

**Paper for the *Educators and Planners: Symphony or Discord* Conference
AAIR Conference 1 – 3 December 1999**

**TEACHING AND LEARNING:
EDUCATORS EXPERIENCE COLLABORATIVE LEARNING**

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ABSTRACT

Collaborative learning requires some form of interactive communication between people. While one may try to re-create a collaborative learning environment that may occur in a conventional classroom, in a virtual class (via computer technology and telecommunication), the quality of the electronic collaborative learning depends on the quality of the virtual communication interaction and the enabling media richness of the technology used. Electronic Collaborative Learning requires appropriate infrastructural networks to be in place. This has implications for educators wishing to add this strategy to their portfolio of teaching techniques.

The insertion of technology has an impact on the system needed for education, and successful implementation requires support from the institution as the provider of the education system. This paper reflects on some of the authors' electronic collaborative learning experiences and discusses issues that an educator would have to address if they wished to adopt electronic collaborative learning as one of their teaching techniques.

TEACHING AND LEARNING: EDUCATORS EXPERIENCE COLLABORATIVE LEARNING

INTRODUCTION

Collaborative learning requires interactive communication between people. While we may try to re-create the collaborative learning environment that occurs in a conventional classroom, in a virtual class (via computer technology and telecommunication), the quality of the outcome depends on the participants' communication interaction and the enabling media richness of the technology used.

Bruffee, (1984), via Hiltz, (1994) defines collaborative learning as...“ a learning process that emphasises group or cooperative efforts among faculty and students. It stresses active participation and interaction on the part of both students and instructors. Knowledge is viewed as a social construct and therefore the educational process is facilitated by social interaction in an environment that facilitates peer interaction, evaluation and co-operation”.

WHY USE 'ELECTRONIC' COLLABORATIVE LEARNING AS A TEACHING TECHNIQUE?

Hiltz and Turoff (1994, p.474) suggest that with large classes of undergraduates, utilising discussions and seminar style presentations, collaborative learning techniques in a traditional class may be difficult. However, these collaborative learning techniques tend to work very well in a virtual class.

Alternatively, a tutor may choose to use electronic collaborative learning in a large traditional class to limit time involved in assessing individual students (Petrova, 1999), or to prepare students for working in a electronic team environment in the “real world”. During the past five years business and commerce use of electronic forms of communication has grown rapidly. In addition, more and more business organisations are now operating in a global environment. Electronic commerce has also opened the doors for businesses to attract customers nationally and internationally. In today's environment there is an ever increasing emphasis on teamwork, together with the implied need to be an effective communicator and contributor within the team. Assigning students to an electronic collaborative learning experience may assist to prepare students to work in this environment.

FACILITATING COLLABORATIVE LEARNING

Any educator in an existing conventional tertiary education institute, who wishes to use an electronic collaborative learning environment as one of their teaching techniques, does so within the context of existing management structures within their organisation. Before an educator can operate a 'virtual class' (which requires computer technology and telecommunications to enable electronic collaborative learning to take place) in conventional tertiary institutions, some questions may need to be addressed such as:

- a) Will the conventional tertiary education institution need to implement or enhance its infrastructures to enable the operation of a virtual class? If so, how should this be managed?
- b) What is required of an educator to manage the operations of a virtual class?
- c) Is a student's electronic learning experience going to be assessed?.

The implementation of an appropriate infrastructure within a conventional tertiary education institution is a non-trivial exercise. Uys (1999) suggests that such an institution could be viewed as a system that includes the five factors identified in the Management in the 90's (MIT90's) Schema, (Scott Morton

1991) namely strategy, structure, roles and skills, and technology which all impinge on the management processes.

