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Refereed Article 13:

Team Health, an Assessment Approach to Engage First Year Students in Cross-cultural and Cross-discipline Teams towards More Effective Team-Working

Kathy Egea,
School of Information Technology and Electrical Engineering, The University of Queensland, Brisbane, Australia
k.egea@uq.edu.au

Soon Kyeong Kim,
School of Information Technology and Electrical Engineering, The University of Queensland, Brisbane, Australia
soon@itee.uq.edu.au

Karin Behrens,
Key Center for Ethics, Law, Justice and Governance, Griffith University, Brisbane, Australia
k.behrens@griffith.edu.au

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Abstract

Specialists who work in a globalised environment, need to work in teams, if they are to be continuously effective. The challenge for IT educators is to design and implement inter-cultural teamwork practices into their curriculum. Investigating this challenge, this case study describes Team Health, an assessment approach designed to skill students to be more effective in team working in cross-cultural and cross-discipline teams. The educational context is teamwork practice within a first year introductory web design course. Framed by Saunders's virtual team lifecycle model (relationship building and team processes) and Hofstede's cultural dimensions (communication and working cross-culturally), the assessment approach utilises reflective and iterative strategies to support team working. At three points in the semester, students complete a survey on these four concepts, identify team strengths and weaknesses from the results of the surveys and work towards addressing one team weakness. The final assessment activity requires students to reflect on team working for the semester.

Key attributes for effective team working are identified from the three surveys and the final reflective summaries. This paper compares course outcomes such as team cohesion and student grades to the previous course offering and shows that with the introduction of Team Health, the more complex student cohorts under this study achieve equally well. It is concluded that the *guided* reflective practices underpinning Team Health can prepare students for first year approaches to teamwork, and thereby provide starting points for working in future global teams where members are both culturally diverse and from different discipline areas.

1. Introduction

Teamwork and workplace training are now part of the IT curriculum as a means of easing the transition of students into the workplace. Frameworks such as UK SFIA - Skills Framework for the Information Age (<http://www.sfia.org.uk/>), have extended job descriptions from technical skills driven competencies to levels of skill with attention to problem solving abilities and abilities to work and drive teams.

Globalisation places internationalisation onto Information Technology curriculums. The level playing field of the flat world (Friedman, 2007) extends country boundaries to multi-national work and business environments. The ACM 2008 Information Technology Curriculum Guidelines suggest pedagogical practices that weave "international, intercultural, and workplace issues within the context of computing resources, teamwork, and projects" (Lunt et al, 2008, p. 46). However to operate in a *globalised* digital world, an understanding of cultural, professional and geographic difference is essential.

Opportunities exist when student cohorts are in themselves diverse. The dramatic increase in international student numbers within the Australian context, requires a pedagogical structure that supports student learning (Biggs 2003, Sanderson 2007) and attend to challenges that these students face. For example, recent studies of IT students from Asia within Australian Universities (see Lu et al., 2010) found that the biggest challenge for these students was communication, particularly oral communication.

The challenge for IT academics is to design and implement inter-cultural teamwork practices that prepare students to be work-ready in a globalised intercultural and diverse work setting. Distributed development team projects with students working across distant borders, such as the collaborative computing project presented in Clear and Kassabova (2008) are one response. The research question posed in this paper however, is whether *localised* university settings can provide similar globalised intercultural experiences for computing students?

The case study presented in this paper investigates this question: An introductory course in web design with three diverse disciplines (Communication Studies, Information Technology and Multimedia) and large student numbers (300 with 20% being international student) utilising cross-discipline and cross-cultural teamwork for project work in web development.

2. Team Health and the literature underpinning it

The conceptual model for building understandings in working globally, for students commencing their studies in technology for this case study, utilises four key teamwork components: communication, task management, relationship and cultural dimensions to guide team working. The components were extracted from literature on virtual teamwork and globalised working guidelines.

Central to working globally, cross-cultural teams require skills in communication. Deeks (2004) suggests communication strategies for cross-cultural working such as reflective preparation for discussion, and using strategies to check understanding, such as paraphrasing. Within a university setting, Hogan and Thomas (2005) train students in software engineering to be aware of the issues of communication failure and link successful communication as a pre-requisite for task management. Lu et al. (2009) found that Asian international students undertaking degree programs in Information Technology had most difficulty with verbal interactions in English, far more difficulties than with written English expression while Chamberlain and Hope (2003) note that language was a major deterrent to voluntary interaction and mixed culture group formation. Problems arise from vocabulary differences, language style differences and noticing non-verbal behaviours. Students therefore need to be aware of these problems and to build strategies to target these issues.

