

Motivational Patterns in Virtual Team Collaboration

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Abstract

This paper reviews experiences from a research project into international collaborative learning, involving trials between virtual teams of students at Auckland University of Technology (AUT) and Uppsala University (UU) in Sweden. In this research-linked model of teaching, several issues have arisen, associated with motivating students to participate in a research project as an integral element of their learning. The literature on student motivation is briefly reviewed and related to observed student motivation over a two-year period of collaborative trials. Identifiable patterns of behaviour have emerged, for which some underlying causes can be discerned. While findings at this stage can be considered tentative in this complex environment, nonetheless we believe some light is shed on the process of motivation for such a model of learning. The paper concludes by outlining our proposed modifications to enhance student motivation in forthcoming collaborative trials.

Keywords: Virtual Teams, Global Virtual Teams, Intrinsic Motivation, Extrinsic Motivation, Collaborative Learning, Groupware, Computer Science Education Research

1 Introduction

Student motivation is a complex issue and becomes more so when a collaborative model of learning is adopted. In this paper we review two years of collaborative learning trials involving local and global virtual teams of students undertaking a common task using collaborative technologies. Trials have been in support of a research programme investigating issues associated with Global Virtual Teams. Students from New Zealand and Sweden who have not previously met have participated in one of the sequence of three trials conducted in 2003 – 2004 reviewed here. During this period the team facilitating the trial exercises have noted differing degrees of student enthusiasm and perseverance throughout the collaborative trials.

This paper explores the question of student motivation in virtual teams, and attempts to identify the key factors or underlying patterns in this complex context that can lead to more successful and enjoyable international collaborative learning experiences.

2 Underlying Pedagogy

The pedagogy upon which this work is based derives from several sources related to a transformative model of pedagogy. These include views on the role of quality in education, the use of IT in education, the value of collaborative pedagogy and the relationship between teaching, learning and research. At AUT the model of educational quality has been expressed in the belief that quality education consists in "a process of transformation by the participant" (Corder, Horsburgh, & Melrose., 1999), as part of the learning experience. The work reported here is part of a sustained intervention exploring the use of collaborative pedagogy and Information Technology (IT) as a vehicle for transforming the teaching and learning process (cf. Leidner & Jarvenpaa, 1995).

The role of research in this transformation process depends upon academics' perceptions of the interrelationship between teaching and research. The collaborative trials are informed by the latter three of the five distinct conceptions identified by Robertson & Bond (2001), namely that: teaching is a means of transmitting new research knowledge; teachers model and encourage a research/critical inquiry approach to learning; and teaching and research share a symbiotic relationship in a learning community.

Thus this work has involved experiments with a new form of collaborative pedagogy. This involves new roles for students who become both learners and co-researchers. The key distinction here is that teaching and learning move from a process of information transmittal, or acquisition of known facts or skills to achieve learning goals, to a model of joint enquiry into the unknown. This carries inherent risks as the findings may be negative, yet failure in the planned activity may reflect success in the research, but the scope for tidy packaging of the whole learning process is reduced, with a corresponding rise in uncertainty and ambiguity. Thus students are challenged to engage in a 'willing suspension of disbelief' as part of their learning process, and to voluntarily commit to the activity under an ethically sanctioned process through an informed consent model as "research subjects".

3 Background of collaborative trials

The history of this collaborative trial goes back to 1998 when it first started as a joint research project between AUT and UU (Clear & Daniels, 2000). It would be relevant to the discussion in this paper to point out that there are certain differences between the two educational institutions. While AUT is the newest university in New Zealand and attracts students with a pragmatic and technical orientation, the UU is a traditional educational institution with a reputation for attracting elite students. Another important point to make is that the student population at AUT is definitely multicultural, with a high percentage of students coming from Asian and Pacific backgrounds while the Swedish groups are mainly monocultural.

The project has a bi-fold aim – on the one hand to provide an opportunity for researchers to investigate how virtual teams work in an educational context and at the same time to introduce the participating students to some of the principles and issues related to working in a virtual team on assigned tasks.

