Is there a mantra for successful collaboration? Mapping faculty experience in facilitating cross-culture collaboration

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ABSTRACT

A number of studies have looked at the benefits of collaboration. However, very few studies have documented the experiences of faculty collaborators in the process. In Fall 2012, two instructors from Singapore and USA collaborated to facilitate cross-cultural interaction between their students to provide feedback on each other's assignments. Using an action research framework, this self-reflective paper looks at the process of faculty collaboration and the experiences of the instructors in facilitating the student interaction. The objectives of this paper were to investigate the enabling conditions and challenges, the stages involved, and the tools and technologies required in ensuring successful collaboration between remote instructors. Using an action research framework, the findings are mapped to four stages – plan, act, observe and reflect. The main contribution is a framework for action research for instructor collaboration. The findings and the framework should be useful both for instructors seeking to collaborate for research and to facilitate collaboration between their students, as well as practitioners of action research. The paper should also help further research on collaboration and collaborative information behavior.

KEYWORDS

Remote collaboration, action research, email, audio conferencing, cloud computing.

INTRODUCTION

Research thrives both on individual work and on collaboration. Faculty often collaborate with researchers from within or across other institutions. However, there are very few studies that have documented the individual reflections and journey of collaborators in the process of initiating and continuing with a successful collaboration, which might be helpful to other researchers – especially in the context of collaboration between educators for teaching-related research. This study documents the process of collaboration between two remote instructors. The collaborators were based in locations far from each other – Singapore and USA, and were instructors in their respective schools. They wanted to get their respective students to engage with each other, and document their own reflections in the process of collaborating. Using an action research framework, this paper presents the authors' experiences and reflections in their collaboration journey. The specific research questions examined are, "What are the 1) enabling conditions and challenges, 2) the stages involved, and 3) the tools and technologies required in ensuring successful collaboration between remote instructors. The theoretical lens used for the study is the action research model adapted from Riding, Fowell, and Levy (1995) and Yasmeen (2002). These findings are mapped to the four stages – plan, act, observe and reflect in the action research framework. The contribution of our paper is a set of findings and an action research framework for instructor collaboration that could be helpful for other researchers and faculty members seeking to collaborate with other remote instructors or researchers. The paper adds to the literature on action research, and on remote and cross-cultural collaboration between instructors and/or researchers.

LITERATURE REVIEW

Collaboration
There is a huge body of literature on collaboration – spanning business and organizations (Gray, 1989), healthcare (e.g. Croker, Trede, & Higgs, 2012 on collaboration in rehabilitating teams), and scholarly and education contexts (e.g. Cook, & Friend, 1995; McDuffie, Mastropieri, & Scruggs, 2009; and Rytivaara & Kershner, 2012 on co-teaching; Kimmel, 2012 on librarian-teacher collaboration).

Definitions. Gray (1989) describes collaboration as the constructive management of differences, and a process in which those parties with a stake in the problem actively seek a mutually determined solution. "They join forces, pool information, knock heads, construct alternative solutions, and forge an agreement." (p.xviii). Mattessich, Murray-Close, & Monsey (2001) define collaboration as "a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals" (p.4). Highlighting the importance of two heads being better than one, Shah (2012), in his book on collaborative information seeking, investigates collaborative processes that are "intentional, interactive, and possibly mutually beneficial." (p.4). Shah (2012, p.4) defines collaboration as "an activity of multiple parties coming together to work toward a mutually beneficial common goal." He cites the example of (one side of a) tug-of-war, where every individual in the team is contributing one's strength to pull the rope in a particular direction to win the game. Even though the team might have a captain, "but when it comes to actually working on the collaborative task (pulling the rope), everyone is contributing more or less the same." "Thus, the real authority lies in the collaboration rather than in individuals." (p.4). Thus, the emphasis of this definition is in the process of knowledge sharing and working towards a common goal. Kemp (2013) highlights the biggest advantage of collaboration as an exposure to new ideas, methodologies and insights. The disadvantages of collaboration include over-specialization, selflessness leading to self-defeating behavior and anonymity (Kemp, 2013).

Factors affecting collaboration. Continuing from the previous example, let us consider a scenario where a member of a team in tug-of-war is not as interested in winning, or decides to give up mid-way? Thus, there are factors which need to be understood as to what makes a successful collaboration. Based on a review of the literature, Mattessich, Murray-Close, & Monsey (2001) identify several factors that make successful collaboration. These factors are related to the environment, membership characteristics, process and structure, communication, purpose and resources. A successful collaborative relationship "includes a commitment to mutual relationships and goals, a jointly developed structure and shared responsibility, mutual authority and accountability for success and sharing of resources and rewards" (Mattessich, Murray-Close, & Monsey, 2001, p.4). Martin-Rodriguez, Beaulieu, D'Amour, & Ferrada-Videla (2005) synthesized the factors affecting successful collaborations in health care teams, as identified by theoretical and empirical studies in the area. The factors include processes at work in interpersonal relationships within the team (*interactional determinants* – willingness to collaborate, trust, communication and mutual respect), conditions within the organization (*organizational determinants* – organizational structure, organization's philosophy, administrative support, team resources, and coordination and communication mechanisms), and the organization's environment (*systemic determinants* – social system, cultural system, professional system and educational system). Shedding further light on the interactional determinants identified by Martin-Rodriguez *et al.* (2005) and discussed above, Culbertson (2013) did a study on the qualities of the best research collaborator based on responses by 7 individuals who had experienced collaborative work with others. The qualities identified include complementing of skills and interests, personality traits such as being a good person who is trustworthy, respectful, open-minded and motivating with the ability to give and receive constructive criticisms, knowledgeable and with great ideas and perspectives, and who has experienced working with others. Dahlendar & McFarland (2013) highlight homophily or the tendency of people to select collaborations with others similar to themselves as a salient factor for research collaboration. People tend to associate and collaborate with others when they share attributes of age, gender, education and ethnicity (Dahlendar & McFarland, 2013).

