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Just Tell Me What to Do: Group Dynamics in a Virtual Environment

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ABSTRACT
Any group task set in a tertiary institution brings with it specific challenges. However, when the groups are working in a virtual environment, with a large majority of the work done in an online mode, the challenges are even greater. This situation however, creates a unique opportunity for the lecturer to observe the group interactions and group dynamics first hand. This paper explores students’ reactions to an online learning environment, and in particular it explores the group dynamics of groups studying an undergraduate course at Central Queensland University. In this course, students were compelled to work collaboratively on a project in an online environment. The work contributed significantly to their assessment and final grade for the course. The project used an approach to learning based on case-study and problem-based learning theory, and relied heavily on students to be self-motivated and to develop skill in operating effectively in both group and virtual environments. The students’ experience and reactions were analysed as were the special challenges of group dynamics in a virtual environment. In this paper, the five-step model proposed by Salmon (2000) relating to computer-mediated communication is integrated with the Tuckman (2001) model of group development. One group in particular was studied in depth, taking into consideration the nature of the group’s interactions during the course of the entire term. Key learning outcomes pertaining to online group dynamics are highlighted taking into account the model of teaching and learning online advanced by Salmon (2000).

1. INTRODUCTION
Groups working in a virtual environment are an ever-increasing phenomena both in industry and in tertiary education. Whilst an online mode of study has often been used for external students, it has more recently been a useful addition to classroom-based, traditional teaching methods (Light et al. 2000). This research explores the group dynamics in terms of online groups operating in a tertiary education undergraduate environment. Firstly, literature in the three distinct areas of group dynamics, computer mediated communication and problem-based learning are considered. General applicability of group dynamics theories is considered in terms of the virtual environment. The activities that the virtual groups complete are devised using problem-based learning theory, which needs to be examined in terms of its impact on group interactions and dynamics particularly in the virtual environment. Analysis is then conducted on interactions between group members completing a project in a virtual environment. Findings in relation to this analysis are presented.
2. LITERATURE REVIEW

2.1 Group dynamics

There are an increasing number of researchers looking specifically at group dynamics in a virtual environment (Bell & Kozlowski 2002; Choon-Ling, Bernard & Kwok-Kee 2002; Holton 2001; Potter & Balthazard 2002). Group dynamics literature originated from a number of different disciplines including psychology and management. More recently, the information technology field has also focused on group dynamics particularly in a virtual environment. Bell & Kozlowski (2002 p19) believe that “it is the absence of … proximal, face-to-face interaction between members of virtual teams that makes them virtual and distinguishes them from more traditional teams”. Katzenbach & Smith (1993 p45), define a team as “...a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable.” Group dynamics focuses on the interactions of the members of a group in terms of interpersonal skills and task performance. The model proposed by Tuckman (2001) was originally published in 1965 and has been widely used in the study and analysis of group development and interaction. Tuckman (2001) identifies five stages in group development, each possessing a particular group structure (that is, pattern of interpersonal relationships) and task activity (that is, content of interaction relating to the task). This model suggests that the group moves through the stages of forming, storming, norming, performing and adjourning, all with characteristic and observable behaviours and actions. It is this model which will be considered in relation to student interactions in e-groups, along with a model of teaching and learning used by Salmon (2000) relating specifically to online groups operating in a virtual environment, which is discussed in the next section.

2.2 Computer mediated communication

Over the last ten years, computer mediated communication (CMC) has become a more widely researched area with the advent of the increasing use of the internet and associated technologies. This has impacted not only on delivery of tertiary education in a flexible mode, but also within organisations in general as we begin working in a truly global environment. (Holton 2001). There is an increasing awareness that in this environment, groups face
additional challenges to those that have the ability to interact via other methods of communication. As Holton (2001 p36) argues, “The challenge to team building in a virtual environment is that of creating avenues and opportunities for team members to have the level and depth of dialogue necessary to create a shared future.” Team building is an important step in the process of team development and directly impacts on the dynamics of the group. Even in general terms, the importance of team building can be related back to the forming and storming stages of the Tuckman (2001) model.