The international nature of the trial is expected to enhance students' experience and appreciation of issues related to collaborative technologies and differences in culture, background, time differences etc. The students involved are either in their last year of study towards a Bachelor of Business degree with a major oriented towards Information Systems and Technology (the New Zealand participants) or first year Computer Science students (participants from Sweden). Each collaborative or Global Virtual Team (GVT) is made up of two or three Local Teams (LT) of New Zealand students and one Local Team of Swedish students, or between 8 and 15 students in a GVT. Five GVTs take part in each collaborative trial. Each of the LTs that make up a GVT are able to communicate face to face and only one LT member represents them online. This is to avoid the problems cited in DeSanctis and Galletta (1987) that "as membership increases the number of potential information exchanges rises geometrically and the frequency duration and intimacy of information exchange all decline." At the same time this arrangement creates an additional layer of complexity to the collaborative process where the face to face communication in the LT's underlies the decision that the group communicates to the GVT. A further compounding element is the fact that due to logistics of synchronising academic calendars, the international trial runs once per annum in the second semester of the Auckland academic year, and in the first semester a substitute local trial is run between classes of Auckland IT students internally.

The collaborative work of the GVTs is supported by a prototype online Collaborative Database developed using a Lotus Notes Domino™ server at the School of Computer & Information Sciences at AUT.

At the beginning of each trial participants are asked to work on each of the activities within a given timeframe. Due to the voluntarism inherent in the ethics approval stipulations students are also allowed to withdraw from the trial at any stage.

At the end of each phase of the collaboration students are asked to evaluate the experience using a set evaluation form that they submit to the database anonymously. Students are also required to submit reflective reports at the end of the trial as part of their assessment.

The collaborative trial includes two phases: Icebreaking and Group decision-making. The Icebreaking phase is designed as a game where participants are asked to give some clues about themselves and the other GVT members need to make guesses based on the clues. The aim is to "break the ice" within the GVT, i.e. participants become acquainted with one another. As it is a required activity and imposes a certain structure, the authors are inclined to consider the icebreaking phase a task in itself.

The second phase involves group decision making and reaching consensus related to a common task. Members of GVTs need to choose and evaluate websites related to assigned topics, engage in online discussions on the evaluation of these Web sites and to reach a team consensus on the final ranking of the sites.

4 Motivation in Learning

Motivation in the learning process is a complex question, which has given rise to a broad literature. Space precludes a full review here, but some key notions are important for this paper. Firstly the distinction between "intrinsic" and "extrinsic" motivation should be drawn. As defined by Sisley (2004, p.31) "if someone loves the process of learning, quite apart from any external goals to which the learning might be a means, or they come to care as much or more for the means (the learning) as the ends (career goals, material goals) then they are said to be 'intrinsically motivated'. By contrast "extrinsic motivation...refers to behaviour performed to attain or avoid some external consequence" (Sisley, 2004). Yet, as Sisley observes, research has found that application of extrinsic motivations through rewards and enticements can reduce intrinsic motivation once those rewards are removed. He argues that "the deleterious effects of extrinsic rewards on intrinsic motivation seem to operate largely through its effects on a person's perceived autonomy". This effect appears to derive from whether the external reward is negatively seen by the recipient as a means of controlling a person's autonomy, whereas if the reward is contingent on performance and seen as a form of positive feedback on ability at the task then there is no negative effect on intrinsic motivation.

In a recent summary of the literature on student motivation Seifert (2004) has identified five patterns of behaviour:

1. the mastery pattern – reflects intrinsically motivated students who are positive towards their learning, flexible and adaptive in their strategy use and will persist at difficult problems and learn from their mistakes. In goal theory terms these students act in the pursuit of learning (mastery, task) goals).
2. the failure avoidance pattern – driven by a desire to maintain ability perceptions and protect self-worth, adopt less sophisticated strategies, make more

negative self-statements, tend to believe that outcomes are beyond their control, have a performance orientation in which they pursue goals to gain a favourable judgement of competence from self and others, or avoid an unfavourable judgement. Appearing superior to others or achieving an extrinsic reward such as a high grade are common pursuits, can be adaptive when confident but not so when confidence is low. In goal theory terms these students act in the pursuit of performance (ego-oriented) goals.