Dimensions of collaboration. Taylor-Powell, Rossing, & Geran (1998) distinguish collaboration from other terms – communication, contribution, coordination and cooperation. They define communication as a process based on the exchange of information and meaning, and crucial for a productive relationship. Contribution or mutual support is defined as an informal relationship through which parties help each other by providing some of the resources and support needed to reach their independent goals. Coordination is seen as a deliberate, joint, and more formalized relation among parties involving communication, some planning and division of roles, longer term goals, and sharing of resources and risks/rewards to achieve complimentary goals. Current activities are adjusted for more efficient and effective results. Cooperation is defined as a relationship in which parties with similar interests plan together, negotiate mutual roles and share resources to achieve joint goals. Each party maintains its own identity.
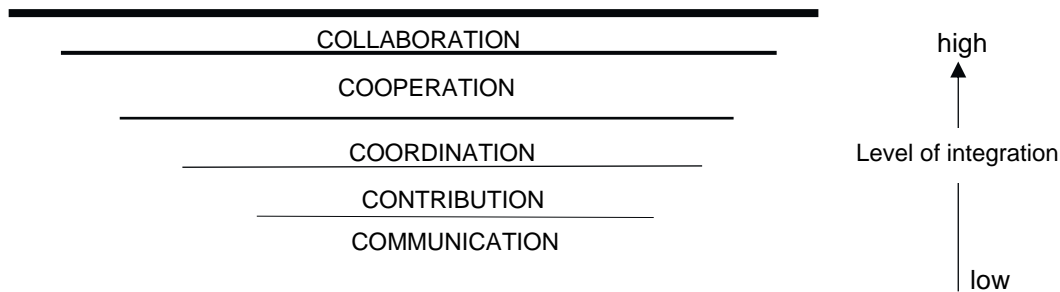
Figure 1. The 5 Cs in reaching the optimal goal of collaboration (adapted from Taylor-Powell, Rossing, & Geran, 1998; Shah, 2012)

Finally, in collaboration, the parties develop a shared vision, build an interdependent system to address issues and opportunities and share resources. Authority is vested in the collaborative, rather than in individuals or an individual agency. The difference between these five Cs is in the level of integration – the lowest integration being in a communicative relationship and the highest in a collaborative one. Shah (2012) explains these as a set-based model where collaboration is the superset of cooperation, cooperation of coordination, and so on. Thus, for successful collaboration to occur, it must involve all the other Cs i.e. cooperation, coordination, contribution and communication.

Croker, Trede, & Higgs (2012) carried out a phenomenological study to study the experiences of healthcare workers collaborating within rehabilitation teams. They interviewed 66 team members across 9 teams. Croker *et al.* discovered 8 dimensions of collaborating experiences, 5 of which were interpersonal and 3, what they called reviewing dimensions. As per the authors, these dimensions represent the essence of the lived experience of collaborating in rehabilitation teams (rather than representing experiences of particular disciplines). The interpersonal dimensions of collaboration experience identified were: 1) engaging positively with other peoples' diversity (self in relation to others); 2) entering into the form and feel of the team (in relation to team membership changes; in our study, there were only 2 collaborators, so this was not an issue); 3) establishing ways of communicating and working together (highlighting complexities of interacting with others); 4) envisioning together frameworks for carrying out the task at hand (sharing expectations and information) and 5) effecting changes in people and teams (also not applicable to our study). In addition, they also identified 3 reviewing dimensions of the experience of collaborating

that operated across the dimensions above: 6) reflexivity (involving critical reflection and development of self in relation to others); 7) reciprocity (enabling mutuality of rehabilitation roles), and 8) responsiveness (facilitating situation-appropriate and contextually-relevant adjustments).

Action Research / Theoretical Lens
Riding, Fowell, & Levy (1995) define action research as a systematic and reflective research method which allows participants to plan, observe, analyze and reflect about their experiences. The reflective and analytical insights of the researcher-practitioners themselves form the basis of the developmental process. It is participative and allows participants to contribute equally to the research inquiry (Riding, Fowell, & Levy, 1995). Through a systematic process of using theoretical developments to improve curriculum design and delivery, action research methodology motivates educators to incorporate innovative teaching and learning. This is done by placing the educator in the dual role of the educational theory producer and user as well (Riding, Fowell, & Levy, 1995). This helps produce knowledge and improve learning and teaching practice, thereby blending design with delivery of teaching while simultaneously filling the gap between theory and practice. This also encourages educators to holistically integrate their research and teaching interests, leading to greater job satisfaction, enrichment of academic programs, enhancement of student learning and practitioner's insights and contributions to the advancement of knowledge in higher education (Riding, Fowell, & Levy, 1995; Zuber-Skerritt, 1982, p.15 as cited by Riding *et al.*). In action research, "no separation need be made between the design and delivery of teaching, and the process of researching these activities, thereby bringing theory and practice closer together." (Riding, Fowell, & Levy, 1995, para. 7).
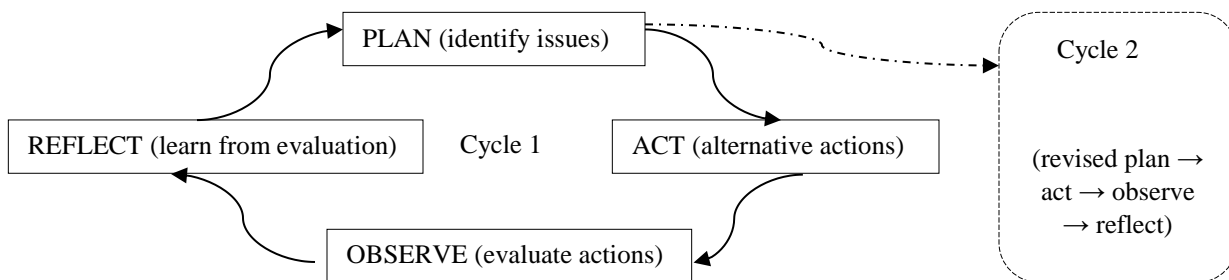
Figure 2. Action research framework – adapted from Riding, Fowell, & Levy (1995) and Yasmeen (2002).

