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Getting to Global Yes! Designing a Distributed Student Collaboration

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GETTING TO GLOBAL YES!
Designing a Distributed Student Collaboration

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Abstract: The authors have taught a course called 'Global Project Management' for four years, engaging students in three international locations in hands-on distance projects. The distance projects are intended to provide students with enriching, realistic global project experience. With experience, improved planning and better coordination, each iteration of the distance projects has improved. In this paper, the authors present lessons learned and a mind map demonstrating key aspects of design of global hands-on projects.

1 INTRODUCTION

Working with distant colleagues on global projects adds complexity, especially when they may be culturally diverse, subject to varying technology constraints, and demonstrating various work styles and skills. Universities increasingly recognize the importance of training a global work force. Students in many university disciplines can benefit from exposure to the cross-cultural, communications, collaborative technologies and project management considerations of a global project.

However, facilitating such learning in a global project is neither a trivial nor easy venture for collaborating instructors, who themselves are not co-located. Having taught a course called 'Global Project Management' for four years across three universities – in the United States, Singapore and Qatar – the authors, have gained valuable experience in designing realistic and interesting collaborative projects for students.

In this paper, we discuss lessons learned and propose a mind map to represent key elements to consider in design of collaborative, distance projects in an academic setting.

2 SURVEY OF COLLABORATIVE GLOBAL STUDENT PROJECTS

Over the past decade, an increasing number of academic 'global experience' courses have been offered in the broad areas of information systems, information technology and computer science. Published articles on these courses indicate a variety of learning outcomes, design of projects and operational details. Two emerging types of contributions are particularly notable:

- Experiential papers that describe various projects, their execution and lessons learned.
-Conceptual papers that use distance project experiences to derive frameworks, attributes or factors influencing outcomes.

2.1 Experiential Papers

(Volkema and Rivers 2008) describe an e-mail based negotiation between graduate students located in the USA (25 students) and Australia (18 students). The authors emphasize the articulation of expected and required tasks, availability of contact details ahead of the assignment, planning the schedule and length of the experience, designing appropriate incentives and a follow-up debriefing.

(Chidanandan et al. 2010) describe a global project course between undergraduates in USA and in Turkey. The authors describe the course learning outcomes, collaboration tools, client set up and the structure of the project. Upon completion, focus groups were assessed the global experience.

(Damian, Hadwin and Al-Ani 2006) report an experience between three universities, in Canada (12 graduate students), Italy (10 graduate students) and Australia (8 undergraduate, 2 graduate students). The authors describe the design, learning outcomes, engagement with real-world project clients, assessment and evaluation of the course.

(Purvis, Purvis and Cranefield 2004) describe a substantial software development project experience between a German university (29 students) and a New Zealand university (5 students). The authors describe the project's goal and structure, students' roles, matching of skills, and note the importance of sharing common course material and setting up a suitable collaborative work environment.

(Gan, Limam Mansar and Weinberg 2010) describe early experience in teaching a global project management course.

2.2 Conceptual papers

(Swigger et. al. 2009) explore factors that affect software development student team performance. The authors observed global projects between the USA and UK and between the USA, Turkey and Panama. In both instances, ten teams of three students each were formed mixing a total of 150 undergraduate and graduate students. The authors demonstrate that differences in culture and attitudes about groups, prior individual experiences and grade point averages impact team performance.

(Quinones el at. 2009) analyze teams' mental models of work process in global collaborative contexts - how tasks should be assigned, how often and by what modality communication should occur, how much effort each member should put forth, and what constitutes team success. Civil engineering students enrolled in construction management courses in the USA (9 students) paired with students in Israel (2), Brazil (3) and Turkey (2). Professors in remote locations acted as project clients.

(Ocker and Rosson 2009) explain the importance of training students participating in partially distributed teams to anticipate the issues with team identification, trust, awareness, coordination, competence, and conflict.

3 'GLOBAL PROJECT MANAGEMENT' COURSE

Research and experience demonstrate challenges for successful global team projects within an academic course. Some obvious questions: How diverse are students culturally and in academic preparation? What will be the impact of differences in calendars and time zones? What are contractual/legal constraints for the project? What are the criteria for assessment? Are the deliverables meeting expectations explicitly?