Salmon (2000) has put forward a model of teaching and learning in an online environment based on five distinct stages of online learning, characterised by differing needs of students, and differing nature of the interactions encountered.

- **Stage one**, Access and Motivation, relates to ensuring students have access to the system and providing an overview of the process of CMC and reassurance to students of the availability of necessary support structures.
- **Stage two**, Socialization, involves the encouragement of the student to engage in online interactions and allows time for students to become familiar with the use of the technology within a communication process.
- **Stage three**, Information Exchange, sees the learners beginning to engage with information relating to learning outcomes.
- **Stage four**, Knowledge construction, involves the learner becoming more focussed on the content matter, and taking more responsibility for their own learning, including openly collaborating with others.
- **The final stage**, Development, involves reflection on the learning process including identification of process skills developed as well as content knowledge.

### 2.3 Problem-based learning

This research considers the effect of the use of problem-based learning on the group dynamics and output in the virtual environment. Problem-based learning has been utilised in many different subject areas including health sciences, medicine, engineering and in the primary and secondary schooling environment. An early definition of problem-based learning as used in the health sciences according to Barrows and Tamblyn (1979 p1) is “.individualized learning that results from working toward the solution or resolution of a problem”. In this context, problem-based learning has been utilised in many different disciplines, to encourage
the development of higher order thinking in students, and to encourage students to seek out their own avenues of knowledge (Hmelo & Ferrari 1997).

As an alternate view to problem-based learning, Herrington, Oliver & Reeves (2002) refer to authentic activities used in learning environments. The concept is relevant to this research, and relies on similar principles and characteristics of that described as problem-based learning. The characteristics of authentic learning activities have been described as possessing real-world relevance; being ill-defined and hence requiring students to define the tasks and sub-tasks needed to complete the activity; comprising complex tasks to be investigated by students over a sustained period of time; providing opportunity for students to examine the task from different perspectives, using a variety of resources; providing the opportunity for collaboration; providing the opportunity to reflect and finally, can be integrated and applied across different subject areas and lead beyond domain-specific outcomes (Herrington, Oliver & Reeves 2002).

Using the Barrows & Tamblyn (1979) definition of problem-based learning, and the characteristics of an authentic learning environment as proposed by Herrington et al (2002), it can be seen that the task set for students in the undergraduate course being studied provides this approach to learning. Problem-based learning in an authentic learning environment allows for a shift from teacher-centred to student-centred learning activities and provides the students with a unique opportunity to engage in a meaningful way with the content material of the course. In addition, this approach provides an insight for students into process issues such as group formation and development, and group dynamics; a key objective of this particular course.
3. PARTICIPANTS

3.1 Course structure and approach

The course being considered was an advanced level undergraduate subject offered by the Faculty of Business and Law, Central Queensland University. Most of the students were in the final year of their studies when undertaking this course and were expected to have prerequisite knowledge for this course. The course offers assessment entirely online, with 25% of the final grade relating to online tests, each assessing knowledge of the prescribed text. This provided the content knowledge required to form a basis for the online group work, which was a case study of the group’s choosing from a recent edition of a business journal.

The online group work required each group (referred to as an e-group), in the role of consultants to produce a report for an organisation which had either undergone change, was undergoing change, or required change. The first step in the project involved the posting of a personal introduction to the rest of the group to allow for socialisation. Secondly the group was asked to provide a brief of the chosen organisation and their focus for the final report. The third step involved the preparation of an action plan showing how they would distribute the work within the group, and the final part of the project involved the presentation of an online report which was loaded into the learning management system for all students within the course to view. The project was spread over a twelve week period. Each e-group was provided with a private discussion list, which only the group members could access. The second and third parts of the project were posted to the general discussion list once completed, for all students within the course to see. Chat rooms were also provided for use by the discussion groups in situations where the group considered synchronous communication necessary. Wilson & Morrison (1999) have in fact identified that the ability to use real-time computer conferencing such as chat rooms does enhance socialisation within an online group.

