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Exploring Assessment of on-line Collaboration in Distance Education: An Action Research Study

Laura April McEwen

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Abstract

Exploring Assessment of On-Line Collaboration in
Distance Education: An Action Research Study

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Computer Supported Collaborative Learning (CSCL) environments offer the perfect

opportunity to explore self and peer assessment practices. Through an Action Research

approach, this study explores the use of self and peer assessment within an on-line

learning context. The process took place over a twelve-month period and involved

students registered in the Winter and Fall, 2000 semester sections of the same

undergraduate course. The course, *Technology for Educational Change*, is offered by the

department of Education at Concordia University and is delivered completely at a

distance using FirstClass® software. Findings suggest that learners do require support in

developing collaborative skills for on-line group work. The quality of learners'

collaborative interaction was directly related to the quality of products produced by

groups. Results also indicate the need for educators to find ways to support the

development of learners' evaluative skills. In conclusion, recommendations for the

orchestration of self and peer assessment practices to meet these instructional goals are

offered.

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OVERVIEW

This project began as an exploration of computer supported collaborative learning (CSCL), driven by personal curiosity and supported by timely opportunity. Included here is an account of the first 3 cycles in what Mills (2000) refers to as The Dialectic Action Research Spiral, investigating assessment practices used to evaluate collaborative group work. It has been and continues to be the richest learning experience of my academic career.

What could initially be conceptualized, as a panoramic survey of a unique learning context, or what Mills (2000) so appropriately labels Reconnaissance has, with every turn of the research spiral become a more narrowly focused inquiry. This process has led to a holistic understanding of the intricately interwoven character of assessment within a constructivist learning environment.

This document will in some ways mirror the process engaged in during action research. Chapter 1 describes the purpose of the study, and discusses personal biases I bring to this research effort through a discussion of the various roles I adopted throughout this project. Readers are then provided with a context for understanding why I selected this area of focus through a rich description of my Reconnaissance activities prior to initiating the study.

Chapter 2 discusses the Action Research Paradigm, describing the participatory action research model and my justification for selecting this research paradigm. It includes a description of the action research process as well as a discussion of issues of validity and ethics in qualitative research

Chapter 3 introduces the fundamental principles of constructivism along with the roles of collaborative learning and assessment practices within this pedagogical framework. The potential role of self and peer assessment within this learning context is presented. Finally, a new model for the calculation of individual grades for computer supported collaborative group work is introduced.

Chapter 4 describes the first cycle of this action research study. A description of the development and pilot of a tool to assess collaborative process is provided within the context of the four phases of action research: (a) planning, (b) action, (c) observation/data collection and d reflection.

Chapter 5 presents the second cycle of research. This involved the implementation of the CSCL process assessment tool by the teaching assistant. Learners were also provided with the assessment criteria and operational definition at the end of the cycle.

Chapter 6 presents the third and final cycle of this action research study. The use of the CSCL process assessment tool was extended to learners to support self and peer assessments.

Chapter 7 proposes an Assessment for Learning Model and an integrated approach to assessment emerging from this action research study. Practical considerations are presented, followed by ethical issues related to researching one's practice.

CHAPTER 1

Introduction

The Purpose of the Study

The purpose of this study is to describe the effects of including the assessment of process in the calculation of individual grades for collaborative group work. Although the multidimensional nature of these effects was not fully appreciated by the researcher at the outset, this undeniable reality evolved over time. As with all research, each successive instructional intervention raised more questions than it answered. These new questions served to fuel the next action research cycle.

This study began as an experiential exploration of computer supported collaborative learning (CSCL). As a graduate student in the Educational Technology program at Concordia University, I was provided with the opportunity to design, develop and monitor the on-line component of an undergraduate course offered completely at a distance by the department of education. As the teaching assistant for *Technology for Educational Change*, I would adopt three different yet overlapping roles of learner/researcher, educational technologist and educator.

As a learner nearing the end of my course requirements for graduate studies I was interested in the possibility of conducting thesis research in this learning context. As educational technologist my responsibilities included a review of the content for the course, design on-line activities to be undertaken by learners in the FirstClass® environment and create the virtual environment. As educator my responsibilities included the facilitation of on-line activity of learners and the evaluation of their on-line performance. The combination of these three different yet overlapping roles and the

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related responsibilities each entailed, fit easily into a Participatory Action Research Paradigm.

Personal Biases

At this point I feel it is important to discuss the personal biases I brought to this research effort as they contribute significantly to the process of my identifying an area of focus for this study. They are best understood in the context of the various roles my academic career enveloped, learner, educational technologist and educator.

Learner's perspective

My undergraduate studies were in the related disciplines of psychology and sociology. I began my post secondary education as a mature student and understood very quickly just how competitive the scholastic arena was due to the very limited opportunities for graduate studies. Learning for me was a very private activity. Research papers were my preferred form of assessment as I felt this activity fostered meaningful learning for me as I could assert a high degree of learner control by focusing on content of personal interest.

When I began my graduate studies in educational technology my experience with collaborative learning strategies was extremely limited. Our graduate program required extensive collaborative group work. As a learner I had often experienced great frustration when working in this type of learning context. One major source of this frustration was the inequity of individual contribution to the group production process and how commonly used assessment practices failed to reflect these disproportionate contributions by awarding the same grade to all group members. I found this assessment practice had a negative impact on my ability to establish and maintain intrinsic motivation.

Educational Technologist's perspective

As an educational technologist I recognized the educational value of collaborative learning strategies as a method for promoting the development of important team work skills as well as providing learners with the opportunity to compare and contrast their personal understanding with others. However, I struggled with the issue of individual accountability to a group and the potentially damaging impact on learners ability to maintain motivation in situations where unequal contribution occurred.

Another concern of mine was the reality that many learners like myself might have limited experience with collaborative learning strategies. I wondered what features of a learning environment could promote the development of such skills. Ideally learners would have to be introduced to the learning strategy, offered opportunities to implement it and somehow be provided feedback to inform their future performance. I saw the assessment of collaborative processes as a potential mechanism for achieving these instructional goals.

Educator's perspective

As an educator I recognized that not all individuals within a collaborative group contribute equally to the production of a group product. Often all members of a collaborative group receive the same group product grade with little or no reference to the amount of individual investment in the group product. I felt it was important to acknowledge this inequity in individual contribution and reflect it in learners' individual grades for group product for two related reasons, (a) to safe guard the motivational levels of highly productive group members and (b) to increase the accountability of all learners.

<center>Context</center>

What follows is an account of the experience that ultimately came to shape the purpose of this study. Ironically, the instructional design process closely mirrors the methodology of action research in that it is a cyclical process ideally recursive in nature. In Action Research the initial task of the investigator is to immerse themselves in the field of action in order to identify an area of focus and develop a plan of action. An implementation stage then follows during which an intervention is implemented and data is collected. The data is then analyzed and interpreted, which serves to inform future action. In comparison, the educational technologist conducts an analysis of content, and then designs and develops instruction. At this stage the instruction is delivered and hopefully followed by an evaluation that served to inform the educational technologist regarding possible improvements to the deliverable. Given the nature of my involvement as educational technologist and on-line course facilitator the recursive cyclical nature of instructional design is exemplified in the description of the process that follows. This project was undertaken in the Fall of 1999 with the implementation phase beginning in January 2000.

<center>Instructional Design of *Technology for Educational Change*</center>

Background

Technology for Educational Change (EDUC 305DE) is an undergraduate course offered at a distance by the department of Education at Concordia University through FirstClass®. This course is intended for pre-service teachers, and other interested students from the Faculty of Arts and Science, as an introduction to the possibilities afforded them through the integration of technology into the classroom. Traditionally the

on-line component of the course was a minor aspect of the course requirement and assessed strictly on the basis of learner participation. The criteria required learners to post one message to the FirstClass© course conference and respond to two others posted there. The quality of individual contributions was not considered.

Literature review

A review of the literature on computer mediated communication (CMC) served to underline the weaknesses in the instructional design of the on-line component of the course, specifically within a distance education context. The literature served to inform the design process.

Distance Education

In Socrates' day education was a personalized two-way communication between tutor and student (Sewart, 1993). For many years education remained the domain of the wealthy as they were the only ones who could afford this type of individualized instruction (Sewart, 1993). As sociologically egalitarian ideals began to permeate the developed world, industrialized approaches to education were seen as the means by which society could economically educate the masses (Garrison, 1997). This changing sociological climate was fertile ground for the development of distance education. This industrialized mode of education met important political criteria; cost-effective accessibility (Garrison, 1997). This dominant world-view of distance education with its emphasis on rationalization, division of labor and mass production persisted until the end of the 1980s (Garrison, 1997). Garrison (1997) describes the industrial approach to distance education as *prescriptive, objectified and depersonalized* and characterizes it as "the loss of a personal relationship between teacher and student". Within the dominant,

industrialized paradigm the educational materials were the primary source of information (Keegan, 1993). This one way flow of communication from institution to learner undoubtedly resulted in passive learning (Keegan 1993).

With the advent of two-way communication technologies, the quality aspect of distance education which could not have been considered previously began to surface (Keegan, 1993). This emerging paradigm of Distance education highlights the importance of collaborative learning through two-way communication between teachers and students (Keegan, 1993). As Garrison (1997) states,

> Computer conferencing represents the next technological step in
> collaborative learning at a distance and solidifies the emergence of the
> post-industrial era (p.7).

Garrison (1997) goes on to remark that the mass produced self-instructional course packages of the industrial era are not compatible with the collaborative constructivist approaches to learning that dominate present day educational theory. Obviously, distance educators must rethink their instructional strategies in order to incorporate the interactional component of CMC that offers the potential to foster this type of learning. Garrison (1997) suggests that CMC is the *flagship* of the post-industrial era of distance education which will make the incorporation of both personalized and collaborative learning activities possible at a distance.

CMC is a specific type of human interaction which enables individuals to exchange knowledge, thoughts and feelings via technology. However communication within a virtual environment poses a challenge for participants for a variety of reasons. Perhaps the most formidable task of communicating in this setting is the mastery of the

distinct form of communication that this environment demands. In effect communication in the virtual realm requires the blending of skills of reading and interpretation, writing and speech to produce a new form of human interaction. This hybrid form of communication offers educators an exciting new means of fostering learning. As with any medium of communication, effective instructional design and implementation is the key to successful learning outcomes.

Characteristics of the Medium

DeSanctis and Monge (1998) define the following six different areas of research relevant to the understanding of CMC, (a) Communication volume and efficiency (b) Message understanding, (c) Virtual tasks, (d) Lateral communication, (e) Norms of technology use and (f) Evolutionary effects. Although much of the literature reviewed by them was based on Virtual Organization research, their findings could well inform educational uses of this medium.

With respect to *Communication volume and communication efficiency*, research findings suggest that the amount of interaction increases in a CMC environment, when compared with face to face interaction, but that efficiency of communication tends to decrease (DeSanctis & Monge 1998). The implications of these findings are many fold for applications in educational environments. Where a professor was required to lecture a certain number of times a week for a set number of hours and grade a predetermined number of assignments, it has been reported that facilitating a course on-line requires as much as one and a half times that investment (Misanchuk 1997). No doubt a considerable amount of this extra time is spent reviewing postings by students who feel the need to write more and pose more questions because of the personalized, collaborative

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environment that CMC promotes (Garrison 1997). This aspect of CMC is amplified

further in a distance education application. Where once the main source of information

was print based material, the inclusion of an intercommunication component in distance

education means that new student support structures must be created (Keegan, 1993). As

well, the issue of the number of students an educator can realistically be expected to

handle is of great relevance. Bates (1997) reports that:

> Teachers who are comfortable managing 20 campus-based students find
>
> they cannot cope when this is expanded to another 50 distance
>
> learners.(p.99)

Efficiency on the other hand, is greatly dependent upon the type of tasks and how it is

structured and integrated into the course. Some activities, such as problem solving and

task completion might be less well suited to CMC (DeSanctis and Monge 1998). This

might be an effect of what Hiltz (1994) refers to as a *rolling present*. It stands to reason

that activities requiring collaboration and consensus would take longer in the virtual

environment since not all participants may be on-line at any given time. Educators must

consider the strengths and weaknesses of the medium when designing tasks for on-line

implementation. For example, learners could be supported in task completion by

providing structured collaborative learning activities. Another consideration for distance

educational applications is the restriction on the previously flexible autonomous character

of this type of study (Bates, 1997). Where once students could complete study modules at

a personally comfortable pace, applications that include a CMC component require that

groups of students move through material at a more structured synchronized rate so that

the collaborative environment can be constructed.

The second area of research reviewed by DeSanctis and Monge (1998) is *message understanding*. Here the conspicuous absence of context formed through visual cues is a factor of consideration. Research findings suggest that success of communication relies heavily on the establishment of a mutual knowledge base (DeSanctis & Monge1, 1998). Again, this aspect of CMC seems to be task specific. Where establishing meaning and the management of feedback are concerned, the virtual environment is thought to be lacking (DeSanctis & Monge, 1998). In this respect the importance of community building in the virtual environment is paramount. A friendly, social tone, which promotes group cohesiveness through participant introductions, can help establish common vocabulary and a point of reference for all concerned (Berge 1995). One great advantage of this medium is that through the removal of visual cues, objective evaluation is possible (DeSanctis & Monge, 1998). Stereotypes and personal prejudice are to some extent reduced in the absence of visual cues. In an educational environment this could be extremely advantageous, especially in distance education applications where geographical dispersion could bring people of many different ethnic and cultural backgrounds together (Dede, 1996). Within such a context, participants' contributions could be judged solely on the basis of content quality, lessening the impact of evaluator's personal biases.

Not surprisingly, virtual task research is intricately intertwined with research in the area of communication efficiency in a CMC environment. The importance of establishing context is again underlined. Findings suggest that tasks requiring divergent thinking are considered optimal for this medium (DeSanctis & Monge, 1998). Knowledge sharing and elicitation have been found to be particularly well suited to CMC (DeSanctis & Monge,

1998). Obviously, the ideals associated with collaborative learning are well represented in the characteristics of tasks that are optimally suited to the CMC environment. Hiltz (1994) points out:

> Collaborative learning means that both teacher and learner are active participants in the learning process; knowledge is not something that is "delivered" to students, but rather something that emerges from active dialogue among those who seek to understand and apply concepts and techniques.(p.23).

This enlightened approach to learning could not previously be accomplished in a distance education context because of the one-way communication that characterized this mode of education but CMC now makes this type of knowledge building /acquisition possible (Garrison, 1997).

Some of the most encouraging literature is in the area of *Lateral Communication*. Broad participation across social groups and less domination by high-status members are characteristic of the CMC environment (DeSanctis & Monge, 1998). Boundaries within a CMC setting appear to be less well defined. The implications for educational applications of CMC are great in this respect. The role of the educator is changed dramatically when compared to conventional educational practices. Where in the conventional educational environment the educator is considered the source of knowledge and in distance education the print material fulfilled this criterion, in the collaborative learning environment of CMC the influence of social constructivism dominates (Garrison 1997). Within such a context, the establishment of a comfortable social environment is the focus, where critical discourse is valued as the goal. Both students and educators are

responsible for developing theories and ideas that challenge pre-existing doctrine (Garrison 1997). This aspect of CMC marks a distinct shift from the dominant paradigm of distance education where the instructional material was the primary source of information towards an emergent philosophical perspective where knowledge is constructed through discourse (Keegan 1993).

As with speech and the written word, styles of technology use are individual. Research in the area of *Norms of Technology Use* suggests that participants would be well served to establish procedures for the reconciliation of differences in communication styles and practices (DeSanctis & Monge, 1998). This consideration is again amplified in a distance education context where participants can be distributed over larger geographical areas and cultural differences could become an issue (Dede, 1996). The responsibility for easing this burden of CMC becomes the domain of the facilitator. Through proper encouragement, the facilitator can help to build group identity and foster cohesion that will serve to ease this challenging aspect of CMC interaction (Berge & Collins, 1995). One method of dealing with this reality of the medium is for facilitators to establish a positive tone for the conference by having students introduce themselves electronically at the beginning of the course (Berge & Collins, 1995). Through this activity students are offered the opportunity to form impressions of their cohorts based on material other than that required of their academic pursuits. Pairing students off early, and later combining these dyads also allows more intimacy to develop between individuals (Berge & Collins, 1995).

Role of the Facilitator

The role of the educator in a virtual environment is changed significantly from that in a conventional classroom (Hiltz 1994). This is due to a shift from an authoritative figure in conventional educational environments to a facilitative role in the virtual realm (Garrison, 1997). Research findings in the area of lateral communication are of relevance in this respect. It should be recognized that the change in role in no way diminishes the importance of it.

The transformation of the educators' role is accompanied by changes in functionality for the individual facilitating CMC activity. Garrison (1997) identifies the three main functions of a facilitator as, *contextualizing, monitoring, and meta-communicating*. These functions are perhaps best conceptualized as categories of responsibility encompassing a range of facilitative activities.

According to Garrison (1997), *contextualizing* for CMC applications requires that the facilitator provide learners with a foundation for understanding the collaborative communication model that dominates the medium. In a distance educational context the importance of students being familiarized with this new approach is paramount, as a certain amount of learner autonomy must be sacrificed in order for it to be accomplished. Creating a comfortable social environment where individuals feel free to participate is the ultimate goal of this function. Responsibility for maintaining discussion focus also falls into this category (Garrison 1997).

In terms of *monitoring*, the facilitators function is to ensure equal access for all participants and the recognition and solicitation of participation of those who hesitate to contribute (Garrison 1997). Ensuring equal access entails not allowing any individual to

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dominate the discussion as this may diminish enthusiasm for the collaborative learning experience of the group as a whole (Misanchuk 1997). At the other end of the spectrum, Hiltz (1994) identifies a group of participants that she refers to as *lurkers* or *read only* participants. In her opinion, two variables influence levels of participation in CMC, one being the level of comfort with the medium and the second related to the cognitive maturity of the learners (Hiltz 1994). Of course a range of learner participation patterns fall between these two extremes (Hiltz 1994). As quoted in Hiltz (1994),

> Anthropologist Kendy Ruby summed up her observations of the
> interaction of the medium with student characteristic as follows: Students
> are like themselves, only more so, when online the chatty ones write long
> responses, the worriers modify their messages, and the dutiful ones do
> what is required reliably but without brilliance, and the irresponsible ones
> are conspicuous by their absence.(p.108)

Irrespective of the situation within the conference in respect to levels of participation, it is the responsibility of the facilitator to augment or adjust interaction through various techniques. This can mean confidentially suggesting that participation be limited by certain individuals, to facilitation through public encouragement and rewarding contributions by less active members (Misanchuk 1997). It should be acknowledged that Hiltz (1994) found that even active pressure by a facilitator did not change learners' participation patterns significantly.

Practical Application

Most educators suggest building CMC skills gradually (Berge & Collins 1995; Hiltz 1994; Misancuk 1997). In this way participants are afforded the opportunity to

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familiarize themselves with the technology and acquire the skill set which will enable

them to communicate effectively through the medium. Hiltz (1994) suggests personally

welcoming students to the environment with an initiating activity, such as having them

post a personal biography to a special conference area for their cohorts to read. Hiltz

(1994), acknowledges this as being advantageous for two reasons:(a) to promote cohesion

and context in the group and (b) to offer the facilitator a means to ensure everyone has

connected successfully. Misanchuk (1997) suggests setting up a series of on-line

exercises of gradually increasing complexity. The use of metaphors can also help orient

learners within the CMC environment and contextualize the atmosphere for them by

signifying appropriate decorum (Harasim 1996). Misanchuk (1997) also suggests that

students be paired up and interview each other through personal messages thus building

skills and developing cohesiveness simultaneously. Dyadic partnering of learners or the

placement of learners in small groups for informal electronic exchange is suggested by

some researchers as a way of building proficiency with the medium (Berge &

Collins,1995). Harasim (1996) points out that *Learning Partnerships* also allow students

to communicate their unfamiliarity with the medium and share their feelings. All of these

activities serve to engage participants and allow facilitators to diagnose difficulties in a

timely fashion.

Creating the Instructional Setting

The nature of this project was to redesign the on-line component of *Technology for*

Educational Change guided by current research findings. The project entailed the

following seven phases: (a) content analysis, (b) the design of on-line activities, (c) the

development of the virtual environment and on-line activities, (d) the implementation and

facilitation of the first three on-line activities (e) a formative evaluation phase, (f) the design, development and implementation of a fourth on-line activity and finally (g) a summative evaluation. A rich description of each phase follows.

The Content Analysis Phase

During the content analysis phase the complete course package used in previous years was reviewed. This task involved reading the assigned textbook and study guide and viewing the course video. I also met with the course instructor to discuss course content, assignment schedules and assessment criteria.

Two areas of weakness in the course design were identified. The first being the lack of development of group cohesion early in the course and the second being the related content issues of *the changing roles of the teacher and students in collaborative learning contexts* and *integrating computers into the classroom*. I suggested the need for structured on-line activities, which would fill the instructional gaps in the course design. The inclusion of four structured on-line activities, an implementation time-line and assessment criteria were proposed. The course instructor approved the proposal, marking the beginning of the design phase.

Design Phase

A constructivist approach to instructional design served as the pedagogical framework for this design project. In keeping with this theoretical perspective peer interaction was highlighted and the TA's role within the virtual environment was defined as facilitative.

Two introductory exercises and one on-line activity were designed for implementation during the first five weeks of the January 2000 semester. In accordance

with recommendations from practitioners/researchers in the field, tasks of gradually increasing complexity were designed to afford learners the opportunity to familiarize themselves with the environment and acquire the skill set that would enable them to communicate effectively through the medium (Berge & Collins 1995;Hiltz 1994; Misanchuk 1997). As recommended in the literature, once basic skills had been mastered, and on-line interaction established, remaining assignments were well-structured, clearly defined, group efforts (Berge 1995). In this way learners would be challenged with various types of activities that promote learning subject matter as well as the software capabilities (Harasim 1996). A brief description of the three activities follows.

<u>Log-in activity</u> This activity was designed to welcome students to the class conference and allow for their assignment to groups. For this initial log-in and introduction task learners were required to post a message to the folder labeled *Welcome* in the class conference area. In this message they were asked to introduce themselves generally to the class. Assessment for this exercise was based strictly on participation.

<u>Structured Interview Assignment</u>: This activity familiarized students with software functionality and served to build cohesion within groups. Learners were required to conduct a structured interview with a group member, post a copy of the chat to their group and summarize the information gathered about their partner during the interview and post it to their assigned group folder. Assessment for this exercise was based strictly on participation.

<u>On-line Activity #1</u>: This activity was designed to introduce students to the constructivist theoretical perspective by requiring them to build on individual experiential knowledge of directed instructional approaches to learning and collectively convert one of the

group's individual contributions to a constructivist learning activity. Learners had two weeks to complete this assignment. Assessment was based on criteria and the assignment was worth 15% of learners' final grade. A breakdown is provided in the section *Formative Evaluation of On-line Activity #1* below.

Development Phase

A virtual environment was created in the FirstClass® course conference *EDUC_305_DE*. Four areas were created within the class conference, the *WELCOME* folder, *Administration* area, *GROUPS*, and a private area restricted for learners' use only.

The log-in activity and Structured Interview assignment were modeled after a method described by Hiltz (1994). Instructions for the log-in activity opened automatically when students entered the general class conference area. The Structured Interview assignment was posted in the individual group forums located within the GROUP folder.

The On-line Activity #1 was created based on Brown, Collins and Duguid (1989) theory of situated cognition. The activity required individual students to recount a personal experience of directed instruction to their group members. Of these, one experience was chosen by the group to be re-designed in a constructivist framework. The instructions for this activity were posted to the general class conference area as students were expected to be familiar with their virtual learning environment by this time.

Implementation Phase

The FirstClass® course conference environment was created the 2nd of January 2000. Learners were given access to the area as of the 3rd of January 2000. A pop-up message greeted students and directed them to the *WELCOME* folder where they were required to

post a short message introducing themselves. Jennifer responded to each student

individually and randomly assigned him or her to a forum group located inside the

GROUPS folder. Due to the nature of the environment and the distance education context

students were given two weeks to perform this task.

During the second week of the semester the *Structured Interview* assignment was

posted in the general *GROUPS* message area. This activity was to be completed by the

end of the third week of the semester. At the beginning of week four the first on-line

activity was posted. This activity had three components: (a) individual contribution, (b)

group collaboration and (c) self and peer evaluation.

The teaching assistant read every FirstClass® message from every student over the

course of a five-week period. Intervention was restricted to allow students to develop

strong group interaction. Only in instances where advice was sought, conflict arose or

lack of participation was evident did the facilitator intervene. Feedback and assessment

was provided within a week of the assignment deadline. Grades were posted in the

ADMIN folder and individual feedback was sent to each student's private mailbox. A six-

week break in on-line activity followed.

Formative Evaluation of On-line Activity #1

Although the first on-line activity was effective in promoting collaborative group

activity, it was evident that some individuals contributed far more to the group product

than others. The self and peer evaluation component had been incorporated as an attempt

to promote individual accountability. However, given the break down of the grade for the

activity, individual component 5%, group product 7%, self and peer evaluation 3% it was

evident that some individuals' grades were not representative of their contribution.

Assessment did present a challenge in this context even with a percentage of the grade derived from self and peer assessment.

The individual component was found to be an effective diagnostic tool for the teaching assistant, as students were required to describe a personal example of directed instruction. This allowed the teaching assistant to provide productive feedback to those individuals who had confused directed instructional approaches with constructivist ones.

The collaborative component was successful in demonstrating to learners some of the major issues they confront in a collaborative context such as consensus building, differing standards of excellence and negotiation of division of responsibility within the groups. More importantly it served to stimulate discussion of the various concepts within the group forums.

Another important observation from the first on-line activity was the tendency in groups of more than six members for the contribution of individuals to vary significantly. Active participants tended to be higher achieving individuals (based on grades for the first on-line activity and an individually completed short paper assignment). In an attempt to stimulate activity of lower achieving individuals, groups of more than six participants were split according to achievement on the above mentioned criteria. This was done in four cases of eight member groups, which resulted in the creation of four high and four low achieving groups.

This design decision was supported by research findings that suggest that capable learners do tend to dominate in situations where a group assignment is the goal (Ross, Crane & Robertson, 1995). Considering the instructional context, literature suggesting that the peers in collaborative learning contexts sometimes marginalize learners with

lower task-relevant skills was thought to be of particular relevance (Ross, et al.). Under

such circumstances the lower ability learners, feeling their contribution unworthy often

demonstrate a degree of passivity (Ross, et al., 1995). As stated above, it was hoped that

dividing the groups might stimulate the participation of these more passive individuals.

