to the idea of interdependent learning. On the other hand, Barkley et al. (2005) argued for a variety of levels of learner control depending on the context. In either case, repeated testing over sequential courses using increasingly student managed CL methods may reveal additional motivational changes. In addition, it would be useful to study the social pressure factor in other learning environments.

Telecollaborative learning

In addition to deeper investigation into motivations within the culturally homogenous environment of Japan, it would be useful to measure the motivational effects of intercultural CSCL. Technology like that used in this study could be used to engage students in distance CSCL, commonly referred to as telecollaborative learning. Intercultural telecollaborative exchange would bring additional challenges when it comes to friendship building and reciprocity, but would also provide opportunity to develop intercultural communication skills and English as a lingua franca. Previous studies (Forsythe, 2014; Miyazoe & Anderson, 2009) used asynchronous student engagement; however, more complex collaborations would be

greatly facilitated by the synchronous online meeting of project groups. Such telecollaborations would require coordination of classroom schedules between two or more universities in two or more countries and time zones. However, using the same kinds of freely available software used in this study, it would be possible for students to prepare research, conduct research, and report on that research telecollaboratively.

Conclusions

The students with higher levels of social learning, task, and project work motivation, as measured by this study, were more productive in CSCL and able to complete more complex research projects. These results are similar to previous studies (Chow & Law, 2005; Lam, 2009) identifying these areas as important motivational factors. However, the discovery of a large increase in the social pressure factor was unexpected, as it had not been reported in previous studies. Social pressure, or, "peer pressure," has often been associated with negative behavior and demotivation; however, in this study it seemed to be an important motivational factor. By participating in their group projects, students applied social pressure to other group members who responded by reciprocating the work effort. As the term progressed, group members developed friendships. As these friendships increased, so did the cycle of reciprocation. It is hoped that this study will in some small way contribute to the investigation of collaborative learning in the Japanese university setting, as it seems an effective way to help learners transition from being largely teacher dependent secondary school students towards being interdependent members of adult society.

References

Barkley, E. F., Cross, K. P., & Major, C. H. (2005). *Collaborative Learning Techniques: A Handbook for College Faculty*. San Francisco, CA: Jossey-Bass.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review, 84*(2), 191–215.

Bishop, J. (2004). Drinking from the fountain of knowledge: student incentive to study and learn –externalities, information problems and peer pressure. *Handbook of the Economics of Education, 2*, 909–944. Retrieved from http://digitalcommons.ilr.cornell.edu/cahrswp

Bruffee, K. A. (1999). *Collaborative Learning: Higher Education, Interdependence, and the Authority of Knowledge*. Baltimore, MD: Johns Hopkins University Press.

Chow, A., & Law, N. (2005). Measuring motivation in collaborative inquiry-based learning contexts. In International conference on computer support for collaborative learning (pp. 68–75). ACM Press.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences (second edition)*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Collins, W., & Hunt, J. (2011). Improved student motivation and confidence through self-access listening, video forums and talking journals. *The JALT CALL Journal, 7*(3), 319–333. Retrieved from http://journal.jaltcall.org/articles/7_3_Collins.pdf

Daniels, P. (2008) Designing CMS modules to support language learning. *The JALT CALL Journal, 4*(1), 93–104. Retrieved from http://journal.jaltcall.org/articles/4_1_Daniels.pdf

Dijkstra, J. (2012). Explaining contributions to public goods: Formalizing the social exchange heuristic. *Rationality and Society, 24*(3), 324–342.

Flowers, S. (2014a). Documentary project: An experiment in cooperative learning. *PeerSpectives,12*, 32–34. Retrieved from https://goo.gl/DMAOh9

Flowers, S. (2014b, Aug 14). Student reactions to Google Presentations. *Digital Mobile Language Learning*. Retrieved from http://digitalmobilelanguagelearning.org/?p=2349

Flowers, S. (2014c) *Cooperative Learning*. [Prezi slides] Retreived from https://prezi.com/maf5nhstrdv_/cooperative-learning/

Forsythe, E. (2014). Online intercultural collaborations using wikis: An analysis of students' comments and factors affective project success. *The JALT CALL Journal, 10*(3), 255–271. Retrieved from http://journal.jaltcall.org/articles/10_3_Forsythe.pdf

Harrington, D., & LeBeau, C. (2009). *Speaking of Speech: New Edition.* Japan: MacMillan.

Iida, H. (2004). Current issues in teacher training. *The Language Teacher, 28*(5). Retrieved from http://JALT-publications.org/tlt/articles/713-current-issues-teacher-training

Kandel, E., & Lazear, E. P. (1992). Peer pressure and partnerships. *Journal of political Economy, 100*(4), 801–817. Retrieved from http://www.jstor.org/stable/2138688

Kiggell, T., Cleary, K., Hitomi, K., Yoshida, H., & Yubune, E. (2008). *Presenting Science: 2nd Edition.* Japan: Macmillan.