Task management is an important strategy for project development. Team members need agreement on tasks and the monitoring of the task completion. TeamWorker (Freeman & McKenzie, 2002) requires students to record the activities of the team members and their alignment to team goals, while academics monitor team progress for dysfunction. A more recent study by Ocker and Rosson (2009) used weekly activities (weekly goals, weekly interaction tasks and team deliverables) for partially distributed information technology teams for a four week project. Improved team interactions and overall team outcomes resulted from "*improved shared team identification, trust, awareness, coordination, competence, and conflict with distant team members*" (Ocker and Rosson, 2009, p. 1). Thus task management needs to address team activities, based on an understanding of the task description, the planned division of member tasks and an awareness of member deliverables.

Successful task management however depends on good working relationships between the team members. Powell, Piccoli and Ives (2004) in their examination of cases studies related to virtual working, found that success when working virtually depended on team-building exercises, shared norms and clear team structure. This was achieved from attending to relationship building, perceived team cohesiveness and high trust levels. Using Saunders (2000) framework on the virtual team life cycle, Powell et al (2004) demonstrate the importance of the three stages for effective virtual team working. In the first stage, team members get to know the goals of the project, the skills of the team members and initial expectations of the team members towards the team project. The second stage combines socio-emotional interaction (relationships, team cohesion and trust) with task management (communication, collaboration and task-technology fit). At the completion of the team project, both the outputs and the level of satisfaction of individual team members are measures of the team's success. Thus, engaging students in factors that build stronger relationships needs to be addressed by the cross-cultural and cross-discipline teams.

Patterns of cultural difference underpin the literature in cross-cultural influences in team working. Hofstede (1996) examined 72 cultures (IBM global workers) reducing cultural difference to five dimensions of national culture. This work formed the basis of numerous other studies. Deeks (2004) utilised Hofstede's work to guide international teams working in the *The Cochran*. He translated the five dimensions of national culture (paired opposites) which were translated into Leadership style (Hierarchy, Collaboration), Working Style (Risk Taking, Routine), Personal Goals (Achievement, Harmony), Personal Values (Individualism, Collectivism) and Personal Commitment (Long-Term Orientation, Immediate Gain). Each of these dimensions might to be considered when framing a tool for team working with members from multi-cultural and multi-discipline contexts such as the globalised work environment that students in computing may experience.

3. Team Health Tools on Team-Working

The Team Health assessment tool focuses on teamworking, and therefore incorporates reflection into the student's own approaches to teamwork, team strengths and strategies to overcome issues arising in the team interaction.

The Team Health tools include an online Survey, a Team Health Report template and Team Health Reflection Report template. All three instruments addressed the four components identified in the literature relating to team-working: communication, task management, relationships and cultural dimensions.

The Survey (see Appendix) consisted of both qualitative and quantitative items used to raise student awareness of the importance of the item towards team working. The first component, Communication, was designed to allow students to highlight issues and document their approaches to vocabulary range (e.g. style – language expression, gesture – body language), use of technology, cultural interaction, discipline interaction and overall working style.

To cover other aspects of communication, the option 'other' was presented.

The other three components: Task Management, Relationship and Cultural Dimension covered 23 attributes. Each attribute was linked to a five point Likert scale, for students to rate their perceived level of importance (1 = lowest level of importance, 5 = highest level of importance).

Task Management had four attributes (task description, responsibility of team members, schedule/task plan, awareness of task and completion by each member).

Relationship addressed nine attributes and included trust, equal contribution, cohesion, equal valuing of team members, sharing/friendship, openness, respect, coordination.

Cultural Dimension had 10 attributes addressing hierarchical structure, collaborative structure, risk taking, routine, individualism, collectivism, achievement, harmony, long-term orientation and immediate gain.

An example of the Likert scaled items from the survey is presented in Figure 1.

Since the project successively builds the website in three stages: identifying user needs and requirements gathering; design and prototyping, development and evaluation, surveys and team health reports were to be completed in line with project tasks. The aim thus was to enable members of the teams to reflect on their team interaction and identify strengths and weaknesses of their team working. To enable the team to reflect on various views for team working, the completed survey for each team member would be collated for viewing by the team as a whole. No team would be able to view the other individual surveys, only the collated view for their team members.

Question 2 (Task management)
Rate the importance of these factors when you are working in a team:

2.1. Clearly defined task description
Very unimportant Unimportant Neutral Important Very important

2.2. Clearly defined responsibility of team members
Very unimportant Unimportant Neutral Important Very important

2.3. Well-defined schedule/task plan
Very unimportant Unimportant Neutral Important Very important

2.4. Awareness of task and completion of each member
Very unimportant Unimportant Neutral Important Very important

**Figure 1. Online Survey check box format for Question 2 (Task Management)
Scale: 1-5**

For example, Figure 2 demonstrates one team's feedback for Question 2 Task Management. The average score for each item is recorded visually by length (green/red), numeric value and bar chart. In this example, the team rated the concept of 2.1 *Clearly defined task description* between important (score =4) and very important (score = 5), with 3 team members rating it as important and one team member rating it as very important.