Figure 2 shows an action research framework. The framework consists of 4 stages – plan, act, observe and reflect (or learning from evaluation) that researchers go through in the process of conducting action research. The insights gained from the initial cycle feeds into planning of the second cycle, where the action plan is modified and the research process repeated (Riding, Fowell, & Levy, 1995). Zuber-Skerritt (1982) describes action research as *critical* collaborative enquiry by *reflective* practitioners who are *accountable* in making the results of their enquiry public, *self-evaluative* in their practice, and engaged in *participative* problem-solving and continuing professional development. We use the action research framework of Figure 2 as a theoretical lens in this study.

Collaboration and Action Research
We have looked at various definitions of collaboration, factors affecting collaboration and the dimensions of collaboration identified in prior studies. There are very few studies that bring together collaboration and action research. Barbara Gray (1989) describes collaboration as a three-stage process. These stages are synthesized by London (2012). The first and the most difficult stage is the *problem-setting phase*. Here, the parties arrive at a shared definition of the problem, make a commitment to collaborate and determine the resources needed for the collaboration to proceed. In the second *direction-setting phase*, the collaborators set the agenda and identify the interests that brought them to the table, determine how they differ from the interests of others, explore pros and cons of various alternatives, set directions and establish shared goals, reaching an agreement on a course of action. In the third and final *implementation phase*, the collaborators establish structures for implementation, monitor the agreement and ensure compliance (Gray, 1989; London, 2012). The problem-setting and direction-setting phases of Gray (1989) correspond to the 'plan' stage of the action research framework of Figure 2. Gray's implementation phase corresponds to the 'act' and 'observe' stages of the action research framework.

Research on collaboration for education and research have covered issues related to incorporating multi-cultural factors such as local cultures, and socioeconomic and psychological issues into the designing and teaching of online courses across borders. Riding, Fowell, & Levy (1995) describe the nature and usage of action research in an on-going development and evaluation of a new undergraduate module to improve teaching and learning practice. Whatley & Bell (2003) discuss the outcomes of an online discussion and exchange of feedback between groups of students from different countries, different experiences and learning goals. Their study highlighted the potential complexity of such an asymmetric collaborative activity but indicates several advantages to students when such activity forms a part of the pedagogical framework of their modules. Thus, action research collaborative learning creates a more interdependent learning community arising from the extension of the individual learning communities and their learning resources (Whatley & Bell, 2003). Bowl, Cooke, & Hockings (2008) discuss the challenges of conducting action research in higher education within a multi-dimensional framework across boundaries and borders.

These challenges include different philosophies underlying academic engagement, institutional and sector diversity and different geographical locations. These touch upon the interactional, organizational and systemic factors affecting collaboration, as synthesized by Martin-Rodriguez *et al.* (2005) from prior research. Bowl, Cooke & Hockings (2008)' study concludes that it is useful for research teams to use the process of reflection-in-action to reflect on issues related to research methodology and differences of carrying out research in different institutional settings (Bowl, Cooke, & Hockings, 2008). Yasmeen (2008) also concludes that action research can be adopted at all educational levels to improve teaching and learning outcomes.

Thus, while there have been a large number of studies investigating the phenomenon of collaboration and its application in various contexts, there is not much work involving collaboration for action research by instructors/researchers based in remote locations, especially in the context of US and Singapore. There is no standard template for potential collaborators to follow should they want to initiate collaboration in a process where they want to get their students to collaborate in turn. Thus, a study is needed to investigate the enabling conditions and challenges, the stages involved, and the tools and technologies required in ensuring successful collaboration between remote instructors. This is especially pertinent keeping in mind cloud computing and audio conferencing technology solutions that are now available for use by instructors. The study will also compare the findings with the determinants and dimensions of collaboration identified in prior studies, and see if it applies to an educational context as well.

METHODOLOGY

To address the research questions for the study, the authors conducted the study based on the stages of the Action Research Framework depicted in Figure 1 above, which serves as the theoretical lens. The unit of analysis is the authors (researchers) themselves. As suggested by Riding, Fowell, & Levy (1995) and other past studies on action research, the study adopted a methodical, iterative approach embracing problem identification, action planning ('plan'), implementation ('act'), evaluation ('observe') and reflection ('reflect' or 'learn from evaluation'). Furthermore, this research had a number of features distinctive of action research, as listed by Zuber-Skerritt (1982). Table 1 lists the salient features of action research as it applies to this paper.

Keywords pertaining to action research (Zuber-Skerritt, 1982):	Description by Riding, Fowell & Levy (1995), para. 11	Application in this study
Critical	"practitioners not only look for ways to improve their practice within the various constraints of the situation in which they are working, but are also critical change agents of those constraints, and of themselves."	Both the co-authors embarked on the collaboration to add value to their teaching and to help their students learn to work virtually with people in different cultures – a key skill in today's workplace. The project was carried out within the confines and requirements of the courses they were already teaching. The first author actively discussed the project as part of a year-long faculty seminar.
Reflective	"participants analyse and develop concepts and theories about their experiences."	The research questions of this study, as well as the analysis and findings, address concepts and theories about the authors' experiences.
Accountable	action researchers "aim to make their learning process and its results public, both to each other and to other interested practitioners, using accessible terminology."	One of the purposes for this reflection and dissemination is to provide a template for other interested instructors to collaborate for action research involving their students.
Self-evaluative	"the reflective and analytical insights of the researcher-practitioners themselves form the basis of the developmental process."	The analysis and findings of this paper is based on self-reflection by the two authors.
Participative	"those involved contribute equally to the inquiry"	Both the authors were highly invested in the success of this project and have contributed equally to addressing the research questions of this study and to this paper.
Collaborative	"the researcher is not an expert doing research from an external perspective, but a partner working with and for those affected by the problem and the way in which it is tackled."	As opposed to studying other research participants, subjects or respondents, the authors (researcher-instructors) were studying themselves and their processes and deliverables in the course of carrying out this collaborative project.