Design, Development and Implementation of Activity #2

In light of the six-week break in on-line activity between the end of activity #1 and

the beginning of the activity #2, this time was used to conduct the formative evaluation of

the first on-line activity to inform the design of the second. As a result the structure of the

second activity included a debate component 5%, group product component 5% and the

self and peer evaluation 5%. Learners were again given two weeks to complete the

assignment.

As this activity was the last assignment for the course many facets of the course

material were incorporated. Learners were asked to debate the pros and cons of computer

use in the classroom. They were then required to design a classroom activity that

incorporated the use of computers. They were asked to define the role of the teacher,

indicate the educational level of the students and describe the implementation as well as

how it would be assessed. Learners were asked to evaluate their peers based on individual

contribution and their contribution to the co-construction of knowledge within the group

and assign each a rating out of 5. They were also required to provide examples for each

individual they evaluated. Finally they were asked to write a 200 word reflection on what

they felt they had learned from the activity and what they would do differently in the

future.

Again the teaching assistant's role was defined as one of facilitation. It was anticipated that the lower achieving groups might require more guidance.

<u>Summative Evaluation</u>

The log-in exercise was effective. Group assignment went smoothly and the teaching assistant was easily able to track the number of students on-line. The Structured Interview assignment stimulated activity in the forums and helped groups develop cohesion early. The on-line activity #1 was assessed in the formative evaluation above and served to inform the design of the second activity reported below.

During the implementation of the second on-line activity four important design issues surfaced. First the impact of group size in collaborative work, specifically its effect on lower achieving students in the pervious activity. The second involved the negative impact of long breaks in once on-line activity has been established. Another issue that arose was the timing of the final assignment. Finally, a most important issue of equity of assessment practices in collaborative work contexts became a serious concern.

In terms of group size and its effect on participation levels of individuals, the observed effect of splitting large groups and doing so according to levels of achievement was effective in promoting greater levels of participation from individuals who posted little during the first on-line activity. As well many student reflections underlined their increased enjoyment of collaboration and often attributed it to smaller group size. Although all groups completed the second on-line activity some experienced difficulty engaging group members early on. This problem might well have been the result of the long break between activities. Even groups who performed extremely well during the first five weeks of the course seemed slow to start their assignments and demonstrated

difficulty in organizing themselves. This could well be an expression of *Evolutionary Effects* observed within the medium of CMC. Evolutionary effects refer to the development of communication patterns, impressions of others and the formation of impression management techniques, as well as degrees and types of communication (DeSanctis & Monge, 1998). In an educational context the effects would be directly related to the duration and intensity of participation. In circumstances where short timelines or geographical distances do not afford the chance for students to develop substantial relationships or that this development is interrupted, communication could be expected to pose more of a challenge.

Along similar lines of consideration was the timing of the assignment. Many students reflected that the end of the semester was a hectic time for everyone and finding the time to productively contribute to the collaborative on-line assignment was a challenge.

With regard to assessment, it has been hoped that by raising the value of the self and peer evaluations from 3% in the first on-line activity to 5% in the second that individual grades would be more representative of individual contributions. Although this did help to some extent, this issue still remains a concern. Two interesting patterns emerged in the self and peer assessment data, (a) peer assessment scores given by students who contributed the most in the on-line activity tended to better reflect their peers' level of contribution, and (b) individuals who contributed the least to the on-line activity often gave full scores to all members of the group regardless of individual differences in level of contribution. As a result, in some cases self and peer assessment scores were adjusted by the teaching assistant. The incorporation of student reflections did help provide a

context for a more equitable grading of assignments by the teaching assistant but the area

of assessment does require further research.

CHAPTER 2

Methodology

Action Research

What is Action Research?

Action Research is the study of the effects of practical interventions on dynamic social systems by individuals situated within the dynamic social system itself. It is a process of systematic inquiry into the impact of practices, the understanding of the practices and the situations that are shaped by them (Car & Kemmis; 1986; Mills, 2000; Zuber-Skerritt, 1992). Action research differs epistemologically from positivistic and interpretive approaches in that it combines characteristics of each. The positivistic tradition is based on the notion of prediction, within a context of controlled intervention, informed by previously established scientific law. Alternatively, the focus of the interpretive approach is illuminating understandings based on the practical judgements of situation in retrospect. Action research combines controlled intervention and practical judgement and situates them within a spiral of action with the critical aim being systematic improvement.

The essence of the action research paradigm can be traced back to classical social theory and associated with philosophers such as Marx who promoted the conceptualization of change as a dynamic process simultaneously involving the individual and the circumstances within which that individual was situated (Car & Kemmis, 1986). Within this context, the duality of subject and object is underlined, one can not hope to understand one outside the context of the other. Action research brings together these aspects of critical theory with a practical orientation. It challenges us to

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acknowledge and account for the impact of the researcher on the research context. The postmodern worldview expressed through critical theory challenges us to question the idea of Truth based on scientific methods, claiming that fundamentally all truth is relative, conditional and situation bound (Wilson,1997).

The action research paradigm honors the socially constructed, historically embedded nature of theory and practice and individual and society. The action researcher is conceptualized as an agent of change, recognizing that objective and subjective constraints exist and striving to understand how the interplay between them impacts the social system. This dialectical view of rationality is a central notion in action research. It is through this dialectical process that action researchers interrelate theory and practice, individuals and social systems and retrospective understanding and prospective action.

Over the years various schools of educational action researcher have developed in America, the United Kingdom and Australia. These different schools have focused on a range of issues from curriculum reform to professional development. However the central notion of improvements in educational practices within each of these schools has remained constant (Mills, 2000).

As the focus of this study was the development and implementation of a new form of assessment, specifically the assessment of collaborative process in an on-line learning environment the action research paradigm seemed particularly appropriate. This instructional intervention required the development of an alternative conceptualization of assessment, an integrated model designed to provide learners with (a) a means to attain more equitable assessment in a group work context and (b) information they could use to improve their future performance. The implications of this type of instructional

intervention could be expected to reverberate across the entire learning context. The action research paradigm offered a means of capturing the richness of this.

Participatory Action Research

When choosing a research methodology one must consider many issues, weighing the trade-offs involved in each. Conventional research methodologies sacrifice responsiveness for replicability (Dicks,1993). However within an instructional context this model presents severe limitations, especially when the goal of the researcher is change. Assessment practices have tremendous implications for learners. Their futures depend upon their ability to navigate academic protocol successfully. This research study involved the introduction of, what was for many, a novel assessment model, one that incorporated the assessment of process. As a researcher I had a responsibility to maintain responsiveness in my research design. The participatory action research methodology offered flexibility and an opportunity to systematically analyze my assessment practices as they emerged in context.

Car & Kemmis (1986) propose three minimal requirements for action research. The first of which concerns the nature of the focus of study. The subject matter must be social practice of some kind that is conducive to change. The second criterion is related to the methodology implemented. Action research must adopt an interrelated, systematic, cyclical spiral of planning, acting, observing and reflecting. The final criterion deals with the participatory nature of action research. Over the life of the project an ever-widening circle of participation should develop. In this study that circle included myself and my teaching assistant who also became a participant researcher in the course of the study.

This study met all of Car and Kemmis' criteria. The instructional design of this course was based on social constructivist ideals. As such learning is conceptualize as an active, social process. Assessment practices designed for use in traditional instructional contexts did not fulfill the learners needs in this learning environment. Proponents of the constructivist orientation recognize the need to integrate assessment into instruction and reconceptualize it as a tool to promote learning (Shepard, 2000). Within this context learning is the social practice and assessment practices were the intervention that could produce change. The process of developing the assessment tool itself naturally followed the action research methodology, in that the criteria for assessment grew out of the researchers prior knowledge of the research context, was tested within context, reflected upon, refined and retested. This research study was a learning experience for all involved, the educator/researcher, the teaching assistant and the learners.

The Participatory Action Research Methodology

The fundamental assumption of the action research approach is that people can learn and create knowledge through the four-phase recursive process outlined below (Zuber-Skerritt, 1992).

The Four Phase Process of Action Research

Phase 1 Planning: This first phase has two important components, (a) the analysis of a problem and (b) the development of a strategic plan. The analysis of the problem requires that the researcher familiarize herself with the field of action and define a specific area of focus. Based upon the chosen area of focus and the characteristics of the social system the researcher then develops a strategic plan involving some form of intervention.

Phase II Acting: At this point the strategic plan is implemented, an intervention is orchestrated and data collection begins.

Phase III Observation: This phase entails the observation and recording the effects of the intervention and an evaluation of them.

Phase IV Reflection: The researcher then reflects upon the results of the evaluation and the action research process as a whole. This inductive process often leads to a narrowing of the focus of investigation which in turn marks the beginning of a new cycle of planning, acting, observing and reflecting.

What is Different about Action Research?

According to Zuber-Skerritt (1992), Action Research differs from traditional social science research in five major ways: (a) Action research is practical. Interventions undertaken not only contribute to the advancement of theory but also have an immediate impact on the research context. (b) The process is participatory and collaborative. Action research is a democratic process. The researcher is conceptualized as a member of a collective focused on developing solution to actual challenges. (c) It is an emancipatory approach to problem solving in that the views of all members of the collective are represented. (d) It is interpretive in nature. Solutions are arrived at through a dialectic process of considering the views and interpretations of all members of the collective. (e) It is a critical process in that all members of the collective are agents of change, and through this engagement, impact their environment and are themselves transformed in the process.

Validity in Qualitative Research

Traditionally issues of external validity have been conceptualized as concerns regarding the *generalizability* of research results, both from one population to another and from one research context to another (Gall, Borg & Gall, 1996). However qualitative researchers take exception to this limited view, as the goal of much qualitative research is to extend understandings of people, situations and constructs (Hadwin, 2000). As mentioned above a focus of conventional research on replicability often means sacrificing responsiveness. Yet responsiveness is a fundamental tenant of the action research paradigm. Further more, the focus of action research is change within a specific context, therefore local relevance must supercede global relevance. Within this context, alternative conceptualizations of validity are appropriate. Guba (1981), suggests that qualitative researchers focus on establishing the *trustworthiness* of their qualitative inquiry as a measure of validity as opposed to the conventional conceptualization of it. According to Guba (1981) the four criteria of (a) Credibility, (b) Transferability, (c) Dependability, and (d) Confirmability offer a framework for establishing the validity of qualitative research contexts. Table 2.1 below adapted from Mills (2000) presents a definition of each criterion along with Guba's recommended strategies for attaining them. A discussion of their relevance within an action research model and how I attempted to meet them within the context of this study follows.

Guba's criteria are particularly relevant within an action research design as the focus of study is situated within a dynamic social system. The ultimate goal of action research is improvement in a specific system as a whole through some type of intervention. Given the interrelatedness of the system components, any form of intervention could be

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expected to have implications across the entire system, perhaps even unanticipated implications. A fundamental principle of action research is the need for researchers to seek out disconfirming evidence as a means of developing understanding. Guba's criteria fit well with the action research model, with its extended spiral of research cycles as well as the dialectical and participatory nature of the research process.

Table 2. 1 Guba's Criteria for Validity of Qualitative Research

Criteria	Definition	Strategies
Credibility	The researcher's ability to take into account all of the complexities that present themselves in a study and to deal with patterns that are not easily explained.	Do prolonged participation at the study site. Do persistent observations. Do peer debriefing Practice triangulation. Collect slice of life data items. Do member checks. Establish structural corroboration or coherence. Establish referential adequacy.
Transferability	The researcher's belief that everything is context-bound.	Collect detailed descriptive data. Develop detailed descriptions of the context.
Dependability	The stability of the data	Overlap methods. Establish an audit trail.
Confirmability	The neutrality or objectivity of the data collected.	Practice triangulation. Practice reflexivity

All of the strategies suggested by Guba for attaining the criteria were implemented in this study. Many of the suggested strategies overlap within the context of this study. As the instructional designer and teaching assistant during the January 2000 semester of *Technology for Educational Change* I developed an intimate appreciation for the research context and was able to identify many of my personal biases and perceptions. In my subsequent role as instructor for the course, my presence within the research context could be considered seamlessly intertwined with my presence as a researcher, hence

reducing any potential impact that presence might have on behaviors of participants in the study. As part of the research process I maintained a journal logging my observations and reflections as well as noting interactions between Jennifer Sclater, the TA and myself regarding our emergent understanding of the research context. As far as possible the practice of triangulation was incorporated into the research design. This was accomplished through the collection of the multiple data sources such as: (a) self and peer assessment scores, (b) instructor assessed individual contribution scores, (c) observations and reflections of the teaching assistant and researcher, and (d) learners' responses to Background Questionnaires (although these were not accessible to the researcher until after submission of final grades to the university). Through the process of overlapping methods of observation within the research context, performance data and learners' responses to background questionnaires and in some cases learners' reflections in journal entries made across the semester, the credibility, dependability, and confirmability of the data could be established.

A detailed description of the instructional design of the course was developed and presented in this study. My journal provided a rich source of contextual detail as did notes from face to face meetings and electronic correspondence with Jennifer Sclater the TA for the course. Through these methods it is hoped that readers of the study can easily situate themselves within the research context. In this way Guba's final criteria of Transferability was met.

Ethical Issues

Ethical issues in an instructional context are always challenging, but the overlap between the roles of instructor/researcher served to further complicate these issues.

Ultimately the interests of the learners must remain paramount. As the instructor/researcher I took several precautionary steps to counterbalance any potential risks to learners. The first of these was to inform learners about the research project at the beginning of the course through FirstClass® in the form of a message explaining the focus of the research and inviting them to read the consent form and participate in the study. Although no manipulation was orchestrated in the delivery of instruction and students' activities throughout the course were required components of the instructional design, students were advised of the assessment model that would be used for the calculation of individual grades for collaborative activities on page 9 of the course study guide as follows:

> Individual grades for collaborative activities will be determined by the
> following formula—(group work product score) multiplied by (peer
> review score + instructor assessed quality of individual contribution
> score).

This was further underlined in the consent form. Seven tasks were assigned throughout the duration of the course. Students were also advised that of those seven assignments, only the three *Structured On-line Activities* would be the focus of the research. The consent form (see Appendix 2.1) also stated that all students would be treated equally and graded as objectivity as possible. Learners were also informed of their right to discontinue participation at any time.

The only potential risk to learners was that the instructor for the course was also the researcher. To address this risk participatory consent and responses to questionnaires

were only accessible to the instructor/researcher after all final grades had been submitted. The following commitment to students was stated in the consent form.

> Participation in this research project will not involve additional work
>
> beyond the course requirements except the completion of the attitudinal
>
> questionnaires. You are being asked to release the materials detailed
>
> above for research purposes that are independent of your assignments and
>
> final grade. Your final grade for the course will be submitted to the
>
> university prior to the researcher having access to the consent form and
>
> questionnaire dropbox. In this way the instructor (Laura McEwen) will
>
> not know who has consented to participate in the research until her
>
> commitment to you in as instructor has been honored in full.

Although the limiting of access to some research data until after final grades were submitted did pose a challenge to the action research design, it was deemed necessary given the duality of the role of instructor/ researcher in this context.

In one case a learner did contact the instructor/researcher stating that he/she was participating in the study and was interested in finding out more about it. I explained that as the instructor for the course I had an ethical responsibility to fulfill and that I should not know who had decided to participate. A portion of my response to the learner's inquiry made through FirstClass® is presented below. It serves to demonstrates the challenges involved in researching ones own practice:

> I am happy you are interested, unfortunately I can not provide more detail
>
> now than what is in the consent form, except to say that I am looking at
>
> three dimensions in group work—the final product, peer evaluations and

the quality of individual contribution. Until now most group work has been graded based solely on product—in a constructivist learning environment the process (the creation of the product) is as important as the product—this is the issue I am research—how can instructors take both product and process into account when grading (my response to learner made through FirstClass®, October 2, 2000)

I further explained that I would be happy to discuss the study further once the final grades were submitted. The student appreciated my position but the significant issue of balancing the democratic action research ideal with ethical considerations was not resolved. As instructor/researcher I was forced to forgo or delay some aspects of the participatory nature of action research in the interests of ethics. It was a choice, but not a difficult one, as the interests of the learners far out-weighed my interests as a researcher.

Methods

Participants

There were three categories of participants in this study, learners, the teaching assistant, and the instructor/researcher.

Learners Of the 56 learners enrolled in the *Technology for Educational Change* course in the Fall of 2000, 52 learners completed all course requirements, of those 24 individuals volunteered to participate in the study. Three individuals were dropped from the study as self and peer assessment data for these individuals was not complete. As a result only 21 learners were included in this analysis. This represented a 40% participation rate.

This course draws a diverse population of student, possibly due to the combination of the unique mode of delivery (completely at a distance, through FirstClass® software) and the topical content covered. In the Fall 2000 semester the course population was comprised of 21 students from the Art Education, Child Studies, Early Childhood & Elementary Education and TESL programs combined, 18 were from various Arts and Science programs (Sociology, Psychology, Urban Studies, Political Science among others). Eleven students were from faculty of Commerce. Two independent students also completed the course. Of the 21 participants in the study, nine were education or Art Education students, 3 were from the faculty of Commerce, three were Sociology majors, 4 were Psychology majors and two were independent students. Eleven females and ten males chose to participate in the study.

All students enrolled in the course were required to participate in on-line structured activities as part of their course requirement as well as communicate with the teaching assistant, the course instructor and their peers through the FirstClass® Intranet server of Concordia University. The only additional work required by study participants was the submission of a consent form and the completion of four questionnaires made available on-line. Volunteers were asked to participate in a research study evaluating the validity and reliability of an assessment model specifically designed for on-line collaborative learning. They were reminded that although they were required to participate in all activities presented in the course as part of the course assignment, they were free to abstain from releasing data for research purposes. Student consent was sought through FirstClass® using the attached consent form (see Appendix 2.1) in electronic format at the beginning of the semester. Students were informed that their consent forms would

not be accessible to the researcher (Instructor, Laura McEwen) and the teaching assistant until all final grades had been submitted. This was accomplished by providing an electronic dropbox within the class conference. The consent form dropbox remained accessible to the administrator of the conference only, until all final grades had been submitted. Students were asked to access the consent form electronically, read it and enter their name at the bottom of the form. If the student chose to send the form, it was deposited directly to the protected dropbox within the class conference. The act of sending the form to the dropbox was considered consent as the "senders" of all messages in FirstClass® are documented in the "from" field of the message. Students were informed that they have the right not to send the form and in doing so are abstaining from participation in the research.

Consent forms were submitted between September 12th and September 25th (Appendix 2.1). Participants were then asked to complete the first questionnaire (see Appendix 2.2). This questionnaire was a baseline measure in which participants rated their prior experience in collaborative learning contexts and assessment practices used to evaluate these learning activities.

Teaching Assistant Jennifer Sclater was a graduate student in the Educational Technology program at Concordia University. She had been a student in the course in the Winter 2000 semester and had a firm grasp of both the content and medium of delivery. Jennifer was informed of my intent to conduct research in the course and asked to participate in the development and piloting of a tool for the assessment of on-line collaborative process. Her participation was voluntary and her role in the research

process was collaborative in every aspect. We discussed the process openly, both face to face and through FirstClass®. She also participated in an interview with the researcher.

Educator /Researcher I was a student in the graduate program of Educational Technology at Concordia University. During the previous offering of the course *Technology for Educational Change* I had done the instructional design for the on-line component of the course, facilitated the on-line interaction and graded all CSCL assignments. Having recognized the limitations of the additive assessment model used to calculate individual grades for group work, I spent the summer months researching possible alternative practices. I developed a multiplicative assessment model that would incorporate both process and product aspects of CSCL equally. I recognized the need to develop some type of standardized tool for the assessment of process. I then developed the CSCL process assessment tool. My intention was to pilot both the tool and the new calculation model in the Fall 2000 semester as the instructor for *Technology for Educational Change.*

Data Sources

Journal entries of educator/researcher: Over the entire semester the educator/researcher kept a journal, logging details regarding class management issues, observation about learner performance and notes about interactions between Jennifer and myself.

Electronic communication between Educator and TA: Copies of electronic communication between the teaching assistant and the educator/researcher were also compiled. These included both asynchronous and synchronous communications.

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Electronic communications posted to Class Conference: Copies of electronic

communication posted to the class conference by learners, the teaching assistant, and the

educator/researcher. These communications are of a asynchronous nature.

Self and peer assessment score: For each on-line activity learners were required to

complete self and peer assessments and submit these electronically to the

educator/researcher for the calculation of individual grades for group work. For On-line

Activity 1: *Structured Debate* and Activity 2: *Experience to Practice* learners were

provided with guiding questions to help frame their self and peer assessments. Based on

their responses to these questions they were asked to rate their peers on a five-point scale.

For Activity 3: *Design* learners were provided with five criteria and the definitions of

these criteria. They were then asked to rate themselves and their peers on each of the

criteria using a three point scale, 0 indicating *no-evidence*, 1 indicating *Good* or 2'

indicating *Outstanding*. These assessments were then summed for individual learners and

an average was calculated. This represented the *Peer Review score* which was then used

in the calculation model to determine individual grades for all group work.

Instructor Assessed Individual Contribution Score: For Activity 1: *Structured Debate*

the educator/research reviewed all group interaction and using the CSCL process

assessment tool assigned an IAIC score for each learner. For the second and third on-line

activity the teaching assistant assumed this responsibility.

Interviews with Jennifer Sclater, the TA: At various intervals throughout the

semester the educator/research met with the teaching assistant to discuss her observations

and reflection regarding the on-line collaboration process and the assessment tool being

used. A final unstructured interview at the end of the semester probed the teaching

assistant's philosophical orientation in educational practices by exploring her previous work experience. Several questions were also asked regarding her use of the CSCL process assessment tool.

Background questionnaire: At the beginning of the semester learner were asked to complete a short questionnaire design to establish their prior experience with collaborative learning activities. This questionnaire also probed their experience with the assessment of these types of learning activity.

CHAPTER 3

Equity in Assessment

The Challenge of Assessment in Computer Supported Collaborative Learning

As the teaching assistant for the *Technology for Educational Change* course during the winter 2000 semester, I attempted to deal with issues of unequal individual contributions to on-line collaborative learning activities in three ways. The first was to implement an additive model for the calculation of individual grades for these learning activities. In the first implementation the calculation of individual grades included three components, (a) an individual portion, potentially worth five marks, (b) a group product score, potentially worth seven marks and (c) a self and peer rating, potentially worth three marks. I assessed both Individual and Group components based on predetermined assessment criteria (see Appendix 3.1). The self and peer ratings for each learner were derived from the average of their self-ratings and the ratings they received from their group members. For example, one learner might rate him/herself 3 and each of their group members might rate him/her 1, in a four member group this would result in a self and peer rating of 1.5.

Although this intervention did provide group members with a means for expressing their opinion regarding the contribution of individual learners to the group process, it did not appear to impact individual grades significantly enough to augment learners' on-line behavior. Imagine a situation where a group members contributes nothing to the group product, gives him/herself a rating of 3, is given a rating of 0 by his/her three group members and still receives a self and peer rating of .75. This amount is then added to his/her individual and group component, (4/5) and (7/7) respectfully. In this case the

individual learner, who had not engaged in the CSCL activity would receive a grade of 11.75/15 when the only contribution made by the individual was the individual component (4/5).

In an attempt to achieve more equity in the model during the second implementation within the same semester, the structure of the assignment was adjusted. The group product component was decreased from 7 marks to only 5 marks, and the potential worth of the self and peer ratings was increased from 3 marks to 5 marks. The value of the individual component remained 5 marks.

An additional aspect was also added to the self and peer rating process in an attempt to increase the level of accountability among group members. Learners were required to justify the ratings they gave both themselves and their peers by responding to the following two questions. (a) *How did the individual contribute to the group product?* and (b) *How did the individual contribute to the co-construction of knowledge within the group?* Learners were also asked to submit a two-hundred word essay reflecting upon their group's functionality throughout the learning activity. No marks were awarded for this work.

Although the adjustments to the weighting of the group and self and peer rating components did have a greater impact on individual grades, I was still forced to adjust the grades of several individuals. A comparison within the context of the example presented above is provided in Table 3.1. The first column of the table indicates the CSCL activity. Individual component grades appear in the second column. The Group component grades are presented in the third. The mean of the self and peer ratings appear in the fourth

column. The grade received by the individual for each CSCL activity is presented in the

final column of the table.

Table 3. 1 Hypothetical Comparison of Calculations of Individual Grades for CSCL Activities for Learner X

	Individual Component Grade	Group Component Grade	Mean of self/peer Ratings	Individual Grade received for Assignment
CSCL activity #1	4/5	7/7	.75/3	11.75/15
CSCL activity #2	4/5	5/5	1.25/5	10.25/15

In the example presented above learner X received the same grade for the individual

components of both CSCL activities. The group to which learner X belonged received full

marks for the group component of both CSCL activities. Learner X rated him/herself 3/3

and 5/5 respectively for each CSCL activity, however all the group members rated

Learner X's contribution to the group effort as 0 for both CSCL activities.

In CSCL activity #1 Learner X receives an individual grade of 11.75/15 or 78% and

in CSCL activity #2 10.25/15 or 68%. This represents a difference of only 1.5 marks or

10% across the two CSCL activities. Again it is important to point out that learner X

made no investment in either of the group components produced. Yet by virtue of group

membership in a highly functional group this individual receives a passing grade for both

assignments. The adjustment to the weighting of the components of the second

assignment did have a greater negative impact on learner X's grade for CSCL activity #2,

but in this educator's opinion a grade of 68% for such an obviously dismal effort is still

far to high.

Striving for Equity in Assessment Practices

Over the months following my experience as teaching assistant for the *Technology for Educational Change* course I continued to struggle with the issue of inequity in assessment within a CSCL context. As constructivist pedagogical practices framed this instructional context, I felt it important to develop a better understanding of the fundamental principles of this paradigm and how assessment within this learning context might be conceptualized. For practical reasons I also felt the need to see how other educators attempted to deal with issues of assessment in collaborative learning contexts. This directed me towards the literature.

Constructivism

The constructivist paradigm is the latest wave in educational reform (Bagley & Hunter, 1992; Hansen & Perry, 1993; Morris & Hayes, 1997; Shepard, 2000). This broad conceptual framework has its roots in 18th century philosophy, and is associated with the work of Giambattista Vico and Jean Jacques Rousseau (Duffy & Cunningham 1996a). Historically, proponents of a constructivist orientation to education were reacting against the dominant traditional objectivist approach. In the early 20th century, John Dewy and later Jerome Bruner proposed a constructivist framework for designing instruction (Duffy & Cunningham, 1996a; Bruner, 1986, 1990).