The next step in the Team Health approach was the completion of the Team Health Report. Teams Building on the collated views of the surveys, teams identify attributes that contributed to team strengths and team weaknesses, and devise a strategy to address at least one identified weakness. The aim here is to help teams improve their team working process. To support this process, for the first two surveys, time and guidance would be provided in tutorial settings. Online resources on team working were developed to support the teams and the tutors.

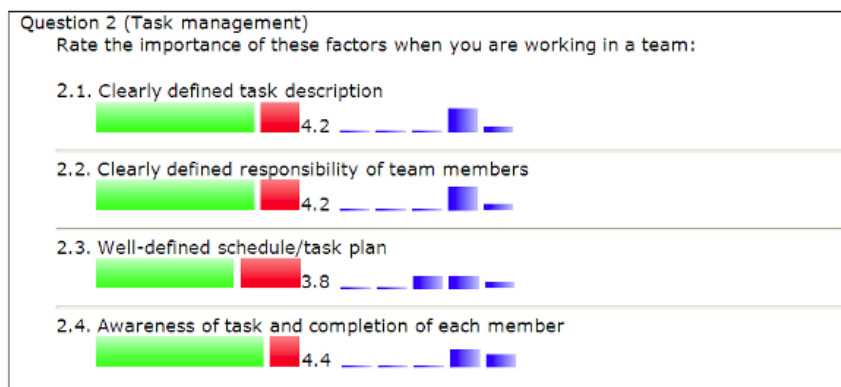


Figure 2. Feedback style for survey: example given is that of Question 2 (Task Management)

The final tool "Team Health Reflection Report" is completed at the end of the semester. Here the student reviews team-working approaches of his/her team, in terms of communication, task management, relationship and cultural dimensions; team effectiveness and cross-discipline and cross-cultural working. This approach is an attempt to enable the student to review any changes in their own approach to team working as well as to judge the effectiveness of their own team.

For purposes of research, a demographic survey was added and measured gender, age, program of study, cultural influences, country of birth, team members from other disciplines and team members from other cultures. Ethical

clearance for the use of the Team Health data in the study was obtained.

To investigate whether the Team Health approach supported students in team working, when team members come from diverse backgrounds, with different perceptions to technology, we analyse the individual perception on working in a cross-cultural and cross-discipline team iteratively over the semester and at the end of the semester. We examine the surveys and the final reflective report.

4. Findings

From the 265 undergraduate students (UG) and 23 post graduate (PG) students who completed the demographic survey, 233 students indicated that they had team members who were from other disciplines, while 179 students indicated they had team members from other cultures. There were 225 (194 UG) submissions for Survey 1 (S1), 207 (180 UG) submissions for Survey 2 (S2) and 143 (130 UG) submissions for Survey 3 (S3). 61 teams submitted reports for Team Health 1 (TH1), 62 submitted reports for Team Health 2 (TH2), and 50 teams submitted Team Health 3 (TH3). 175 students submitted the Team Health Reflective Report.

4.1 Survey Attributes

For each survey, the total score for each Likert category for each item was found. Since most students rated each item as either 'important' or 'very important', these two score ratings were joined to represent the overall percentage importance of the various attributes for each component. Changes for items across surveys were also noted. The following discussion presents each of the three components and their attributes in terms of overall importance across each of the three surveys, S1, S2, and S3.

4.2 Task Management Component (4 attributes)

All attributes in Task Management were deemed important or very important by 80% or more of the students (see Figure 3). The attribute *clear task description* was judged the most important and *defined task plan* was the least important over the three surveys. However differences between attributes were small.

However, it can be seen that *clear task description* becomes less important in S3, while *member effort* becomes more important in S3, but less important in S2. The reduced importance of all other attributes (*clear task description*, *member responsibility* and *defined task plan*), supports the stage where the students are with their project. Survey 3 was completed at the final stages of the project, where the team submission depends on the awareness of where each team member is with their part of the assessment activity.