Table 1. Salient features of action research as it applies to this paper

To capture the process of instructor collaboration, the authors relied on a few sources:

1) The string of emails that the authors had exchanged during the entire course of their collaboration. These emails served as an archive of all the exchange that took place in the process. The emails were analyzed by date, direction of exchange (from Singapore to the US or vice-versa), and the content of the exchange.
2) The Dropbox folders that served as a repository of all documents and deliverables produced at various stages of the collaboration. The timestamps associated with the files in Dropbox were analyzed with respect to the email exchange, to arrive at the trail of communication and the deliverables that resulted from that communication.

3) There was no direct data logged from the synchronous Skype calls, as the calls were not recorded. However, notes from the calls and summaries based on the discussion were part of files in Dropbox or exchanged in emails, which served to highlight the content of discussion in specific Skype calls. The dates and times for specific Skype calls were retrieved from the emails, as well as from the Google and Microsoft Outlook calendars used by the co-authors.
4) Finally, retrospective reflection of the collaborative process was employed by both the authors, and their notes compared. These reflections (as well as the outputs of the emails and the Dropbox files) were analyzed with respect to the respective stage of the theoretical framework (plan, act, observe or reflect) that they best fit into.

All these served as the data for the study. The findings were also analyzed using Anderson & Herr (1999)'s criteria for action research, to ensure that the study had been done rigorously and effectively.

CASE DESCRIPTION – WHAT WE COLLABORATED ON

In early 2012, the authors got in touch with each other over email to discuss the possibility of collaboration, and to get their respective students to engage with each other. The two authors were based more than 9000 miles from each other – in Temasek Polytechnic, Singapore and Simmons University (then College), Boston, USA, and had never met. They were teaching in two very different institutions, in separate educational disciplines, and to students who were vastly different in age and educational level. Was collaboration, then, even likely or feasible? They spent the next few months in interaction over email and audio conferencing (Skype) discussing how they might collaborate. Most of the initial interaction was asynchronous (over email). As the collaboration progressed, synchronous interaction between the authors was achieved using Skype.

After the initial rounds of discussion, the authors settled on the specific areas of collaboration in Fall 2012. Considering the differences between students and the constraints of time and distance, the authors decided that it might be best to get their respective students to evaluate and provide feedback on each other's assignments. They decided to explore how incorporating cross-country student interaction using Facebook into their respective courses impacts student learning and satisfaction. The Singapore-based author was teaching a cross-disciplinary course 'Effective Internet Research' to 10 classes with a total of 238 students. The course was offered by Temasek Polytechnic. The US-based author was teaching the 'Technology for Information Professionals' course to 2 classes with a total of 58 students. The course was offered at Simmons University (then College) to Masters-level students. The Singapore students had to work on an assignment whereby they had to work in teams to come up with Facebook advocacy pages on an assigned socially-relevant topic such as human trafficking, social justice, youth depression, mobile gaming, internet addiction, etc. Each team had to set up their Facebook page to publicize their group's research findings and to garner feedback from the online community.

One of the assignments the US students had to work on was creating a comprehensive personal website / web portfolio featuring personal and professional aspects of their lives. The US and Singapore students differed in a number of ways: 1) type of school (Polytechnic versus Graduate school); 2) discipline (cross-disciplinary versus Library and Information Science); 3) types of assignment; 4) age (the Singapore students were much younger); and 5) culture, and considering the geographical distance and the virtual nature of collaboration over Facebook.

Facebook was chosen as the platform for the students to collaborate (as the Singapore students already had an assignment that required use of Facebook). Since the Singapore students were going to be creating Facebook pages, a designated area could be created within those pages (named 'collaborative peer review', though, being from different institutions, they were technically not peers) whereby 1-2 US students were to collaborate with a team of 4-5 Singapore students. While the purpose of the collaboration was simple i.e. to evaluate and to provide feedback on each other's assignments, students were encouraged to get to know one another. The students were provided with a set of criteria based on which to evaluate each other's respective assignments. For the Singapore students, the graded Facebook activity constituted 10% of their continual assessment component. For the US students, the Singapore collaboration was 5% of their grade for the web portfolio assignment. The duration of the collaboration between the students was 1-2 weeks.

The objective was to gather insights into the challenges, effectiveness and student perceptions of such a collaboration, and also to prepare students for working with people separated by geography – an increasing reality in workplaces. The study was designed and approved by the Institutional Review Board / Ethics Committee of the respective schools.

Along with face-to-face briefing, both sets of students were given detailed written instructions about their assignments, as well as the collaboration with their virtual collaborators. During the collaboration week(s), the US students (a single or at most two students) assigned to each team of Singapore students posted a self-introductory note about themselves, together with the link to their personal website which they had created as part of their course deliverable and an invitation for the Singapore students to review their websites. The Singapore students visited their collaborators' websites and provide constructive comments and critique. The USA students provided their feedback and critique about their Singapore collaborators' Facebook pages.