3. the learned helplessness pattern – students are unwilling to engage in tasks because they believe that failure is imminent, outcomes are beyond their control and regardless of one's actions the outcomes are the same. They blame themselves for failure but do not take credit for success. They experience much shame, boredom, humiliation and hopelessness.
4. The bright work avoidant pattern – these students tend to believe themselves capable of doing the work, but take less control over their learning. They expect the content to be made meaningful for them, in contrast to the mastery student who might seek out ways to make academic content meaningful.
5. The hostile work avoidant pattern – these students exhibit passive aggressive behaviours with little or no effort as an attempt to seek revenge on the teacher. These students while little understood, appear to be angry with their teachers and feel they have little control.

Naturally as an educator the mastery pattern is one we desire to see our students exhibit, but it vies with several others expressed in the patterns above, although Seifert has not suggested the proportions of students who might typically be found in each category.

Seifert further observes that few studies have given consideration to “meaning” in academic work, and suggests that if students do not know what they are meant to do they will find little meaning in their work, or if the topic does not make sense they may not be able to discern its relevance, or if they feel incapable of understanding the topic they may not find the work meaningful. This suggests that the nature and difficulty of the learning task itself, how well it is explained and how it relates to the wider world of the student, are all critical to motivation.

Sound teaching strategies such as problem-based learning (Boud, 1985) and the use of authentic online learning environments (Herrington, Oliver & Reeves, 2002) appear to recognise the criticality of the assigned task in a learning design.

4.1 Group Motivation

While the above literature has addressed student motivation generally, in this context the virtual group adds further dimensions to the nature of motivation. What motivates members to participate in a virtual group? What sustains that motivation as the group

develops? What levels of motivation are necessary in order for a group to achieve its goals?

Here the literature is both more diverse and more sparse on this particular topic.

4.1.1 Task as a Motivator

‘Task’ has long been identified as a critical variable in group decision making and for group support systems (DeSanctis & Gallupe, 1987). The nature of the tasks in this trial are considered as key motivational elements, but in themselves are quite different. If the two phases of the trial are considered in relation to the classic circumplex model of group task types (McGrath, 1984), it becomes apparent that the second phase of the trial gets the students involved mainly in tasks of type 4 (decision making on issues with no right answer) and type 5 (where they need to resolve cognitive conflicts). At the same time the icebreaking phase does not seem to fit in any of the tasks types described there. However it is consistent with McGrath’s (1991) TIP (time, interaction and performance) model of group process and development, which as Mennecke et al., (1992) note, suggests that “groups should be investigated both in terms of their task related behaviours...and their socioemotional behaviours (i.e. how did group members relate with one another and with their environment?)”. Thus the icebreaking activity could be defined as a socio-emotional task, a category of tasks that is omitted from the circumplex model, but considered vital for this trial. For instance Huang (2003) notes that “most prior GSS research focuses on supporting task-oriented teamwork and largely neglects socio-emotional activities of a team”. In addition to its critical role for building group awareness, it was expected that students would perceive this phase as more satisfying due to its social and “fun” nature.

4.1.2 Incentives & Rewards

In the Group Support Systems literature Mennecke et al., (1992) propose a model in which they embed motivation in the categorization “meeting context” under “incentives & rewards”. Thus motivation is represented as an input to a group’s meeting process. Reminiscent of this, in their study of GVTs Jarvenpaa & Leidner (1998) “explicitly stated that one of the conditions for participation include having the exercise comprise at least 20% of the student’s course grade. To further motivate the student’s participation, the professors were provided reports on their students’ levels of activity after the second and fourth weeks. Additionally a monetary reward (\$600) and industry publicity were promised for the highest performing team”.

4.1.3 Sustaining Teams

Marks et al., (2001) propose a taxonomy of team processes which incorporates interpersonal processes including “motivation and confidence building”. In this model “teams motivate members by communicating their beliefs about team ability (e.g. pep talks), competence on particular tasks, and feedback on team success”. Negative comments can reduce team confidence and task

cohesiveness. In the conduct of the Jarvenpaa & Leidner (1998) study too, the role of trust as a key motivator for continued performance in the GVT was observed, with specific behaviours which served to build and maintain that trust.