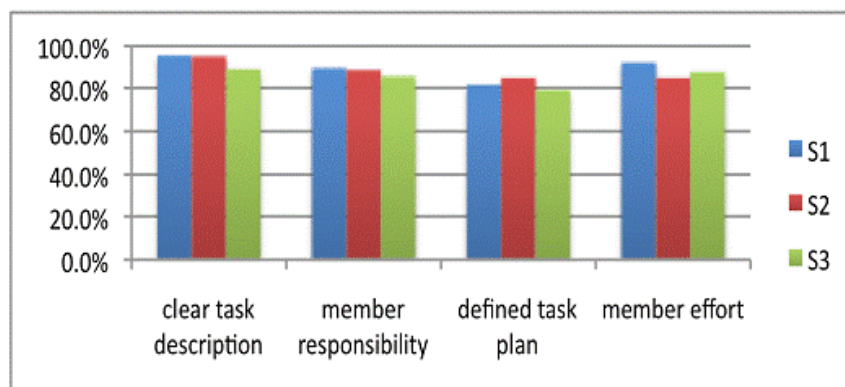


Figure 3. Task Management and percentage of scores for rating attribute 'important' and 'Very Important' for Survey 1,2 and 3

4.3 Relationship Component (9 attributes)

Figure 4 compares the nine attributes in the Relationship Component for each of the three surveys. The attributes *equal valuing*, *respect* and *coordination* were rated as most important by more than 80% of the student for all three surveys. However, overall, the most important attribute was *respect*, and the least important is *sharing/friendship*.

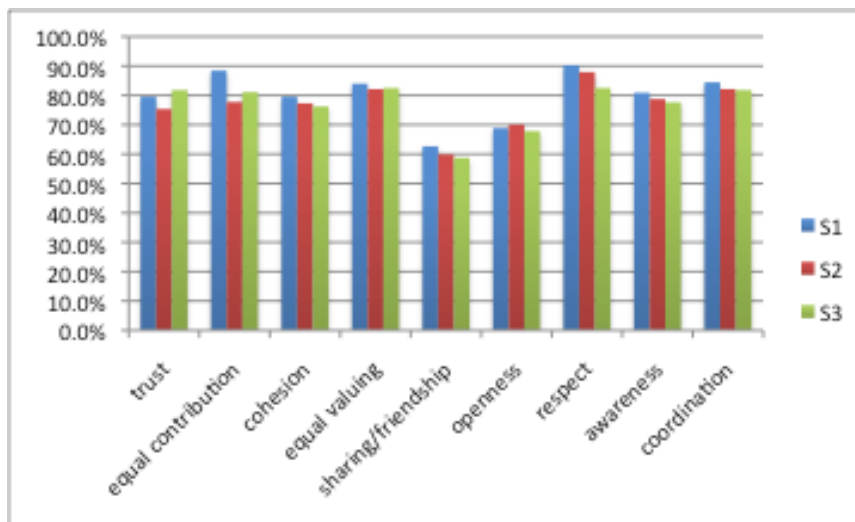


Figure 4. Relationship and percentage of scores for rating attribute 'important' and 'Very Important' for Surveys 1,2 and 3

In S1, all attributes (apart from *sharing/friendship* and *openness*) ranged from 80 to 90 percent. In S2, three attributes (*equal valuing*, *respect*, *coordination*) were 80 percent or more, with all attributes (except *openness*) having lower ratings than in S1. In the final survey, S3, five attributes (*trust*, *equal contribution*, *equal valuing*, *respect* and *coordination*) were 80 percent or more important where the attributes (*trust*, *equal contribution*, *equal valuing*) had higher overall ratings than S2, with *sharing/friendship*, *openness*, *respect*, *awareness*, being slightly less important than in S2. *Trust* was the only S3 attribute weighted higher than in S1.

4.4 Cultural Dimensions Component (10 attributes)

Figure 5 presents the percentage of important and very important ratings for the ten attributes defined in the cultural Dimensions component. Unlike the previous two components, this component has greater diversity in the students' ratings.

About half of the attributes, including *hierarchical structure*, *risk taking* and *individualism* had low percentages, indicating low importance for teamwork. Other attributes had higher percentages, similar to the previous components, including *collaborative structure*, *collectivism*, *achievement* and *harmony*.

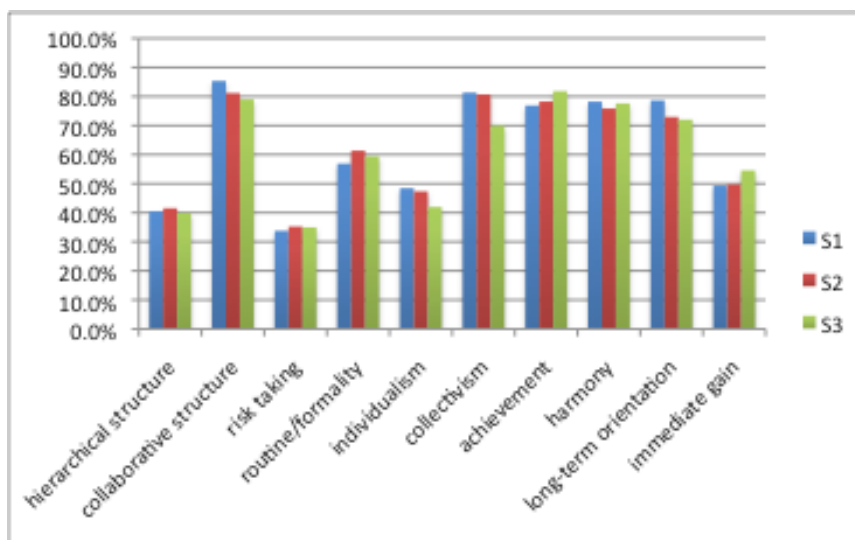


Figure 5. Cultural Dimension and percentage of scores for rating attribute 'important' and 'Very Important' for Surveys 1,2 and 3

The pattern of results was generally indicative of Hofstede's dimensions of national culture showing one attribute was rated almost twice as important as the other. However students rated the importance of *achievement* equally to *harmony*, which is inconsistent with Hofstede.