The constructivist approach to education encompasses various theories of and approaches to learning, such as the theory of Situated Cognition (Brown, et al.., 1998) and the Cognitive Apprenticeship Approach (Lave & Wenger, 1991), Experiential Learning (Rogers & Freiberg, 1994) and Sociocultural Theory (Vygotsky, 1978), Anchored Instruction (Vanderbilt, 1992) and Problem-Based Learning Approaches

(Barrows,1986). Regardless of the theory of learning or the instructional approach adopted, it is the way in which knowledge and the learning processes are conceptualized that marks the constructivist departure from traditional objectivist educational practices. At a very simplistic level, objectivists view knowledge as a *commodity* to be *acquired*, while constructivists conceptualize it as a *process* to be *fostered*.

Within the constructivist paradigm there are two major perspectives (Cobb, 1994). Constructivism can be conceptualized as a continuum. At one end it is rooted in cognitive psychology, emphasizing Piaget's focus on individualized knowledge construction. At the other end, constructivism is rooted in socio-cultural psychology often associated with Vygotsky's social learning focus (Driscoll, 1994). These two trends simply emphasize different aspects of the same learning process. The cognitive perspective adopts a micro-orientation, highlighting the individual cognitive process and the impact of culture (Cain & Cain, 1991; Duffy & Cunningham, 1996a). Alternatively, the socio-cultural perspective ascribes to a macro-view, examining the social and cultural context within which the individual learner is situated (Duffy & Cunningham, 1996a). Whether the emphasis is individual or social context, ultimately, constructivist pedagogy supports a process of learning that involves analyzing, comparing, contrasting and developing a personal understanding of content. This represents a direct opposition to the behaviorist approach that emphasizes the acquisition of knowledge and skills for prompted recall.

Constructivist theoretical perspectives highlight the need for a positive learning experience to be active, social and authentically situated (Carr, et al.; 1998; Shepard, 2000; Tam. 2000). The need to recognize learners'prior experience and knowledge as an integral component of the learning process is underlined (Carr, et al., 1998; Driscoll,

1994; Roblyer, et al.,1997; Winn & Snyder,1996). Within such a context the learner constructs his/her knowledge internally through the process of making new information personally meaningful (Carr, et al., 1998). Learners are encouraged to develop an eclectic orientation to a knowledge domain through interaction with instructors, their peers and resources (Lave & Wenger, 1991, Shepard, 2000; Tam, 2000). This collaborative interaction promotes the externalization of personal thoughts, leading towards profound understanding and the development of critical thinking skills (Jonassen, 1996b). In this conceptualization of education the learners are actively collaborating within authentic contexts and by necessity must maintain a higher degree of learner control (Carr, et al., 1998).

Three basic assumptions underlie the constructivist theoretical paradigm. First, learners are active, responsible participants in the learning process. Second, learners possess the skills to gather and evaluate information effectively. And third, the learning process is interactive and therefore social by definition (Carr, et al., 1998; Duffy & Cunningham, 1996a, Shepard, 2000; Tam, 2000). The implications of these assumptions for both the learners and the learning environment are that: (a) learners are interested in learning and monitoring their growth and capable of effective self-monitoring, (b) that the learning context supports information gathering and promotes the development of evaluative skills and (c) that effective collaboration among learners in fact takes place.

Integrated Assessment

Constructivist learning contexts provide a dramatic contrast to the traditional instructor directed approach. Therefore, many assessment practices designed for use in teacher-centered instruction do not translate well into constructivist learning

environments. A major reason for this is the dynamically opposed fundamental beliefs about the process of learning (Duffy & Cunningham, 1996a; Mabry & Stake, 1994; Shepard, 1991). An objectivist model of learning conceptualizes the process as an assembling of incremental components of *knowledge*. Such a model lends itself to a decontextualized assessment approach where learners are required to demonstrate an awareness of facts (Boud, Cohen & Sampson, 1999; Dochy, Seger & Sluijsmans, 1999; Frederiksen & Collins, 1998; Hambleton, 1996; Mabry & Stake,1994; Shepard,2000; Tam, 2000). Within this pedagogical framework, instruction and assessment are often separated in time and sequential in nature, a learning episode precedes a testing event that often marks the end of instruction. The focus of testing in this model is measurement not facilitating learning.

In contrast, proponents of constructivist pedagogy emphasize the need for assessment to become an integrated component of the learning experience (Boud, et al., 1999; Duffy & Cunningham 1996a; Shepard, 2000; Sullivan & Hall, 1997; Wiggins, 1993). Within this framework, assessment is not an end in and of itself, but instead regarded as a tool for promoting individual growth through the development of important metacognitive, critical thinking and communication skills (Frederiksen & Collins, 1998; Linn & Burbules, 1993; Stefani 1998). From a Constructivist perspective successful learners need to effectively self-monitor, evaluate and interact. By including these processes in the focus of assessment, learners are provided with feedback they can use to inform their future performance.

The Changing Educational Landscape

Educators are being encouraged to move away from directed instructional approaches and adopt a more interactive style of teaching. This fundamental shift in educator orientation involves dramatic adjustments in the flow of communication. Within such a context, learners are encouraged to interact among each other as well as with educators. One method of promoting interaction among students is to include collaborative projects in the instructional design of courses. In keeping with the current emphasis in academic institutions on constructivist theoretical orientations it is not surprising that the incorporation of these learning strategies have been on the rise (Bagley & Hunter, 1992; Hansen & Perry, 1993; Morris & Hayes, 1997). Added to this reality is the emergence of technological tools such as CMC software that present the potential to facilitate collaborative interaction at a distance (Keegan, 1993; Hiltz, 1994; Garrison, 1997). The culmination of this marriage of theory and technology is a powerful, dynamic learning environment unconstrained by time and space. Few would argue the compelling potential of such an active learning context, but along with this powerful pedagogical redirection come many challenges for both practitioners and participants.

One of the practical realities of implementation is the issue of equity among participants in terms of individual investment in the collaborative product. Freeriders can have a profoundly negative impact on the quality of learning taking place. From the learners' perspective, group members who do not contribute to the group product can gain substantially from the mere association with an otherwise highly functional group. That is, unless the collaborative process is somehow considered in assessment. By dividing the focus of assessment between the collaborative process and product, the level

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of individual accountability to the group might be raised. Some researchers have even suggested a positive relationship between individual accountability and self and peer assessment practices used within these types of learning contexts (Topping, 1998).

From the educator's perspective, assessment of collaborative group work cannot be reflected simply in the group product. Issues of process and individual contribution must be considered (Web, 1995). The relevance for educators of considering both the product and process aspects of group work is underlined by Robyn Morris and Colleen Hayes in their article *Small Group Work: Are group assignments a legitimate form of assessment?*(1997). The precarious position of faculty grading group-work is highlighted in the passage below.

> A legal implication of using group assignments and the issue of the
> "freerider" experience. The use of a group project as part of the student
> coursework requirement resulted in the member of staff awarding one
> non-contributing student a mark of zero, only to have the student appeal
> the grade. The appeal was upheld on the grounds that it was specified in
> the unit outline that the assessment was on a group basis and while
> admitting to having not contributed at all to the project, the student argued
> successfully that he had a legal entitlement to pass as all other members of
> the group had passed. (p. 230).

Calculating Individual Grades for Group Work

The phenomenon commonly referred to as the *Freeriders* has led some educators to develop elaborate methods of calculating individual grades for this type of learning activity. In some instances these methods adopt additive models, such as the one

implemented during the January 2000 semester of *Technology for Educational Change*.

Others are based on the distribution by group members of a pool of marks. Researchers

Goldfinch and Raeside developed a multiplicative model that was later refined by

Conway (Lejk, Wyvill, & Farrow, 1996). In this model, individual grades for group work

were derived by multiplying a portion of the grade received for a group work product by

a weighting factor. Individual weighting factors for each learner were calculated based on

self and peer assessments. In this way 50% of an individual's grade was attributable

solely to the quality of the product produced, and the remaining 50% was multiplied by

the weighting factor to represent individual contribution (Lejk, et al., 1996). The

weighting factor was derived by dividing the sum of individual self and peer assessment

scores by the average score. The average score being the sum of all self and peer

assessment scores divided by the number of members in the group. This method amounts

to a calculation for distributing a pool of grades among group members according to

learners' self and peer assessments. Upon close inspection this calculation method can

actually place some members of lower functioning groups at an advantage. An example

of this is presented in Table 3.2.

For the purpose of illustration, the grade for the group product was maintained at

60% for both the high and low functioning groups in the example presented above.

Judging from the average of the self and peer assessment scores, one could surmise that

the members of the *high* functioning group probably demonstrated more collaborative

behaviors than the individual in the *low* functioning group. Yet when the calculation

method refined by Conway, et al. (1993) is applied, it is a member of the *lower*

functioning group who receives the highest grade. This is obviously a serious weakness

of this calculation model if the goal is to better represent the collaborative process in

individual grades for group work.

Table 3. 2 Comparison of Grades Between High and Low Functioning Groups.

	Group Member	High functioning group	Low functioning group
Average score		(40 + 30 + 20)/3 = 30	(30 + 20 + 10)/3 = 20
Weighting factor	1	40/30 = 1.33	30/20 = 1.5
	2	30/30 = 1	20/20 = 1
	3	20/30 = .67	10/20 = .50
Weighting of 50% of group mark	1	50% + 50% x 1.33 =116.5%	50% + 50% x 1.5 =125%
	2	50% + 50% x 1 = 100%	50% + 50% x 1 =100%
	3	50% + 50% x .67 = 83.5%	50% + 50% x .50 = 75%
Individual grade	1	116.5% x 60% = **69.9%**	125% x 60% = **75%**
	2	100% x 60% = 60%	100% x 60% = 60%
	3	83.5% x 60% = 50.1%	75% x 60% = 45%

Questioning the Validity and Reliability of Role of Self and Peer Assessment

An additional concern regarding Conway, et al.'s refined calculation model was that

weighting factors were derived based solely on self and peer assessments. The validity

and reliability of self and peer assessment have tremendous implications in this respect. A

review of the literature revealed some interesting findings.

Discussions of validity in the self and peer assessment literature center around the

degree of agreement between ratings by faculty and learners. Reliability on the other

hand is judged based on the degree of agreement between peers over time. To date,

research in the area of self and peer assessment has identified several variables that are

considered to impact the validity and reliability of assessments of learners by learners.

The first of these has to do with the characteristics of the assessment criteria, the second being the issue of training and practice for learners and learners' level of maturity. The third involves the number of individuals engaged in the assessment process and finally, the nature of the task being assessed has been considered. The reader is cautioned that the findings presented below are based solely on research conducted in *on-site* learning contexts, therefore generalizability to a distance education context is questionable.

Assessment criteria

Types of Judgments Required by Learners.

Generally researchers have explored the effects of requiring learners to make three types of judgments when conducting self and peer assessments. These include: (a) global judgments, where learners are not provided with explicit assessment criteria,, (b) overall judgments, where learners are provided with dimensions or criteria to guide their assessments but are required to assign one overall rating, and finally (c) dimensionality judgments, where learners are required to assign ratings for each criteria separately. Based on the degree of agreement between peer and instructor ratings as the measure of validity, the category of studies which seems to achieve the most valid peer scores is the overall judgement category. In the on-site context, learners' ratings seem to agree more strongly with faculty assessments when they are required to make global judgments with the guidance of several criteria (Falchikov & Goldfinch, 2000).

The Development and Understanding of Assessment Criteria.

Although limited research has been conducted in this area, findings to date, suggest that student negotiated criteria promote higher rates of faulty/peer rating agreement (Falchikov & Goldfinch, 2000; Topping, 1998). Whether this effect is due solely to the

increase in learners' understanding of the criteria or an increase in their perceived

ownership of the task is unclear. However, some literature also reports a preference on

the part of learners for specific performance related criteria as opposed to vague ratings

(Topping, 1998)

Issues of Practice/Training and Learner's Level of Maturity

Not surprisingly, better agreement between peer/faculty ratings seems to be

associated with the amount and quality of training provided to learners. Some techniques

reported in the literature are video modeling and discussion (Topping, 1998). In some

instances the level of maturity of the learners seemed to reduce the need for training, but

this line of inquiry is as yet conflicted at best (Dochy, et al., 1999; Topping, 1998).

Comparisons made across academic years has not supported the hypothesis that more

experienced learners are more reliable assessors (Falchikov & Goldfinch, 2000).

However, some research findings do suggest that peer assessment is generally more

reliable than self assessment, and that the practice of assessing ones' peers could foster

more reliable self-assessment (Dochy, et al., 1999; Topping, 1998).

Issues of Group Size

On the surface, issues of the reliability of self and peer assessment, findings seem to

be counter intuitive. Statistically we might expect the reliability of self and peer

assessment to increase as the number of learners in a group increases. However, the

research suggests that the reliability of peer ratings actually declines as the number of

group members increases (Falchikov & Goldfinch, 2000). Optimal group size seems to be

between 2-7 members with a marked decline in the measure of reliability once group size

reaches 20 or more participants.

Nature of the Task Engaged in by Learners

Self and peer assessment practices have been implemented in various learning contexts, such as professional development, oral presentations, and group projects. In a meta-analysis of the self and peer assessment literature conducted by Falchikov and Goldfinch (2000), the validity of self and peer assessment increased in contexts where academic tasks were the focus. The authors suggest this might well be a result of learners' familiarity with academic tasks and the characteristics of quality associated with them (Falchikov & Goldfinch, 2000).

Reflection to this Point

My review of the literature underlined several important issues. Up to this point my concern with assessment had centered around issues of equity in practice. This failed to acknowledge the important underlying conceptualization of constructivist assessment practices as *tools for learning*. Within this context it was equally important that learners be provided with information they could use to inform their future performance.

To address issues of equity in assessment of collaborative learning activities, the need for a new calculation model was obvious. In addition the prospect of using self and peer assessment as a potential mechanism for supporting the development of collaborative skills was also evident. In this way assessment could become an integrated component of the learning context, providing equitable assessment while at the same time directing learners attention to the important characteristics of behavior that led to effective collaborative interaction.

Self and peer assessment practices had been the focus of research for sometime within the on-site learning context. However, little investigation of the potential of these

practices within a CSCL context has been reported. Considering the characteristics of an on-line learning environment, where group interaction is a matter of permanent record, the potential for exploring these practices was apparent. Where in the on-site context it would be impossible for instructors and teaching assistants to observe all collaborative interaction, in an on-line context this would be possible. Furthermore, since the monitoring of on-line interaction between learners by instructors and/or teaching assistants is considered best practice, the possibility of co-assessment presented itself. In this context the learners would engage in self and peer assessment and the individual monitoring the on-line activity could do the same. Both of these assessment components could then be included in the calculation of individual grades for the collaborative learning activity. In this way self and peer assessments could be validated and the development of learners' evaluative skills could be supported. With these issues in mind the calculation model presented in Table 3.4 was developed.

Within a constructivist learning context, learning is conceptualized as a process of developing personal understandings through interaction with peers, educators and resources. As such, the process engaged in by learners is as important as the product a group of learners might produce. The model in Table 3.4 honors this fundamental principle by placing equal emphasis on process and product. This is a multiplicative model in that the assessment of process is multiplied by the assessment of product.

In the calculation model presented in Table 3.4, *Peer Review scores* are the mean of the self and peer assessment ratings within a group for each individual. The *Instructor Assessed Individual Contribution* (IAIC) score is established by observations by the individual monitoring the group conference across the duration of a computer supported

collaborative learning activity. The *Group Product* score is the mark given by an

instructor or grader for the product produced by the group. In effect the *Peer Review*

scores and *Instructor Assessed Individual Contribution* scores (IAIC) become a

weighting factor, representing each individual learner's contribution to the production of

the group product.

Table 3. 3 A New Calculation Model for Calculating Individual Grades for Group Work

Peer Review score (average of self and peer assessment scores)	+	Instructor Assessed Individual Contribution	X	Group Product score	=	Individual grade

The prospect of using self and peer assessment practices as a tool for learning and

the additional issue of incorporating a co-assessment component in the calculation of

individual grades for group work raised the issue of the need to develop a tool to

standardized the assessment of collaborative process. Although much research has been

undertaken in on-site learning contexts, the extent to which criteria developed for those

applications could be generalized for use in on-line collaborative learning was

questionable. This was due to the distinct nature of the communication in an on-line

environment. I turned towards the literature once again to examine the prospect of using

self and peer assessment within a CSCL context.

<div align="center">Literature Review</div>

The Role of Self and Peer Assessment in Computer Supported Collaborative Learning

Computer supported collaborative learning (CSCL) environments are the product of

constructivist approaches to learning supported by the technology of CMC software

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(Wenger, Holloway & Garton, 1999) This combination of theory and technology enable

collaborative interaction independent of time and space (Garrison, 1997; Hiltz, 1994;

Keegan, 1993). In addition, given the text-based nature of interaction, learners and

educators are also provided with a permanent record of their collaborative learning

processes (Dehler, 1998).

The computer supported collaborative learning process is best conceptualized as a

dynamic interrelationship between several key elements. This interrelationship can

provide learners the opportunity to build knowledge collectively (Brandon &

Hollingshead, 1999; Dehler, 1998; DeSanctis & Monge, 1998; Garrison, 1997; Hiltz,

1994).

Central to the concept of collective knowledge building is the ability of learners to

communicate effectively or make the implicit, explicit. Through effective communication

learners can: (a) define learning goals, (b) make individual contributions to the group

process, (c) negotiate roles and responsibilities, and (d) synthesize individual contribution

into a cohesive group product. Figure 3.1 depicts the elements of a computer supported

collaborative learning process. In this model the key elements in the knowledge building

process are identified and the implications of each element are provided. As is implied by

the circular arrangement of the elements, a computer supported collaborative learning

process is not linear but rather dynamic. A discussion of each element and its relative

relation to self and peer assessment follows.

Figure 3. 1 Elements of a Computer Supported Collaborative Learning Process

| recognition of prior knowledge and experience |
| establishing group dynamics |
| Reflection upon individual and group process |

define learning goals

contribute individually to group product

negotiate roles and responsibilities

communicate effectively

Synthesize individual contributions into a cohesive group product

Assess self and peers

| effective distribution of expertise |
| co-construction of knowledge within the group |

involving

*Understanding and compensating for limitations of communication medium.

*Writing and comprehension skills

Elements of a Computer Supported Collaborative Learning Process

Communication in CSCL

The centrality of effective communication is emphasized in the Figure 3.1

Successful communication within a CSCL environment involves learners: (a) attaining a

high level of competency in writing and comprehension skills and (b) an in-depth

understanding of the limitations of the CMC medium. For the purpose of analysis these

two aspects of effective CMC are considered separately. The author acknowledges the

artificiality of this imposed separation, as the impact of these two aspects of CMC are not

accurately represented in isolation of one and another.

Writing and Comprehension Skills Given the text-based nature of the CMC, the

importance of writing and comprehension skills can not be overemphasized. Within the

CSCL context, learners are working to develop a shared meaning through the creation

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and interpretation of communication in a text-based form. Promising research in the area of language arts suggests that CMC can actually be used as a tool for fostering writing ability (Berge & Collins, 1995; Hawisher & Pemberton, 1997).

Understanding the Medium CMC (CMC) is a specific type of human interaction that enables individuals to exchange knowledge, thoughts and feelings via technology. Probably the most formidable task of communicating in this setting is the mastery of the distinct form of communication that this environment demands. In effect, communication in the virtual realm requires the blending of the skills of writing and speech, in the absence of visual and paralinguistic cues, to produce a new form of human interaction (Graetz, et al., 1998; Wegerif, 1998). Although this hybrid form of communication offers an exciting new means of fostering critical and complex thinking skills, it can pose additional challenges for learners (Gibson, 1996; Hiltz, 1996; Harasim, 1996; O'Hagan, 1997).

Defining Learning Goals in CSCL

Ultimately, the act of defining learning goals involves individuals' reflection upon and recognition of relevant prior knowledge and experience that they can then contribute to the group (Itin, 1999). An important aspect of effective collaboration is the individual's ability to accurately assess the validity of the knowledge and experience brought to the group (Linn, & Burbules 1993). Individuals are often bias in regard to judging personal expertise. By providing opportunities for learners to communicate their prior knowledge and experience clearly and concisely and promoting an analytical approach to assessment by peers, this potentially damaging characteristic of collaboration could be offset.

Individual Contribution in CSCL

Where defining learning goals emphasize the identification and evaluation of individuals' potential contribution of expertise to the group, individual contribution highlights the effectiveness with which the expertise is distributed. This element of CSCL is closely tied to the concept of standards of excellence. Diverse group composition that is a potential strength of collaborative interaction rests on the tenuous assumption of common high standards of excellence within the group. Unfortunately, this is rarely the reality. The ability to clearly, concisely, and completely represent individual understanding to others is associated with high ability learners (Linn, & Burbules, 1993). Self and peer assessment practices could offer learners the opportunity to reflect upon the effectiveness of this distribution of expertise and provide informative feedback about how this distribution might be improved.

Negotiating Roles and Responsibilities in CSCL

In considering the collaborative process, aspects of group dynamics are emphasized. Although CMC has been found to be a mediating factor in regard to high-status members' dominance (DeSanctis & Monge 1998), the threat of restrictive, status-based norms in collaborative interaction must be recognized and compensated for (Linn & Burbules, 1993). As learners are often inexperienced with collaborative learning, generally, their awareness about critical aspects of productive group functioning must be raised. Self and peer assessment practices could serve to guide learners in developing these valued methods of group interaction by highlighting behaviors that foster effective collaboration and diversely defining leadership roles within a group.

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Synthesizing Individual Contributions in CSCL

According to the Bloom (1956) taxonomy, synthesizing at the individual level is considered a complex cognitive task requiring: (a) the use of old ideas to create new ones,(b) generalization from given facts, (c) relating knowledge from several areas, and (d) prediction and drawing conclusions. The challenge of this type of task is compounded within as a CSCL learning context, as group members struggle to synthesize individual expertise in such a way that all members of the group are richer for the interaction. Many learners are unaware of the importance of relevant individual contributions and the strength such activity brings to a group. Self and peer assessment can support learners in developing this appreciation.

Including Self and Peer Assessment in CSCL

To this point five elements of the computer supported collaborative learning process have been identified. As the element of communication could be conceptualized as the energy by which all elements of computer supported collaboration are intertwined, self and peer assessment practices could be conceptualized as a catalyst for their growth and diversification. Through the practices of self and peer assessment learners are provided with important information about their current levels of performance. This information can help them target specific areas of weakness. The practice of self and peer assessment can also guide learners towards more effective performance by highlighting: (a) characteristics of effective performance, and (b) access to exemplars of varying levels demonstrated by their peers.

The Focus of Assessment

Educators communicate to learners what content and skills are important to learn through the focus of assessment (Boud, et al., 1999). In a social-constructivist learning context effective communication is a required skill, learners' success ultimately hinges upon their ability to communicate their ideas and comprehend those of their peers. Since the purpose of assessment is to promote student learning, assessment practices need to acknowledge the importance of the communication processes and provided incentives and guidance to improve these collaborative skills (Murray, 1999).

As learners do not always accurately assess the validity of prior knowledge and experience nor distribute their expertise effectively, support for doing so must also be provided (Linn, & Burbules, 1993). Given the implications of social skills in group dynamics, and the novelty of this arrangement within a learning context, learners also require guidance in developing these skills.

Self and peer assessment practices can be an effective means of accomplishing these instructional goals. The process of learners engaging in such evaluative activities could also scaffold the development of evaluative skills. Bloom (1956) identifies such activities as: (a) comparing and discriminating between ideas, (b) assessing the value of theories, (c) making choices based on reasoned argument, (d) verifying the value of evidence, and (e) recognizing subjectivity. The assessment process could then become a true moment in learning, as learners' competencies in complex cognitive skills associated with evaluation are highlighted.

CHAPTER 4

Cycle 1: The Development of an Assessment Tool for CSCL

Overview of Cycle 1

My focus in the first cycle of this action research study was to develop and pilot an assessment tool for CSCL process. Each action research cycle involves four phases: (a) planning, (b) action, (c) observation /data collection followed by (d) a reflection phase. Defining the boundaries between these phases in this first cycle was a challenging task. I have remained true to the ordering of the phases in this chapter and have acknowledged any strategic deviations from the model in an attempt to facilitate the reader's navigation through the rich description of our dynamic process.

In the planning phase of this cycle, Jennifer and I collaboratively developed the CSCL process assessment tool. In the acting phase of the cycle, we applied the tool as we monitored learners' interaction during the on-line activity. This acting phase was interspersed with critical moments of active reflection when Jennifer and I came together to discuss our observations and experiences. Although normally reserved for the reflection phase of the cycle, these reflections have been shared with the reader at strategic points in my account. Had I restricted these to the final reflection phase, the reader would have been robbed of the richness of our collaborative process.

The observation/data collection phase came at the end of the first on-line activity. This phase had two components: (a) assessment and (b) feedback. During the assessment component, learners were required to conduct self and peer assessments and submit them to me through FirstClass®. This assessment process was supported by providing learners with two guiding questions: (a) what was the individual's contribution to the group? and

(b) how did they contribute to the co-construction of knowledge within the group? These assessments were then used to calculate Peer Review scores for individual learners. IAIC scores were also assigned during this component. The feedback component followed. Each learner was provided with feedback in the form of the three scores used to calculate their individual grades: (a) Peer Review score, (b) IAIC scores, and (c) the Group Product score. The assessment rubric used to grade the group products was also provided to learners at this time.

The reflection phase marks the end of this action research cycle. In this phase I review the data collected to date and discuss my interpretations of it. I also share my reflections of the cycle as a whole.

Planning Phase

The planning phase of this action research cycle focused on verifying the characteristics of effective collaboration in CSCL that I had informally identified. It also involved defining these in terms of learner behaviors and refining these definitions to support the development of an assessment tool.

Defining Effective Collaboration in CSCL

Given the novelty of the learning context of CSCL it might be expected that what has been considered effective on-site collaboration could look quite different from manifestations in an on-line context. Collaboration is a dynamic process involving the sharing and constructing of knowledge through communication skills. Although the sharing and construction of knowledge aspect of collaboration remains constant across both instructional contexts, the skills used to exchange that knowledge in an on-line context are quite different. In order to develop a tool for assessing on-line collaborative

process I first needed to identify the characteristics of successful on-line collaboration. So what does effective on-line collaboration look like, as expressed in behaviors by learners successfully engaged in the process?