At collaborating universities in the United States, Singapore and Qatar, Information Systems faculty taught co-incident undergraduate courses called 'Global Project Management' for four years. To put theory into practice, students have been assigned to work in small distributed teams (4 to 5 students drawn across locations) on a four to five week collaborative project. Enrollments in the course have ranged from 22 (involving USA and Singapore) to 63 (involving all three locations). No particular prerequisite in systems development or project management was assumed for participating students.

During the first course offering, student teams were assigned to work with external stakeholders to prepare project plans for a proposed joint venture with one of the partner universities. It became apparent that course logistics, communications, tight time boxing and managing stakeholder dependencies substantially reduced the possibility for a satisfying project experience for the students.

In subsequent years, assigning teams to study cases in global business ethics, online social networking, and cross-cultural communications reduced external dependencies. Ultimately, after having experimented with a variety of project parameters (complexity, ambiguity of expectations, open-endedness, length of project, involvement of external stakeholders), we settled on a negotiation exercise as an, effectively bounded, intellectually

interesting, relevant and appealing team project. (Upton and Staats 2008a) (Upton and Staats 2008b).

3.1 Preparation for Collaborative Project

Students enrolled in the course have had little or no experience in global collaboration. For these students, appropriate preparation for project work along with controlled project scope and manageable risks have been essential. We have thus designed the collaborative experience to begin well before the students are introduced to their project assignment or to their distant teammates. Common readings, icebreaker exercises, preparatory background readings, sample cases and local practice in negotiations and cultural awareness lessons have been coordinated across the three locations.

We quickly learned that contradictory (and not necessarily compatible) assessment criteria and grading weights resulted in an uneven level of student commitment and imbalanced expectations among distant teammates. We addressed this through development of common grading rubrics and like weighting of expected commitment. While instructors in each location have been responsible for assigning grades and providing clear feedback to students, the instructors discussed and reconciled all team grades to avoid deviations within the same team.

3.2 Instructional Design

Design and execution of a global team-based, student project can be described through a basic triple: a *learning objective-activity-assessment* model, as consistent with (Ambrose et al. 2010),

1. *Learning Objective*: To learn the basic skills and concepts of effective negotiation.

Activity: An in-class negotiating skills exercise prepared the students for the negotiation project (PWHC negotiation exercise 2010).

Assessment: Students prepared a negotiation position based on an existing case study (with partial information); negotiated with distant partners and wrote reports detailing the outcomes and describing the process; and submitted a statement of individual reflection. The instructors jointly marked the reports and reflections based on a common grading rubric.

2. *Learning Objective*: To appreciate the importance of culture in a global team.

Activity: Students read and discussed articles and case studies on cross cultural intelligence before the negotiation project, students completed an icebreaker exercise to meet global team members and submitted a brief statement of reflection.

Assessment (Instructors): Credit was awarded for participation and performing the icebreaker exercise; the statement of reflection was graded and obvious problems, communications issues, student absences, and the like were noted.

3. *Learning Objective*: To experience the practical issues when working in a global team.

Activity: Students viewed and discussed various videos/papers involving tactical issues in global team collaboration.

Assessment: Students were asked to meet global milestones and to submit a final collaborative reflection on the negotiation and the process. The instructors marked the report on the quality of the reflection and insights into lessons learned and team's management of process, schedules, tools, absentees and 'problem' people.

4 GLOBAL PROJECT DESIGN MIND MAP

Based on our experience designing and teaching global projects, we propose a mind map to reflect key elements in project design. It includes the three essential nodes *'Learning outcomes', 'Instructional activities' and 'Assessment',* plus a fourth node *'Evaluation / Reflection'* to represent the additional instructors' debriefing and reflection that takes place away from students.