All lecturers within the course acted as e-tutors for specific groups. Their role within the group was simply to provide feedback when requested or to steer the group in a different direction, should they appear to be making unsatisfactory progress. The e-tutors were asked to act as facilitators, and not to simply provide answers to students, but to encourage and mentor those within the group to find answers for themselves. After submission, students
were asked on an informal basis to reflect upon their experiences during the course, and the group processes that occurred. They were asked for feedback on both the content and process of the course delivery.

### 3.2 Group formation

The Faculty of Business and Law offers this course across a number of campuses including Brisbane, Gold Coast, Sydney and Melbourne. It is also offered at Rockhampton campus and to those students studying externally (referred to as Flexible mode students). This provided an opportunity to ensure that in all the groups, students were drawn from a cross section of these campuses and modes. This provided an opportunity for students to interact with peers on different campuses and also ensured that the large majority of work was done online rather than in offline splinter groups. The selection for each group was based entirely on ensuring that randomly selected students from each campus were spread evenly between the groups. As it was early in the course, no academic performance indicators were used to ensure groups had a spread of abilities. In addition, there was no indication of other biographical details including age, gender or background/experience used by the Course Coordinator when forming these groups.
4. RESULTS

In order to analyse the interactions within the e-groups, a number of categories were created to describe the nature of the discussion list posting. These categories were:

- Fully task focussed postings (relating only to the course content and the current task)
- Partially task focussed postings, (relating partly to course content but also containing off task or interpersonal content) or
- Off task/interpersonal postings (purely interaction unrelated to the current task or relating specifically to technical rather than content issues)

Table 1 provides the total number of postings during the term to the private discussion list for the group selected. This group was selected as it represented a group receiving a passing grade for the final project, and yet still encountered typical group interactions and issues. In addition, the table provides an indication of the number of these postings during each stage of the project using the classifications described above.

<table>
<thead>
<tr>
<th>Task</th>
<th>Fully</th>
<th>Partially</th>
<th>Off</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project part 1</td>
<td>13</td>
<td>4</td>
<td>15</td>
<td>32</td>
</tr>
<tr>
<td>Project part 2</td>
<td>48</td>
<td>12</td>
<td>36</td>
<td>96</td>
</tr>
<tr>
<td>Project part 3</td>
<td>19</td>
<td>17</td>
<td>37</td>
<td>73</td>
</tr>
<tr>
<td>Project part 4</td>
<td>47</td>
<td>38</td>
<td>36</td>
<td>121</td>
</tr>
<tr>
<td>After project presentation</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>127</strong></td>
<td><strong>71</strong></td>
<td><strong>129</strong></td>
<td><strong>327</strong></td>
</tr>
</tbody>
</table>

From observation of student interactions, it became apparent that whilst there were individual differences, the group generally followed the Tuckman (2001) model of group development, with the group taking some time to socialise and form a cohesive team, prior to focussing on the task at hand. Off-task postings and partially task-focussed postings remained significant throughout the group’s project, which would indicate that even in an online environment, the process of socialisation remains an important part of maintenance of a functional group. The postings fully focussed on completing the task however appear to be more related to the nature of each part of the project rather than general group dynamics. For example, part 2 requires consultation between group members in a relatively short space of time, hence there was a rapid increase in the purely task-related postings during this stage. These results (and
the nature and content of the postings) also show that in the case of this group and the activity, the model of online teaching and learning proposed by Salmon (2000) was applicable. The earlier postings related more to the use of the medium and adapting to the nature of the task. As time elapses, the group becomes more immersed in meaningful interactions and in-depth analysis over the discussion list.

4.1 Sample group composition

The group consisted of eight students at the beginning of the term, and all the students remained in this group through until the end of term. The group was comprised of four domestic students and four international students, with three females and five males in the group. The gender of the students was not immediately evident to all within the group, and this information had to be inferred for some of the participants.