Identifying Characteristics of Effective CSCL

In an attempt to identify the characteristics of effective computer supported collaborative process and establish criteria for the assessment of these characteristics I compiled a preliminary list of five criteria. These criteria were based on personal observations as a teaching assistant facilitating the on-line learning activities of the course *Technology for Educational Change* during the January 2000 semester.

In August 2000 I was awarded the teaching contract for the course *Technology for Educational Change* to be offered in the fall 2000 semester. Since this course was offered completely at a distance, the Department of Education provided funding for a teaching assistant position. It is the instructor's responsibility to recruit an individual for this position. As I was aware of this and had anticipated receiving the contract, I approached a student who had completed the course in the January 2000 semester. This individual had since applied and been accepted into the Educational Technology graduate program. She was an ideal candidate for the teaching assistantship because she was very interested in learning about both the instructional context and the research process. I offered her the opportunity to be an active participant in my thesis research project. She accepted and we began the collaborative process of developing the CSCL process assessment tool.

In September 2000, with my preliminary list of assessment criteria Jennifer and I reviewed the archived interaction of learners from the January 2000 semester. One criterion was added, and our criteria labels were refined. We then developed definitions

of the six criteria and compiled a list of examples of each based on our review of learner interaction. These six criteria could then be used to assess the *Characteristics of effective computer supported collaborative process*. Our criteria, the definitions we developed and examples of each are presented in Table 4.1.

Table 4. 1 **Characteristics of Effective Computer Supported Collaboration**

Criteria	Definition	Examples
Distributed expertise	■ Bring in personal knowledge not acquired from course material. ■ Integrates information posted in forum, bringing it to a higher level/reaches conclusion based on postings.	■ Posts a link to a website of interest. ■ Shares personal experience in educational setting or with technology.
Leadership	■ Supportive attitude. ■ Negotiates/ coordinates group activity. ■ Initiates activity.	■ Encourages group members. ■ Setting deadlines. ■ Meeting deadlines/ posting early.
Asks for/ provides clarification	■ specificity with which information is sought ■ Responding to a previous posting.	■ Making reference to previous posting. ■ Questioning the source of information provided.
Clarity and accuracy of information provided	Quality of posting. ■ Comprehensibility of response. ■ accuracy of information (as judged by us)	Not applicable
Overall quality of contribution	■ Postings contribute to final project. ■ Forum member does his/her part. ■ Total responsibility for his/her contribution.	■ Respects deadlines that are set & were agreed upon by forum members. ■ His/her contributions are "complete"—not relying on the person who is putting things together to make changes. —(Submits fully developed ideas.)
Demonstrates improvement over task duration	Improvement in quality of posting. ■ Communication skills within "CMC" context. (direct, concise wording)	■ Postings are short—to the point/ less wordiness.

Defining our Assessment Scale

Together we agreed that the assessment tool would indicate either a *presence*,

denoted as *1* or the *absence of evidence*, denoted as *0* of each criterion for each learner.

Therefore at the end of an on-line learning activity the score for each criterion would be

summed to produce an *Instructor Accessed Individual Contribution Score* (IAIC score).

This score would be used in the previously developed calculation model for individual

grades. The formula for calculating individual grades is presented in Table 4.2. The Peer

Review score was the mean of the self and peer assessment ratings for each individual

learner. The IAIC score was the score attained through the use of the CSCL Process

Assessment Tool. The final component of the model, the Group Product score was the

grade awarded by the instructor/grader for the product produced by the group.

Table 4. 2 New Calculation Model for Calculating Individual Grades for Group Work

Peer Review score	+	IAI C score	X	Group product score	=	Individual grade

At this point we were preparing to pilot the CSCL process assessment tool in the first

on-line activity of the fall of 2000 offering of the course *Technology for Educational*

Change. Although the instructional design was similar in many respects to the previous

year's offering, some adjustments had been made.

Adjustments to the Instructional Context

Whereas in the pervious semester the on-line component of the course involved two

on-line exercises (log-in and structured interviews) and only two on-line activities, in the

fall 2000 semester an additional on-line collaborative learning activity was included. This

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new on-line activity was inserted between the structured interview and what had been on-line activity 1 in the January 2000 semester. A learning journal was also incorporated although this was not a collaborative learning activity; learners did use the FirstClass® conference space to submit these assignments. It is important to note that much of the reflective activity to be recorded in the learning journals was based on learners' experiences of CSCL. An overview of the revised on-line component for the course *Technology for Educational Change* is provided in Table 4.3.

Table 4. 3 **On-Line Component for** *Technology for Educational Change*

Week	On-line Component of *Technology for Educational Change*
1	Participate: Initial Log-on & Introduction. 5% Benchmark your knowledge in your journal
2	Structured Interview assignment Weekly journal entry
3	Structured Interview due. Weekly journal entry
4	On-line Activity 1: *Structured debate* Weekly journal entry
5	On-line activity: due Weekly journal entry
6	Weekly journal entry
7	Weekly journal entry
8	On-line Activity 2: *Experience to Practice* Weekly journal entry
9	On-line activity :due Weekly journal entry
10	On-line Activity 3:*Design* Weekly journal entry
11	On-line activity: due Weekly journal entry
12	Weekly journal entry
13	Learning Journal- Final Entry.

The addition of an on-line collaborative learning activity

The new collaborative learning activity was intended to familiarize learners with the strengths and weakness of CMC. This learning activity had three components: (a) group preparation, (b) presentation of arguments, and (c) self and peer assessment (see Appendix 4.1). Groups of learners were paired and each group within the pair group was designated an opposing position, presenting either the strengths or weakness of CMC. A reference to an on-line journal was provided in the FirstClass® course conference. Individual learners were asked to select and read an article. Groups were then given a week to collaboratively prepare a position paper supporting their argument with the literature they had reviewed and submit the paper to their partner group for rebuttal. Only the rebuttal paper was graded. This assignment was worth 15% of learners' final grades.

The Inclusion of a Learning Journal

A private space within FirstClass® was created for learners to record their journals. This exercise was designed to help learners monitor their learning throughout the course. The first entry was worth 8% of their final grade and required them to benchmark their current understanding regarding educational technologies by responding to three guiding questions. After this initial exercise, learners were required to submit weekly entries recording the challenges they had encountered in their on-line collaborative learning activities, as well as record how they resolved these issues. In some weeks learners were also required to respond to a *question of the week*. The weekly entries were worth 1% per week, based strictly on participation. A final journal entry worth 10% required them to review and critique one of their peer groups' Activity 3:*Design* products.

Action Phase

The action phase of this research cycle involved applying and subsequently refining of the CSCL assessment tool.

Applying the Assessment Tool

At the beginning of the first on-line activity thirteen four-member learning groups (forums) were divided between Jennifer and I. Activity 1: *Structured Debate* spanned a two-week period. Best practice in applications of CMC recommend that all learner interaction be monitored on a daily basis. We followed this model due to learners' inexperience with the medium. We decided that during week one Jennifer would monitor forums one through seven inclusive and I would monitor forums eight through thirteen inclusive. At the beginning of the second week of the on-line learning activity Jennifer and I would switch groups. During week two Jennifer would monitor forums eight through thirteen and I would monitor forums one through seven.

On-line moderation involves reviewing all messages posted by learners in the virtual environment. It often entails posting messages to the class conference offering guidance, responding to questions and providing clarification and encouragement when necessary. Our postings can be classified into three categories of responses: (a) reminders, (b) responses and recommendations and (c) encouragement.

We continually reminded learners to restrict course-related interaction to the class conference area. The following examples of messages posted by me to groups fall into this category of responses,

Hi all,

I just wanted remind you to please keep your interaction in the class

conference. I understand emails are a way of life—but this is our means of

communication we need to see your group process:-)(Forum, 09/19/00)

Hello All,

I get the feeling that messages are not all being posted in the Forum—it is

important that I know what is happening so please post interaction in

here:-)(Forum, 09/21/00)

At other times we responded to questions posted by learners when a response was not

forthcoming from their group members. The message below posted by Jennifer illustrates

such an intervention:

I am assuming that since no one responded to your question, that the rest

of your forum mates aren't sure about this either :~).

I think that it is up to you guys to decide how you want to organize things

... but my suggestion would be for you to post your individual summaries

in point form (it will make things easier to synthesize later). The key to

productive on-line group activities is good organization and time

management :~) !!! (Forum, 09/27/00)

We also frequently encouraged learners by publicly recognizing their efforts. The

following two postings demonstrate our use of this instructional strategy,

72

Hello All,

May I just say I am most impressed with the latest additions to this

Forum—WOW your interviews are done and summaries are posted!

Cheers to you two:-)(Forum,09/25/00)

Hello all,

May I just say that it looks like you all learned a great deal from this first

"computer supported collaborative learning activity"—I am happy to see

the positive actions you are discussing! I am certain your group activity

will benefit from the organizational strategies you have outlined:-) I look

forward to seeing your Formal opposing argument!(Forum,10/01/00)

Reflections at mid-point

At the end of the first week of the learning activity Jennifer and I met to compare and

discuss observations to date. At this time several issues arose concerning our

methodology and the assessment scale we had established.

The methodology proved problematic for two reasons. The first involved the nature

of the learning activity, and the second involved learner's level of expertise with the

medium. The design of the on-line learning activity was such that very different types of

tasks were required of learners during the first week of Activity 1:*Structured Debate*

compared to the second. As the assessment tool was intended to assess learner's

performance across entire learning activities some characteristics of effective computer

supported collaboration would only be expected to be present later in Activity 1:

Structured Debate due to the nature of its design.

In addition to the design characteristics of the learning activity, the learner's level of expertise with the medium also figured prominently. Many learners were novice users of CMC technology and most had never participated in collaborative on-line learning. Although the instructional design of the course did incorporate technical skills building components, most interaction to this point had been highly structured pair-wise communication. As a result the first week of Activity 1: *Structure Debate* was challenging for learners as they struggled to establish group work norms in a novel learning environment. Even by the end of the first week of the activity some groups were lagging behind. In some instances I was forced to intervene. This is illustrated in my posting to one group whose members had not yet chosen their article to review,

> Hello All,
>
> I was just wondering what you people are doing about your
> argument—only [learner's name] has posted her article and
> summary—better get a move on here!
>
> (Forum8, 09/28/00)

One learner contacted me electronically seeking advice about how to deal with non-contributing members of her group. Her description of the situation reflects the types of issues groups were struggling with during this first on-line activity. This individual clearly recognized the importance of establishing group work norms and maintaining group cohesion. Although she knew she could wait until the end of the second week of the activity and reflect non-participation in peer assessments, she was actively seeking alternative that could strengthen the group. The electronic record of our exchange follows:

Learner7:

Dear Laura,

I just wanted to know if it is okay if we post a complaint to our group members in our forum. I know that we get to individually grade our peers but I really feel I need to talk to them before I give them a low grade, kind of like a chance to redeem themselves. One of my other group members and I have done all the work in putting it together, and we both agree that this should not have happened. We have also begun to take steps so that we are better organized next time. Do you feel we should post such a message in their individual mailboxes or in our group forum? Please let me know.

Laura:

I think you should post in the Forum—but be very careful in the way you do it (no flaming!)

Learner 7:

I also wanted to say thank you for being so compassionate and understanding about my situation with my mother. I can't not begin to express how much your compassion has helped me, Like with the group activity.

Laura:

At times like these we all need to be understanding—the stress you are under is enough, the last thing you need is me coming down on you. I am

very impressed that you were so productive in spite of everything that is

going on—I want you to know I noticed:-)

Learner 7:

I hope to have my journal in on time, if it is not, I hope to have it in no

later then Sunday.

Laura:

Not a problem—even if you need more time.

Learner 7:

I just wanted to keep you up to date with my situation. Once again, Thank

You!

Learner 7:

P.S. we posted our message a little late and then kept finding errors so we

had to unsend and then send again. Will this effect our assignment or our

grade in any way?

Laura:

I figured that was what you were doing—no problem:-)(Email response to

Learner 7, 09/30/00/7:52a.m.)

Given the above-mentioned issues we decided that the validity of the assessment

criteria could be determined only at the end of on-line activity 1. We decided that in

fairness to learners I would review all interaction across both weeks of the learning

activity once the activity was finished and assign the IAIC score based on this

assessment. In this way the validity of the CSCL process assessment criteria could be

based on comparisons between my observations and reflections across all forums and those of Jennifer for only the forums for which she was responsible.

Along with the methodological issues, it became apparent that our previously defined assessment scale of *presence* (1) or *absence of evidence* (0), did not sufficiently represent the range of quality in individual performance. This except from my journal reflects our thinking on this matter:

> We both feel the categories have degrees, perhaps a scale for grading
>
> would be more effective than our current *presence/absence* approach. We
>
> will reserve final judgement until after the second week of the activity as
>
> we expect more collaborative interaction due to the instructional design of
>
> the activity(Journal entry, 09/27/00)

Jennifer proposed an adjustment to the assessment scale and the inclusion of a score for *outstanding contribution* (2). During the same meeting we also reviewed the criteria and our use of it. I questioned the need for the criteria of *Demonstrated Improvement over time* in light of the expanded assessment scale. We decided to consider both these issues as we resumed our on-line monitoring for the duration of the first activity. Although we did not meet again face to face for another week, we did exchange emails through FirstClass®. In one such communication we discussed an adjustment to the CSCL process assessment criterion of *asks for/provides clarification*. As a result of this discussion we did add *feedback* to the criterion. We also reflected upon the application of the CSCL process assessment tool:

> Laura:

I just wanted to mention these things while I could still remember them:-

)One thing I think we might want to include in the criteria under asks for /provides clarification is feedback/So the category would include clarification and feedback.

Jennifer:

Good idea. As I have been using the criteria for this part of the activity I have been trying to think of ways to improve/focus them, but nothing has come to mind yet :~)

Laura:

Another thing I don't know if I mentioned was about the issue of seeking clarification—in my mind I thought of this only as interaction between students—not asking us to hold their hands. This issue dawned on me after our discussion about chats.

Jennifer:

I hadn't even thought of this. One thing that often happened in Part 1 was questions/concerns were aimed at their fellow students but no one answered, so I stepped in. I considered these postings as examples of this criteria (right :~) ?!?).

Laura:

Yes—but as time goes on they should rely more on each other. Personally I don't really think they should receive grades for asking us questions:)What are your thoughts on this? (email exchange 10/5/00/10:11a.m.)

In the same exchange we discussed our general observations regarding the functionality of groups and their adaptation to this novel learning environment. In following quote Jennifer specially identifies the types of behaviors she is observing in the group forums. Her observations are a reflection of learners' continued struggle to establish group norms in this new medium:

Laura:

By the way—how are your groups going? I haven't had a chance to look at anyone but #8 yet—they seem to be getting it together. What are your thoughts on the activity this week?

Jennifer:

Better but part of it is the illusion of getting things together ... spending a lot of time planning on when they were going to get things done. They are rather clever in doing this, masking the fact that they aren't really discussing anything necessarily constructive. But I think they are getting the idea of these activities and are showing some improvement and they will continue to improve. One thing that I have noticed is that they are really starting to build some camaraderie within their group.

Laura:

Developing group cohesion was a major focus of the initial ID. I have noticed it too.

Jennifer:

They are really competitive (We're going to kill their argument, etc.), which is pretty cool.

Laura:

Inter-group competition can be a really wonderful motivation tool:-)

Jennifer:

So all this to say that yes they are showing some improvement, but there is

still a lot of room for improvement :~).

Laura:

As there should be we still have 8 weeks left:-) (and yes if they are good I

will include them in my journal:-)

Jennifer:

So am I journal worthy?

Laura:

Yes:-) (email exchange 10/5/00/10:11a.m.)

Post-application reflections

Jennifer and I met again at the end of the on-line activity to discuss our observations

and reflections. The expanded assessment scale was found to be more representative of

individual participation. An assessment form was designed for use in the following on-

line activity and is presented in Table 4.4 below. Learners' names were recorded in the

first column of the table. Our assessments of each CSCL process assessment criteria were

recorded in the following five columns. The total of these ratings was then entered in the

final column.

At this time we both agreed that with the expanded assessment scale the CSCL

process assessment criterion of *Demonstrated Improvement over Task Duration* was

redundant. We felt the five CSCL process assessment criteria identified the

characteristics of effective computer supported collaborative interaction. The expanded assessment scale allowed us to indicate levels of performance and indicate improvement over time. As a result the criterion of *Demonstrated Improvement over Task Duration* was dropped from the assessment tool.

Table 4. 4 Raters Working Sheet

Individual Con.	D.EX			LEAD.			Clar/Feed			Info pro.			Quality			total
Student Name	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	
Robert	x				x				x		x				x	6

Observation /Data Collection Phase

The observation /data collection phase of this first action research cycle included two components. assessment and feedback. The assessment component involved: (a) the actual implementation of the CSCL process assessment tool by me to determine IAIC scores for learners. (b) the collection of learners self and peer evaluations and the calculation of Peer Review scores from those and (c) the grading of group assignments. Specifically, the data collected included: (a) IAIC scores assigned by me, (b) Peer Review scores calculated from learners' self and peer evaluations, and (c) grades for Group Products. The feedback component involved providing learners with the three scores used to calculate their individual grades for group work along with the assessment rubric used to grade their group products.

Assessment component

Using the CSCL process assessment tool I reviewed all FirstClass® messages posted

by learners in their Forums for the duration of the on-line activity 1. The revised CSCL

process assessment criteria are presented in Table 4.5. The criteria appear in the first

column of the table. The final status of each is recorded in the last column. Only two

adjustments were made, *Feedback* was included with *Asks for/provides clarification* and

the sixth criterion of *Demonstrates improvement over task duration* was dropped. Both of

these modifications were negotiated between Jennifer and I as discussed above.

Table 4. 5 Review of CSCL Process Assessment Criteria

CSCL Process Assessment Criteria	Status at implementation
1) Distributed expertise	No change
2) Leadership	No change
3) Asks for/ provides clarification/feedback	*Feedback* added
4) Clarity and accuracy of information provided	No change
5) Overall quality of contribution	No change
6) Demonstrates improvement over task duration	Dropped

Based on my review of learner interaction, I assigned a rating for each of the five

assessment criteria and calculated an IAIC score. I then reviewed all self and peer

evaluations and calculated Peer Review scores for each individual. The Peer Review

score was the mean of each learner's self and peer evaluations. I then graded all the group

products and calculated individual grades for each learner.

Peer Review and IAIC scores for Activity 1:*Structured Debate*

The Peer Review and IAIC scores for Activity 1:*Structured Debate* are presented in

Table 4.6. The last two columns of the table represent the differences between these

scores. Where a number appears in the difference column with the sub-heading *under*,

peers underestimated the individual's contribution to the collaborative process in respect

to my assessment. This was the case for only three learners. Alternatively, in cases where

a number appears in the difference column with the sub-heading *over*, peers

overestimated the contribution of the individual to the collaborative process, with respect

to my assessment. This was the case for eighteen learners.

Table 4. 6 Differences Between Peer Review and IAIC Scores for Activity
1:*Structured Debate*

Learner	Peer Review Score for Activity 1: *Structured Debate*	IAIC Scores for Activity 1: *Structured Debate*	Differences between Peer Review and IAIC Scores for Activity 1: *Structured Debate*	
			Under	Over
1	4.9	3.5		1.4
2	4.2	3.5		0.7
3	4.3	3.5		0.8
4	4.1	3.0		1.1
5	3.6	4.0	-0.4	
6	4.2	3.0		1.2
7	4.4	5.0	-0.6	
8	3.8	2.0		1.8
9	4.6	3.0		1.6
10	4.1	2.5		1.6
11	4.0	2.0		2.0
12	1.9	2.0	-0.1	
13	4.5	4.0		0.5
14	4.3	3.0		1.3
15	4.5	3.0		1.5
16	4.6	3.5		1.1
17	3.6	1.0		2.6
18	4.0	1.5		2.5
19	4.2	2.5		1.7
20	3.8	2.0		1.8
21	3.8	1.5		2.3
Mean	4.07	2.81		
SD	.60	.98		

The Grading of Group Products

An assessment rubric for the grading of the group products of Activity 1:

Structured Debate was developed. I clearly defined levels of performance for each

criterion. The assessment rubric is presented in Table 4.7. The criteria and total worth

appear first, followed by two columns. The column to the left denotes the value of each

level of performance that is detailed in the column on the right.

Table 4. 7 Group Product Assessment Rubric - Activity 1: Structured Debate

Articulation/3	
0	unclear
1	areas of confusion
2	generally clear-lacking sufficient elaboration
3	Excellent-clear / concise
Support for views/3	
0	no references, site no sources/personal experience
1	provide reference list, do not site sources/personal experience throughout paper
1.5	no references, site some sources/ personal experience
2	provide reference list, site some sources/personal experience throughout paper
3	provide reference list, support views with sources/personal experience
Accuracy of Information presented/2	
0	misleading interpretation
1	some questionable information
2	good, but little or no elaboration
3	Excellent, provide elaboration
Grammar/ Style/1	
0	weak
0.5	choppy in places/lacks transition between sections
1	Good overall
Overall Presentation/3	
0	weak
1	Choppy-lacking introduction and conclusion
1.5	Choppy with introduction and conclusion
2	Well integrated-lacking introduction or conclusion
3	Well integrated with introduction and conclusion
Thoroughness of Product/2	
0	no reference to opposing argument
1	addresses some issues raised in opposing argument
2	Addresses all points raised in opposing argument

Group Product Scores for Activity 1:*Structure Debate*

Unfortunately, members of only eleven of the thirteen groups consented to participate in this research study. Overall, most learners appeared to have struggled with this assignment. There was great variation in the quality of products produced by these eleven groups and the average grade out of 15 marks was quite low (M = 9.9, SD = 2.55). The Group Product scores for these eleven groups are presented in Table 4.8. The first column of the table indicates the name of the group. The second column provides the Group Product scores attained by each group for Activity 1:*Structured Debate*. These numbers are out of a possible fifteen. The final column of the table presents the scores as percentages.

Table 4. 8 Group Product Scores for Activity 1: *Structured Debate*

Group	Group Product Score for Activity 1: *Structured Debate* (out of 15)	%
1	10	67%
2	14	93%
3	8	53%
4	14	93%
5	9	60%
6	9.5	63%
8	12	80%
9	9.5	63%
10	8.5	57%
11	5.5	37%
12	9	60%

Feedback component

Given the obvious challenges encountered by learners new to this learning context, I felt it necessary to adjust the IAIC scores for feedback purposes. For this initial implementation the presence of five points in any combination in the CSCL process

assessment tool resulted in a full IAIC score. One exception was made. This was in the

case of a Learner 12 who had contributed a total of three postings to the group forum

over the entire activity. Other individuals in his group posted between thirty-nine and

fifty messages. The adjusted IAIC score are presented in Table 4.9. Learners are

identified in the first column of the table. The authentic IAIC scores are presented in the

second column of the table. The Adjusted IAIC score provided to learners appears in the

third column.

Table 4. 9 Comparison between Authentic and Adjusted IAIC Scores for Activity 1:
Structured Debate.

Learner	Authentic IAIC Scores for Activity 1: *Structured Debate*	Adjusted IAIC Scores for Activity 1: *Structured Debate*
1	3.5	5.0
2	3.5	5.0
3	3.5	5.0
4	3.0	5.0
5	4.0	5.0
6	3.0	5.0
7	5.0	5.0
8	2.0	4.0
9	3.0	5.0
10	2.5	4.0
11	2.0	4.0
12	2.0	2.0
13	4.0	5.0
14	3.0	5.0
15	3.0	5.0
16	3.5	5.0
17	1.0	3.0
18	1.5	3.5
19	2.5	5.0
20	2.0	5.0
21	1.5	3.0

Once the IAIC were adjusted, Peer Review scores were tabulated and Group products graded, learners were provided with individual feedback. This feedback was sent to learners in a FirstClass® message to their private mailboxes. This included the three scores: (a) adjusted IAIC score, (b) Peer Review score, and (c) Group Product score. A copy of the assessment rubric used by me to structure my evaluation of group products was posted in the class conference and included with individual feedback (see Table 4.7 above). This was the first time the learners were provided with the group product assessment rubric. No information was supplied to learners regarding how the IAIC score had been calculated except to say that it was based on their collaborative process taking into consideration that this was their first on-line activity.

Reflection Phase

In the reflection phase of this action research cycle I present my analysis of the data collected in the form of authentic IAIC score, Peer Review score and Group Product scores. Specifically, I answer the following questions: (a) Did Peer Review scores agree with IAIC scores? and (b) Were differences between Peer Review and IAIC group specific?

Finding 1: Peers gave each other inflated grades

My line of inquiry was to compare peer grading to instructor grading. The descriptive are presented in Table 4.9. Findings indicate that peers over-scored each other in comparison to instructor grades (t (40) = 6.59, p <.01, d = 1.56).

The pervasiveness of over-marking is evident. Fifteen learners received Peer Review scores that were more than a full point higher than authentic IAIC scores. These findings are consistent with the self and peers assessment literature suggesting that

learners inexperienced with peer assessment, frequently award inflated grades (Dochy, et al., 1999).

Table 4. 10 Descriptive Statistics for Samples of Peer Review and IAIC Scores for Activity 1: *Structured Debate.*

	Peer Review Scores for Activity 1: *Structured Debate*	IAIC Score for Activity 1: *Structured Debate*
Mean	4.07	2.81
Standard Deviation	0.60	.98

The relationship between Peer Review and IAIC scores is represented graphically in Figure 4.1. For learners who received inflated grades, the bar extends above the horizon line, indicating the degree of difference from the IAIC score. In cases where under-marking occurred the bar extends below the horizon line and indicates the degree to which the Peer Review score differed from the IAIC assigned for that learner.