Thus while there is a developing body of work on GVTs, work specifically addressing the question of motivation for students to participate and persevere in such exercises is limited.

5 Research Methods

This paper results from an ongoing action research project into learning with GVTs in which each collaborative trial could be considered an action cycle (cf. Susman & Evered, 1978, McKay & Marshall, 2001). The authors are two of the New Zealand participants in the process, one being the project coordinator and the other a lecturer directly involved with the students in the delivery of the course, and the conduct of the trial with the New Zealand LTs. Several sources of data have been called upon to support the analysis in this paper. In each trial some 40 – 60 New Zealand students (typically from 2 – 3 separate classes) and 60 – 80 Swedish students have participated. Student contributions from both locations are available through their on line postings to the Notes database (discussion threads, website links, evaluation and ranking forms); observations of LT behaviour and discussions with students by the lecturer; anonymous online questionnaires for evaluation of icebreaking and collaborative trial activities; analysis of students' written reflective reports; notes recording discussions with Swedish counterparts, and joint plans for trial exercises of the authors.

6 Patterns of student motivation in the collaborative trials

Over the seven years of running these trials, both locally and internationally, the researchers have been trying to identify the main motivational factors that drive students' participation and performance. This attempt has been at times somewhat intuitive and at other times more consciously addressed. For instance a question relating to students' commitment to the exercise has been added over time to the student evaluation questionnaires, and several adjustments have been made to the task, the assessment, the instructions, the icebreaker and the Notes prototype. This paper by reviewing three relatively comparable trials conducted between 2003 and 2004, attempts to consolidate our existing, and far from conclusive, perspectives on the multi-faceted issue of student motivation in GVTs.

From the data collected from the above sources, a few key patterns have been observed, namely the following: "committed and satisfied", "committed and unhappy", and "others' commitment matters".

1. The first pattern "**committed and satisfied**" is where those students who reported that they made a serious commitment to the exercise, also reported they enjoyed it, learnt a lot and found it a 'better learning exercise than theoretical readings, use of case studies

and in-class discussions'. This is to be expected as 'internalised motivation refers to a person engaging in an activity simply for the pleasure and satisfaction inherent in the activity itself' as pointed out by Sisley (2004). From students' comments both in the anonymous evaluation forms as well as from their reflective reports it appears that the first phase was perceived as more engaging. A typical example is given below:

"It is always fun to communicate with people from different parts of the world!" and "... people on either side of the earth has similar goals in life :)"

2. Another pattern that appears less often but is still quite prominent is that of the "**committed but unhappy**". These students reported on being committed and found the trial offered a 'better learning exercise than theoretical readings, use of case studies and in-class discussions' but did not enjoy and did not learn from the trial. It could be questioned why these students remained committed in this case. While these evaluations are anonymous, from the grammatical hints in the language used in the free text entered in the forms it appears that this group of students may be predominantly from Chinese speaking backgrounds. It appears there is a cultural influence on the motivation for this grouping where one perseveres with the task at hand regardless of the negative perception.
3. A third pattern that has been identified is when students explicitly relate their motivation to other participants' performance, i.e. those who have identified that "**others' commitment matters**". Some students reported verbally that their motivation was very negatively affected by what they perceived as lack of commitment in other participants in their virtual team. They were also unhappy about the availability of the 'withdraw from trial' option as this allowed some participants to leave the team at some stage without any repercussions. At the same time this group included other students who reported positively in their anonymous forms that their virtual groups functioned well throughout the process, also found the exercise enjoyable and worthwhile, and reported that they learnt a lot from it.

All this indicates that when students are working in groups, individuals' motivation becomes a function of group processes. It is suggested by Seifert (2004) that, "Of interest to teachers and researchers would be the pivotal role that feelings of competence and control play". Indeed, the third pattern described above indicates that when students participate in virtual group work the individuals' feeling of control can be affected either positively or negatively by other participants' performance.

Some students clearly expressed this concern over loss of control:

"It's good to be responsible for your own work without any group members" (a comment on the introduction phase)

One can almost feel student's desperation of not being in control of others' behaviour in the following statement:

"I didn't gain anything because the collaboration didn't work at all, even though I e-mailed the Auckland students in our group."