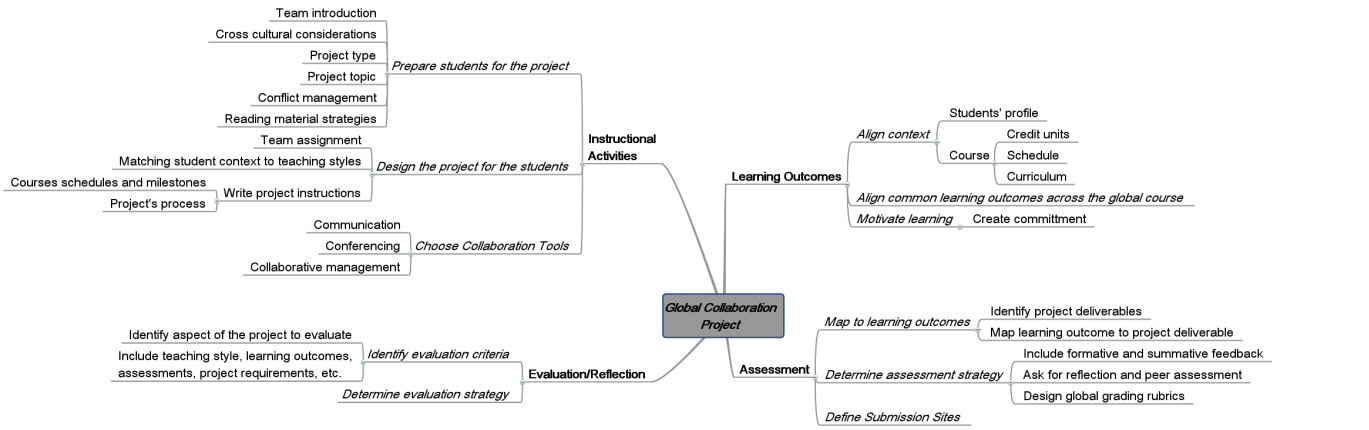

Figure 1: Global Project Design Mind Map.

4.1 Learning outcomes.

Common Learning outcomes (compatible across locations), take into consideration the *context* of the course as offered at participating universities, which includes students' experience, prerequisites and preparation, similar positioning of the course in the overall curriculum and its relative weight in terms of credit units, anticipated workload and convenience for basic logistics.

In our experience, students' *motivation* across the institutions generally varies in proportion to the effort and commitment each student expects to put forth in relation to the perceived value of the project, the grade and the overall course.

4.2 Instructional activities.

Preparing students for their global projects accounts for a large part of the outcome and the quality of the experience. Effective team introductions, cross cultural awareness, and domain specific background (negotiation readings and practice sessions) are important. Common background readings and classroom activities across locations help set common expectations and a common base of knowledge.

Designing the project to anticipate problems is important. Things can, and do, go wrong - students go missing, lose momentum or procrastinate, misunderstand requirements, and misplace shared documents in progress. Explicit and clear project instructions assessment criteria and notices of individual accountability are important. Reducing conflicting advice and instructions from the instructor team reduces potential misunderstandings. Small details matter including when, where and how requirements for submitting team and individual deliverables

Finally, working with distant partners requires a careful choice of useful *collaborative tools*,plus appropriate demonstrations and training, if needed.

4.3 Assessment.

An *assessment strategy* must be defined. We have found in-class debriefing sessions useful to identify and discuss common misunderstandings and common issues. We assess team deliverables with a common rubric and use individual statements of reflection and peer assessment surveys to gauge team members' relative contributions..

4.4 Evaluation/Reflection.

Mistakes, misunderstandings, contradictory and unclear communications among instructors and with students complicate course flow. It is thus important for instructors to evaluate the effectiveness of the course, projects, student interactions, results and methods. The evaluation of such an experience requires a prior discussion of what should be evaluated (*evaluation criteria*) and how it should be conducted (*evaluation strategies*). With an eye toward improvement in the future, attention to increased efficiency, tightened coordination, better assessment and reduction of anticipated pitfalls is important.

5 STUDENT SURVEY AND REFLECTIONS

In 2010, students were surveyed before and after the negotiation project. Students were undergraduates in their second to fourth year of study. 87% of the students were majoring in Information Systems. Other students were enrolled in a business, humanities or social sciences major.

Both surveys included questions about the experience, including quantitative questions (for example, "Rank the skills needed for a successful global project.") and qualitative questions (in the

pre-survey: "What skills do you think you can bring to the global negotiation project?" "What is motivating you to take this course?"; in the post-survey "What was the most rewarding aspect of the global project?" "What do you think you did well on your team or on your project", "What would you do differently next time?", "What did your distant counterparts do well?"). These questions are variations on the survey questions described in (Topi et al. 2010) and (Volkema and Rivers 2008) and the skill set listed in (Govindarajan and Gupta 2001) and (Gotel, Kulkarni and Phal 2009).