DATA ANALYSIS

It is difficult to make a clear distinction between data gathering and data analysis in qualitative research (Agarwal, Poo, and Tan, 2007). Thus, both data gathering and analysis go hand-in-hand. The theoretical framework used for the analysis is based on Riding, Fowell, & Levy (1995) and Yasmeen (2002). See Figure 1. The data in question here is the reflection of the authors on their collaboration for this project, as well as an analysis of their interaction, documents generated and tools/technologies

used. The tools/technologies used to support the collaboration included an online voice and chat software application (Skype), a cloud sharing application (Dropbox) and basic email applications (Microsoft Outlook and Gmail).

Table 2 below summarizes the email interaction between the researchers in each phase of the action research framework. Only emails exchanged in the first seven months of the collaboration (when the majority of the work was carried out) have been analyzed. The details of the contents of each email were analyzed but not presented due to organizational sensitivities associated with emails.

	Months	No. of emails exchanged	Content
Plan	Jun 2012	SG → US: 5 US → SG: 8	▪ Outreach for possible collaboration; expression of interest to collaborate
	Jul 2012	SG → US: 2 US → SG: 3	▪ discussion to firm up the collaborative project proposal; initial submission to institutional review board in the US
	Aug 2012	SG → US: 10 US → SG: 8	▪ planning of the student's collaboration e.g. scheduling of dates ▪ finalizing of syllabus and teaching plans ▪ discussion on the appropriate social media tools for students to use to evaluate and provide feedback on each other's course assignments e.g. Wiki, Twitter, Facebook ▪ discussion on communication tools for authors (researchers) to use to discuss on details of the collaboration ▪ setting up and exchanging of Skype and Dropbox accounts ▪ scheduled first Skype conference call Friday 31 Aug 2012 at 10pm Singapore time and 9am US Eastern time.
	Sep 2012	SG → US: 12 US → SG: 13	▪ assignment evaluation/feedback idea for student collaboration ▪ Drafts of assignments for US and Singapore students ▪ references for main study ▪ questionnaire for main study ▪ appointment for Skype conference calls (Friday Sep 14 and Sep 21 at 10pm Singapore Time; 9am US Time)
Act	Oct 2012	SG → US: 4 US → SG: 5	▪ Project briefs / assignment sheets finalized for both US and Singapore students and distributed to students ▪ Incorporation of evaluation criteria for websites developed by US students and Facebook pages by Singapore students ▪ Singapore researcher set up a test page on Facebook site for the US researcher's comments and feedback ▪ Agreement to submit research paper to an overseas conference
Observe	Nov 2012	SG → US: 8 US → SG: 4	▪ Set up Skype conference calls on Friday November 2 and Saturday November 10 at 10pm Singapore time and 9am USA time ▪ Singapore students' research groupings uploaded via Dropbox ▪ Preparing the IRB and ethics committee documents for both schools ▪ Designing the main study questionnaire ▪ Week(s) for collaboration between US and Singapore students ▪ Authors addressed issues relating to specific students including missing website links, inadequate Facebook resources, missed allocation of partners, dislocation of Facebook posts
Reflect	Dec 2012	SG → US: 14 US → SG: 14	▪ Final editing and confirmation of the IRB and ethics documents ▪ Approval of IRB documents ▪ 1st batch of main survey data completed by US students who have just ended their course ▪ Reorganization of Dropbox folders ▪ Appointment for a Skype conference call on 7 Dec 2012 to discuss on finalizing the overseas conference paper
Cycle 2			▪ Working on data analysis and finalizing journal articles; Implementing Cycle 2 during the next phase of the collaboration in the Oct 2013 semester by incorporating the observation and reflection phase of Cycle 1

Table 2. The email interaction in each phase of the Action Research Framework

Table 3 below shows the synchronous Skype meetings needs and deliverables produced in the shared Dropbox folder.

	Month (2012)	Skype calls (date, time)	Duration	Content of Discussion / Deliverable in Dropbox folder
Plan	Jul			Setting up of Dropbox and Skype connections *Dropbox*: Initial IRB submission to US school
	Aug	Friday Aug 31 (10pm SG, 9am US time)	1 hour	Nature of collaboration, subjects for collaboration, instruction sheets
	Sep	Friday Sep 14 (10pm SG, 9am US time)	1.5 hours	Details of collaboration, teaching plan schedules, technology tools to use, student groupings *Dropbox*: Subject syllabi, teaching plans, research topics

		Friday Sep 21 (10pm SG, 9am US time)	1.5 hours	Discussion of paper for journal *Dropbox*: draft versions of assignment briefs, questionnaire design
Act	Oct	No Skype call		*Dropbox*: final versions of assignment briefs, IRB documents; students' groupings by names and classes
Observe	Nov	Friday November 2 (10pm SG, 9am US time)	2 hours	IRB ethics documents; setting up of students' collaboration sections via Facebook; presentation at conference
		Saturday Nov 10 (10pm SG, 9am US time)	2 hours	Questionnaire for main study to be submitted to IRB *Dropbox*: reference research papers
Reflect	Dec	Saturday Dec 1 (11pm SG, 10am US time)	2 hours	Drafting of the conference paper *Dropbox*: reference research papers for conference paper
		Tuesday Dec 11 (11.30pm SG, 10:30am US time)	2.5 hours	Reorganization of the conference paper *Dropbox*: drafts of the conference paper, final version of the IRB documents
Cycle 2				Implement Cycle 2 during the next phase of the collaboration in the Oct 2013 semester by incorporating the observation and reflection phase of Cycle 1

Table 3. Skype calls and deliverables in Dropbox for each phase of the Action Research Framework

After looking at the raw data of the paper, let us briefly summarize the author experiences in the collaborative process. Table 4 below details the authors' experiences when conducting action research for this collaboration, using the Action Research Framework adapted from Riding, Fowell, & Levy (1995) and Yasmeen (2002).