The work above compares attributes from the cohort view. In an early work, we compared cross-discipline with single-discipline teams, and cross-discipline and single-discipline teams for significant differences in score rating for each attribute over the three surveys. Students in cross-discipline teams had significant score differences from those in single discipline teams in ten of the 23 attributes for S3 ($p < .05$) but no difference in S1 or S2. For cross-cultural teams (defined from student perception that team members were from other cultures), there was no statistical difference in S1 or S3, with *long-term orientation* being the only attribute in S2 where cross-cultural

teams rated this attribute higher than for single-cultural teams ($p < .05$). When all survey data were combined, it was found that there was no difference in approach to working together for the attributes of *trust*, *cohesion*, *equal valuing* and *awareness* from both perspectives of discipline and culture. It is therefore concluded that the approach to building more effective teams was achieved through relationship development, over task management and cultural dimensions. For more details, please refer to Egea, Kim, Andrews and Behrens, 2010.

4.5 Team Health Reflection Report

From the 175 submissions, a stratified random sample of twenty reflections was qualitatively reviewed to identify key themes and issues noted with cross-cultural and cross-discipline team working. Sample proportions matched to the course grade: 21% grade of 7 (4 students chosen), 47% grade of 6 (9 students chosen), 22% grade of 5 (4 students chosen), 9% grade of 4 (2 students chosen) and 2% a fail grade (no students chosen). Thus the reflections here do not represent the total population in the course, but for those students who completed the final reflective activity.

Using the report format, common themes were evident in each of the topics that students were asked to consider. In the section below, we have drawn from student comment and attempted to build a picture of what they view as benefits of working in cross-cultural and cross-discipline teams, along with the challenges in team working. The data was separated by question, for all students. One researcher reviewed this raw data to build a list of themes for each question. A second researcher took these themes and went back to the student data, and added the student number to each theme, thereby identifying where students indicated several themes, and to weight the themes by unique student number. This way, we could map if any other themes were missing from the first set of identified themes.

4.6 Team effectiveness

Sixteen students responded to this question, with nine indicating that their team was effective, and no student indicated that their team was not effective. The main definitions for effective teams addressed quality product and timely completion (6 students), a team that achieves its goals with an expected output (5 students) and a team that works cohesively with equal contribution (4 students). Other themes (trust, valuing team member contributions, proficiency of tasks, efficiency of time to complete tasks, and ensuring that tasks matched student ability) were raised by four students.

Cross-cultural interaction

Thirteen students responded positively to cross-cultural interaction, with just under half indicating that the influence of cross-cultural members provided for rich and creative ideas from different perspectives and experience (six students) with four students indicating that the cross-cultural teams enabled students to learn about how people from other cultures do their work (e.g. work style, problem solution approach, work ethics), while three students wrote of cultural beliefs and values.

However, more students wrote of the negative impact of cross-cultural teams (17 students) with the majority (11 students) indicating that the language barrier caused many communication difficulties or misunderstandings. Four students claimed that the different ways of thinking challenged them into argument or disagreement, with only one of these students considering the experience as rich and creative. Thus it would appear that the concept of conflict is viewed negatively rather than seen as enriching (Ocker et al, 2009).

4.7 Cross-discipline interaction

Fifteen students responded positively to the cross-discipline nature of teams with 12 students indicating that the variation in knowledge and associated difference in viewpoints produces quality work. Six students indicated that effective task distribution and completion of the project was achieved with cross-discipline teams. Five students noted that cross-discipline teams provided a learning opportunity to understand the processes and working styles of people from other disciplines with one student commenting on the social networking opportunities with such teams.

Eleven students noted at least one negative feature arising from cross-discipline teamwork. Four students stated that students from other disciplines were unable or not interested in extending their knowledge beyond their own discipline, three comments addressed the disagreement or argument that occurred from the different ways of approaching a problem solution. Students also noted problems arising from different aims, different work ethics, unequal workload and different skill sets within their teams.