On the other hand those who felt that the other participants in their virtual team were committed and participated effectively, reported high level of satisfaction with the trial and no problems achieving the outcome. One such student wrote:

"Most of the users finished their tasks before the suggested due date and it was easy for me to do the required activities. We could all understand each other well and it was quite trouble-free to make a decision about the best website."

The picture becomes even more complicated when group work is performed in virtual teams supported in their work by technology. The work by Jarvenpaa & Leidner (1998) suggests that factors associated with online competence, responsiveness, leadership and performance, as well as communication aimed at socialisation become inextricably involved in the process of creating trust in GVTs. This view is graphically reinforced by one student's comment:

"Hard to see the other's feelings and reactions. Difficult to create trust within the system."

6.1 Trial Completion Rates

The authors analysed the completed individual trial evaluations to derive some empirical data related to student performance. These statistics are given in table 1 below.

Topics	S1 04 completed %	S2 03 completed %	S1 03 completed %
DM	83%	69%	67%
DWH	88%	40%	50%
ES	100%	76%	36%
NN	88%	86%	85%
IA	88%	38%	100%
Total	90%	58%	67%
StDev.	6%	22%	26%

Table 1. Student Completion Rates - %'s

Topic refers to the category of the course topic related website evaluated (DM - datamining; DWH - datawarehousing; ES - expert systems; NN - neural networks; IA - intelligent agents). The trials in semester one of 2003 and 2004 were internal virtual team collaborations within AUT, whereas the semester 2 2003 trial was a global virtual team trial between AUT and UU.

To fill out the picture the actual numbers of students involved in each trial are given in table 2 below.

Topics	S1 04 started	S1 04 finished	S2 03 started	S2 03 finished	S1 03 started	S1 03 finished
DM	6	5	16	11	12	8
DWH	8	7	25	10	16	8
ES	11	11	17	13	11	4
NN	8	7	14	12	13	11
IA	8	7	21	8	12	12
Total	41	37	93	54	64	43

Table 2. Student Completion Rates - no's.

At first glance the observed performance patterns suggest a much higher completion rate in the most recent internal trial. Naturally we would hope that our progressive refinements of the process would result in better outcomes. However the variability in the 2003 trials may perhaps have been related to the larger size of the virtual teams. But analysis of student evaluation data, postings to the database and facilitator observations suggest that other motivating factors appear to have been at play too.

6.2 Motivational Patterns

A comparison of the three motivational patterns identified in 6 above, with those proposed by Seifert (2004), appears to draw some distinction between an orientation towards learning goals (mastery) and towards performance goals (ego-oriented).

Pattern Proposed by Seifert (2004)	Pattern Observed in Trials
Mastery	Committed and satisfied
Failure avoidance	Committed but unhappy
Mastery	Others' commitment matters - +ve
Failure avoidance	Others' commitment matters - -ve
Learned Helplessness	Not observed
Bright work avoidant	Not Observed
Hostile work avoidant	Observed in one location

Table 3. Motivation Patterns Compared

The two primary patterns observed of mastery and failure avoidance also relate to intrinsically versus extrinsically motivated students. In a vocationally oriented University such as AUT Sisley (2004 p. 31) notes that undergraduate business students typically identify their motivation to study for a degree as to get a qualification to enable them to begin a business or professional career, and to get the high income and standard of living associated with such

careers, or because they feel such a career will be more fulfilling than alternative occupations not requiring degrees. “Only rarely does someone respond that they are here at University to ‘expand their mind’ or because they love the process of learning” (Sisley, 2004). Thus extrinsic motivation would be expected to be part of the AUT student response. For UU, as a traditional and elite institution, the intrinsic motivation for students could perhaps be expected to be higher.

The absence of the other patterns might be a function of the tertiary learning context, prior to which one would expect the hopeless to have been weeded out. The bright work avoidant may have been carried by their other LT members, or perhaps elected not to participate, or withdraw at an intermediate stage. The hostile work avoidant pattern was discerned with some Swedish students. Several students dropped out of the trial early and others refused to continue their participation. Indicative causes were their very recent arrival as fresh students on a new campus; their inexperience and frustration with the prototype collaborative software and its interface; and an apparent annoyance at the perceived lack of clarity of the instructions provided by their instructor. It appeared that facilitator experience and enthusiasm are critical components in the motivational jigsaw.