Figure 4. 1 Graph of Differences between Peer Review and IAIC Scores Activity 1: *Structured Debate.*

Participants
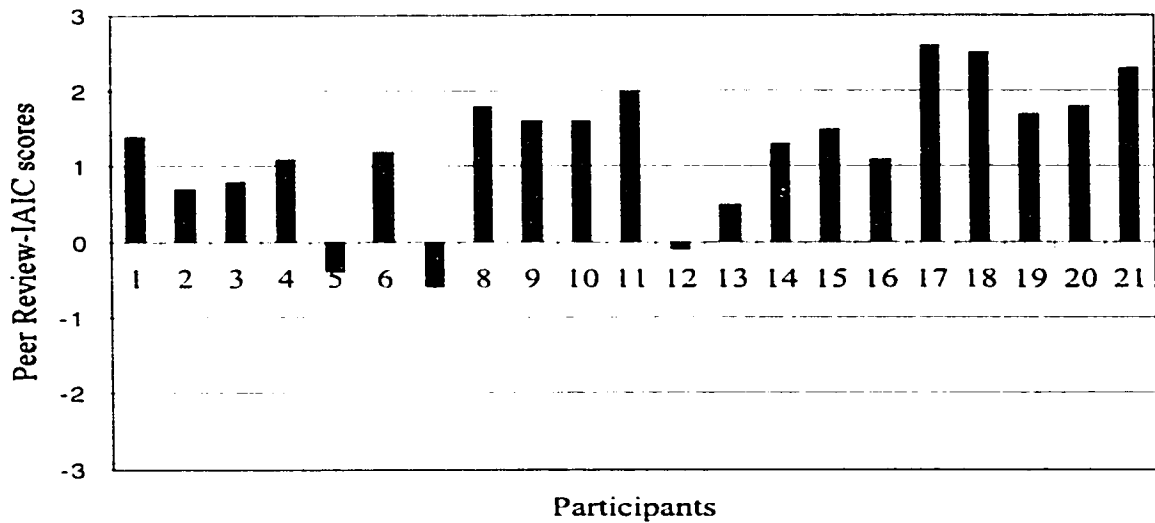
Table 4. 11 Difference between Peer Review and IAIC Scores by Group Membership for Activity 1: *Structured Debate.*

	Learner	Peer Review Score for Activity 1: *Structured Debate*	IAIC Scores for Activity 1: *Structured Debate*	Differences between Peer Review and IAIC Scores for Activity 1: *Structured Debate*	
Group 2	3	4.3	3.5	+0.8	
	4	4.1	3.0	+1.1	
	5	3.6	4.0	-0.4	
				Mean	.77
				SD	.35
Group 6	11	4.0	2.0	+2.0	
	12	1.9	2.0	-0.1	
	13	4.5	4.0	-0.5	
				Mean	.87
				SD	1.00
Group 10	16	4.6	3.5	+1.1	
	17	3.6	1	+2.6	
	18	4.0	1.5	+2.5	
				Mean	2.07
				SD	.84

Finding 2: Peer grade inflation was consistent across groups

I examined the possibility that grade inflation might be group specific. Although no

complete group of learners from any one group consented to participate in this research

study, three members of three different groups did. The Peer Review score, IAIC scores

and differences for these nine individuals are presented in Table 4.11, categorized by

group membership. Based on these three groups, group membership was not responsible

for the discrepancies between Peer Review and IAIC scores. An analysis of variance

comparing mean differences of each of the three groups revealed no statistically

significant difference between them, F (2,6) = 2.57, p = .16. Although these findings

must be interpreted cautiously due to small sample size, findings suggest that discrepancies between Peer Review and IAIC scores were consistent across groups.

My Reflections

My goal in the development of the new calculation model and assessment tool was founded on two central beliefs: (a) that grades for collaborative group work should reflect both process and product equally, and (b) that learners needed to be supported in the development of evaluative skills.

Problems with the Calculation Model

I did realize that the idea of placing just as much emphasis on process as product would be a novel orientation for learners. Although the study guide for the course underlined this principle, and we continually reminded learners of the importance of sharing their process with us, it was not until feedback for the first on-line activity was received that the implications of such an orientation fully impacted the learners.

Overall learners' reaction to feedback was negative even with this calculation based on adjusted IAIC scores. The mean individual grade was only 52%, with grades ranging from 91% to as little as 20%. Several learners contacted me with their concerns. One learner suggested adjusting the weighting of the assignment. Another suggested those interested be provided the opportunity to do extra work for bonus points. Although Jennifer and I discussed the possibility of making some adjustment to the weighting of the assignment, the issue of how to orchestrate an adjustment fairly for all learners was our major concern. Some learners also communicated their concern about this possibility. Learner 5 articulated his position clearly in an email to me:

Laura,

Currently there are people in the class who wish to have the first assignment changed to being worth only 10% of the final grade and the others worth a bit more. However, I did well on the first assignment and do not think that I should be punished because the rest of the class did not properly comprehend the task at hand and therefore did not do well. Maybe if they would realize that they were graded for what they did and not how hard they worked they would realize that they got what they deserved. If we were all to be graded by how hard we think we tried than we would all get A's all of the time. Unfortunately that is not the way that it works. When you do poorly on a math test does the grade get changed because you tried really hard. No, it remains the same. Then why should this be changed. If I do poorly on assignment#2 I will not come begging for you to change the grade or to change the course outline because I did not do what was asked of me. I just can not believe the fact that so many people are so upset over their grades when they are the ones who earned them. You did not just suddenly decide to hand out low grades for fun. You even warned that the first assignment is usually low whereas the second is usually much higher. Does this mean that the first should be less important than the second? No. Anyway, all of this is to say that these people will not receive my backing on this argument. It sounds like we are back in High School again blaming everything on the school and the curriculum instead of where the blame belongs, which is with ourselves.

Jennifer and I both felt that most grades had fairly reflected learners' individual investment, but we were both concerned about the effect their dissatisfaction might have on future collaborative performance. As a result I attempted to address learners concerns by posting the following message in the class conference. This message provides a good example of how we tried to promote a *learning culture* within our instructional environment.

Hello Everyone,

I have had a few questions/concerns about your grades for the first on-line activity. I felt the best way to deal with this issue was for me to explain to you all as a group what my feelings are on this issue.

This course has 4 major components—learning journal, short paper, initial on-line participation and the on-line activities.

1) The learning journal grades are awarded solely on the basis of your submitting them, with the exception of the Final entry worth 10% that will be graded. So 20% of your course grade is awarded simply based on submitting your weekly journal entries.

2) Your short paper is worth 15% and is an individual effort.

3) The log-in and structured interview tasks are worth 10% and these grades are awarded based on you having completed the two tasks.

4) The on-line activities are worth 45% of your grade. Throughout the study guide I have underlined the importance of interacting with your peers on the computer supported collaborative activities.

There is no final exam in this course, 30% of your grade for the course is awarded based on you having submitted the journal entries and completed the first two on-line tasks.

You are being offered the opportunity to develop your collaborative skills. For many of you this is your first encounter with this learning orientation. You will all improve with practice. This reality will be reflected in your grades for your on-line activities, both in the "group product scores" and the participation components—"peer review scores" and "instructor assessed individual contribution scores".

For those of you who question your "group product scores" I must point out to you that the average score for this component was a respectable 63.25%.

For those of you who find your group at the lower end of the distribution I suggest that you examine why your group is ranked there. Some of you have suggested that the nature of the assignment contributed to this reality—if this was so then we should expect to see an abnormal distribution of scores, this is not the case.

In terms of grading your group work products I have posted the criteria I used to assess your work. This is a 300 level undergraduate course, so a certain standard of excellence is expected of you.

My interpretation of the grades for on-line activity #1 are as follows:

1) A few group came to the course with strong collaborative skills and high standards of excellence—they received very good grades for this activity.

2) Most groups are familiarizing themselves with the collaborative orientation of these activities and invested the time to develop their proficiency with the medium.

3) A few groups have group management challenges and are struggling with the new learning orientation.

My conclusions:

The groups in category 1 will continue to improve—, as these groups are highly functional.

The groups in category 2 will improve greatly with practice.

The groups in category 3 will work the hardest and gain the most. You will be the shining stars of this course because you will master both the learning orientation and the medium.

As an instructor I can not underline strongly enough how important it is for all groups to work on effective collaboration. Philosophically "the group" is greater than the sum of your members—you need to share your expertise and personal experience. You need to draw on individual strengths to promote effective communication and high standards of excellence that will result in good grades for all. I expect to see dramatic improvement in the next on-line activity—I look forward to sharing your great sense of achievement then:-)

(Groups conference,10/25/00/12:36p.m.)

In reviewing the grades for group products it became apparent that learners might have been justified to some extent in their dissatisfaction with the Group Product scores. The grades might actually have been confounded by the task design and Group Product assessment rubric I used. Since learners were required to adopt a position and support that position with literature, groups who were assigned the task of identifying the weaknesses of computer supported communication might have been at a disadvantage. Since learners were provided with a link to an on-line journal, it could be expected that articles published there would adopt a positive perspective in relation to the medium. As such, learners searching for the shortcomings associated with CMC would certainly find it more difficult to support their position. If this was the case we would expect to see two things: (a) consistent differences between group product score for groups assigned to opposing positions, (b) differences within the specific assessment criteria of *support for views* and *accuracy of information provided*.

For the groups who were assigned the position of *the strengths of CMC* the average score was 74 percent, alternatively for groups assigned to *the weaknesses of CMC* position, the average was only 54 percent. Although the assessment criteria of *support for views* did not reveal any differences between the two positions, the criteria of *accuracy of information provided* did. Groups who were assigned to the *strengths* position received an average score of 2.33/3 on this criterion, whereas those assigned to the *weaknesses* position, received 1.25/3. It would appear that learners were justified in their discontent to some extent. Members of groups assigned to *the weakness of CMC* position, do appear to have been disadvantaged as a function of the task design and the group product

assessment criterion of *accuracy of information provided*. This situation was unfortunate as it jaded learners' perceptions of the calculation model and created a negative atmosphere in the instructional environment.

Reflections about the Development of Learners' Evaluative Skills

It had been my hope that by incorporating the IAIC score in the calculation of individual grades for CSCL, more equitable assessment would be achieved. I realized how labor intensive the assessment of collaborative process could be and hope that with the use of an assessment tool this task would be manageable. Initially, I viewed the CSCL process assessment tool from an instructional designer's perspective. I understood that an instructor could not maintain the commitment of monitoring collaborative process but with a stable tool, a teaching assistant might.

However, my conceptualization of the tools' usefulness evolved and I began to see the tool as a potential mechanism for supporting the development of evaluative skills in learners. Given the differences between Peer Review scores and IAIC scores and the pattern of those differences, learners were not attending to the same characteristics of performance as were deemed important in the CSCL process assessment criteria. To this point learners self and peer assessment was relatively unstructured. They had been provided with two guiding questions to support their evaluations, but with little prior experience with CSCL, perhaps they needed more support.

If learners were provided with the breakdown of the IAIC score and the definitions of each criterion of the CSCL process assessment tool, this information could direct their attention to the important characteristics of CSCL process. This information could help them in two ways: (a) understand how they could improve their individual contributions

to the group, and (b) improve their assessments of their peers' contributions to the group. In this way the CSCL process assessment tool would improve their task understanding and support the development of evaluative skills.

At this point in the study I was not yet confident in the CSCL process assessment tool. I felt it was important to have Jennifer implement the tool in the next on-line activity prior to extending its use to learners. However, our feedback component in the next action research cycle would include the breakdown of the IAIC score and the definitions of the CSCL process assessment criteria. The following chapter describes the second cycle of this action research study.

CHAPTER 5

Cycle 2: The Implementation of an Assessment Tool for CSCL

Overview of Cycle 2

The second cycle of this action research study examined the use of the CSCL process assessment tool by Jennifer to: (a) support the monitoring of learners' on-line interaction, and (b) support her assignment of IAIC scores at the conclusion of the activity. In addition in this cycle, I hoped to increase the transparency of assessment practices for learners.

As in the first action research cycle, this cycle encompassed four phases: (a) planning, (b) action, (c) observation /data collection, followed by (d) a reflection phase. Where defining the boundaries between phases in the first cycle posed challenges; defining the boundaries between cycles one and two of the study was equally so. Temporal overlap did occur between the feedback and reflection phases of cycle one and the planning phase of cycle two. To maintain clarity, I have remained true to the ordering of the phases in this cycle and have acknowledged areas of temporal overlap to maintain the reader's orientation.

Planning Phase

In the planning phase of cycle two, I planned how I would increase the transparency of assessment practices. To this end I worked at defining the CSCL process assessment criteria in terms of operational definitions. In the action phase of the cycle Jennifer monitored learners' on-line interaction using the CSCL process assessment tool. I focused on: (a) the expanded use and continued evaluation of the CSCL process assessment tool,

and (b) finding ways to make assessment practices more transparent for learners in our instructional context. I envisioned accomplishing the first goal by having Jennifer use the CSCL process assessment tool to assign IAIC scores. I anticipated meeting the goal of increasing the transparency of assessment practices by providing learners with: (a) the Individual portion and Group Product assessment rubric at the beginning of Activity 2: *Directed vs Constructivist*, and (b) information about what the IAIC scores were based on at the end of the activity. To this end, I worked towards defining the CSCL process assessment criteria in terms of examples of learner performance observed while implementing the tool.

Continuing the Evaluation of the CSCL Process Assessment Tool

Initially, my motivation for developing a tool to assess collaborative performance centered around issues of the manageability of such a task within an instructional context. From an instructional designer's perspective, I conceptualized the CSCL process assessment tool as support for a teaching assistant assuming the task of assessing on-line collaborative process. It was therefore important to evaluate the potential of such an application. Consequently, I planned to have Jennifer use the CSCL process assessment tool to assign IAIC scores for learners in this second action research cycle.

Increasing the Transparency of Assessment: Assessment Rubrics

The assessment rubrics for Activity 2: *Experience to Practice* had been developed for use in the January 2000 offering of the course *Technology for Educational Change*. The rubrics for this second activity were less elaborate than the one used for Activity 1: *Structured Debate* due to the nature of the product produced. Two rubrics were necessary because this activity had an individual and group component.

The rubric for the individual portion of Activity 2:*Experience to Practice* is

presented Table 5.1. The column to the left denotes the value of each criterion listed in

the column to the right. This component of the activity was completed by individual

learners and was worth five marks.

Table 5. 1 Assessment Rubric for Individual Portion of Activity 2: Experience to Practice

Out of 5	Criteria
1	Example is a *Directed Instructional Approach*
1	Learning objectives are clearly defined
1	Activity is thoroughly described
1	Method of assessment is included
1	Evaluation of personal achievement is included

The rubric for the Group Product Score of Activity 2:*Experience to Practice* is

presented in Table 5.2. The column to the left denotes the value of each criterion listed in

the column to the right. This component of the activity was a collaborative effort, worth

ten marks.

Table 5. 2 Assessment Rubric for Group Product Score of Activity 2: Experience to Practice

Out of 10	Criteria
2	Example is a *Constructivist Instructional Approach*
2	Learning outcomes are defined
2	Activities are clearly described
2	Method of assessment is included
2	Justification for design decisions are made (this means reference to literature are included)

Increasing the Transparency of Assessment: Refining CSCL Process Assessment Criteria

In the planning phase of cycle one, Jennifer and I defined the criteria of the CSCL

process assessment tool and developed examples of each based on the archived

interaction of learners during the January 2000 semester of the course *Technology for Educational Change*. As I used the tool to assign IAIC scores for Activity 1:*Structured Debate*, I found that some criterion needed further elaboration. Throughout the implementation process I compiled a list of the specific types of behaviors that exemplified these criterion. Often the refined examples were more diverse than our original conceptualizations, in some cases these were more representative of the types of behaviors denoted by the criterion. My intention was to express the definitions of the criteria in operational terms as exemplars of performance. I felt that in this way the CSCL process assessment tool could be used as a meaningful feedback tool for learners.

The refined CSCL process assessment tool is presented in Table 5.3. The CSCL process assessment criteria appear in the first column of the table. The definitions and original examples appear in the second and third columns respectively, my list of observed learner behaviors appears in the final column.

Table 5. 3 **Refined CSCL Process Assessment and Feedback Tool**

Criteria	Definitions	Original Examples	Refined Exemplars
Distributed Expertise	• Bring in personal knowledge not acquired from course material. • Integrates information posted in forum, bringing it to a higher level/reaches conclusion based on postings.	• Posts a link to a website of interest. • Shares personal experience in educational setting or with technology.	• shared prior knowledge or experience • introduced new information, relating it to activity/discussion
Leadership	• Supportive attitude. • Negotiates/ coordinates group activity. • Initiates activity.	• Encourages group members. • Setting deadlines. • Meeting deadlines/ posting early	• initiate discussion of task/group meetings • proposes deadlines • defines roles • posts early • offers guidelines to support/promote group interaction • combines/edits group product

Criteria	Definitions	Original Examples	Refined Exemplars
Provides or asks for clarification/ feedback	▪ specificity with which information is sought ▪ Responding to a previous posting.	▪ Making reference to previous posting. ▪ Questioning the source of information provided.	▪ provides clarification on task instructions ▪ provides constructive feedback on teammate's contribution ▪ provides constructive feedback on combine group product ▪ provides information/instructions about functionality of software. ▪ requests feedback from group on combine group product ▪ asks for clarification about group member's contribution
Clarity and Accuracy of information Provided	Quality of posting. ▪ Comprehensibility of response. ▪ accuracy of information (as judged by us)	Not applicable	▪ clear concise instructions ▪ accurate information or directions
Quality of individual contribution	▪ Postings contribute to final project. ▪ Forum member does his/her part. ▪ Total responsibility for his/her contribution.	▪ Respects deadlines that are set & were agreed upon by forum members. ▪ His/her contributions are "complete"—not relying on the person who is putting things together to make changes. —(Submits fully developed ideas.)	▪ individual component of task (article summary, personal learning experience) ▪ completeness, clarity, and utility of Introduction/conclusion/sectio n of assignment

Once this task was complete, I shared the refined exemplars with Jennifer

electronically. Her response indicated that these exemplars were a good match to her

experience. The following email exchange illustrates her enthusiasm.

Jennifer:

Wow!!! The details/definitions for the criteria are amazing. I really think

that you did an excellent job of verbalizing what characterizes each

criterion.

Laura:

I just hope this helps us better score their collaboration because that last

activity was a nightmare to review! Please keep notes on your experiences

this week—as well as a rough estimate of the time you spend. (not that I

am checking up on you just that I have to also evaluate the feasibility of

this type of assessment. (Email exchange,10/ 22/9.54p.m.)

Action Phase

The action phase of this cycle involved Jennifer monitoring learners' on-line

interaction throughout Activity 2:*Experience to Practice*. During this phase Jennifer was

also asked to journal her observation of learner interaction and group functionality.

The Moderation of Activity 2:Experience to Practice

There was a two-week break between the end of Activity 1:*Structured Debate* and

the beginning of Activity 2:*Experience to Practice*. Originally I planned to provide

learners with feedback on the first activity prior to them beginning the second.

Unfortunately, this was not possible because I was forced to revisit all messages posted

across Activity 1:*Structured Debate*. As a result learners received feedback for Activity

1: *Structured Debate* three days into the second on-line activity. As previously described

in the reflection phase of cycle one; learners were generally dissatisfied with their grades

for the first on-line activity.

Our postings for Activity 2: *Experience to Practice* can be classified into three

categories of responses: (a) reminders, (b) responses and recommendations, and (c)

encouragement. This limited approach to intervention is consistent with

recommendations based on recent research findings. According to Bernard & Lundgren-

Cayrol (2000), the combination of random group assignment and lower levels of

moderator intervention is optimal.

Jennifer assumed responsibility for monitoring the learners' on-line interaction. At this

time I made a conscious effort to reduce my presence within the virtual environment.

Subsequently, my postings were restricted to: (a) responses to inquiries made by learners

specifically to me, and (b) interventions when requested by Jennifer.

Much of the Jennifer's on-line intervention came near the end of Activity 2:

Experience vs. Practice during the group component of the activity. These took the form

of reminders about impending deadlines and warnings to learners about the importance of

keeping their collaborative process visible to us by posting interaction in their Forums as

collaborative process was also a focus of assessment. Examples of these types of

interventions orchestrated by Jennifer follow. The first is an example of a warning she

posted to group 10:

> Hello guys
>
> I don't see much interaction going on here guys ... get a move on. This part
>
> is a group activity, therefore I should be seeing EVERYONE discussing
>
> and contributing to the activity :~). (11/01/00/2:41p.m.)

The second posting dealt with issues of collaborative process and the need to keep the

group's interaction transparent for purposes of grading, the first was posted to group 7:

Hello guys,

I know that there is only the two of you but you must get a move on if you

are going to finish this part of the activity on time :~).

I see that you are sending each other messages to your personal mailboxes,

which is fine as long as these messages have nothing to do with part 2 of

this activity. Remember that you guys are being graded on your process -

at this point there isn't really anything here :~).

Therefore, if you have been sending each other messages some where else

about this activity, please forward them to your forum.(11/2/00/11:24

A second example of the Jennifer's continued emphasis on the need to maintain visibility

of collaborative process is further evident in her posting to group 12:

Hi guys,

It looks like your activity is well on its way. I would, however, like to see

more collaboration going on here :~).(11/03/00/12:09 a.m.)

Observation/Data Collection Phase

The observation/data collection phase came at the end of the second on-line activity.

Specifically, data collected included: (a) Jennifer's experiences implementing the IAIC

process assessment tool and the IAIC scores assigned by her, (b) Peer Review scores

calculated from learners' self and peer evaluations, and (c) Group Product scores.

Learners were provided with feedback in the form of: (a) Peer Review score, (b) IAIC

scores, (c) Individual component scores, and (d) Group product scores. At this time

learners were provided with the CSCL process assessment criteria and operational

definitions of these constructs.

During the assessment component, learners were once more required to conduct self and peer assessments and submit them to me through FirstClass®. The only support provided to learners were the same two guiding questions used in Activity 1: *Structured Debate*: (a) *What was the quality of the individual's contribution to the group product?* , and (b) *How did the individual contribute to the co-construction of knowledge within the group?* These assessments were then used to calculate Peer Review scores for individual learners. Jennifer submitted the IAIC scores for all learners at this time and a report of her observation over the duration of the activity. I graded the group products and assigned Group Product scores. The feedback component followed. Each learner was provided with feedback in the form of the four scores used to calculate their individual grades and the CSCL process assessment criteria along with the operational definitions developed in the planning phase of this cycle. This feedback was sent to learners' private FirstClass® mailboxes.

Peer Review and IAIC scores for Activity 2:*Experience to Practice*

The Peer Review scores and IAIC score for Activity 2: Experience to Practice are presented in Table 5.4. Learners are identified in the first column of the table. Peer Review and IAIC scores appear in the following two columns respectively. The differences between these Peer Reviews and IAIC scores are presented in the third column. The absolute differences between Peer Review and IAIC scores appear in the last column of the table. The final rows of the table indicate the means and standard deviations for each sample of scores.

Table 5. 4 Differences between Peer Review and IAIC Scores for Activity 2: *Experience to Practice*

Learner	Peer Review Scores for Activity 2: *Experience to Practice*	IAIC Scores for Activity 2: *Experience to Practice*	Differences between Peer Review and IAIC Scores for Activity 2: *Experience to Practice*	Absolute Differences between Peer Review and IAIC Scores for Activity 2: *Experience to Practice*
1	5.0	4.0	+1.0	1.0
2	5.0	3.5	+1.5	1.5
3	4.4	3.5	+0.9	0.9
4	4.3	4.5	-0.2	0.2
5	4.9	3.5	+1.4	0.4
6	3.6	3.5	+0.1	0.1
7	5.0	4.0	+1.0	1.0
8	4.0	3.5	+0.5	0.5
9	4.9	4.0	+0.9	0.9
10	4.1	3.5	+0.6	0.6
11	5.0	4.5	+0.5	0.5
12	4.3	3.5	+0.8	0.8
13	4.8	4.0	+0.8	0.8
14	4.5	4.5	0	0
15	5.0	4.0	+1.0	1.0
16	4.3	3.0	+1.3	1.3
17	3.1	3.0	+0.1	0.1
18	4.3	2.0	+2.3	2.3
19	4.3	3.5	+0.8	0.8
20	4.2	4.0	+0.2	0.2
21	3.5	3.0	+0.5	0.5
means	4.40	3.64		0.77
SD	.55	.59		.53

The Grading of Group Products

I conceptualized the individual portion of Activity 2: *Experience to Practice* as a mastery task. Learners whose submissions did not meet the assessment criteria were provided immediate feedback by Jennifer and encouraged to resubmit their assignments.

As a result all learners received full marks for this portion of Activity2: *Experience to Practice*.

Group Product Scores for Activity 2:*Experience to Practice*

Members of only eleven of the thirteen groups consented to participate in this research study. The Group Product scores for these eleven groups are presented in Table 5.5. The first column of the table indicates the name of the group. The second column provides the Group Product scores attained by each group for Activity 2: *Experience to Practice*. These numbers are out of a possible ten. The final column of the table presents the scores as percentages. The mean and standard deviation of this sample of scores are presented in the last rows of the table.

Table 5. 5 **Group Product Scores for Activity 2:** *Experience to Practice*

Group	Group Product Score for Activity 2: *Experience to Practice* (out of 10)	%
1	10	100%
2	10	100%
3	10	100%
4	10	100%
5	10	100%
6	10	100%
8	10	100%
9	9	90%
10	10	100%
11	8	80%
12	8	80%
Means	9.5	
SD	.82	

Feedback Component

Once the IAIC and Peer Review scores were tabulated and Group products graded, learners were provided with individual feedback. Feedback was sent to learners in a FirstClass® message to their private mailboxes between twelve and thirteen days after the end of Activity 2: *Experience to Practice*. It included the three scores: (a) IAIC score, (b) Peer Review score, (c) Group Product score, including cryptic comments about the group product that indicated where marks were lost, and (d) an explanation of the how their individual grades were calculated. A copy of the CSCL Process Assessment Criteria and operational definitions was also included in the message. The following is a copy of the feedback email sent to one learner:

On-line Activity2: Experience to Practice—Feedback

NOTE: All students who submitted a personal learning example received 5/5.

The balance of your grade for Activity2: Experience to Practice was calculated as follows:

$$(a + b) \times C = D$$

Where:

a = Peer Review score (which is the average of all group members' ratings including your own)

b = Instructor Assessed Individual Contribution score (see criteria and method of calculation below)

C = Group Product score

Here is the breakdown

a = Peer Review score: .47

b = Instructor Assessed Individual Contribution score: .45

C = Group Product score: 8—(You needed to provide information about

learners, needed to provide references.)

D + 5 = your grade for on-line activity #2

The following criteria were used to evaluate your Individual contribution

to the group product. A perfect score would be 0.5 and would entail a

rating of 2 on all five dimensions defined below.

Instructor Assessed Individual Contribution

Scale: 0- no-evidence, 1-good, 2-exceptional

Definition of Dimensions:

1) Distributed Expertise

- shared prior knowledge or experience

- introduced new information relating it to activity/discussion

  2) Leadership

- initiate discussion of task/group meetings

- proposes deadlines

- defines roles

- posts early

- offers guidelines to support/promote group interaction

- combines/edits group product

3) Provides/asks for clarification/ feedback

- provides clarification on task instructions

- provides constructive feedback on teammate's contribution

- provides constructive feedback on combine group product

- provides information/instructions about functionality of software.