4.8 Communication

Sixteen students made positive comments towards their communication gains. The two dominant themes address effective communication methods (meeting times, process and frequency) and communication styles (listening, patience, visualization, sharing opinions, open minded, explanation with an awareness of limited vocabulary range). Other less dominant themes included tolerance of difference, well defined roles and commitment to teamwork.

Only five students indicated negative outcomes from communication addressing issues of progress updates, different working styles and culture, misunderstanding tasks and team roles, language difficulties and conflicting schedules affecting face-to-face meeting opportunities.

4.9 Task Management

Sixteen indicated the processes that supported their teamwork. These addressed four strategies: the early identification of tasks (3 students), the allocating of tasks based on student ability (7 students) set 'due dates' and monitoring progress of tasks (4 students), through the use of schedules and regular weekly meetings (6 students).

Four students highlighted challenges for task management within the teams. The themes here addressed unequal or uneven distribution of tasks, unclear task responsibility, and dominant team member.

4.10 Relationships

Of the twenty students, all but one student made comments. The two most dominant strategies discussed mutual respect (six students) and increased communication (7 students). Other concepts include useful online technologies for the communication process (2 students), trust (3 students), equal contribution and equal valuing of team members (2 students), open-minded (2 students), understanding each others capabilities (1 student), sharing common goals, work ethic (1 student), and friendship beyond the course (2 students).

Challenges to building healthy team relationships were noted by three students and these included unequal or uneven contribution, different work ethics and poor communication strategies. One other student suggested the need for a team leader.

4.11 Cultural dimension

Four students stated that there were no issues in their teams due to the cultural grouping of their teams. Of the remaining students, eleven students provided their suggestions for strategies to address the cultural dimensions of their teams. The concepts identified include mutual respect (4 students), open and honest (2 students), understanding cultural background (3 students), team leader (2 students) and ensuring each member has similar understanding of team tasks (1 student).

Challenges were stated by four students and included difficulties in coming to an agreement due to cultural differences and communication issues due to low levels of English.

5. Was the strategy effective?

We examine the student grades as a measure of the impact of the cross-cultural and cross-discipline teams for the project design. The web project including Team Health was 50% of the course. Overall the course grades reflected similar results to the previous year where there was less diversity (2 cohorts) and fewer students (124). Course grade is a score from 1 to 7 where a grade of 7 represents High Distinction (85% or higher), and grades above 3 represent a passing grade. Results are similar for both years, with little difference in the average grade: 2008 (5.5) and 2009 (5.4). Table 1 below demonstrates that link between course grade and team health (TH) mark (where TH mark is on a scale from 0 -10).

Table 1. Average mark in Team Health (TH) associated with course grade

Grade	7	6	5	4	F	W
TH (10)	8.4	7.7	5.6	4.5	3	0

The Team Health assessment was designed to support students in building more resilient teams through a series of iterative and reflective strategies. Those with upper grades have higher marks in the team health activities, and those with fails had very low average mark. It is noted however that a significant number of students put limited effort into the assessment strategies, with 84 (30%) students getting less than half marks and 17 (6%) students not attempting the assessment piece at all, including 6 Fail grade and 6 Withdrawal grade students.

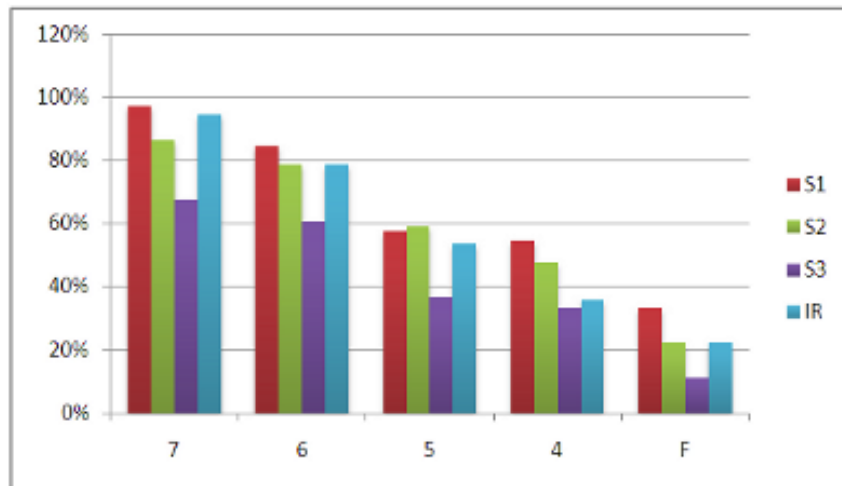


Figure 6. Percentage of submissions for the surveys and Individual Reflection by course grade

Figure 6 compares the submission percentage for each survey (S1,S2, S3) and individual Team Health Reflective report (IR) by student grade for those students who completed the Team Health assignment. 17 of 281 students received a mark of zero for this assignment, of which 11 did no course work over the semester. Students whose grade was 3 or less were grouped in the fail (F) category. Thus activity in this assignment is closely linked to course grades.