Students indicated that teamwork skills, project management skills and cultural intelligence were expected to be the most important skills for a successful global negotiation project. Despite variations in majors and backgrounds, we note that all three cohorts agreed on the same three skills (1 = highest rank; 8 = lowest rank). See Table 2.

Table 2: Essential Skills for Global Project Management Experience (pre-survey).

Skill Factors	U.S.	Singapore	Middle East	All
	Rank	Rank	Rank	Rank
Cultural Intelligence	3	3	3	3
Teamwork Skill	1	1	2	1
Project Management Skills	2	2	1	2
Mastery of English	5	6	7	7
Domain Skill	7	7	5	6
Global Project Experience	5	4	6	5
Collaboration Tools	4	4	3	4
Other	8	8	8	8

Surveys indicated that students were intrinsically motivated to enroll in the global project management course (as opposed to fulfilling distribution requirement or upon recommendations of friends) and that was consistent across the three locations. This was a useful predictor for the success of the experience as research shows that intrinsic value is a better motivator than the expectation of some reward or grade (Ambrose et al. 2010)

5.1 Students' reflections

tudents related a general feeling that the experience was rewarding and that the course was, despite the challenges, useful and interesting.

In their written reflections, students commented on their preparation for the project. We noted that students seemed to find more challenges in the planning of the experience (planning meetings, paying attention to time zones, motivation) and fewer challenges in classic project management issues such as the collaboration, planning and delivery of work products, and the differences in work ethics. This is a different result from the survey of senior managers in (Govindarajan and Gupta 2001).

While students generally appreciated the ice breaker negotiation exercise ("I believe getting a chance to know all teammates through the Ice Breaker case is a very important first step, which helped us a lot"), some indicated they would have preferred an ice breaker that would help them to know each other more ("I think a more personal ice breaker would be cool - like learning about team member interests").

Although all three sites shared common material and online references, these were not made available on one common course content management platform. As one student commented, "having a common communication media i.e. wiki or vista for all three schools" would enhance the experience and reinforce consistent global expectations.

Students noted that understanding partners' culture impacts the team's collaboration ("...I've also had personal Skype conversations with our Singaporean counterparts, and they are very fun and hardworking people. I think what will stick with me from this global encounter is their work ethic, which is extremely amazing. "; "Through the ice-breaker exercise I discovered certain traits, such as openness in expressing themselves in a conversations: joking about almost everything, it was decided that we might have more success if we remain slightly informal in our discussion…")

Students ranked collaborative tools expected and used. Students *expected* to use primarily Skype, videoconferencing and email. They actually made little use of videoconferencing, replacing it by instant messaging. Students noted the usefulness of a collaborative writing tool such as Google Docs. Other collaboration tools used include discussion boards, online file sharing, and wikis.

Students also realized the value of meeting structure and some facilitation ("Sometimes during the negotiation, we can encounter a standstill where everyone keeps silent and not knowing what to comment on"; "We adopted a role-based style during the negotiation process, I was in charge of carrying out the conversation with the other party, my teammate would input the main details into Google docs"; "The problem we faced is the lack of ability to ensure all members are focusing and actively participating in the conference").

Overall, students reported a high level of satisfaction with the project ("This experience of

working with students in SE Asia was the best thing I had ever done in my life. I learned a lot about the global team project and how to manage working with people from different parts of the world. I really hope to have such an experience in the following years. Moreover, I'm hoping to keep in touch with my team…"; "Being able to actually work with students on the other side of the globe and coming to agreements was very rewarding"; "This course gave me a chance to experience collaborating with a person who I might never meet with. This literally made me feel the effect of globalization…").

6 CONCLUSIONS

The authors recommend paying attention to three main instructional challenges: 1) the time effort needed to coordinate and teach a global project is substantially more than for a local project. Coordinating calendars, assignments, readings, due dates, team rosters; grading student work in a timely and consistent way; providing IT support for video calls and software tools complicates all aspects of course preparation and delivery. Intervening when students find their distance relationships not working increases complexity. 2) Motivating students to keep up the global communication through a fast moving project schedule is a real challenge. Procrastination and uncoordinated work add to pressure to meet hard deadlines. Intermediate project deliverables to demonstrate progress on the project can alleviate; 3) Managing student problems, such as "global free riders" are exacerbated. Distribution of work and responsibility within each team should be carefully watched.