- requests feedback from group on combine group product

- asks for clarification about group member's contribution

4) Clarity and Accuracy of information Provided

- clear concise instructions

- accurate information/directions

5) Quality of individual contribution

- individual component of task (example: article summary/personal learning
  experience)

- completeness, clarity, and utility of Introduction/conclusion/section of
  assignment (Emailed to learner-11/16/00/2:16p.m.)

Reflection Phase

In the reflection phase of this action research cycle I present my analysis of the data

collected in the form of TA assigned IAIC scores, Peer Review scores and Group Product

scores. Specifically, I answer the following questions: (a) Did Peer Review scores agree

with IAIC scores assigned by Jennifer? (b) Was there improved agreement between Peer

Review and IAIC scores over time? (c) Was the improved agreement between Peer

Review and IAIC scores attributable to improvements in learners' evaluative skills? and

(d) Was the improved agreement between Peer Review and IAIC scores attributable to improvement in learners' collaborative performance?

Finding 3: Peers continued to give each other inflated grades

My line of inquiry was to compare peer grading to Jennifer's grading. Learners awarded Peer Review scores that were significantly higher than IAIC scores assigned by Jennifer, (t (40) = 6.01, $p < .01$, d = 1.34). Descriptives are presented in Table 5.6. These findings are consistent with some of the self and peer assessment literature suggesting that learners inexperienced in the process of peer assessment, often inflate grades when assessing each other (Dochy, et al., 1999).

Table 5. 6 Descriptive for Peer Review and IAIC Scores for Activity 2: *Experience to Practice.*

	Peer Review Scores for Activity 2: *Experience to Practice*	IAIC scores for Activity 2: *Experience to Practice*
Mean	4.40	3.64
Standard Deviation	0.55	0.59

The incidence of over-marking among peers was similar in On-line Activity 1:*Structured Debate* (where eighteen students were over-marked by peers) and Activity 2: *Experience to Practice* (where nineteen of the twenty-one learners received inflated Peer Review scores). These findings may indicate that learners were: (a) not monitoring against the same aspects of performance deemed relevant in the CSCL process assessment tool, or (b) monitoring was not attuned to Jennifer's standards of excellence in assessing those aspects of performance.

A graphic representation of the differences between Peer Review scores and IAIC scores is presented in Figure 5.1. For learners who received inflated grades, the bar extends above the horizon line, indicating the degree of difference from the IAIC score.

In cases where under-marking occurred, the bar extends below the horizon line and indicates the degree to which the Peer Review score differed from the IAIC assigned for that learner.

Figure 5. 1 **Graph of Differences between Peer Review and IAIC scores Activity 2:** *Experience to Practice*

Participants
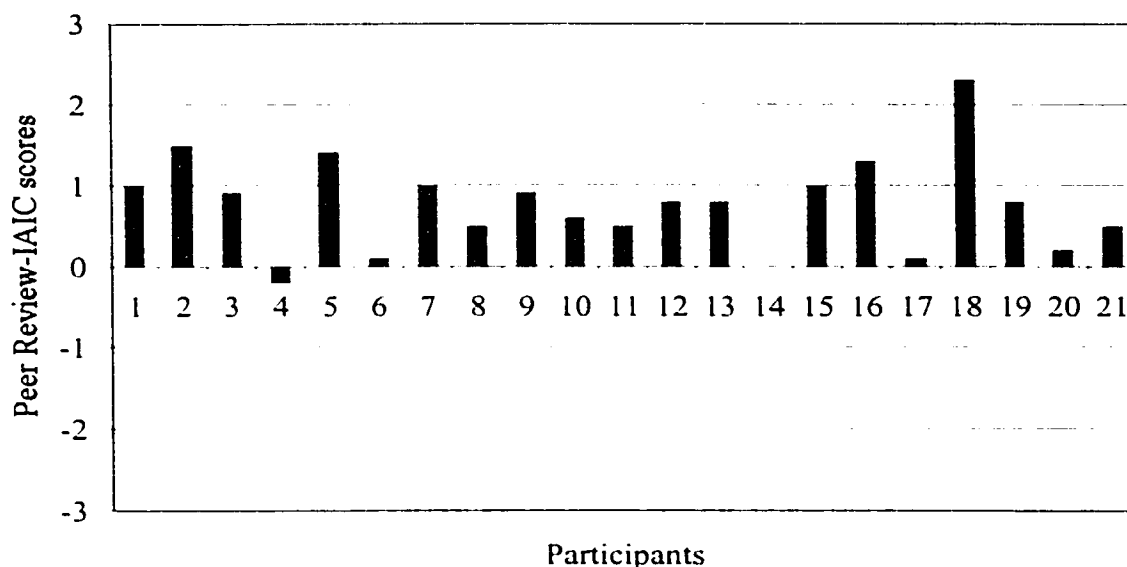
Finding 4: Improvement in agreement between Peer Review and IAIC scores was evident

Although the phenomena of pervasive over-marking endured, the degree of agreement between Peer Review scores and IAIC scores increased for some learners in the second implementation. Fourteen of the twenty-one learners actually received Peer Review scores that matched more closely IAIC scores than their Peer Review scores had for Activity 1: *Structured Debate*. A comparison was made of the degree of difference between Peer Review scores and IAIC scores over time. Table 5.7 presents the differences between Peer Review and IAIC scores for both on-line activities. Learners are identified in the first column of the table. Absolute differences between Peer Review and IAIC scores for Activity 1: *Structured Debate* appear in the second column. Absolute

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differences between Peer Review and IAIC scores for Activity 2: *Experience to Practice*

appear in the third column. The means and standard deviations for these samples of

scores were calculated based on absolute values and are presented in the final two rows

of the table. A t-test revealed Peer Review scores agreed significantly more with IAIC

scores for Activity 2: *Experience to Practice*, than they had for the first on-line activity, t

$(38) = 3.01, p < .01$.

Finding 5: According to Peer Review scores there was no improvement in collaborative

performance from Activity1: *Structured Debate* to Activity 2:*Experience to Practice*

A comparison of Peer Review scores for Activity 1: *Structured Debate* and Activity

2: *Experience to Practice* revealed that learners' assessment of peers' collaborative

performance changed little form Activity 1: *Structured Debate* to Activity 2: *Experience

to Practice* $(t (40) = 1.91, n.s., d = 1.02)$. According to learners' assessments no

improvement in collaborative performance occurred between the first and second on-line

activity.

Finding 6: Improved agreement between Peer Review and IAIC scores was attributable to

improvement in collaborative performance as represented in IAIC scores

A comparison between IAIC scores assigned by me for Activity 1: *Structured

Debate* and those assigned by Jennifer for Activity 2: *Experience to Practice* revealed a

statistically significant improvement in the quality of learners' collaboration $(t (33) =$

$3.33, p < .01)$. The effect size for Peer Review scores between tasks $(d = .57)$ indicates

less movement in mean scores across tasks than those of IAIC scores between tasks, $(d =$

$1.02)$. These findings suggests that the improved agreement between Peer Review and

IAIC scores had more to do with improvements in learners' collaborative performance

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expressed in rising IAIC scores than improvements in learners' evaluative skills. However, this finding must be interpreted cautiously as different raters assigned IAIC scores in Activity 1 versus Activity 2.

Table 5. 7 Absolute Difference for Peer Review and IAIC Scores across Tasks

Learner	Absolute Differences between Peer Review and IAIC Scores for Activity 1: *Structured Debate*	Absolute Differences between Peer Review and IAIC Scores for Activity 2: *Experience to Practice*
1	1.4	1.0
2	0.7	1.5
3	0.8	0.9
4	1.1	0.2
5	0.4	1.4
6	1.2	0.1
7	0.6	1.0
8	1.8	0.5
9	1.6	0.9
10	1.6	0.6
11	2.0	0.5
12	0.1	0.8
13	0.5	0.8
14	1.3	0
15	1.5	1.0
16	1.1	1.3
17	2.6	0.1
18	2.5	2.3
19	1.7	0.8
20	1.8	0.2
21	2.3	0.2
Means	1.36	0.78
SD	0.69	0.55

<u>My Reflections</u>

Ultimately, I envisioned the CSCL process assessment tool fulfilling three purposes: (a) supporting the act of monitoring on-line interaction between learning engaged in CSCL activities, (b) supporting the assessment of collaborative interaction within the context of assigning IAIC scores, and (c) providing learners with valuable feedback they could use to improve their future collaborative performance.

<u>Reflections about the CSCL Process Assessment Tool</u>

From an instructional designer's perspective I considered the CSCL process assessment tool as a performance support tool for teaching assistants. Its value lay in the extent to which it could direct a teaching assistant's attention to characteristics of collaborative performance that a Faculty member would consider important. To this end I needed to examine how Jennifer was applying the tool. Did the behaviors of learners she identified as examples of the CSCL process assessment criteria match my conceptualizations of them?

Jennifer was very organized in her approach to on-line monitoring. While she monitored Activity 2: *Experience to Practice* she compiled a list of the behaviors she observed in a coding journal. At the end of Activity 2: *Experience to Practice* Jennifer presented me with: (a) the IAIC scores, (b) her *coding journal* and (c) a *list of learners' behaviors* she had observed. Entries in the *coding journal* were organized chronologically with her codes marked clearly beside each entry. The *list of learner's behaviors* was typed and organized by learner and group-membership. In instances where serious group functionality issues arose she also included a notation in the *list of learner's behaviors*.

The following example was taken from Jennifer's *list of learner's behaviors*. They are her notations for Learner 1:

- proposed deadline (everyone responded to these deadlines)

- posted personal learning experience (Oct. 22)

- clarified deadlines

- proposed Personal Learning Experience to work wit

- encouraged group members (after some complained about Act.1)

- posted pros and cons and compiled group pros and cons

- established deadlines for part 2

- discussed activity with {learner's name]

- assigned jobs

- posted a lesson plan

- encouraged others (Email from Jen/11/04/00/7:40)

This was invaluable information that allowed me to validate her coding practice. Upon reviewing her coding journal, I was in complete agreement with her application of the CSCL process assessment tool. Although I did not formally calculate inter-rater reliability, my agreement with Jennifer's application of the CSCL process assessment tool raised my level of confidence in the reliability of the tool.

Due to my struggle during the implementation of the CSCL process assessment tool for Activity 1: *Structured Debate* I had developed operational definitions of the CSCL process assessment criteria. These seemed to have been effective in supporting Jennifer in her coding task. However, I recognized that Jennifer's first formal application of the CSCL process assessment tool would be most challenging. Therefore, although I did

make inquires about her perceptions about the tool, I decided to hold off conducting a structured interview until after her second formal use of it in Activity 3: *Design.*

Reflections about Group Development and Quality of Collaboration

At the conclusion of Activity 2: *Experience to Practice,* Jennifer also provided an overview of her impressions of the functionality of each group. She sent the following email with her *list of observed behaviors* attached:

> Hi Laura,
>
> Well, I stayed home all day in my jammies and I finished the individual
>
> contributions :~). I was wondering what would be the best way for me to
>
> send them to you?
>
> I filled out the grid and added up the marks - no one got 10/10 because of
>
> the distributed expertise category (only a few got a point for that cat.). I
>
> have attached my typed out notes for each student - with some comments
>
> about the forums (where there were problems).
>
>
> Here are some general comments about each forum:
>
> Group 1: very good, no problems
>
> Group 2: Excellent group - they don't over chat they set deadlines, divide
>
> the work and get it done with no complaints :~).
>
> Group 3: So-so, they are really only two [two learners' names], [learner's
>
> name] sort of comes and goes (is late), and I think that for part 2 [learner's
>
> name] got tired of doing everything:~)

Group 4: Very good group - only problem is that [learner's name] was in the Hospital therefore didn't participate (didn't really give him a grade) (is there something brewing between [two learners' names],?!?)

Group 5: Complainers but they get things done - they help each other out, and have [two learners' names], as pretty good leaders

Group 6: [learner name], is getting frustrated with chatting, got kind of upset at everyone, [learner name], is the peace maker, [learner name], looks for [learner name]'s approval a lot, and [learner name], has improved by leaps and bounds - even the group acknowledged it :~).

Group 7: Well they are only 2 but they don't seem to be able to handle it - not much went on in the group for this activity

Group 8: [learner name], is the leader, [learners' name], helps her do all the work and [learner name], is in and out of there.

Group 9: [learner name], accused them of discriminating against her, [learner name], responded, she is the leader, they do fine - they all do what they are supposed to/agreed to do - except [two learners' names], - they don't seem to log on enough

Group 10: communication problem - [two learners' names], changed the activity without the others knowing, they did all their communicating by e-mail, [learner name], was working on another PLE. I sent them a message - [learner name], responded (I sent you a copy), [learner name], did nothing for the group activity.

Group 11: They get there work done without too much chatting they all

contributed in all aspects - no distribution of expertise - the only problem

Group 12: Not much collaboration - revised versions of Part 2 were being

posted but I have no idea who was revising them/making suggestions -

[learner name], didn't contribute anything for part 2 (I got a message from

[learner name])

Group 13: [two learners' names], did most of the work - [learner name],

had tech problems, and [learner name], - well....

So that is what I have for you :~),

Jen (Email sent by Jen/11/04/00/7:40)

It was obvious from Jennifer's report that group functionality had progressed

tremendously from Activity 1: *Structured Debate* to Activity 2:*Experience to Practice.*

For example, from Jennifer's report Group eleven is sharing the responsibility for the

group product equally. According to Jennifer the only thing they need to emphasize more

is the sharing of prior knowledge and experience. However, the progression was not

uniform across the class. I turned towards the literature on group development for insight.

Several researchers have developed models of group development based on stages or

phases that groups appear to progress through towards a functional state of effective

collaborative work (Dehler, 2000). It is important to note that the concept of group

development and change is associated with aspects of the quality of experience shared by

a group overtime and is less contingent upon the length of their association (Dehler,

2000). Within this context, task experience is not the crucial factor, but rather the amount

of development and change achieved.

Drexler and Sibbit's (1987) model of group development describes seven stages that groups of people pass through as they solidify into a highly functional group. Although this model is conceptualized linearly, groups often move back and forth between stages and sometimes skip ahead, only to revisit a stage later. Within this model, each stage is characterized as presenting group members with important issues. The success with which a group moves through the cycle depends to a great extent upon the successful resolution of conflict presented at each stage. The seven stages of Drexler/Sibbit Model of Team Performance are: (a) Orientation stage, in this stage the issue is *why am I here*, (b) Trust Building stage, in this stage the issue is *who are you*, (c) Goal/Role Clarification stage, in this stage the issue is *what are we doing*, (d) Commitment stage, in this stage the issue is *how will we do it*, (e) Implementation stage, in this stage the issues are *who does what, when and where* (f) High Performance stage, at this stage the group either achieves *synergy* or *experiences overload*, and (g) Renewal stage, the issue is *why continue*. This model provides an excellent framework for examining the functionality of the learning group in *Technology for Educational Change.*

Groups one, two, four, five, and eleven seemed to demonstrate progression though the Drexler/Sibbit model right to successful resolution of the *High Performance stage.* However, other groups continued to experience problems. Groups three, eight, nine, ten and thirteen had encountered challenges related to unequal contribution of group members suggesting that issues at the *Implementation* stage of the Drexler/Sibbit model had not been completely resolved.

Group six had experienced difficulty with group dynamics generally. We had anticipated challenges in this group due to Learner 12's desertion during Activity 1:

Structured Debate. As a result of his lack of contribution in the first on-line activity, the development of trust within this group was stunted. Given the circumstances, they needed to revisit the *Trust Building Stage* of the Drexler/ Sibbit model. The following entry from Jennifer's *list of observable behaviors* provides a more detailed picture of how the group was operating. It suggests that the *Implementation* stage also presented challenges for this group:

> (There was some disagreement within the group over who was going to do
>
> what, who's to use, Learner 13 got upset over comments that were made
>
> about his portion - suggested no longer chatting - used justification from
>
> literature ☺, Learner 12 wanted to use his - caused problems, [another
>
> learner] just kept looking to see what Learner 11 was going to say - he just
>
> kept peace. Later, Learner 11 and Learner 13 chatted and ironed things
>
> out.) (Taken from Jennifer's typed list)

Only two of the thirteen group demonstrated evidence of communication outside the group forum. They do not appear to have reached the *High Performance* stage of the Drexler/Sibbit model, although they did make their deadline, their execution was not optimal. Group ten appeared to be using ICQ and Group twelve seemed to communicate through private email. This was in spite of Jennifer's continued emphasis on the importance of keeping their collaborative process visible to us. The following message posted to Group ten is an example of her emphasizing the importance of their collaborative process:

I don't see much interaction going on here guys ... get a move on. This part

is a group activity, therefore I should be seeing EVERYONE discussing

and contributing to the activity :~).

Jen (Posted to Group 10 /11/01/00/2:41p.m)

Group twelve received a similar message a few days later:

Hi guys,

It looks like your activity is well on its way. I would, however, like to see

more collaboration going on here :~)

Jen (Posted to Group 12 /10/03/00/12:09 a.m.

Jennifer reported that Group seven was experiencing difficulty. We had been aware

of this situation for sometime. Due to attrition in the course, this group had been reduced

to only two members. This type of situation sometimes occurs in the *Technology for*

Educational Change course. Although we delay the intense collaborative activities until

the end of the first month of the course, and assign four members to each group,

occasionally one group ends up with only two members. This presents a real dilemma.

Given the requirements, the on-line learning activities call for a minimum group size of

three, ideally three highly functional individuals.

Obviously the two individuals in Group seven where not adapting well to their

circumstances. Jennifer and I had discussed this issue during an on-line chat. We had two

choices: (a) add another member to Group seven, or (b) split the pair up among other

groups. Moving both members into the same group was not considered an option as all

other groups had at least four member and my prior experience with group of more than

five members had been extremely negative. Our on-line chat illustrates the issues we had

to consider in dealing with the dilemma in Group seven:

JENNIFER SCLATER: Group 7 will not be able to stay like that (just 2)

LAURA MCEWEN: I asked you before where you think they should go

JENNIFER SCLATER: I'm not sure - there are some groups where only

1/2 do the work but would they really be better off there? Then putting

them into a group that is working well will screw up the group and they

won't have much opportunity to contrib

JENNIFER SCLATER: contribute

JENNIFER SCLATER: I was thinking that I would see who dropped the

class and then see where they should be placed :~)

LAURA MCEWEN: this is always such a problem

LAURA MCEWEN: from what I can see Group 3 has 3 members-I really

don't want to touch Group 2—they do amazing work together

JENNIFER SCLATER: I agree

LAURA MCEWEN: Who works in Group 12?

LAURA MCEWEN: they have bad dynamics anyway

JENNIFER SCLATER: (Have you read any of their [F2] chats- quite

amusing)

LAURA MCEWEN: could we move some one out of there?

JENNIFER SCLATER: F12 - is [learner's names] etc.

LAURA MCEWEN: their papers were outstanding too

LAURA MCEWEN: so do we move one of them

LAURA MCEWEN: which one?

JENNIFER SCLATER: I'm not sure

LAURA MCEWEN: learner's name isn't happy there

JENNIFER SCLATER: only [three learner's names] work

LAURA MCEWEN: maybe she is the right choice

JENNIFER SCLATER: Group 10 have problems :~)

LAURA MCEWEN: what kind?

JENNIFER SCLATER: communication

LAURA MCEWEN: they just don't or what?

JENNIFER SCLATER: At this point only really two members are posting

things and they were still discussing the Pros and cons

JENNIFER SCLATER: I don't know what is going on :~)

LAURA MCEWEN: I think we should just move learner's name to Group

7 and see what happens

JENNIFER SCLATER: OK

JENNIFER SCLATER: How many have dropped?

LAURA MCEWEN: let's hold off saying anything for now

LAURA MCEWEN: not sure

JENNIFER SCLATER: I agree

JENNIFER SCLATER: I will collect my thoughts about each forum

LAURA MCEWEN: great

JENNIFER SCLATER: and see what happens

We were faced with the decision of whether to move: (a) one learner into Group seven and possibly disrupt the dynamics of the group he/she was from as well as risk the moved individual's state of mind, or (b) the two members of Group seven into two separate groups and place the dynamics of those two groups in jeopardy along with the unsettling effect of the move on the two members. After some deliberation we elected to move the two members of Group seven into separate groups. We felt this would be the least disruptive to all concerned. This solution worked out well.

Reflections about the Improvement in Agreement between Peer Review and IAIC Scores

Given that no significant difference was found between Peer Review scores for Activity 1: *Structured Debate* and Activity 2: *Experience to Practice*, I was confident that the better agreement between Peer Review and IAIC scores for the second on-line activity was attributable to improvement in the quality of learner's collaboration, as indicated in rising IAIC scores assigned by Jennifer. An analysis of group development based on Jennifer's observation of group functionality lent further support to this hypothesis. However, I also worried about the impact of my having provided learners with misleading feedback on their collaborative performance for Activity 1: *Structured Debate*.

Reflections about Misleading Feedback for Activity 1: *Structured Debate*

While based on good intention, my awarding learners adjusted IAIC score for Activity 1:*Structured Debate* might well have confused learners. By adjusting the IAIC scores upward, I felt learners might have interpreted self and peer evaluations they assigned as valid. In hindsight the following email from Learner 19 discussing the grades for Activity 1: *Structured Debate* provides support for my fears. Learner 19 suggests

placing more emphasis on participation aspect in the calculation model for Activity 1:

Structured Debate:

> Hi Laura,
>
> I understand that with this new way of learning one might find these first
>
> tasks to be challenging. So PERHAPS you should base more grades on
>
> participation for the first activity and provide extensive feedback as to
>
> where we had gone wrong. We all worked very hard on this paper and this
>
> is reflected in the grade disapproval of all group members. Perhaps we are
>
> to "learn from experience" but our final grade for this course is still
>
> damaged by this first assignment. I just feel that we were a little bit
>
> cheated, because we are all first time users and all worked very hard on
>
> this first assignment. Receiving a grade that low is quite discouraging to
>
> all.(Email from Learner 19/ 10/27/00)

Learner 19's group received a Group Product score of 5.5 for the first on-line activity

and most group members received adjusted IAIC scores of .50, a perfect score. Perhaps

had she known the authentic IAIC scores, she might not have suggested increasing the

emphasis on participation grades. The reality of her situation was that the group had not

collaborated effectively, and the quality of the group product was low.

Regretfully, I did not recognize the true impact of this misleading information until it

was too late. Had I, I might have publicly announced the adjustment. However, this

would have raised ethical issues in terms of my responsibility to provide additional

feedback, had learners sought more information. This example serves to underlines the

delicate balance one attempts to maintain in an action research study. Had learners

requested more information regarding their collaborative performance I was ethically bound as their instructor and would have provided it. However, this action might have compromised my examination of the CSCL process assessment tool. I would have had to provide the CSCL process assessment criteria in order to explain what aspects of their collaborative performance I was looking for. I had planned to provide learners with this information only upon the completion of Activity 2: *Experience to Practice* and then only in the form of feedback once they had conducted self and peer evaluations.

Reflections about the Potential of IAIC Scores as Feedback

Once I had graded the Group Products and calculated individual grades for Activity 2: *Experience to Practice* I provided learners with individual feedback. Although I included a copy of the CSCL process assessment criteria and the operational definitions I did not give a breakdown of IAIC according to each criteria. I fully anticipated learners contacting me for this information once they reviewed their individual grades. Only one learner did. A copy of her email request is presented here. Learner 7 writes:

> Dear Laura,
>
> I was just reviewing my evaluation so as to see what I could improve for activity #3, and found that I am not too sure where specifically I should improve. I was wondering if possible, if you could simply place a grade next to each criteria so I would know where I got a 0, 1, 2. This would help me out greatly, because I would then know exactly what to concentrate on, and what to continue doing. Thank You!
>
> (Email request from Learner 7/10/19/00)

I was happy to provide her with this information. Her requested also increased my

confidence in the CSCL process assessment tool as a feedback tool.

CHAPTER 6

Cycle 3: Implementing the CSCL Process Assessment Tool with Learners

Overview of Cycle 3

My Focus in the third cycle of this action research study was to extend my examination of the CSCL process assessment tool by examining the stability of the tool over time. I was also interested in examining the relationship between the quality of collaboration and the subsequent quality of group products produced.

As in the first action research cycle, this cycle encompasses four phases: (a) planning, (b) action, (c) observation /data collection, followed by (d) a reflection phase. Some temporal overlap did occur between the feedback and reflection phases of cycle two and the planning phase of cycle three. To maintain clarity, I have remained true to the ordering of the phases in this cycle and have acknowledged areas of temporal overlap to maintain the reader's orientation.

In the planning phase of this cycle, I planned how I would increase the transparency of assessment practices by providing learners with the CSCL process assessment tool to support their self and peer evaluations. In the action phase of the cycle Jennifer continued to monitor the learners' on-line collaboration. The observation/data collection phase came at the end of Activity 3: *Design*. Once again, this phase included two components, assessment and feedback. During the assessment component, learners were once more required to conduct self and peer assessments and submit them to me through FirstClass®. In this implementation they were provided with the CSCL process assessment tool to support the evaluation process. These assessments were then used to calculate Peer Review scores for individual learners. Jennifer submitted the IAIC scores

for all learners at this time and a report of her observation over the duration of the activity. I graded the group products and assigned Group Product scores. The feedback component followed. Each learner was provided with feedback in the form of the four scores used to calculate their individual grades: (a) Peer Review score, (b) IAIC score, (c) Individual Portion score, and (d) Group Product score.

A reflection phase marks the end of this action research study. In this phase I provide an analysis of the data collected over the entire study and discuss my interpretations of it. I also share my reflection of the study on the whole and make recommendations based on my findings, experiences, and reflections.

Planning Phase

The planning phase of cycle three overlapped with the observation/data collection and reflection phases of the previous cycle. My goals in the third cycle were to: (a) continue evaluating the CSCL process assessment tool, and (b) increase the transparency of assessment practices for learners in our instructional context. The evaluation goal entailed the continued use of the CSCL process assessment tool by Jennifer to assign IAIC scores. I foresaw meeting my goal of increasing the transparency of assessment by providing learners with the CSCL process assessment tool to support the self and peer assessment process at the end of Activity 3: *Design*.

Maintaining the Transparency of Assessment: Assessment Rubric

The assessment rubrics for Activity 3:*Design* had been developed for use in the January 2000 offering of the course *Technology for Educational Change*. I used the same rubric in this implementation of the activity. The rubric for the Group Product Score of Activity3: *Design is* presented in Table 6.1. The column to the left denotes the value of

each criterion listed in the column to the right. The activity was a collaborative effort,

worth fifteen marks.