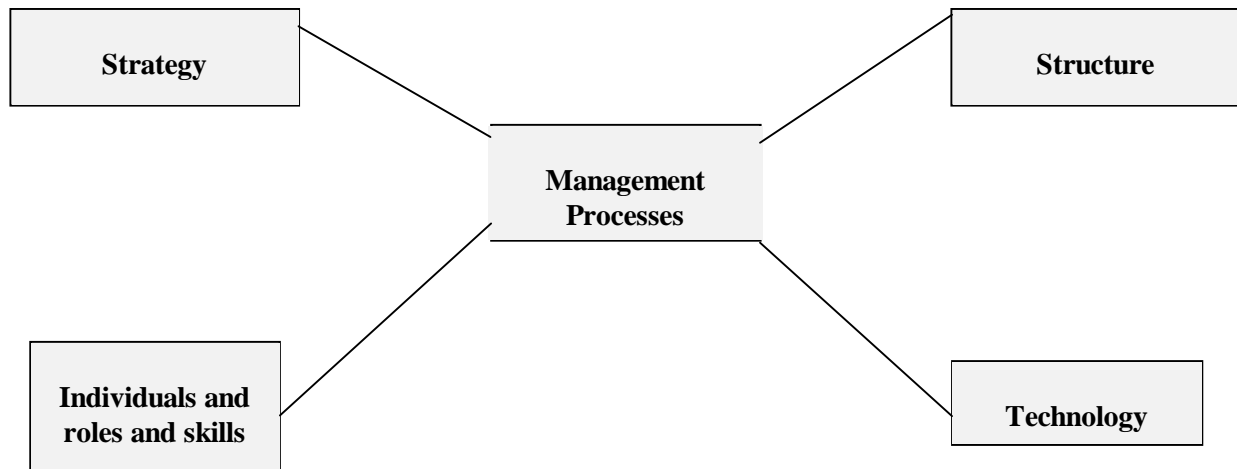
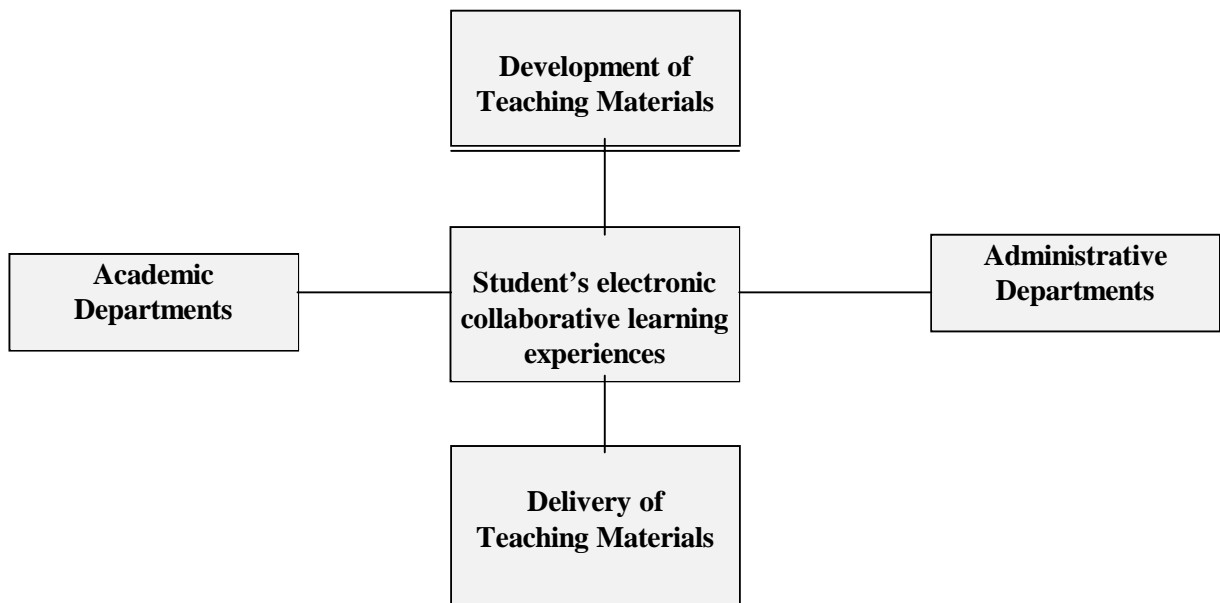


Figure 1 Further adaptation from Uys's(1999) MIT90's Schema - Implementation of an Institutional Infrastructure for a Virtual Class

At a different fractal level, these same issues also could apply to an educator's management of electronic collaborative learning. ie The educator:

- Strategy - has to have effective strategies in place for setting the assessment, monitoring the communication, and evaluating the assessment.
- Structure – requires their Institution to have the required structures in place for them to facilitate electronic collaborative learning.
- Technology –has to understand electronic collaborative learning's impact on the four critical factors of education eg. *learner, teacher, problem, and knowledge* as outlined by Tiffin & Rajasingham's (1995)
- Individuals' roles and skills - requires appropriate skills for their role in an electronic collaborative learning environment.
- Management processes – needs to have appropriate structures in place to manage the electronic collaborative learning environment.