Plan	Planned a collaborative strategy and devised resources and processes to support it. The authors did three months of advanced planning starting July 2012 for the implementation of the collaboration in October 2012. This phase involved careful planning of their respective subject teaching plans to schedule the actual dates for the collaborative feedback process to take place virtually via Facebook during the weeks of November 12–15 and November 26-30 in 2012, developing the research themes, and setting up and testing the Facebook site for the subject.
Act	Put the planned collaborative strategy into practice by incorporating it into the delivery of subjects Effective Internet Research (for Singapore students) and Technology for Information Professionals (for USA students). All interaction by the instructors with their respective set of students with regard to the collaborative project was discussed with each other, and any changes decided upon. This interaction with students included a briefing about the social-cultural backgrounds of the remote students, urging them to exchange greetings and self-introductory posts on Facebook, and helping manage student expectations on both sides. The authors allocated time slots (mainly on Fridays – 10 pm Singapore time and 9 am USA Eastern time) for online voice chat over Skype, communicated regularly via email and updated resources via Dropbox. The authors developed the research survey questionnaire, collected data, analyzed the data, wrote a research paper for a conference based on a qualitative analysis of student expectations data. They also began work on journal articles.
Observe	Made observations on the practice and evaluated its effects. The authors, who are also researchers and instructors, adopted an evaluation and self-assessment strategy. This included regular updating of resources via Dropbox, weekly discussions via Skype and email to address issues arising from classroom observations, close monitoring of students' performance, answering their questions, conducting on-going student feedback sessions and briefings. During this phase, most of the exchange was based on what was working, and what not working with their respective students. A great degree of coordination was required by the instructors, so that they could ensure a good overall experience and learning for their students. The advantage was that, by this time, the authors had developed a good rapport and an understanding, which made the process easier.
Reflect	Reflected upon the results of the evaluation, modifying actual practice for next revised implementation of the next cycle of the collaborative student feedback. Despite the complex nature of the collaborative activity, students provided positive feedback about their experience including learning from one another's culture and being motivated to collaborate in the future. This positive feedback from students affected the judgment of the authors regarding the success of their own collaboration as well. The huge amount of data gathered required additional time to be factored in. The work in the collaborative project had to be balanced with the other individual activities and responsibilities of the coauthors. Based on the observations and reflections, the researchers would modify the actual practice of conducting the next round of collaborative feedback research project in Cycle 2.
Cycle 2	The same cycle of Plan, Act, Observe and Reflect was repeated in Cycle 2 during the next run of the subjects in Oct 2013, when a new set of collaboration was conducted between new batches of students of the two schools. This time, the authors decided to make the student collaboration synchronous – where the US students taking a different course presented their research to their Singapore counterparts on Skype, and later provided feedback asynchronously on the virtual recorded presentations by the US students. Thus, the success of one round of collaboration triggered further collaboration, and is likely to continue.

Table 4. The process followed in each phase of the Action Research Framework

Anderson and Herr (1999) developed 5 criteria to ensure that action research has been done rigorously and effectively:

1. *Outcome validity* – the extent to which actions occur which lead to a resolution of the problem that lead to the study. The authors came together to find ways to get their students to collaborate with each other. This was successful, as evidenced by a sample of two students' reflections/expectations: "*This collaboration opened my eyes to what other student elsewhere had chances to. It showed me their capabilities and their imaginative power, her web page was undoubtedly well done, in my opinion*". – a Singapore student. Another Singapore student wrote, "*Before I started on this USA collaboration, I honestly did not know what to expect. I've never communicated with people overseas, so I was actually quite fearful but also excited upon this USA collaboration. I was afraid I would not be able to communicate well with our USA counterparts. But in the end when I did the peer collaboration review on their website, I felt that it wasn't actually that tough to get through to them. They showed serious effort in their work and that made me want to work just as hard as well! Overall I find that this collaboration is going on smoothly and so far so good!*"

2. *Process validity* – the extent to which problems are framed and solved in a manner that permits ongoing learning of the individual or system. The findings of the study were a result of a series of reflective cycles that included reevaluating the problem and the research questions at various stages as the researches finalized the area of study, and the details of the assignment and collaboration instructions to be given out to students. The assignments sheets and criteria developed for the student evaluation, as well as the documents created in the shared Dropbox folder, and the series of emails exchanged, all formed the evidence to support the validity of the process.

3. *Democratic validity* – the extent to which research is done in collaboration with all parties who have a stake in the problem under investigation. As the authors designed the study and the nature of their collaboration, issues of ethics and social justice were paramount on their mind. The study was approved by the institutional review board / ethics committees of both institutions. Informed consent forms were designed and approved that required seeking consent from students to use their data for research and publication purposes. Even though the collaboration itself was a graded part of the course, students were free to allow use of their data or not. Also, the collaboration designed was aimed at helping the students learn about a different culture and discipline.

4. *Catalytic validity* – the extent to which the research process reorients, focuses and energizes participants toward knowing reality in order to transform it. The Singapore students were insecure about their language proficiencies, while the US students feared that they may not be as technology-savvy as their Singapore counterparts. The students confirmed through the reflections that the collaboration helped break stereotypes they had about their prospective collaborators, as well as about themselves. The authors of the study themselves grew in the process of this collaboration. The primary learning was three fold: 1) the collaboration confirmed for them that it was possible to do classroom research successfully and ethically; 2) that collaboration enriches the experience for themselves and their students; 3) that collaboration was an important determinant of research productivity.

5. *Dialogic validity* – to ensure that the research has passed through the process of peer review. This research passed through multiple rounds of review. It was part of, and evaluated by the Center for Excellence in Teaching at Simmons University (then College), anonymous reviewers, and a research assistant. Thus, it underwent multiple rounds or reviews and revisions, and was strengthened in the process.

FINDINGS AND DISCUSSION

Using the Action Research Framework provided an important lens to make sense of the entire collaboration process.