Table 6. 1 Group Product Assessment Rubric - Activity 3: *Design*

Audience /0.5	
.5	Clearly profiled
Description of Context /2	
0	Not provided
1	Lacking detail
2	complete
Definition of Learning Outcomes /2	
0	Not defined
1	Unclear/lacking detail
2	Complete
Description of learning activity /2	
0	Unclear
1	Areas of confusion/lack of detail
2	Clear/comprehensive
Method of assessment /2	
0	Not provided
1	Described
2	Assessment tools developed
Role of Instructor /2	
0	Undefined
1	Role described
2	Description of methods used
Time line for activity /1	
0	Not provided
.5	Unclear
1	Clear
Justification of Design Features / 3	
0	Not provided
1	Justification, no elaboration, no direct reference to literature
2	Justification, elaboration, direct reference to literature
3	Justification, elaboration and literature sited throughout learning activity
References /1.5	
1.5	APA format

Supporting Learners' Self and Peer Assessments with the CSCL Process Assessment Tool

For the final on-line activity I asked learners to use the CSCL process assessment tool to conduct self and peer assessments. Learners were already familiar with the criteria at this point, as it was included with feedback for Activity 2:*Experience to Practice.*

Action Phase

In the action phase of this final cycle, Jennifer monitored learners' on-line interaction throughout Activity 3:*Design*. During this phase Jennifer continued to compile a *list of behaviors* based on her observations while monitoring the class conference.

The Moderation of Activity 3:*Design*

There was a one-week break between the end of Activity 2:*Experience to Practice* and the beginning of Activity 3:*Design*. Learners received feedback for Activity 2: *Experience to Practice* one week into the third on-line activity.

Once again, Jennifer assumed principal responsibility for monitoring the learners' on-line interaction. Our postings for Activity 3: *Design* resembled the types previously identified: (a) reminders, (b) responses and recommendations, and (c) encouragement.

Several major issues arose in the instructional environment during the action phase of cycle three. The first concerned Group seven that had only two members. After much deliberation we decided to move the two remaining members of the group into two separate groups. This was a difficult decision, but Jennifer and I both agreed it was the least disruptive to all involved. Jennifer posted the following announcement in the Group seven folder:

> Hi guys,
>
> Well, since you guys are only two, Laura and I have decided to put you
>
> into other forums that have "lost" members :~).

It is very unfortunate that this has to happen this late in the year - however,

we strongly believe that you will get so much more out of the course if

you work with several group members.

Therefore, [Learner's name], you are now part of Forum 3, and [Learner's

name], you are now part of Forum 8.

I have sent you both messages in your personal mailboxes, and I will send

a messages to your new forums to let them know that you are arriving :~).

Good luck to you both in your new homes,

Jen(Group 7/11/08/00/3:52p.m.)

The second issue to arise involved Group nine. Although we tried to restrict group

size to four members, two groups in the class had six members, and one had five. This

was due to circumstances where individuals had either: (a) joined the course in progress,

or (b) disappeared for a time only to resurface after additional members have been

assigned to the group. In the case of group nine, two members had joined the course late.

One of these individuals had easily integrated into the group; unfortunately the other had

a difficult time. Over the semester conflict worsened, until finally I was forced to

intervene. Although we had continually emphasized the challenges associated with group

chatting in real time, group nine continued to favor this mode. A situation arose where

one member felt marginalized during group chats. I posted the following warning to the

group:

As my first warning requesting an end to the posting of disrespectful

messages was ignored I am forced to resort to the following.....

1) There is to be no more use of the chat function in the Forum.

From now on ideas and responses are to be posted to the Forum in regular messages. You may use the "reply with quote" function as a means of linking your response with a previously posted message. In this way everyone has a voice and the opportunity to access and exchange ideas. If you recall both Jen and myself have strongly urged you NOT to rely on the chat function to complete these activities.

2) All group decisions will be made in a Democratic manner—this means "that majority rules".

Members are expected to each cast a vote. As soon as 4 out of the 6 members agree on something—the group moves on.....which means no further discussion of that point is necessary. If you are not available to vote before a majority is reached you must abide by the decision arrived at by the group in your absences.

3) Your journal entries this week must include your personal perceptions as to what is happening in your Forum and how things should be handled/resolved.

These are my last words on this subject....NOW get to work:-)

(Group 9/11/17/00/3:15p.m.)

Unfortunately, this strategy did not work. The individual who felt maginalized continued to posted derogatory comments and accusations of discriminatory behavior to their group folder which were met with sarcasm. The situation was finally resolved by creating a new group folder the following day. I offered the opportunity to move, to

whomever wished to do so. Two members did move to the newly created group, and all went well after that.

At the end of Activity 3:*Design* Jennifer assigned IAIC scores using the CSCL Process Assessment Tool. A protected area was created within the class conference where learners could submit self and peer evaluations. The following message was posted to the GROUPS conference providing instructions about who to conduct and submit the self and peer evaluations:

> Hello All,
>
> Just wanted to draw your attention to the **Dropbox** I have created for your
>
> **Group products for on-line activity #3**. You will notice that you all may
>
> open the folder and send items there—but you may not open other's
>
> messages:-)
>
> I have also created the folder **"Evaluations/Act.#3"**. This folder allows
>
> you to open it and send items—but you may not open other's messages.
>
> **For your Peer Evaluations for On-line Activity #3 I ask that you use**
>
> **the criteria provided below.**
>
> Please rate your peers and yourself on each of the 5
>
> dimensions—Distributed expertise, Leadership, Clarification/Feedback,
>
> Information Provided, Quality of individual contribution according to the
>
> scale provided below.
>
> (The CSCL process assessment criteria and operational definition were
>
> included in the message) (GROUPS conference/11/21/00/5:03a.m.)

Observation/Data Collection Phase

The observation/data collection phase of the third action research cycle included

collecting data about assessment and feedback. The assessment component involved: (a)

the implementation of the CSCL process assessment tool by Jennifer to determine IAIC

scores for learners, (b) the collection of learners self and peer evaluations and the

calculation of Peer Review scores from those, and (c) the grading of group assignments.

Specifically, the data collected included: (a) IAIC scores assigned by Jennifer, (b) Peer

Review scores calculated from learners' self and peer evaluations, and (c) grades for

Group Products.

The feedback component involved providing learners with the three scores used to

calculate their individual grades for group work: (a) Peer Review score, (b) IAIC scores,

and (c) Group product scores.

Peer Review and IAIC scores for Activity 3:*Design*

The Peer Review scores and IAIC scores for Activity 3: *Design* are presented in

Table 6.2. Learners are identified in the first column of the table. Peer Review and IAIC

scores appear in the following two columns respectively. The differences between the

Peer Review and IAIC scores are presented in the third column of the table. The absolute

differences between Peer Review and IAIC scores appear in the last column of the table.

The final rows of the table indicate the means and standard deviations for each sample of

scores.

Group Product Scores for Activity 3: *Design*

The Group Product scores for eleven groups are presented in Table 6.3. The first

column of the table indicates the name of the group. The second column provides the

Group Product scores attained by each group for Activity 3: *Design*. These numbers are

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out of a possible fifteen. Group Product scores in percentages appear in the last column.

The descriptives of Group Product scores are presented in the last rows of the table.

Table 6. 2 Differences between Peer Review and IAIC Scores for Activity 3: *Design*

Learner	Peer Review Scores for Activity 3: *Design*	IAIC Scores for Activity 3: *Design*	Differences between Peer Review and IAIC Scores for Activity 3: *Design*	Absolute Differences between Peer Review and IAIC Scores for Activity 3: *Design*
1	5.0	5.0	0	0
2	4.4	4.0	+0.4	0.4
3	5.0	5.0	0	0
4	4.5	5.0	-0.5	0.5
5	3.9	5.0	-1.1	1.1
6	2.6	4.5	-1.9	1.9
7	5.0	5.0	0	0
8	4.5	5.0	-0.5	0.5
9	5.0	5.0	0	0
10	3.8	4.5	-0.7	0.7
11	4.3	5.0	-0.7	0.7
12	4.5	4.0	+.5	0.5
13	4.0	4.5	-0.5	0.5
14	4.6	4.0	+.6	0.6
15	4.7	5.0	-0.3	0.3
16	4.4	4.5	-0.1	0.1
17	3.8	4.0	-0.2	0.2
18	4.4	4.0	+0.4	0.4
19	4.0	4.5	-0.5	0.5
20	4.0	5.0	-1.0	1.0
21	3.7	3.5	+0.2	0.2
Means	4.29	4.57		.48
SD	.57	.48		.45

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Table 6. 3 Group Product Scores for Activity 3: *Design*

Group	Group Product Score for Activity 3: *Design* (out of 15)	%
1	14.0	93
2	11.5	77
3	14.0	93
4	15.0	100
5	13.0	87
6	13.0	87
8	13.0	87
9	14.0	93
10	11.5	77
11	14.5	97
12	14.0	93
Means	13.40	89.45
SD	1.14	7.39

Feedback Component

Activity 3:*Design* was the final on-line activity and was completed by learners the 24th of November 2000. Learners were busy completing assignments for other courses and studying for final examinations and many were late submitting self and peer evaluations. Consequently, the calculation of individual grades for CSCL group work was delayed. This caused a delay in learners receiving feedback for the final on-line activity. Once the IAIC and Peer Review scores were tabulated and Group products graded, learners were provided with individual feedback. Feedback was sent to learners in a FirstClass® message to their private mailboxes on or before the 8th of December 2000. It included the three scores: (a) IAIC score, (b) Peer Review score, (c) Group Product score.

Reflection Phase

In the final reflection phase of this action research study, I provide an analysis of the data collected over the entire study and discuss my interpretations of it. Specifically, I answer the following questions: (a) Was improvement in agreement between Peer Review and IAIC scores assigned by Jennifer for Activity 3:*Design* evident? (b) Did learners' collaborative skills improve over time? (c) Did learners' evaluations of peer reflect improvements in collaborative skills? and (d) Did Group Product quality reflect improvements in the quality of collaboration as represented in IAIC scores?

Finding 7: Improvement in agreement between Peer Review and IAIC scores was evident

The degree of difference between Peer Review scores (M = 4.29, SD = .57) and IAIC scores (M = 4.75, SD = .48) had reduced dramatically from Activity 2: *Experience to Practice* to Activity 3: *Design*. However, there remained a statistically significant difference between these two samples of scores, t (40) = 2.10, p <. 05, a medium effect size was also evident (d = .52).

The fact that differences between Peer Review and IAIC scores had reduced meant little. The improved agreement between these scores was attributable to improved collaborative performance as represented in IAIC scores and not improvement in the validity of Peer Review scores. Support for this hypothesis is provided in the following comparisons of raters over time.

Finding 8: According to mean IAIC scores learners' collaborative performance improved significantly over time

There was a steady rise of the means of the IAIC scores over time, M = 2.81, SD = .98; M = 3.64, SD = .59 and M = 4.75, SD = .48, respectively. The CSCL process

assessment tool does appear to have captured improvements in learners' collaborative

performance across tasks. An analysis of variance revealed statistically significant

differences among the three means of the IAIC scores, F (2,60) = 31.62, p < .01. This

finding suggests a degree of stability both in the improvement in learners' collaborative

skills and in the CSCL process assessment tool.

Finding 9: According to Peer Review scores the quality of learners' collaborative

performance remained constant over time

The means of Peer Review scores changed relatively little over the three on-line

activities, F (2, 60) = 1.89, p = .16,n.s. The mean of the Peer Review scores did drop

slightly from Activity 2:*Experience to Practice* to Activity 3:*Design*, M = 4.40, SD = .55

and M = 4.29, SD = .57, respectively. It appears that this had little to do with

improvements in evaluative skills and could be attributed to the quality of learners'

collaborative performance finally catching up with their assessments.

Figure 6.1 provides a visual representation of the means for Peer Review and IAIC

scores across all three tasks. A solid line connects the IAIC means among tasks as an aid

for interpretation. The broken line connects the means of Peer Review scores among

tasks as an aid for interpretation.

Regarding the Impact of the Quality of Collaborative Process on Group Products

Given the similarity of task demand for Activity 1:*Structured Debate* and Activity 3:

Design a comparison of Group Product quality across these two on-line activities was

made. The Group Product scores for Activity 1:*Structured Debate* and Activity 3:*Design*

are presented in Table 6.4. Groups are identified in the first column of the table. Group

Product scores for Activity 1:*Structured Debate* appear in the second column. The Group

Products scores for Activity 3:*Design* are presented in the third column. The differences

between these two samples of scores are listed in the last column of the table. The means

and standard deviations for these samples of scores are presented in the final rows of the

table.

The Group Product scores for Activity 1:*Structured Debate* were adjusted to

compensate for the group product assessment criteria of *Accuracy of Information* as the

level of performance on this criteria appears to have been confounded by features of the

task design.

Figure 6. 1 Graph of Within Rater Comparison across Tasks

	1	2	3
IAIC Scores	2.81	3.64	4.57
Peer Review Scores	4.07	4.4	4.3
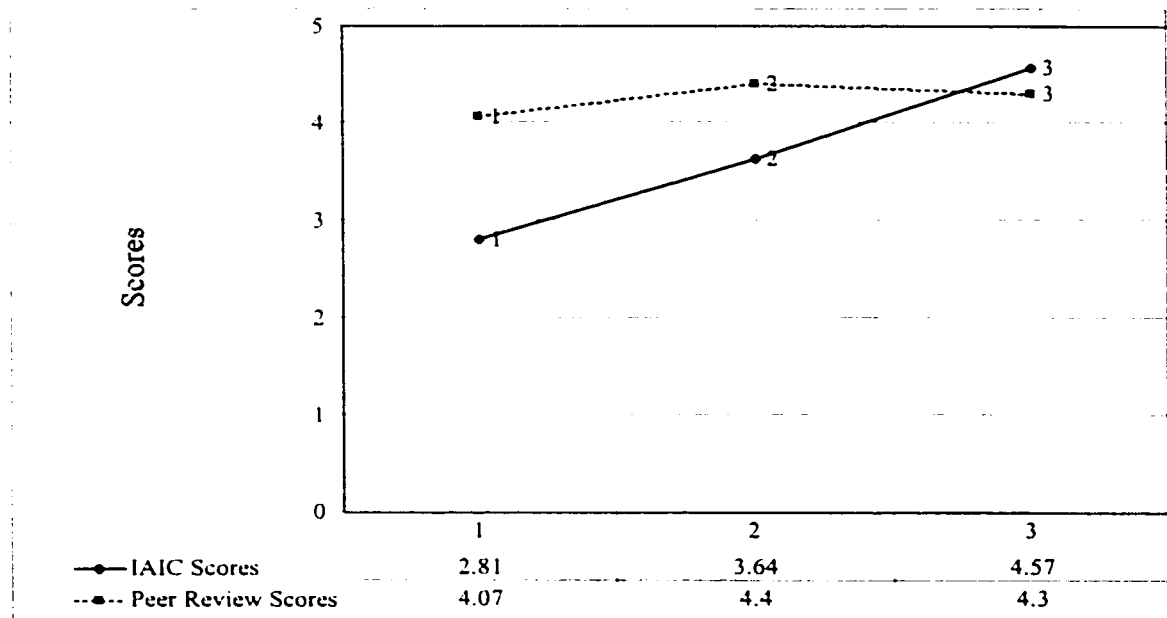
Finding 10: The quality of Group Products improved significantly from Activity 1:

Structured Debate to Activity 3: Design

The quality of Group Products increased dramatically from Activity 1:*Structured*

Debate to Activity 3: *Design*. All but one group scored remarkably higher in the final

group product. A *t*-test revealed that Group Products scores were statistically

significantly higher for Activity 3: *Design*, $t(13) = 4.03$, $p < .01$. A possible explanation

is the improved collaboration within groups as represented in improvement in IAIC

scores across tasks.

Table 6. 4 Differences in Group Product Scores between Activity 1:*Structured*
Debate and Activity 3:*Design*

Group	Group Product Scores Activity 1: *Structured Debate*	Group Product Score Activity 3: *Design*
1	75	93
2	92	77
3	58	93
4	92	100
5	58	87
6	63	87
8	75	87
9	67	93
10	54	77
11	38	97
12	58	93
Mean	66.36	89.45
SD	16.26	7.39

My Reflections

Revisiting the Underlying Assumption Associated with this Thesis Research

The basic underlying assumption of this research study was that inequity in

assessment practices in collaborative learning contexts did exist. To establish the validity

of this assumption I needed to triangulate data from several sources. Originally, I had

based my assumption on personal experiences in collaborative learning contexts. As the

teaching assistant for the course *Technology for Educational Change* offered in the

winter 2000 semester my observations supported this assumption. A review of the

literature revealed that other educators were attempting to develop calculation models for

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grades that could better represent individual contributions to collaborative work (Lejk, et al., 1996). This finding further supported my assumption.

I felt it was important to explore the experiences of learners within these learning contexts. At the beginning of the Fall Semester 2000 semester I asked learners to complete a *Background Questionnaire* designed to explore their prior experience with collaborative learning and the assessment practices used to evaluate their performances within such learning arrangements (see Appendix 2.2). It is important to note that given the context of this research study, and my dual role as educator/researcher, I did not have access to these data until after learners' final grades were submitted to the university. However, I feel it is important to acknowledge these responses at this time, as they lend further support to the underlying assumption that assessment practices commonly used in collaborative learning contexts do not fairly represent individual contribution to collaborative work.

Only seventeen of the twenty-one participants in this study completed the *Background Questionnaire*. Learners' responses do support the premise upon which this research study was based. According to learners, collaborative learning activities are relatively common features of our educational landscape—forty-seven percent of respondents reported having previously worked collaboratively more than three times in academia. Another forty-seven percent reported having encountered this instructional strategy more than ten times in their academic career. Furthermore, learners reported that situations frequently occur in which individual group members' contribution to group work products was unequal—fifty-eight percent of respondents reported this as occurring more than fifty percent of the time. Seventy percent of Learners also reported that

differences in individual contribution were represented in the individual grades for collaborative work less than fifty percent of the time. Evidently, students commonly encounter collaborative learning situations. The contribution of group members is often unequal and more often than not, all group members receive the same grade.

Reflections about Accessing Learners' Attitudinal Change over the Course of this Study

Over the course of this study I attempted to collect information about learners' reactions to interventions I had orchestrated in assessment practices. I undertook this task in the form of post-activity questionnaires (see Appendix 6.1). Regretfully, only four learners submitted the complete series of post-activity questionnaires.

In examining the responses of the six learners who submitted the final post-activity questionnaire, I realized the loss of this data was most unfortunate. Among other things, it could have provided information about how learners used the feedback they received. It also might have allowed me to make a link between their use of feedback and the impact that knowledge had on the quality of their subsequent performance.

For example, question number six on the final questionnaire asked learners: *After Activity 2:Experience to Practice you were provided with the criteria used by the instructor to evaluate your individual contribution to the group product. Did your knowledge of the criteria change the way you participated in your group for Activity 3: Design?*. Three of the six respondents reported yes. These three learners further elaborated their positive responses as follows:

> I made sure that I put in the work required from me, and it helped me to see my weaknesses, thus allowing me to refine them. (Learner 3)
>
> Because I knew exactly what was expected of me (Learner 5)

We knew what the teacher was looking for, we had goals so we tried hard

to achieve them. (Learner 6)

These responses suggest that even after having completed two CSCL

activities, learners were uncertain as to how to collaborate effectively within the

on-line environment. These learners conceptualized the information they received

in the form of IAIC scores as feedback they could use to improve their future

collaborative performance.

Interestingly enough, the same three learners' collaborative performance improved

dramatically from Activity 2:*Experience to Practice* to Activity 3: *Design*. The greatest

improvement demonstrated by learners five and six, whose IAIC scores had been the

lowest of the three in Activity 2: *Experience to practice*. Alternatively, the three learners

who responded that the knowledge of the assessment criteria did not change the way they

participated in group work demonstrated no change in the quality of collaborative

performance from Activity 2:*Experience to Practice* to Activity 3: *Design*.

These findings illustrate that providing learners with feedback is not sufficient to

ensure improvements in performance. Some learners may need guidance in interpreting

and applying the feedback they receive.

Reflections about the Inter-relatedness of the Quality of Process and Product

There appears to be a definite positive relationship between the quality of process

engaged in by groups and the quality of products produced. The stunning improvement in

the quality of Group Products from Activity 1: *Structured Debate* to Activity 3:*Design*,

coupled with the tremendous improvement in collaborative performance as represented in

IAIC scores supports this hypothesis.

This finding raises the important issue of the need to support the development of learners' collaborative skills early on. Apparently, a learning context characterized by a collaborative learning orientation within an on-line environment posed unfair challenges for learners. Upon reflection, I feel strongly that self and peer assessment practices offer educators a means of providing the support learners may require. I suggest that if these practices are appropriately orchestrated within a learner-centered context, learners can be successfully supported through this adaptation phase. These practices can draw learners' attention to the types of activities that promote effective collaboration. Furthermore, as the assessment process unfolds learners stand to further benefit through the development of evaluative and self-monitoring skills.

Reflections about my Evolving Conceptualization of the CSCL Process Assessment Tool

My original focus in this action research study was to develop an equitable method of assessing group work within an on-line learning context. Out of this quest grew the need to develop a stable tool that could measure the collaborative performance of learners reliably. I am satisfied that the CSCL process assessment criteria well represent the characteristics of effective computer supported collaboration. The fact that collaborative performance, as represented by IAIC scores, rose steadily over the semester supports this claim. Although further minor adjustments to operational definitions of the criteria are warranted, such an undertaking was beyond the scope of this study.

Initially, I envisioned the CSCL process assessment tool as a performance support tool to be used by teaching assistants as they monitored learners' on-line interaction. In effect I conceptualized it as a means for an instructor to reliably extend the focus of assessment from the product of collaboration to include the process of collaboration.

In the first cycle of this action research study, I conceptualized the CSCL Process Assessment Tool as a means of ensuring valid assessments of the collaborative process. I envisaged the incorporation of the IAIC scores in the calculation of individual grades for group work as a mechanism to offset the potential inaccuracies of the peer assessments of process. I viewed the IAIC scores as a means of enhancing the validity of self and peer assessments of process. I drew this strategy from the self and peer assessment literature, where much discussion focuses on issues of the validity of peer assessment, especially in situations where subjective judgement is required of assessors (Freeman, 1995).

However, this strategy violated a fundamental principle of constructivism; it robbed learners of the control that self and peer assessment practices where intended to provide. Although empowering learners to some extent, it limited the degree of trust I was willing to extend to them, a rather hypocritical stance. In retrospect, this strategy represented my overt intervention in the assessment process and the consequent disempowerment of learners. I now recognize this action as an expression of my attempt to maintain control of the assessment process.

In the second cycle of the study, my conceptualization of the usefulness of the IAIC scores had evolved. I had begun to see the value of IAIC scores as providing learners with a point of reference against which they could judge the validity of their self-assessments and the Peer Review scores they received. My hope at the time was that this feedback might foster more valid judgements in future self and peer assessments. Evidently, I had progressed from my previous position of overt intervention to a position of covert support for the development of self-monitoring and evaluative skills. Although

this evolution was progressive, it fell short of allowing learners to take full ownership of the assessment process.

As the study came to an end in the third cycle, my understanding of the self and peer assessment process had evolved to the point that I began to fully comprehend the potential of these practices as an holistic approach to support the development of learners' collaborative, evaluative and self-monitoring skills. My focus had become the enhancement of the validity of self and peer assessments through the improvement of the quality of judgements made by learners, instead of offsetting their assessments with IAIC scores.

By the end of this study I had reconceptualized the assessment process as a true episode in learning. From this perspective, learners' awareness of the CSCL process assessment criteria could support their collaborative skills by highlighting characteristics of effective collaborative interaction. The process of assessing their peers could support the development of evaluative skills by requiring them to analyze, compare and contrast various exemplars of performance and finally make judgements of the worth of their peers' contributions. In turn, the process of self-assessment could foster reflection upon personal performance, potentially supporting the development of self-monitoring skills.

Reflections about the Atmosphere within our Instructional Context

The process of gradually reducing the instructional constraints of assignments, in effect, gradually built the degree of learner control over the process of learning. Our relaxed facilitative style also supported learners' feelings of ownership of the learning environment. However, due to my limited conceptualization of assessment at the

beginning of the investigation, I failed to draw on the most powerful strategy for empowering learners. I failed to fully involve them in the assessment process.

To truly translate the principles of constructivism into practice, learners needed to take ownership of the entire learning process. I recognized the centrality of task design in this respect. In designing the on-line activities I was respectful of issues of learner control. I expressed this mindfulness in several design features of the tasks. Over the semester the degree of structure of the activities was gradually diminished, and the amount of learner control increased.

Although the importance of course design can not be denied, it is not sufficient to create a constructivist learning environment. The success of accomplishing this goal hinges upon promoting a *culture of learning* within the instructional context. As underlined by Salmon (2000), the facilitator's human touch and understanding contributes significantly to this evolution. Central to this concept is the issue of the locus of power within the learning context.

Our response to unforeseen developments within the instructional context was one way Jennifer and I implicitly attempted to share the shaping of our learning environment with learners. An excellent example of such came in the first week of the semester. Only eighteen learners were on-line at the time. I created a *Questions* folder within the class conference. My intention was to centralize inquires of relevance to the class as a whole and potentially reduce the redundancy that often occurs, where the same question is asked by several class members. Initially, I saw this as a course management strategy, but that limited conceptualization soon changed. The first time a learner posted an inquiry to the area, another learner responded. I was surprised and delighted by this development. I

realized then that this was an opportunity to share responsibility for the learning environment with learners.

Over the course of the following week I scaffolded learners' use of the area by suggesting guidelines for its use. Although I monitored this area on a regular basis, learners took on the principal responsibility for trouble-shooting each other's problems, ranging from technical support issues to navigating our class conference. It was a fascinating development that I actively encouraged. Learners maintained use of this area up until December twentieth, long after the course was officially finished on the eighth. What began as a spontaneous intervention by one learner during the first week of the course was actively cultivated to promote a *culture of learning* within our virtual environment.

Upon reflection, I marvel at how easily I was able to share responsibility with learners and how naturally I supported them through the process. This was in striking contrast to my unwillingness to fully surrender the process of assessment at that time. Although I believed traditional hierarchies associated with education, where the instructor is in control of the learning environment impede the development of a *culture of learning* and that such a culture requires the sharing of power equally among instructor and learners, my control over assessment endured.