While the adapted MIT90's schema (Figure 1) may be appropriate for addressing question a), figure 2 outlines further modifications to address question b).



**Figure 2 Modified MIT90's Schema –(Uys 1999)
Collaborative Learning in a Virtual Class**

ELECTRONIC COLLABORATIVE LEARNING: FOR CREDIT OR NOT FOR CREDIT

A learners' electronic collaborative learning experience may, or may not, be formally assessed. If collaborative learning is to be accompanied by group assessment, then careful consideration has to be given at the time of the development of the teaching materials as to how the group assessment is to be structured. Comins' et al (1999) paper, *The Development of a Peer Marking System for Group Assignments*, outline an interesting peer marking system for group assignments. They point out that "A problem facing educators who use group assignments is how to allocate marks so that they fairly represent the contribution that each student has made to the group solution." (Comins, 1999 p23) This issue certainly needs to be addressed by an educator if they are contemplating assessment of a student's electronic collaborative learning experience.

TWO CASE STUDIES INVOLVING COLLABORATIVE LEARNING

To determine issues one must address prior to implementing collaborative electronic learning two case studies are analysed. The first case study describes a tutor's experience, and student results when implementing a team assessment for credit with two groups of students studying via alternative methods (distance learning). In this instance students had the facility to meet with each other face-to-face in a community classroom. To communicate with the tutor students had access to electronic communication, (speaker telephone, email, list-serv). Face to face communication with the tutor was limited to two block courses each semester.

The second case study describes the tutor's own experiences (not for credit as such) when participating in an electronic collaborative experience to contribute to the writing of a report. The analysis of both these case studies is a qualitative view from the tutor's perspective.

CASE STUDY 1 – AN ASSESSMENT FOR CREDIT - STUDENTS STUDYING VIA ALTERNATIVE METHODS

During the first semester in 1998 at a block course, undergraduate students were introduced to the concept of a team assessment. The motivation for these students to complete the assessment was that they were going to receive credit for working as a team as well as for their individual contribution. In addition, credit was given for self evaluation by each contributing team member, and self-evaluation of the performance of the team. Headings used in the individual self evaluation section were:: problem solving, inquiry and communication, teamwork, and team leadership. The overall performance of the team was rated on a scale of 1 to 5 from superior down through the scale to unacceptable performance.

Setting the scene - requirements, roles and responsibilities

For the purpose of this assessment the students were divided into two teams - five students in each team. Requirements were to interview an organisation to gather sufficient material, to research relevant information and to write a collaborative team report. Within this assessment team meetings were to be set up. The time-line given for the completion of the team project was five weeks.

Instruction was given on the process of team work and also how to optimise the team effort to obtain synergy. The tutor encouraged the students to discuss their roles in the team and to divide the responsibilities of the tasks equally. The tutor did not appoint the team leader(s), or oversee any activities to socialise team members to each other. This was the second year that these students had been meeting together in the community classroom and an assumption was made that appropriate social “bonds” had already been formed.

Maintenance of Communication and Collaboration between the tutor and the team members

The tutor encouraged the use of a list-server for team discussion, e-mail by individual students, and was also available for telephone contact by the individual students in each team. In addition, for four consecutive weeks a half-hour was allocated to allow the tutor to join each team meeting via speaker telephone. Not all team members used the list-server and it became evident by the second week from some of the individual emails to the tutor that the “Green” team was not coming together on their project. To resolve this an extra speaker telephone meeting with the “Green” team was initiated. Only three of the five members attended this meeting. Questioning by the tutor revealed that no clear leader had been elected, rather the team operated on a consensus basis. There were also difficulties as one of these students had a part-time job, and another student had matters to attend to “outside of the Polytechnic”. In an effort to resolve these difficulties the tutor suggested that the “Green” team split the leadership role among the team members and implement a decision making process that would enable them to complete the assignment.