Kimura, Y., Nakata, Y., & Okumura, T. (2001). Language learning motivation of EFL learners in Japan – A cross-sectional analysis of various learning milieus. *JALT Journal, 23*(1), 47–68.

Kiyonari, T., Tanida, S., & Yamagishi, T. (2000). Social Exchange and Reciprocity: Confusion or a Heuristic? *Evolution and Human Behavior, 21*, 411–427.

Kline, P. (2000). The handbook of psychological testing (2nd ed.). London: Routledge

Konishi, M. (1990). Changes in motivation for English language learning: A series of four measurements. *The* IRLT *Bulletin, 4*, 1–23.

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Front Psychol, 4*. Retrieved from http://journal.frontiersin.org/article/10.3389/fpsyg.2013.00863/full

Lam, P. (2009). Quasi-Experimental Research into the Effects of an International Collaboration Project on Hong Kong Secondary School Students' Learning Motivation. *The International Journal of Learning, 16*(7), 325–337.

Miyazoe, T., & Anderson, T. (2009). Learning outcomes and students' perceptions of online writing: Simultaneous implementation of a forum, blog, and wiki in an EFL blended learning setting. *System, 38*, 185–199.

Murphey, T. (1996). Near peer role models. *Teachers Talking To Teachers: JALT Teacher Education SIG Newsletter, 4*(3), 21–22.

Murphey, T. (2003). NNS primary school teachers learning English with their students. *TESOL Matters, 13*(4), 1–6.

Murphey, T., Asaoka, C., & Sekiguchi, M. (2004). Primary teachers co-learning English with their students. *The Language Teacher, 28*(2). Retrieved from http://JALT-publications.org/tlt/articles/1903-primary-teachers-co-learning-english-their-students

Nunan, D. (Ed.). (1992). *Collaborative language learning and teaching*. Cambridge, UK: Cambridge University Press.

Oxford, R. L. (1997). Cooperative learning, collaborative learning, and interaction: Three communicative strands in the language classroom. *The Modern Language Journal, 81*(4), 443–456.

Ryan, R., & Deci, E. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology 25*, 54–67. doi:10.1006/ceps.1999.1020

Ryan, S. (2009). Self and Identity in L2 Motivation in Japan: The Ideal L2 Selves of Japanese Learners of English. In Z. Dörnyei & E. Ushioda (Eds.), *Motivation, Language Identity and the L2 Self* (pp. 120–143). Bristol: Multilingual Matters.

Stahl, G., Koschmann, T., & Suthers, D. (2006) Computer-supported collaborative learning: An historical perspective. In R. K. Sawyer (Ed.), *Cambridge handbook of the learning sciences* (pp. 409–426). Cambridge, UK: Cambridge University Press. Retrieved from: http://gerrystahl.net/cscl/CSCL_English.pdf

Yashima, T. (2000). Orientations and motivation in foreign language learning: A study of Japanese college students. *JACET Bulletin, 31*, 121–133.

Zaiontz, C. (2015). *Real Statistics Resource Pack for Excel 2010/2013* (Release 4.1) [Software]. Available from: http://www.real-statistics.com/free-download/real-statistics-resource-pack/

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Appendix A

The Collaborative Inquiry-based Project Questionnaire (Chow & Law, 2005)

(A) Why do I try to do well in school?
1. Because that's what I'm supposed to do. (T)
2. Because I will be scolded by my parents or teachers if I don't do well. (R)
3. Because I enjoy doing my classwork. (T)
4. Because I might get a reward if I do well. (R)

(B) Why do I work on my class work?
5. Because I want the teacher to think I'm a good student. (R)
6. Because I want to learn new things. (T)
7. Because I'll be ashamed of myself if it didn't get done. (R)
8. Because I enjoy doing my school work well. (T)

(C) Why do I participate in project work?
9. Because I like to work with my classmates in group activities. (SL)
10. I participate in project work because it's fun. (PW)
11. Because it's important to me to do project work. (PW)
12. Because if I don't participate, the friendship between my friends and I will be affected badly. (SP)

13. Because working in group (compare with working individually) allows me to tackle more complex project topics. (SL)
14. Because participating in project work can help my academic learning. (PW)
15. Because if I don't participate, my groupmates will blame me. (SP)
16. Because compared to learning by doing homework, it is more effective to learn by doing project work. (PW)
17. Because I don't want to be perceived as a burden to my groupmates. (SP)
18. Because there are many chances for discussion and sharing of ideas by working in groups. (SL)
19. Because learning in a group allows me to have more courage to investigate more complex topics. (SL)
20. Because if I don't participate, my reputation will be affected badly. (SP)

T = Task Factor
R = Reinforcement Factor
SL = Social Learning Factor
PW = Project Work Factor
SP = Social Pressure Factor

Appendix B

The Collaborative Inquiry-based Project Questionnaire (Japanese Version) Translated from Chow and Law (2005)