The impact of being in a team with members with different background appeared to support students in their learning and course outcomes. In our previous study (Egea et al. 2010), we statistically compared individual mark (50% of course mark) with team mark (50% of course mark) across discipline and culture make-up of teams. We found no statistical difference in grades for students in cross-cultural team or teams from the same culture. However, students in single discipline teams performed significantly lower in both team mark and individual mark. When statistically analysed, the following table shows the results (Table 2).

Table 2. Results of students in Single discipline teams and cross-discipline teams

Course component	Single-discipline teams	Cross-discipline teams
Individual	35.8 (71.7%)	38/50 (76%)
Team	33.3 (66.5%)	39.2/50 (78.4%)

These results demonstrate that cross-discipline teams can be more effective in achieving a higher grade than single-discipline teams. They also show that the cross-discipline teams are able to have effective team strategies based on their rich and diverse strengths.

Extending from this concept, we consider *team cohesion*, which measures the grade difference between each member of the team. The results of this measure are presented in Table 3:

Table 3. Levels of Team Cohesion: Grade comparison of students within a team

Grade comparison of students within a team	Code	2009 (N=80)
No grade difference between team members and all passed	0	16%
One grade difference between team members and all passed	1	31%
Two grade differences between team members and all passed	2	23%
Three grade differences between team members and all passed	3	9%
At least one team member failed the course and others passed	F+	14%
At least one team member withdrew from the course and others passed	W+	3%
At least one failed team member and at least one withdrawn team member	F+W+	5%

Thus, almost half the teams were cohesive, that is with a maximum of one grade difference between all members. Only 9% of teams had team members with a wide discrepancy of passing grade (code =3). 14% of all teams had at least one member failing the course. By drilling into the data further, one finds that 12 of 18 (67%) teams with failing members had high team cohesion, i.e. all other members of the team were similar in overall grades. Students in the failing group had poor attendance marks and/or limited marks for individual assessment activities. Thus it would appear that teams were able to work independently of the member who was missing from the team or who did little work. It is suggested that the iterative and reflective instruments that were part of Team Health may have helped teams work with together and build stronger relationships with members that were willing to part-take in the team activities.

6. Summary

6.1 Survey data

The majority of the students who completed the three surveys rated the attributes within each component (Relationship, Task Management, and Cultural Dimensions) as important or very important. All four attributes in Task Management were scored highest as most important. Since their project work represented assignment marks, this is expected. The relationship attributes were also rated of high importance with *respect* being the most important. In contrast the cultural dimensions component was rated more diversely with *collaborative structure, collectivism, achievement, harmony and long term orientation* being identified as most important in terms of team work. A more diverse rating could be expected in terms of Hofstede's dimensions, however the high ratings of *achievement* and *harmony* was inconsistent with his dimensions and this might be an indication that students perceived both of these attributes as essential for successful team outcomes. This complements Saunders' team life cycle model that combines the process of teamwork, relationships and task management with successful outcomes of individuals and teams.

6.2 Student reflections

When investigating the student reflections on their teamwork experience, there was no indication that teams were not effective. Students defined effectiveness as timely completion of their projects, individual satisfaction toward their achievements and equal contribution.

Students had mixed views on cross-cultural interaction. While they indicated positive outcomes of rich and creative ideas, and learning about different working styles, difficulties arose from language barriers, and inability to reach agreement.

More positive responses were noted in cross-discipline interaction, where the students highlighted effective task distribution and completion of the project. Negative views included the limited ability for students to extend beyond their own discipline.

Most students provided positive comments on their communication approaches, although a small number were dissatisfied with their ways of communicating within the team.

Students were mostly positive about their approach to task management reflecting all the attributes of the component Task Management, while negative comments of unequal distribution of tasks and unclear task distribution were indicated. The dominant concepts for the component Relationship were mutual respect and improved communication while a small number of students indicate difficulties with different working and communication styles and unequal contribution. The more important concepts that students discussed for the component Cultural Dimension, were mutual respect and understanding cultural backgrounds, while decision making was restricted due to cultural differences and English language ability.

6.3 Course results

The course results were sustainable, that is, they were similar to the previous less complex course offering. The single discipline teams had a significantly poorer final grade than their peers in cross-discipline teams. Thus the diversity of cross-discipline groups improves the overall outcome for the course.

However, there was no difference in overall grades with cross-cultural or single cultured teamwork. These results indicate that students overcome the difficulties of cross-cultural communication mentioned above and in the literature (Lu et al, 2010).

Over half the teams have good team cohesion - their course grades were within one grade difference for all members of the team. Students, who failed the course, generally did not affect the cohesion of the remaining students in their teams, since the majority of teams remained cohesive.