7 Interventions and Iterations

As the collaborative trials have continued, we have reflected on our experiences at the end of each cycle and made progressive adaptations and improvements to address issues as they have arisen. Student feedback from the evaluations has also been a source for some of these improvements.

We have surmised that several factors impact positively and negatively upon the student learning experience and their motivations to both participate and persevere with the exercise. Among these are: the research component of the exercise and its voluntary nature; the perceived significance of the research; the difference between this learning approach and other courses in the degree; the formative versus summative assessment balance; the nature of the collaborative task(s); the design of the learning tasks - summative assessment activity (trial and alternative); relative effort involved in trial versus alternative; the clarity of trial instructions; the perceived relevance of the collaborative task to the course work; student prior experience with collaborative technologies; the usability of the prototype application; the degree of structure in the icebreaking task; group formation strategies; the international dimension of the exercise versus the internal trial version; LT & GVT effectiveness. This plethora of issues unfortunately is simply reflective of the inherent complexity of the domain (cf. DeSanctis & Poole, 1994 for one framework attempting to capture the variables involved in Group Support Systems). Yet even this model omits the dimension of motivation to participate or persevere.

7.1 In search of meaning

Interventions aimed at improving the collaborative experience and motivating student participation have intuitively been aimed at making the experience more meaningful to students. Seifert (2004) has noted that, “few studies have given consideration to meaning in academic work”. His breakdown of the term ‘meaning’ for students has three implicit elements, each of which is an important motivational element:

- meaningfulness of directions;
- relevance of learning task;
- level and comprehensibility of learning task.

The interventions of the authors in fine-tuning the learning design have largely been addressed at these issues of improving the activity as a meaningful student learning experience.

Addressing the question of meaningfulness of directions, we have spent much time and effort in developing explicit, clear yet succinct instructions for students to follow. Accompanying this has been continued effort at refining the interface of the collaborative application to improve the usability of the prototype.

Relevance had been addressed in past trials for the AUT students by linking the topics to the course work, however this may have been to the detriment of relevance for the UU students. Progressively increasing the weighting of the summative assessment related to the trial has been another strategy. Visits by the project coordinator to the initial class of each course explaining the goals of the overall research has been used as a motivational technique to demonstrate the relevance and significance of the work.

Addressing the level of the work and comprehensibility for students had been undertaken by refining instructions, improving the user interface, and linking the collaborative task more explicitly to the course work for the AUT students. Active in-class guidance and encouragement by course lecturers and the initial visit by the project coordinator have been additional strategies here.

Nonetheless we still have much to learn. The AUT and UU project coordinators met face to face and reviewed progress of the trials recently at the FIE 2003 conference. Given the notable motivational issues observed for the Swedish students we agreed a revised collaboration design to better suit the needs of each student cohort. Since then we have been adapting the plan for the coming trial to incorporate these elements and feedback from students gleaned from post-trial evaluations and reflective reports.

7.2 The way ahead

7.2.1 Icebreaker phase redesign

A key change resulting from the FIE 2003 meeting was a redesign of the ice-breaker phase. The AUT project coordinator’s notes of the meeting included the observation “UU coordinator observed that the Notes

icebreaker had proved a hurdle for weaker UU groups causing loss of momentum – too complex, too serial?” To obviate the Swedish student disgruntlement over the usability of the collaborative application, we have planned a task for teams to complete which requires that a degree of team ice-breaking has been conducted. The task requires that GVTs select a leader (or a self-managed team, if they so choose) using whatever approach best suits them. Thus the task is inherently more open, and less tightly structured and as a goal driven activity affords the students more autonomy. Motivationally this is closer to an intrinsically motivational task and consistent with the views of Ryan and Deci (2000), who propose under the umbrella of self-determination theory “the critical distinction between behaviours that are volitional and accompanied by the experience of freedom and autonomy – those that emanate from one’s sense of the self - and those that are accompanied by the feeling of pressure and control and are not representative of one’s self”. This change in the learning design also addresses the meaning question through matching the level and comprehensibility of the learning task for both student cohorts.