What went right? What went wrong? And what could the tutor have done better?

The “blue” team worked together well. This group of students attended the community classroom on a regular basis, had regular meetings and discussions, combined, sorted and sifted their research, interacted with the tutor, and produced a good report. On the other hand the “green” team members had different dynamics in their group. Factors such as the part-time work, life outside of the Polytechnic, together with team members' different preferred modes of learning, and team member preference for completing individual assessments hindered the result. Communication difficulties, such as not contacting the tutor or replying to emails from the tutor, not being available for the team meetings and speaker telephone sessions also contributed. Participating in this form of assessment created a great deal of stress for this group of students.

Reflection on the Results

Reflection on these results produced by the two teams enabled the tutor to identify a number of processes that could have been implemented that would have assisted the “green” team to obtain better results. Hansen Holmfied, Lewis and Rugeli (1998), discuss restructuring the tasks, in effect reviewing what had been accomplished, setting new tasks for the next week and agendas to assist with the completion of the tasks to give new impetus and new energy. The tutor could have enabled this process during the weekly speaker telephone meetings. At the outset of the team project it would have been helpful if the tutor had addressed upfront why teamwork can go wrong. Anderson, Brown and Race (1997, p.35) discuss students cope better when they understand the ‘hazards of interpersonal relationships and groupwork’.

Reflection on the Assessment Process

The assessment was evaluated on four results. Individual contribution, process of working in a team, self evaluation and team evaluation. This method of assessment was not successful. Whilst it was possible to assess the individual contribution to each team’s report, it was difficult to assess the process of working as a team. Insufficient use was made of discussion via electronic means for the tutor to have an objective view. A better means of doing this needed to have been implemented. Self evaluation of their individual contribution completed by six of the ten students demonstrated that they had ticked an “median” measure of “3” in the scale of 1 to 5 for all questions. The “Blue” team’s self evaluation of their process indicated that they considered on average they performed “highly” as a team, whilst the “Green” team rated their performance on average “below standard”.

Summary of Case 1

Conducting this collaborative learning team assessment via electronic means was not considered successful by the tutor. The results highlighted a number of assumptions and expectations the tutor had of the students. In particular it was expected that all students would be motivated to contribute and complete the assessment as this was for credit. It also assumed all of the students had a “good” working relationship and in assigning a team assessment the tutor did not fully allow for individual modes of learning.

CASE STUDY 2 – PARTICIPATION BY THE TUTOR IN WRITING A COLLABORATIVE REPORT

An opportunity to participate in an electronic work-group to contribute towards writing a report to be presented at a conference, introduced the second phase of the tutor’s collaborative learning experience. In this phase the tutor was a “student” as it were, as this was a first occurrence. When the proposal was accepted for the conference, it was published on the conference web-site, and colleagues interested in contributing to the report were asked to indicate their interest by posting their resume to the work-group leader(s). In this instance two persons had collaborated on writing the proposal and subsequently were co-leaders of the workshop. The report proposal attracted nine applications. All applications were accepted and participants were from Europe, England, and the Pacific. Motivation for contributing to this electronic collaborative work group was to experience electronic collaborative learning to produce a paper to be published in a referred journal. Guidelines for participating in a work-group, based on past experience, were posted on the conference site. It was expected all team members would read this.

Communication modes used for the electronic collaborative learning were email, and a list-serv. It was anticipated that the time working together at the conference would focus on editing and refining the report prior to presentation and publication.

Setting the scene - Socialisation of the team members

Ten weeks prior to the conference date the list serv was set up and the participants were invited to introduce themselves to “break the ground” socially. Team members e-mail introductions included their academic background, qualifications as well as some aspects of their social activities. A member set up a site on the World Wide Web (WWW), and these introductions were posted to the web-site with links from the Web Site home page for easy reference. The home page included the workshop objective, a link to the workshop proposal, suggested themes to include in the report, and the suggested timetable proposed by the workshop convenors. The web page(s) were updated each week with links to the information received from the members.