The first stage of planning was perhaps the most important to ensure that the collaboration was successful. The main focus of the action *planning* stage was deciding to collaborate and narrowing down towards the focus of collaboration. These are the set of key findings from the planning stage: 1) A person looking for possible collaboration needs to be proactive; 2) Requests for collaboration need to be timed well; 3) Shared context and shared interests help bring collaborators together; 4) Silence does not mean loss of interest. It might mean lack of clarity on details or how to proceed, or that the possible collaborator is busy. Follow up after a few days if you do not hear back; 5) A face-to-face meeting or some form of synchronous interaction (either on phone, Skype or other software) is necessary to work out complex details; 6) When setting up virtual meetings, be mindful of availability and time difference; 7) Schedule 1 hour or more for the first face-to-face or online synchronous meeting

The second phase in the action research framework suggested by Riding, Fowell and Levy (1995) is that of implementation or *acting* upon the planning done. Summarized below are the key lessons learned in the first two phases and the specific phases they apply to.

1. *The role of motivation* (plan, act): Motivation was extremely important to make this collaboration a success. Both the collaborators were motivated to proceed with this collaboration because of the possibility of publishing the results of the research study findings in an external journal publication and presenting at a conference. This would contribute directly towards the professional development of both researchers who are also collaborators and lecturers of the subjects being studied. Publishing was important for tenure and promotion considerations of both researchers, thus providing a strong motivation to collaborate.

2. *Initial expectations in terms of pedagogy and learning outcomes* (Bowl, Cooke, & Hockings, 2008) (plan): At the professional level, the authors expected to share with other fellow educators, their knowledge, experience and

practice of incorporating blended e-learning approaches into their courses. In terms of student development, the authors' expectations included providing students with a more flexible, stimulating and independent learning environment to increase the level of interactivity in teaching and to enhance student learning; teaching students practical and real-life skills of providing effective and constructive feedback/comments on each other's work; and teaching students to appreciate learning, networking and communicating with other students across different cultures, countries and even age groups. The level of student engagement (asynchronous, limited to student feedback on assignments) was customized to suit the students' different educational, cultural backgrounds and geographical locations (Bowl, Cooke, & Hockings, 2008).

3. *Initial views of research questions / goals of the action research* (plan): The questionnaire for the students were very detailed and attempted to seek answers to achieve goals for the research. It was necessary to invest time and effort to craft good research questions to facilitate data analysis. This will, in turn, translate into meaningful research outcomes and contribute to current literature on the topic. It is also important for researchers to use survey questions that have been tested in past studies and to self-develop when questions are not found for certain constructs and variables.

4. *Careful planning* (plan): The researchers learnt that good planning and careful time management was necessary to match the timing of the Singapore school's start of the October 2012 semester with the September start of the Fall semester in the US school. The collaboration was successful mainly because the researchers had designed a detailed research project brief and assignment instructions which provided clear guidance before, during and after the research project process. The process of action research also helped in this endeavor.

5. *Overcoming time constraints* (plan, act): The collaborators invested a lot of time and effort into the collaborative project. This becomes necessary in order to carefully carry out the stages of the research i.e. planning, action, observation and reflection leading to further cycles of research and development. Despite facing the challenges to complete the collaboration within the time constraints of the semester deadlines, the collaborators managed to overcome this by implementing effective time management techniques including advanced planning to ensure the success of the collaboration.
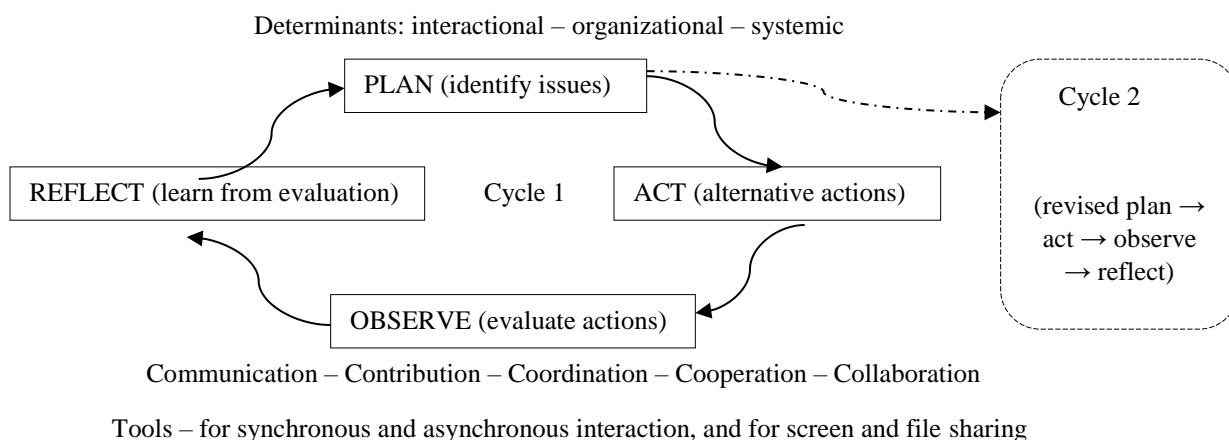
The *plan* and *act* stages of the action research framework were followed by evaluation ('*observe*' in Figure 1) and reflection ('*reflect*' or 'learn from evaluation' in Figure 1) (Riding, Fowell, & Levy, 1995). Summarized below are the key lessons from these other phases.

1. *Synchronous interaction / Use of appropriate technology tools* (Dawson, 2012) (act, observe): The collaborators learnt that good use of technology for asynchronous interaction, memory and future recall (email), synchronous interaction and building of a shared context (face-to-face meeting or Skype) and cloud-based, seamless document sharing (Dropbox) helps to facilitate effective communication. Use of these tools provided a conducive environment for the authors to discuss and solve pertaining issues and challenges faced. The collaborators also learnt about the importance of using the appropriate technology to support interaction between students. Facebook discussion was chosen as it is user-friendly and widely used amongst students in both US and Singapore even though they are from different cultures and age groups (Dawson, 2012).