(A) 学校で良い成績を取ろうとするのはなぜですか?
1. やるべきことだから。(T)
2. 成績が悪いと、両親や先生に叱られるから。(R)
3. 授業が楽しいから。(T)
4. 成績が良いと、報いが得られるかもしれないから。(R)

(B) 授業の活動に取り組むのはなぜですか?
5. 先生から良い生徒だと思ってもらいたいから。(R)
6. 新しいことを学びたいから。(T)
7. 課題を終えていないと、恥ずかしい思いをするから。(R)
8. 学校の活動にしっかり取り組むのが楽しいから。(T)

(C) グループでのプロジェクト活動に参加するのはなぜですか?
9. クラスの友達とグループ活動に取り組むのが好きだから。(SL)
10. プロジェクト活動に参加するのが楽しいから。(PW)
11. 自分にとって、プロジェクト活動に取り組むことは大切だから。(PW)
12. 参加しないと、自分と友達との関係に悪影響が出るから。(SP)
13. グループで活動すると (1人で取り組むのと比べて) より複雑なプロジェクトのトピックに挑戦できるから。(SL)
14. プロジェクト活動に参加すると、自分の学習に役立つから。(PW)
15. 参加しないと、グループの仲間が自分のことを責めるから。(SP)

16. 宿題で学習するのと比べて、プロジェクト活動に取り組んで学習する方が効率的だから。(PW)
17. グループの仲間にとっての負担と思われたくないから。(SP)
18. グループで活動すると、議論をしたり、考えを共有したりする機会が多くなるから。(SL)
19. グループでの学習は、より複雑なトピックについて調べる勇気をより持てるから。(SL)
20. 参加しないと、自分の評価に悪影響が出るから。(SP)

T = Task Factor
R = Reinforcement Factor
SL = Social Learning Factor
PW = Project Work Factor
SP = Social Pressure Factor

Appendix C

Self-assessment Questionnaire

Template available from: https://goo.gl/aU48UQ

Use the following scale to represent your responses to each item:
1 = Not satisfactory. 2 = I did this to some extent. 3 = I did this well. 4 = I did this very well.

Preparation
___ I found and prepared relevant background information about our topic.
___ I rehearsed my portion of the presentation.
___ I used feedback from the teacher or group-mates to improve our presentation.
___ I was an active member of my group during the preparation stage.
___ I contributed as much or more than other members of my group.

Presentation Structure
___ I introduced my topic and made my purpose clear.
___ I gave an outline of the key points of my presentation.
___ I organized my information in a suitable way for the presentation.
___ I used charts, graphs, and images to assist in communicating my ideas.
___ I included a conclusion in my presentation, where I summed up key points.

Development of Ideas
___ I made links and connections between ideas.
___ I presented important details and gave examples to help make my points clear.
___ The information I presented was important to my group's presentation.
___ I presented information in my own words.

Speech Quality
___ I made good eye contact with the audience.
___ I spoke clearly and with good volume.
___ I varied my speed and tone appropriately.
___ I used appropriate body language and gestures.

Answering Questions from the Audience
___ I answered questions from the audience.
___ My responses during question time contributed positively to my presentation.
___ I was well prepared and defended my presentation from critique.

Self-Reflection
How did I prepare for speaking in front of this group?

_____
_____

What was the most successful or enjoyable part of my presentation?

_____
_____

What would I do differently next time?

_____
_____

Appendix D

Peer-assessment Questionnaire

Template available from: https://goo.gl/SvobLW
(Based on the skills taught in *Speaking of Speech*, Harrington & LeBeau, 2009)

Please rate each factor on a 1–5 scale (1 = lowest, 5 = highest)

Physical Message
___ Posture
___ Eye Contact
___ Volume
___ Use of Gesture
___ Voice Inflection

Visual Message
___ Text
___ Images
___ Numbers
___ Charts

Story Message
___ Introduction
___ Body and Evidence
___ Transitions and Sequences
___ Conclusion

Additional Comments

_____
_____
_____
_____
_____

Appendix E

Instructor's Group-assessment Questionnaire

Template available from: https://goo.gl/iwbC5P
(Used for the second SIPEC research project: Researching a social issue)

Rate each factor on a 1–5 scale (1 = lowest, 5 = highest)

Background Research
___ The topic was researched in detail.
___ The topic was broadly explained giving a good general overview.
___ Key point in this topic were identified.
___ The topic was narrowed to a specific social issue.

Social Problem
___ The group identified a core problem.
___ The problem had a great impact on the social issue.
___ A manageable area of the problem was identified.

Solution
___ A solution to the manageable area of the problem was identified.
___ The solution was linked back to the core problem.
___ The group presented a detailed plan of action for achieving their solution.

Plan of Action
___ The group's plan of action included budgeting concerns.
___ The group's plan of action included public relations issues.
___ The group's plan of action included a time-frame for achieving their solution.

Defense of Ideas

___ The group solicited questions from the audience.
___ The group's answers to audience questions helped clarify the presentation.
___ The group defended their solution from critical questions.

Additional Comments

_____
_____
_____
_____
_____