Communication and process

Maintenance of the communication was erratic. At times members in this collaborative work group were trying to identify were they teachers, or were they learners on a given theme? The lack of richness in the media used (i.e. text only), made it very difficult for a member to judge whether their individual knowledge put them in a learner or a teacher situation vis a vis the rest of the group. As a result of this only limited information was exchanged. This process was slightly easier when members met face-to-face at the Conference. As noted by Hansen et.al. (1998), meeting face to face added the benefit of “rich” media to communication and assisted in developing sufficient agreement to allow allocation of the tasks to write the paper.

Summary of Case 2

Very little progress on the collaborative writing of the report occurred electronically. Minimal social interaction occurred between work group members on the list server. Some of the group members contributed their experience on the themes relating to the topic. Although Kiesler and colleagues (1985), cited in McGrath and Hollingshead, (1994), saw e-mail as having great potential facilitate collaborative work amongst dispersed people this did not happen in our case.

The authors' experience in the collaborative electronic workgroup was an experiential role. Even though the process did not eventuate as expected, and did not align with the definition of collaborative learning given by Bruffee, at the end of the day, the focus was on completing the task, and the themes in the report were arbitrarily assigned to each member. It didn't matter who was the teacher, or who was the learner, the task was to get the report done. This report ended up as being five individuals each writing on a given theme. By the end of the work group process at Conference a paper had been produced. However, significant further work by an editorial board was required prior to the paper's acceptance for publication.

SELECTED ISSUES FOR EDUCATORS USING ELECTRONIC COLLABORATIVE LEARNING

For most educators, absence of the necessary institutional infrastructures would mean that implementation of electronic collaborative learning would not possible. Thus this paper has assumed that the required infrastructures are in place within the tertiary educational institution, and will consider issues associated with a learners Electronic Collaborative Learning experiences.

Issue 1. Initial Socialisation

- ◆ Significant difficulties may occur if a disparate group of people are forced into electronic collaborative learning.
- ◆ A strategy to aid electronic collaborative learning groups may be to socialise the members with team building activities prior to participating on-line.
- ◆ The “blue” team enjoyed an established social relationship, which appeared to benefit their group communication and assist with the establishment of group consensus and aided decision making.
- ◆ This may not be possible when the group is widely physically dispersed

Issue 2. - Educators Expectations

- ◆ Has what educators expect from electronic collaborative learners been made clear? Comins (1999) suggests that communication can be difficult in a face-to-face situation, and far more difficult in an electronic environment.

Issue 3. - Motivation of Learners

- ◆ Never let the learner feel disconnected from other learners.
- ◆ Educators should make contact with learners who are not contributing, be prepared to praise contributions, and give timely, relevant feedback.
- ◆ Emphasise the importance of the task within the real world and the benefits to the learner of completing the task
- ◆ Ensure tasks apply to the real world
- ◆ Ensure learners have the necessary technology skills

Issue 4 - Functioning as a Team

- ◆ Emphasise the necessity for team skills in industry
- ◆ Provide information for all learners on how to contribute to a team
- ◆ Include initial "practice" team building skills

Issue 5 - Encouraging Learners to Accept Responsibility

- ◆ Share leadership of group among all team members
- ◆ Allow for learners to suggest agenda for the task
- ◆ Use "group" contracts
- ◆ Use "Peer" assessment

Issue 6 - Learners Requirement of Educator

- ◆ Praise in public, and a sensitivity if giving feedback to the group as a whole
- ◆ An awareness of the individuality of each learner
- ◆ An awareness of the differing learner needs in given learning situations
- ◆ An awareness that a learner has a potentially difficult "gap" in their learning
- ◆ An assurance that assumptions have not been made about the learner, that are incorrect
- ◆ An opportunity to communicate learner expectations to the educator
- ◆ An understanding of what learners want/need from each other

CONCLUSIONS

In the course of this paper we have suggested that there is some merit in learners being exposed to collaborative learning as it mimics conditions that they are likely to meet in the work force. We considered Phillip Uys concepts of conventional tertiary institutes as a system. In general we agree with Uys and think that his analysis of management of the implementation of infrastructures and management of operations of a virtual class is a strong one. Through two case studies we show that experiences of electronic collaborative learning may be different, depending on whether it is for credit, or not for credit. We identify a number of issues that an educator would have to address should they wish to adopt electronic collaborative learning as a teaching technique.

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