2. *Managing student expectations and experiences* (plan, act, observe): The collaborator from US had to manage the expectations of much older Masters-level students (58 students in 2 sections) sharing their web portfolios and interacting with teenage students from another culture and country. The collaborator from Singapore was faced with the challenge to manage and coordinate collaboration involving 238 students in 10 classes from various course disciplines across different schools in the Singapore institution. Coordination was also required with a co-tutor who handled 3 of the 10 classes. This challenge was overcome by following these steps: i) dividing students in each of the 10 classes into smaller groups of 4-5 students and assigning each group with a research topic (1 or 2 US students were assigned to each group); ii) assigning a group leader for each research group to help coordinate work that needed to be done at the group level; iii) briefing at the start of the research project; close monitoring, observation and feedback during the process and de-briefing, feedback and affirmation at the end of the process (this was done for the US students as well); iv) using a learning management system and social media (Twitter and Facebook) to communicate with students and address their concerns and queries (the US students used a separate learning management system, though the interaction with Singapore students was on Facebook); v) using face-to-face discussions and briefing sessions to address student expectations and to address their concerns (done for both Singapore and US students).

3. *Ensuring rigor / time-consuming steps* (act, observe, reflect): The collaborators reflected on the amount of time that each step took – from figuring out what to collaborate on, to finalizing the research questions, coming up with a research model and hypotheses, deciding on what data to gather (both quantitative and qualitative), doing a thorough literature review and coming up with survey questions, finalizing dates for collaboration and instructions for students, preparing IRB documents, analyzing the data gathered and working on research articles for conferences and journals – and this, apart from everything else that each collaborator might be doing during that period. Both the authors are satisfied that they were able to ensure research rigor during the entire process. Despite the time spent in each step, the collaborators have benefited in terms of professional and personal growth and development, as well as incorporating the research into their teaching.

Thus, this study identified the following pre-conditions for a successful collaboration – the timing of collaboration, a shared interest in the collaboration, and a high degree of motivation in the study. This is in line with the "commitment to mutual relationships and goals" identified by Mattessich, Murray-Close, & Monsey (2001, p.4) and the interactional determinants (willingness to collaborate, trust, communication and mutual respect) identified by Martin-Rodriguez, Beaulieu, D'Amour, & Ferrada-Videla (2005). The organizational determinants (Martin-Rodriguez et al., 2005) of both the co-authors were also supportive of collaboration, and one were the tenure and promotion process did not view collaboration negatively. Finally, the systemic determinants (Martin-Rodriguez et al., 2005) of the socio-cultural, professional and educational systems of the two co-authors were also supportive of collaboration. The first author, while based in the United States, had spent many years in Singapore. This helped provide a common grounding of the socio-cultural understanding of Singapore and its students and educational environment, which helped in the collaboration. This was in line with the homophily factor identified by Dahlendar & McFarland (2013), who found that people tend to select collaborations with others similar to themselves.

The collaboration involved all the 5 Cs identified by Taylor-Powell, Rossing, & Geran (1998) and Shah (2012). Communication was facilitated by email and Skype calls. Contribution was mutual and led to deliverables in the shared Dropbox folder. Coordination was necessary to liaise with the respective students, and to ensure common timings for the two sets of students to collaborate. Cooperation and collaboration was at the heart of all work carried out in the study.

In carrying out the collaboration, a few factors were salient. These included developing a shared context, setting up synchronous calls, noting time differences and overcoming time constraints. The plan stage of the study corresponded to Gray (1989)'s problem-setting and direction-setting phases. The act and reflect stages of the study corresponded to Gray (1989)'s implementation phase of collaboration.

Determinants: interactional – organizational – systemic

Communication – Contribution – Coordination – Cooperation – Collaboration

Tools – for synchronous and asynchronous interaction, and for screen and file sharing

Figure 3. Action research framework for instructor collaboration

Figure 3 above shows the framework for action research for instructor collaboration. It combines the action research framework (adapted from Riding, Fowell, & Levy, 1995; Yasmeen, 2002) with the determinants for successful collaboration (interactional, organizational and systemic – identified by Martin-Rodriguez, Beaulieu, D'Amour, & Ferrada-Videla, 2005), the 5 Cs model (Taylor-Powell, Rossing, & Geran, 1998; Shah, 2012) and the technology tools necessary for successful collaboration. The framework should help other instructor-researchers seeking to initiate and carry out collaborations with each other.

CONCLUSIONS AND IMPLICATIONS

In this paper, we have mapped the findings based on our collaboration with the action research framework adapted from Riding, Fowell, & Levy (1995) and Yasmeen (2002), as well as other collaborative frameworks. The findings have included the triumphs and challenges, technologies to be used, type and frequency of collaboration that led to a successful outcome for collaborators and effective learning and satisfaction for students. Good use of relevant tools and technology helped in motivating and supporting both the students and the authors to ensure successful collaboration. The main contribution is the action research framework for instructor collaboration. The findings and the framework should be useful both for instructors seeking to collaborate for research and to facilitate collaboration between their students, as well as practitioners of action research. The paper should also help further research on collaboration and collaborative information behavior.

The study has a few limitations: First, it is limited by a specific task – initiating collaboration between respective sets of students. Different tasks might call for different collaborative experiences. Second, the collaboration was specific to instructors based in two countries. The unique contexts of these countries had an effect on the collaboration and its outcomes. Different countries would require different levels of cultural and organizational sensitivities with regard to collaboration. Finally, the personalities and the prior experiences of the co-authors made the collaboration unique. Different people with different personalities and experiences might take to collaboration differently. These factors limit the generalizability of the findings. Future work will involve reporting on the student collaboration and on the outcomes of subsequent cycles of collaboration.

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