4.2 Modelling Group Dynamics

The forming stage of the group development occurred early in the term, assisted by the deadline for the initial stage of the project, requiring the students to introduce themselves in the virtual environment. This typically involved the students giving their backgrounds, interests, and aims for the course. Introductory postings also prompted responses from other group members starting conversations in relation to backgrounds and expectations for the course. These interactions however, were simply transactional in nature.

The storming phase commenced as the group began to negotiate the roles within the group and responsibilities for achieving outcomes. Two of the group members took a leadership role when it became clear that others were more reticent to begin the activity. Some of the group members became frustrated during this phase as others were not meeting the expectations of the group. This issue came to a climax with those active members of the group calling on the e-tutor for input and assistance as to how to manage the group processes.

At the norming stage of the group’s development, the e-group appeared to move to an understanding of each others role within the group, and through the development of an action plan as part of the project, established individual contributions. Once the group reached the performing stage, their postings became more focussed upon the job at hand and achieving an
outcome. Postings were more content-related than earlier postings, and each team member appeared to be working on their piece of the overall project. This was only marred by one issue of agreed timelines not being met causing others within the group concern about meeting the final overall deadline. The adjourning phase of the group’s development occurred once the final report had been submitted, with the students thanking each other for input, and reflecting on the process they had encountered during the term.

Some of the issues raised by this group were similar to those confronted by any group regardless of the environment in which they are operating. These include; defining of roles, distributing work evenly and ensuring deadlines are met. However, some of the barriers and performance issues related to the impact of a virtual environment on group performance and communication. For this reason, the model provided by Salmon (2000) which relates specifically to teaching and learning in computer-mediated conferencing adds further insight into the functioning and experiences of this group.

### 4.3 CMC Model

Salmon (2000) proposes that the first stage of online teaching and learning is to deal with technological access issues and to ensure that participants are motivated to use the technology to their advantage, rather than being overwhelmed by this new experience. In the situation with this particular e-group, it became obvious early in the interactions that there existed varying levels of expertise with the technology and its use. Some were struggling to use the basic functions of the discussion list and others were keen to enter chat rooms and commence interactions in a synchronous rather than asynchronous way. The e-tutor contributed a large amount at this stage encouraging the students to begin interacting online and set the scene with an introductory posting explaining to them the value of the project they were about to undertake.

During the online socialisation phase, the students commenced their interactions, introducing themselves and their backgrounds (the forming stage). This stage was encouraged by incorporating this step into the assessment requirements. This encouraged the students to engage online and required them to commence using the technology early in the term. At this stage the e-tutor played less of a direct role, however where technology and team issues arose,
the e-tutor stepped in to provide input and guidance where requested. The team was left generally to make decisions without intervention.

Information exchange commenced when the group started working on their project. They began more content-related exchanges (refer Table 1) and started to engage with the material as it related to their final project. They began discussing the issues relating to choice of a suitable topic and sharing information about possible resources for the project – both online and other reference sources.

Knowledge construction within the group occurred once the project had been selected and the action plan for the project had been determined. The group began questioning each other at a deeper level than previously and examining different ways to analyse the data necessary for preparation of the final report. All group members were being actively encouraged to involve themselves in the material and to provide input to the group outputs. The group members at this stage were more reliant upon each other for knowledge, rather than requesting input from the e-tutor. The e-tutor at this stage took less of a direct role and became more of a facilitator.

Finally, at the development stage, the group could be seen reflecting upon the achievements they had made, and its applicability to an environment outside the specific group task assigned to them. The reflection upon the learning outcomes at this stage provided a useful insight into the student’s reactions to this approach to delivery. The most rewarding feedback at this stage however, was that students continued to access the site and discussion lists long after the submission of the final piece of assessment.
5. FINDINGS

A number of conclusions can be drawn from this experience of e-groups operating in a virtual environment.