7. Conclusion

The paper has demonstrated that for complex cohorts of students, many students were able to achieve as effectively as in previous less diverse course offerings. While some students did not complete the surveys, Team Health Reports provide a focus on how to work effectively in diverse teams.

We have presented a case for team cohesion where many students achieved similar results to the other team members for the course. Given that teamwork has a 50% weighting, students may have extended beyond the team project to share learning.

Student reflections, when working in cross-cultural and cross-discipline teams, indicate an appreciation for the benefits from diversity, and a greater understanding of communication challenges in cross-cultural working. Perhaps the reflective practice in Team Health, has helped to create a more productive learning environment for its team members.

Team Health was developed from literature on virtual team working with the view of providing IT students within a university setting, the opportunity to work with students from other cultures and other disciplines, thereby supporting future globalised teamwork experiences that they may have. We would argue that students have achieved some real understanding/appreciation of global working through the iterative and reflective strategies in the Team Health assessment tool.

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Appendix: Survey Form

Your reflection on your team's communication:

Question 1 (Communication)

Please select factors which reduce the effectiveness of your team's communication and provide suggestions on how to improve these factors

Factors		Please comment on your ideas to improve these factors
1.1. Vocabulary range (Language)	<input type="checkbox"/>	
1.2. Style (language expression)	<input type="checkbox"/>	
1.3. Gesture (body language)	<input type="checkbox"/>	
1.4. Using technology	<input type="checkbox"/>	
1.5. Culture	<input type="checkbox"/>	
1.6. Discipline	<input type="checkbox"/>	
1.7. Working style	<input type="checkbox"/>	
1.8. Other:	<input type="checkbox"/>	

Your reflection on how you work in a team:

Question 2 (Task management)

Rate the importance of these factors when you are working in a team:

2.1. Clearly defined task description

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

2.2. Clearly defined responsibility of team members

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

2.3. Well-defined schedule/task plan

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

2.4. Awareness of task and completion of each member

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

Question 3 (Relationship)

Rate the importance of these factors when you are working in a team:

3.1. Trust

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

3.2. Equal contribution

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

3.3. Cohesion

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

3.4. Equal valuing of team members

Very unimportant **Unimportant** **Neutral** **Important** **Very Important**
 1 2 3 4 5

3.5. Sharing/Friendship

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

3.6. Openness

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

3.7. Respect

Very unimportant **Unimportant** **Neutral** **Important** **Very Important**
 1 2 3 4 5

3.8. Awareness

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

3.9. Coordination

Very unimportant **Unimportant** **Neutral** **Important** **Very important**
 1 2 3 4 5

Question 4 (Cultural Dimensions)

<i>Cultural Dimension</i>	<i>Approach</i>	
1: Leadership style	Hierarchy: Successful teamwork requires a leader to provide direction and make decision	Collaboration: Successful team work requires the contribution of all members, intense consultation and group decision making
2: working style	Risk Taking: Tries out new things and different ways to approach tasks	Routine/ Regulation/ Formality: Prefers tried and tested ways of doing things
3: Personal values	Individualism: Values self-determination, individual success and the need to look after oneself	Collectivism: Values being part of groups, group loyalty and promoting the interest of the group
4: personal goals	Achievement: Values success, achievement and money	Harmony: Values quality of life, interpersonal harmony and sharing
5: personal commitment	Long Term Orientation: Value commitment, persistence and concern about the future	Immediate Gain: Value taking advantages as they occur, consumerism, use what is available now

Using the definitions above, please rate the level of importance in your approach to team work of the following:

4.1. Hierarchical structure (leader directed)

Very unimportant Unimportant Neutral Important Very important
 1 2 3 4 5

4.2. Collaboration structure (team directed)

Very unimportant Unimportant Neutral Important Very important
 1 2 3 4 5

4.3. Risk Taking

Very unimportant Unimportant Neutral Important Very important
 1 2 3 4 5

4.4. Routine/ Regulation/ Formality

Very unimportant Unimportant Neutral Important Very important
 1 2 3 4 5

4.5. Individualism

Very unimportant Unimportant Neutral Important Very important
 1 2 3 4 5

4.6. Collectivism

Very unimportant Unimportant Neutral Important Very important
 1 2 3 4 5

4.7. Achievement				
Very unimportant	Unimportant	Neutral	Important	Very important
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
<hr/>				
4.8. Harmony				
Very unimportant	Unimportant	Neutral	Important	Very important
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
<hr/>				
4.9. Long Term Orientation				
Very unimportant	Unimportant	Neutral	Important	Very important
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
<hr/>				
4.10. Immediate Gain				
Very unimportant	Unimportant	Neutral	Important	Very important
<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

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Michael Verhaart, Krassie Petrova and Nick Wallingford (Eds.). =? =