In the future, the authors will continue to explore how different choices for project design would influence the global team experience and success.

REFERENCES

Ambrose, S., Bridges, M., DiPietro, M., Lovett, M., and Norman, M., 2010. How Learning Works: Seven Research-Based Principles for Smart Teaching. In *San Francisco: Jossey-Bass*.

Chidanandan, A., Russell-Dag, L., Laxer, C., and Ayfer, R., 2010. In Their Words: Students Feedback on an International Project Collaboration. In *SIGCSE'10, Milwaukee, Wisconsin, USA, ACM, March 10-13, 2010.*

Damian, D., Hadwin, A., and Al-Ani, B., 2006. Instructional Design and Assessment Strategies for Teaching Global Software Development: A framework. In *ICSE'06, Shanghai, China, ACM, May 20-28, 2006, pp. 685-690.*

Fisher, R., Ury, W., and Paton, B., 2003. Getting to Yes, Negotiating an Agreement without Giving. In *2nd ed. Simon & Schuster Audio.*

Gan, B.K.S., Weinberg, R., and Mansar, S., 2010. Global Project Management: Pedagogy For Distributed Teams. In *Proceedings of Global Learn Asia Pacific 2010, Penang, Malaysia.*

Gotel, O., Kulkarni, V., and Phal, D., 2009. Evolving an infrastructure for student global software development projects: lessons for industry. In *ISEC'09, Pune, India, ACM, 23-26 February 2009, pp. 117-125.*

Govindarajan, V., and Gupta, A.K., 2001. Building an Effective Global Business Team. In *MIT Sloan Management Review, 42 (4), 2001, pp. 63-71.*

Ocker, R., and Rosson, M.B., 2009. Training students to work effectively in partially distributed teams. In *ACM Transactional Computing Education 9, 1, Article 6, March 2009, 24 pages.*

Purvis, M., Purvis, M., and Cranefield, S., 2004. Educational Experiences from a Global Software Engineering (GSE) Project. In *6th Australasian Computing Education Conference (ACE2004), Dunedin. Conferences in Research and Practice in Information technology, Vol. 30, R. Lister and A. Young, Ed., 2004, pp. 269-275.*

PWHC negotiation exercise, www.studentnet.manchester.ac.uk/media/media,145305,en.doc; last retrieved May 2010.

Quinones, P.A., Fussell, S.R., Soibelman, L., and Akinei. B., 2009. Bridging the Gap: Discovering Mental Models in Globally Collaborative Contexts. In *IWIC'09, Palo Alto, California, USA, ACM, February 20-21 2009, pp. 101-110.*

Staff Development Unit, University of Birmingham, 2010. A Model of Course Design – Commentary.

Swigger, K., Alpaslan, F.N., Lopez, V., Brazile, R., Dafoulas, G., and Serce, F.C., 2009. Structural Factors that Affect Global Software Development Learning Team Performance. In *SIGMIS-CPR'09, Limerick, Ireland, May 28-30, 2009, pp. 187-195.*

Topi, H., Valacich, J.S., Wright, R.T., Kaiser, K.M., Nunamaker Jr., J.F., Sipior, J.C. and de Vreede, G.J., 2010, IS 2010 Curriculum Guidelines for Undergraduate Degree Programs in Information Systems. In *ACM 2010 Information Systems Curriculum.*

Upton, D.M., and Staats, B.R., 2008a. Tegan, c.c.c. In *Harvard Business School, Case #9-609-038.*

Upton, D.M. and Staats, B.R., 2008b. Hrad Technika. In *Harvard Business School, Case #9-609-039.*

Volkema, R. and Rivers, C., 2008. Negotiating on the Internet: Insights From a Cross-Cultural Exercise. In *Journal of Education for Business, Vol. 83, N. 3, Jan-Feb 2008, p.165-172.*

Westerlund, M.J., 2008. Super performance in a remote global team. In *Performance Improvement, 47, 5, ABI/INFORM Global, May/June 2008, pp. 32-37.*