5.1 Phases of Group development in an online mode

It is apparent that regardless of the environment, many of the developmental issues that occur within face-to-face teams also apply in an online mode of delivery. However, there are also some additional challenges to be faced particularly due to the requirement for the students to communicate more with the written word than the spoken word. The fact that the discussion lists were asynchronous communication however appeared to assist those students with English as a second language, as they were able to reflect on other discussion postings, and to take the necessary time to construct their individual responses. Some groups reported that the discussion list environment assisted the process more than the chat rooms which require immediate reaction. Over the term, it was evident that the students’ ability to communicate via the discussion list in terms of conveying information to other students had improved. In particular, it was noted that by the end of term, they were communicating more frequently and were more willing to discuss and address issues using the online communication tools.

5.2 Stages of the teaching and learning online model

The stages of the online teaching and learning model (Salmon 2000) provide a useful guide to delivery in a virtual environment. It also highlights the importance of structuring the tasks to reflect the different stages of this model, and to address the different needs and foci of students at each of these stages. Therefore, the CMC model is useful to online course developers as well as facilitators.

It is also important to emphasise that ensuring a functional, productive group relies not only upon the available technology, but most importantly upon the ability of those facilitating the learning to ensure that sufficient time and effort is spent upon group socialisation and team building issues. Potter & Balthazard (2002 p18) likewise determined this to be an important issue and emphasised that “interventions are needed to help some virtual teams adopt
constructive interaction styles either before or while they tackle a task.” So, in constructing tasks for online, course developers need to be aware of the stages of group development, and those facilitating need to understand that these stages are important to the overall delivery of an outcome.

5.3 Reactions to a problem based learning approach

In addition to the online experience, the reaction of groups to managing their own problem-based learning appeared to be a confronting yet extremely worthwhile experience. As the reactions of students attests, this proved to be a challenging experience for many, as it was an approach different to that which they had come to expect in the tertiary sector. Some were also asking the e-tutor or other group members “just tell me what to do”. The realisation that this would have to be negotiated within the group was difficult for these team members to assimilate.

5.4 The effect of cultural background on online interactions

It became clear during the term that a number of cultural issues were also impacting on the group interactions. Tan et al (1998) refer to the group phenomenon of majority influence as the likelihood of those with a minority view preferring to agree with the majority even when they know the majority to be incorrect. This issue at its most destructive is often referred to as groupthink.

In previous research, Tan et al (1998 p1267) identified that “people from a culture that emphasises individual rights may see CMC as an opportunity to share opinions frankly and challenge the majority position. Conversely, people from a culture that values cohesion may see CMC as a threat to group cohesion because it allows the majority position to be challenged.” In some of the interactions within the group analysed, it was obvious that those from cultures where individualistic behaviours dominate, approached the task in a different way to those from more collectivist ethnic cultures. Whilst some within the group were openly challenging and offering constructive criticism, it was clear that others were not as comfortable in this mode of operation. Therefore it is important to raise the students’ awareness of issues such as this in order to improve the overall productivity of the group.
Three key conclusions can be drawn from this study relating to group dynamics and computer mediated communication. An understanding of group dynamics and its application to an online environment is essential for all those involved in the facilitation of these groups to allow the stages of group development to occur without unnecessary intervention. In addition, e-tutors need to make allowance for ongoing socialisation within the group and not view this as unnecessary off-task behaviour. It is equally important for course designers in particular to have an understanding of the model of online teaching and learning to ensure learning is structured in such a way to accommodate this teaching medium. Finally, in the case of a course involving problem-based learning, it is important for course designers to ensure that in an online environment, whilst the problems must be challenging, they must also have sufficient structure in terms of timelines and deliverables to ensure that the groups maintain sufficient focus. Online environments using group problem-based activities provide an opportunity for the learners to be central to the learning process. For the e-tutors this may require a shift in thinking; taking the role of a facilitator rather than director and allowing sufficient space for the students to guide their own learning.
References

Barrows, HS & Tamblyn, RM 1979, *Problem-Based Learning in Health Sciences Education*, Atlanta.