In the redesign of this phase of the trial several student suggestions for improvement from previous trials have been incorporated. One of these came indirectly via the UU coordinator:

“Give groups freedom to choose software, (hopefully more motivating for technically stronger and more vociferous students)”.

This request is being addressed partially by the adoption of the AUT learning management system (LMS) based on Blackboard™, which incorporates several different collaborative technologies (chat, discussion forums, shared whiteboard, email, personal webpage option etc.). Thus the feedback below (cited verbatim) can be supported.

“Create a more direct communication. Like icq. Ok i know there is a time difference.”

“Just by guessing about someone you dont really get to know and judge the person's skills and experience. introductions in my opinions would be better of, by allocating specific time for cross communication via chat feature between groups.”

“More info about each others. Maybe a personal homepage”

Generally, there were a number of suggestions for improving the interface and navigability of the system. The Notes database will be included as a less complex application embedded within the LMS, and will be used to record evaluations, and group decision data such as choice of leader, websites, rankings etc.

7.2.2 Group decision task modifications

In the second phase of the exercise the group decision task has also been modified, with the website topics for ranking now addressing collaborative technologies and

thus being directly of relevance to each of the participating student cohorts, regardless of the different courses they are studying. Student comments have been taken into account.

“Apply more wight to this assement.”

Relevance, level and comprehensibility have been enhanced for the AUT students by increasing the proportion of the assessment to 20% of the course grade. Interestingly this figure echoes the stipulation of 20% grade contribution by Leidner & Jarvenpaa (1998) for participation in their GVT study. AUT students have an alternative assessment option, but the assessment for those who participate in the trial includes the following aspects:

“Consistent and meaningful participation in the trial according to the requirements in the Instructions for the trial.

Identify five key issues that you have experienced during the trial and collect at least five pieces of evidence related to these issues.

Reflective report in which you reflect upon the process of collaboration and the five issues that you identified during the collaborative trial.”

Thus the trial activities and the course work are closely interrelated and their relevance is made explicit. The voluntary participation may also serve to enhance student autonomy. Furthermore this learning design does not impact upon the UU students’ own and separate course of study.

The international dimension of the trial was thought to be a motivator, and there was some AUT student support for that view in the internal and international trials:

“Get more students involeved, spacilay from other countries”

“Second change: I understand that this collaboration trial was carried out internationally with students in Sweeden. Unfortunately there was no interaction with those students, which would be interesting”.

“International projects are always fun and exciting.”

“It is always fun to communicate with people from different parts of the world!”

“I found it to be an enjoyable experience and got a feel for what a virtual global team would be like. Working across differetnt time zone and countries is challenging but can be a valuable asset in today's workplace. Hence I gained cross-cultural and online discussion skills.”

However, achieving this desired value in a way that benefits both sides of an international collaboration can be a challenging task, requiring careful design and some evolutionary trial and error.

8 Conclusion

The challenges of international collaboration across country, time-zone, computing sub-discipline, program and level and cultural barriers can be considerable. However the benefits can be rewarding, summed up in the comments from one student:

“3. What did you gain from the International Collaboration that was of most value ? An awareness of how the commitment of people on both ends is important to make virtual teams work and an example of how language does not translate well solely in text - especially to a country with language and cultural differences.

Also it was interesting to find out a little bit about the Swedish users as well”.

Yet we are still on the frontiers with this model of learning and have much yet to learn about how to design effective and meaningful learning experiences that will motivate students to learn deeply, and become inquiring global citizens.

In this paper we have reviewed aspects of student motivation for learning designs with global virtual teams, and identified specific patterns, which we have observed over the last two years of collaborative trials. These patterns appear consistent with patterns of individual motivation suggested in the literature, but the aspects of group motivation remain far from understood. The authors intend to persevere with this challenging work, and the collaboration planned for this semester will include a third partnering University, this time from the US. This no doubt will bring its own challenges as we move from a dyadic to a triadic configuration. But we think this is important work, as the world globalises and the need for us to better understand one another across cultural boundaries becomes more of an imperative.

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