In retrospect this comparison illustrates a fundamental issue raised in the literature about educators' beliefs about assessment practices. Shepard (2000) talks about the legacy of behaviorist learning theories and objectivsit testing traditions as enduring beliefs about "the nature of evidence and principles of fairness"(p.5). Within this context, the need for objectivity and impartiality in assessment is central. I now believe my need

to maintain control over assessment was an expression of the influence of the objectivist

tradition in my practice. After all. *control over others* is another concept strongly

associated with objectivity.

CHAPTER 7

The Role and Function of Assessment within a CSCL Environment

Summary of Findings

According to the findings of the first cycle of this action research study, learners do not make valid judgements about the quality of their peers' collaborative performance. Support in the form of guiding questions was insufficient to impact this process in any meaningful way. Learners pervasively awarded peers inflated grades. Furthermore, this phenomenon was not found to be group specific.

In the second cycle of the study, unguided practice in assessment was found to be of little consequence. Learners continued to award peers inflated grades.

Providing learners with the CSCL process assessment tool to support their evaluations of peers in the third cycle of this study had little impact on the quality of judgements made. Although the degree of agreement between Peer Review and IAIC scores did improve, the improvement was attributable to improved collaborative performance as represented in rising IAIC scores. Peer review scores changed little over the semester.

Upon examining learners' collaborative performance as represented in IAIC scores over time, significant improvement was demonstrated. This improvement in the quality of collaborative performance was also reflected in dramatic improvements in the quality of products produced by groups.

A summary of findings is presented in Table 7.1. The second column of the table identifies the problem of interest. The third column describes the action undertaken. An

interpretation of the outcome of the action is presented in the forth column. The findings

that support the interpretation appear in the fifth column. Entries in the final column

underline the theoretical and practical significance of findings.

Table 7. 1 Summary of Findings

	Problem	Action	Measure of success	Findings	Theoretical & Practical Significance
Cycle 1	Learners do not accurately assess peers' collaborative performance.	Learners were provided with questions to guide the assessment of their peers.	Action was not sufficient to support valid self and peer assessments of process.	Pervasive over-marking by peers was evident and this phenomenon was not group specific.	Learners require support in making valid judgements about the quality of collaborative performance.
Cycle 2	Learners do not accurately assess peers' collaborative performance	Learners were provided with questions to guide the assessment of their peers a second time.	Practice in assessing peers was insufficient to support more valid judgements.	Improved agreement between Peer Review and IAIC scores was attributable to improvement in learners' collaborative performance as represented in rising IAIC scores and not improvement in learners' evaluative skills.	Unguided practice in assessment was not sufficient to impact the quality of learners' evaluation skills
Cycle 3	Learners required support in making valid judgements about the quality of collaborative performance of themselves and their peers.	Supported learners' evaluative process with the CSCL process assessment tool.	Providing learners with the CSCL process assessment tool was not sufficient to improve the quality of learners' judgements about the collaborative performance of their peers.	According to learners' evaluations, peers' collaborative performance did not change across the semester. However, according to IAIC scores a significant improvement in the quality of learners' collaborative skills was evident.	Opportunities for unguided practice and the inclusion of support tools such as the CSCL process assessment tool are not sufficient to support valid judgements by learners.
	Educators need to include aspects of process in calculation of individual grades for group work.	New Calculation model for individual grades for group work.	According to our observations, individual grades better reflected individual investment.	The quality of group products reflected the quality of collaboration performance within a group as represented in IAIC scores.	Support for the development of learners' collaborative skills is warranted.

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Discussion of Findings

Supporting the Development of Collaborative Skills

The finding that the quality of collaborative interaction improved significantly over the course of the semester, along with the finding that the quality of collaboration was reflected in the quality of products produced by groups has great implications for the implementation of CSCL activities. These learning arrangements are based on social-constructivist prinicples. A corner stone of social-constructivism is the belief that learning is a social process. According to the social-constructivist paradigm, group learning offers participants the opportunity to co-construct knowledge with their peers (Harasim, 1993; Linn & Burbules 1993; Salomon, 1993; Serim, 2000). This collaborative learning dynamic is believed to promote reflective practice and active re-conceptualizations (Hiltz, 1994; Boud, et al., 1999; Buchy & Quinlan, 2000).

An underlying assumption associated with the benefits of collaborative interaction is that learners communicate effectively (Linn & Burbules, 1993). Unfortunately, most learners' prior educational experience has been in the objectivist tradition of instruction, where competition among learners has been strongly promoted (Shepard, 2000; Wiggins, 1993; Wilbrinks, 1997). The findings of this study suggest it is unrealistic to expect learners to suddenly adopt a collaborative learning orientation without supporting the development of social skills necessary for their success. Learners need to understand what constitutes effective collaborative interaction within a unfamiliar learning environment. Self and peer assessment practices offer educators a means of supporting learners' emergent understanding of this learning orientation and the manner in which it is expressed on-line.

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A central tenant of the self and peer assessment literature is learners' ownership of the assessment process. According to researchers exploring self and peer assessment practices in on-site learning contexts, feeling of ownership grow out of the act of learners having a hand in either the creation or definition of assessment criteria (Dochy et al, 1999;Topping, 1998). Activities such as these are also believed to foster deeper understanding for learners (Falchikov, 1993; Stefani, 1998). Therefore, truly supporting the development of collaborative skills would require that learners be included in the negotiation of the meaning of the characteristics of effective collaborative interaction. The impact of which could very well be the expression of this knowledge in learners' on-line practice. Consequently, the strength of the CSCL process assessment tool lies in the directing of learners' attention to important characteristics of effective collaborative interaction.

Supporting the Development of Evaluative Skills

The findings of this study also suggest that learners lack the evaluative skills necessary to make valid judgements. Evaluation involves analyzing, comparing, and contrasting information and requires that judgements of merit and worth be made (Topping, 1998). The literature suggests that learners require guidance and practice in developing evaluative skills and that this process can be effectively fostered through peer assessment practices (Macpherson, 1999). My findings suggest that practice and guidance are not sufficient support for the development of evaluative skills. I propose that the way self and peer assessment is orchestrated could figure prominently in this respect.

In the current study, learners were asked to provide a rating for each criterion separately. According to the self and peer assessment literature this was not the optimal

implementation strategy. Learners appear to produce the most valid assessments of peers when required to make global judgements guided by several criteria (Falchikov & Goldfinch, 2000).

A more appropriate implementation would adjust the judgement task such that assessors are required to assign one overall score for each learner including themselves. However, simply requiring learner to assign a global score does not actively promote the development of evaluative skills. To translate the process of self and peer assessment into a learning opportunity, further adjustments to the assessment process are recommended.

I suggest requiring assessors to rate each of their peers (high, medium, low) on each CSCL process assessment criteria and then provide examples of learners' performance to support these ratings. Such tasks would engage assessors fully in the evaluative act. A further adjustment might require assessors to provide at least one suggestion about how individuals being assessed might improve their future performance. In this way, the self and peer assessment process could foster reflective activity for the assessor while at the same time generating feedback to help learners improve their future performance (Claxton, 1997). The impact of an assessment process orchestrated in such a way would in effect extend the benefit of such practices to promote the development of self-monitoring skills.

Promoting the Development of Self-Monitoring Skills

I have moved very far away from my original position with a focus on the validity of IAIC scores as a counterbalance to offset the invalidity of self and peer assessments. My emergent understanding of the powerful potential of self and peer assessment practices as a means of supporting the development of collaborative and evaluative skills contributed

to this dramatic shift. As did the realization that assessment was worth nothing if learners could not interprete and use the information collected to inform their future performance. In effect, feedback is a diagnostic tool for learners.

Black and Williams (1998), define the term feedback as "any information that is provided to the performer of any action about that performance."(p.52) Further, they suggest that the source of information can be internal. Such a broad conceptualization introduces the concept of self-monitoring skills. Monitoring higher level cognitive skills is a skill that is believed to develop over time. The ability to effectively self-monitor is strongly associated with high achieving learners, as is the effective use of feedback.

A learner's ability to effectively self-monitor is considered to be a critical component of self-regulated learning (Perry, 1998). Self-monitoring has been operationalized as the ability to monitor information as demonstrated by the learner's awareness of his/her current level of understanding (Howard-Rose & Winne 1993). Several relevant attributes of a learning environment that promote the development of self-monitoring skills have been identified, providing learners with the opportunity to self-evaluate is one (Perry, 1998). The ability to effectively self-evaluate requires that learners are taught how to analyze, compare and contrast personal understanding with alternative perspectives (Boud, et al., 1999; Topping, 1998).

The self and peer assessment literature suggests that practice in assessing one's peers can foster more valid self-assessments (Dochy, et al, 1999; Buchy & Quinlan, 2000; Somervell, 1993; Topping, 1998). It appears that learners can often more easily and objectively assess their peers than they can themselves. The literature also suggests that the activity of assessing ones' peers can raise awareness about one's own state of

knowledge (Somervell, 1993). Therefore, the strength of self and peer assessment lies not only in the potential to promote collaborative and evaluative skills but if implemented appropriately, could also encourage the development of self-monitoring skills as well.

The evaluative process require a set of skills that should be fostered by first promoting the internalization of the criteria associated with superior performance (Shepard, 2000). With this knowledge learners are able to identify personal areas of weakness. In order for learners to identify and understand these criteria, they must first become aware of their existence. but as the literature suggest and the findings of this study support, simply providing learners with a list of criteria is not sufficient (Sullivan & Hall, 1997). Many suggest that learners need to be actively engaged in defining or negotiating the meaning of assessment criteria (Boud, et al., 1999). Learners also require access to various exemplars of performance that can concretize abstract characteristics associated with superior performance (Frederiksen & Collins, 1998). In order for true internalization to occur, learners need to be provided with the opportunity to apply the criteria of assessment on a range of performances. Self and peer assessment practices can provide learners with opportunities to engage in this types of activities in a meaningful way.

An Integrated Approach to Assessment

Shepard (2000) proposes an integrated approach to assessment, suggesting that for the process of assessment to truly enhance the learning process a reconceptualization is necessary. According to Shepard (2000) the realization of this goal depends upon the extent to which learners and educators can establish an equal partnership. Such a dynamic

requires the sharing of assessment processes. I suggest that self and peer assessment

practices offer us the opportunity to do just that.

My experience as instructional design, educator, researcher and learner throughout

this study was enlightening. Although I was never comfortable with the objectivist

approach to assessment, I now see it as a true violation of the sacred covenant we as

educators enter into with learners. We have a responsibility to make the implicit explicit.

I strongly believe we need to adjust our assessment practices to reflect this fundamental

responsibility. We need to adopt an integrated approach to assessment where learners: (a)

are provided with opportunities to negotiate how their performance and products will be

judged, (b) have access to frequent informative feedback and supported in the effective

use of this information, and (c) are actively engaged in the evaluative process themselves.

I suggest self and peer assessment practices offer educators a means of translating such

an approach into practice.

The Social-Constructivist Assessment for Learning Model

Ultimately, the practices of self and peer assessment encourage the interplay

between self-monitoring, evaluation skills and collaboration. This dynamic interaction

can be capitalized upon to increase the learners-centeredness of educational experience

(Boud, et al. 1999). The overlap between the three major elements of a social-

constructivist assessment for learning model is represented in Figure.7.1. The assessment

model depicts a learning context emphasizing social-constructivist principles where

learners are: (a) actively supported in developing collaborative skills, (b) provided with

the opportunity to develop evaluative skills within authentic contexts, in personally

meaningful ways, and (c) supported in developing self-monitoring skills by providing

social opportunities to analyze, compare, and contrast personal understanding with those of their peers. All three elements are considered by the author to be integral components of a successful, productive social-constructivist learning experience. The suggested relationship between them is dynamic in nature and expressed in the process of self and peer assessment practices.

Figure 7. 1 Social-Constructivist Assessment for Learning Model
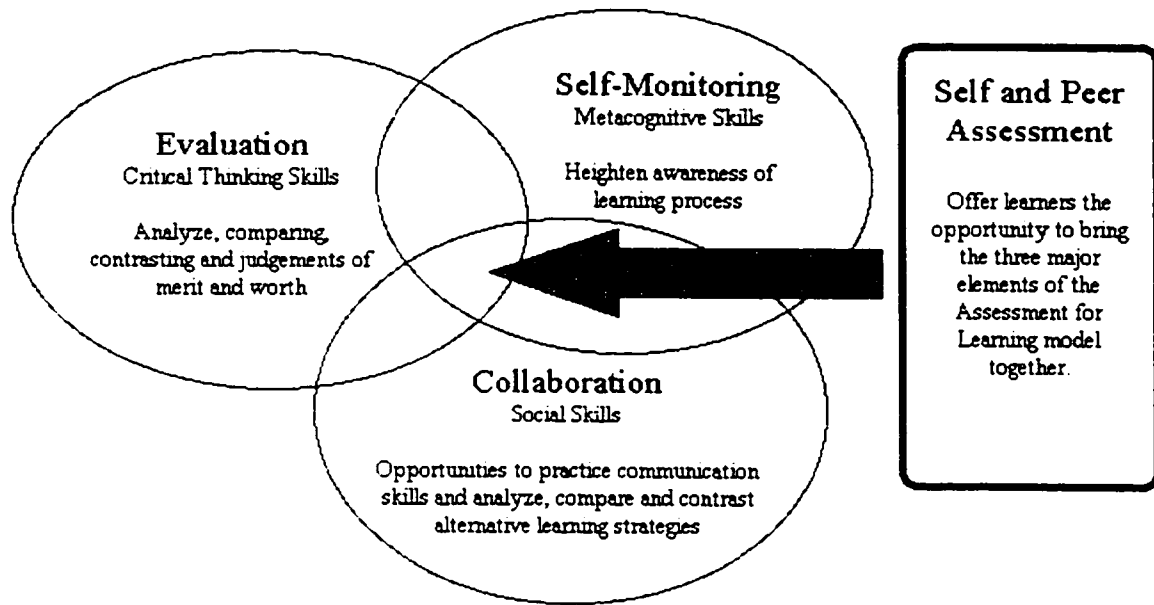
Implications for Practice

- Support for the development of collaborative skills must precede learning activities where grades are contingent upon group products.

- The development of evaluative skills should be seamlessly incorporated into the instructional context through the use of self and peer assessment practices where learners are: (a) actively involved in the process of negotiating the meaning of the criteria of assessment, (b) offered opportunities to apply the assessment criteria on a

range of performances, and (c) supported in interpreting the feedback they receive through collaborative discourse with group members.

Future Directions in Research

The CSCL context provides a unique opportunity for researchers interested in examining self and peer assessment practices. Future research should focus on engaging learners more fully in the assessment process. A potential area of interest would be to design the first collaborative activity around the task of negotiating the meaning of assessment criteria associated with the characteristics of effective collaborative interaction. This could serve to help learners internalize the characteristics of effective collaboration and support the development of important collaborative skills prior to engaging learners in activities where the quality of group product is at risk.

Another promising area of interest centers around learners' use of feedback. Throughout this study I attempted to collect information about how learners used the information they received about their collaborative performance and how they felt about the interventions I orchestrated in the assessment process. Regretfully, much of this information was lost because most learners did not complete the series of post-activity questionnaires designed to track their emergent understanding. Future research should focus on attempting to access these types of information in alternative ways. One promising method might be to include learning journals as a course requirement. Another might be to engage learners in discussion of feedback as a group. Such activities could provide learners with the opportunity to enhance self-monitoring skills by actively promoting the sharing of strategies associated with effective self-monitoring.

The Ethics of Researching One's Practice

Throughout this action research study I was faced with daunting ethical issues. The most important of which concerned my dual role as instructor/researcher. As my focus of research was assessment practices this issue was compounded. Learners' identities needed to be protected until final grades were submitted for ethical reasons, yet several learners contacted me with genuine interest in my research. Unfortunately, I was bound to advise them that I could not discuss the study in any more detail than what had been provided in the consent form. But this was not a comfortable place to be, especially for someone like myself who holds the principle of learner-centered education very close to my heart. I felt I was violating the central premise upon which our instructional context was built—that of open, honest exchange of ideas and experiences. Within the context of this study I had no other choice, the protection of learners was paramount.

The second issue I struggled with was the reality that my research required interventions in assessment practices. Although I had fully disclosed the new calculation model for individual grades for group work in the course study guide, and reminded learners repeatedly, the fact remained that these interventions effected their grades. I dealt with this as fairly as I felt was possible, by adjusting their IAIC scores for Activity 1:*Structured Debate*. However, this raised another ethical issue to deal with. I worried about having providing learners with misleading feedback, although I did not recognize this issue until much later.

Finally, the issue of withholding information that I knew could help learners' improve their performance was troubling. Although this action was grounded in the fact that the validity of the CSCL process assessment tool was unproven, it did not make watching their struggle any easier.

Researching one's practice is a perplexing collection of quandaries. As the instructor you stand to benefit most from the insights gained, but as the researcher you are forced to make very challenging compromises. Exploring learning within context is an admiral aspiration but a most challenging undertaking. I do feel that the participatory action research model in its true form, with learners fully engaged as co-researcher might afford a plausible vehicle for investigating this dynamic social process.

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Appendix 2.1 - CONSENT FORM

Assessment in On-line Collaborative Learning

I, (Laura April McEwen) am researching how assessment of on-line collaborative learning is conducted. This study will contribute to our understanding of computer mediated communication (CMC) course design and development. I will be evaluating the validity and reliability of an assessment model designed to provide equitable assessment of collaborative group product. The assessment model is as follows:

> * **Individual** grades for collaborative activities will be determined by the following formula—(group work product score) multiplied by (peer review score + instructor assessed quality of individual contribution score).

The basis for my evaluation of the assessment model will be student interactions (FirstClass messages sent to the class conference area), attitudinal measures (short questionnaires to be completed on-line) and comparisons between grades for individually completed assignments, group work products and final grades. This information will provide instructors and instructional designers with a better understanding of the potential uses of collaborative computer mediated communication in a distance education context. As well, the information you provide will serve to inform both myself and other instructional designers about how students think about collaborative on-line learning. It is hoped this information will help instructors improve their integration of CMC into their courses.

I am asking you to voluntarily take part in this study. If you agree to participate, rest assured that all information provided by you for the purposes of this research project will be kept confidential.

What does consent mean?

Your participation is voluntary; you are under no obligation to take part in this study. You may choose to discontinue your participation at any time. If you decide not to submit an electronic consent form, no information you have generated will be used in the study. If you decide to withdraw your consent prior to the end of the course, no information you have generated will be used in the study. In the event that a you decide to withdraw your consent after the course, or you feel uneasy about your participation in the research, I encourage you to contact me via email (laura@education.concrodia.ca) or FirstClass (Laura McEwen).

Alternatively, you may contact my thesis supervisor via FirstClass (Allyson Hadwin) or e-mail (allysonh@education.concordia.ca) or Richard Schmid via FirstClass (Richard Schmid) or email (schmid@education.concordia.ca)."

Your participation in this research project is completely voluntary and will not involve additional work beyond the course requirements except the completion of short attitudinal questionnaires. You are being asked to release the materials detailed below for research purposes that are independent of your assignments and final grade. Your final

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grade for the course will be submitted to the university prior to the researcher (Laura McEwen) having access to the consent form and attitudinal questionnaire dropboxes. In this way, I, (Laura McEwen) will not know who has consented to participate in the research until your final grades have been submitted.

What Data will be collected?
If you agree to participate, in this study the following five sources of data will be collected.
List of data you are consenting to release for the research
a) Student interaction in FirstClass course conference. (FirstClass messages sent to class conference.)
b) Responses to short attitudinal questionnaires
c) Grades for individually completed assignments
d) Grades for group products
f) Final course grades.

Who do I contact with concerns?
Once this information has been compiled, a brief summary of results and a complete explanation of the study will be provided upon request. I will also be pleased to discuss the results once my thesis is complete. Any questions or concerns you have with respect to this research should be addressed to Laura April McEwen via e-mail at laura@education.concordia.ca or via FirstClass at Laura McEwen or my thesis supervisor via FirstClass (Allyson Hadwin) or e-mail (allysonh@education.concordia.ca)

Student Consent to Participate in Research
This is to state that I agree to participate in research conducted by Laura April McEwen for her master's thesis in Educational Technology. I have read the above description and understand the agreement. I freely consent and agree to participate in the collection of data for this research project.

I agree to participate.   [   ]
I do not agree to participate.   [   ]

Name   [   ]
Student ID   [   ]

Thank You

Appendix 2.2 – Background Questionnaire

The following questionnaire is designed to establish your prior experience in collaborative learning contexts. Please underline the response which most closely matches your experience.

1) Do you feel the grades you have received for group work products in the past truly reflected your contributions?

   a) never
   b) more than 50% of the time
   c) less than 50% of the time
   d) always
   e) I have never worked collaboratively

2) How often have you worked collaboratively in academia?

   a) never
   b) more than 3 times
   c) more than 10 times

3) In your past experience in collaborative learning contexts how often has one or more member/s of your group **not** contributed equally to the group product?

   a) never
   b) more than 50% of the time
   c) less than 50% of the time
   d) always
   e) I have never worked collaboratively

4) Have you ever felt you did not contribute equally to a collaborative group product?

   a) never
   b) more than 3 times
   c) more than 10 times

5) How often was the same grade for collaborative group work given to all members of the group, regardless of individual contribution?

   a) never
   b) more than 50% of the time
   c) less than 50% of the time
   d) always
   e) I have never worked collaboratively

Appendix 3.1 - Activity #1—Group Product—Grading Criteria

Articulation/3

0   unclear
1   areas of confusion
2   generally clear-lacking sufficent elaboration
3   Excellent-clear / consice

Support for views/3

0   no references, site no sources/personal experience
1   provide reference list, do not site sources/personal experience throughout paper 1.5
     no references, site some sources/ personal experience
2   provide reference list, site some sources/personal experience throughout paper
▪   provide reference list, support views with sources/personal experience

Accuracy of Information presented/2

0   misleading interpretation
1   some questionable information
2   good, but little or no elaboration
3   Excellent, provide elaboration

Grammar/ Style/1

0   weak
0.5   choppy in places/lacks transition between sections
1   Good overall

Overall Presentation/3

0   weak
1   Choppy-lacking introduction and conclusion
1.5   Choppy with introduction and conclusion
2   Well integrated-lacking introduction or conclusion
3   Well integrated with introduction and conclusion

Thoroughness of Product/2

0   no reference to opposing argument
1   addresses some issues raised in opposing argument
2   Addresses all points raised in opposing argument

     Group product score
     /3   Articulation
     /3   Support for views
     /3   Accuracy of Information presented
     /1   Grammar/ Style
     /3   Overall Presentation
     /2   Thoroughness of Product
       /15   Total—group work product score

I will also provide you individually with the 3 scores listed below:
1) Your group work product scores,
2) Your peer review scores
3) Instructor assessed quality of individual contribution scores.

Appendix 4.1 - On-Line Learning Activity Descriptions

INITIAL ON-LINE PARTICIPATION: INITIAL LOG-IN AND INTRODUCTION

For this initial log-in and introduction task each class member is required to post a message to the folder labeled "Welcome" in the class conference area. For this exercise you need only introduce yourself by name and say a few words about yourself.

As you post your first messages to the "Welcome" folder you will be randomly assigned to a group. The second task, "the structured interview with a group member" will be posted to the general message area but will be responded to in your newly assigned group folders.

Initial On-line Participation: Structured Interview

The questionnaire below will form the basis of your structured interview. This exercise is designed to familiarize you with the chat function of FirstClass. For this exercise you will partner up with a group member of your choice.

Follow the steps outlined below.

1) Through FirstClass organize a mutually convenient time to conduct your on-line interview.
2) Conduct the interview synchronously (in real time) on-line using the chat function.
3) One member must 'save' the chat and post it to your group folder.
4) Each member must summarize the information gathered about their partner during the interview and post it to the group folder.

Questionnaire

> Name, Major, Year of study.
>
> What was your motivation for taking this course?
>
> > On a scale of 1-5 how would you rate your proficiency with technology in general?
> >
> > On a scale of 1-5 how would you rate your proficiency with FirstClass?
> >
> > **(#1 being a novice, #5 being a pro)**
> >
> > Have you participated in a Distance Education course before?
>
> What do you hope to learn in this course?

On-line activity #1:Structured Debate on Strengths and Weaknesses of CMC

The group preparation and presentation of argument phase of the debate are outlined below.
- Even group forum #s (2,4,6,8,10,12,14) will argue the strengths of CMC.
- Odd group forum #s (1,3,5,7,9,11,13) will argue the weaknesses of CMC

Each even group will be randomly assigned to an odd group once the Group Preparation Phase is complete.

Part 1
Group Preparation phase
- Choose an article from the on-line journal "jcmc". The link for this journal can be found in the "Course Library" located on the first level of our class conference.
- Post the title of your article in your group forum so another member of your group does not choose the same one. The goal of this exercise is to develop a range of expertise within your group.
- Read and understand the article thoroughly. You must be able to discuss the contents in relation to the position of the argument to which you are assigned. (Even group forum #—argues strengths of CMC.)
- Explain to your group how your article supports your group's position (strength or weakness).

Combine all group submissions to create your formal argument for your opposing group. Include specific references to the literature your group has reviewed.

Part 2
Presentation of Argument Phase
- Submit your formal argument to your opposing group.
- Review their submission to your group.
- Prepare a response to their submission with reference to the literature that your group has reviewed.
- Submit this response on-line on or before midnight on Oct 6th 2000.

<u>**On-line Activity #2**</u>
<u>**From Personal Experience to Practice**</u>

<u>**Introduction**</u>
The following assignment has three parts. The first is to be completed individually. The second and third parts are group activities. I strongly suggest that you negotiate deadlines for the completion of each part in advance. You have two weeks to complete this assignment so I advise you to get organized early and be faithful to the timelines you establish as a group!

<u>**Part I   5%**</u>
Each member of each Forum is required to describe a personal learning experience that they would classify as an example of "Directed Instruction". Post this description to your Forum.
Be sure to
1) Identify learning objectives.
2) Describe activity well enough so that some one could replicate it.
3) Describe the method of assessment used to measure the attainment of learning objectives at the end of learning activity.
4) Evaluate your personal achievement in the activity described.

<u>**Part II**</u>
Discuss the pros and cons of each learning activity presented in the Forum and chose one example to work on as a group.

<u>**Part III 10%**</u>
As a group develop a learning activity that would achieve similar learning outcomes through using a Constructivist approach. Post your newly designed learning activity to your Forum.
Be sure to clearly describe
1) The anticipated learning outcomes.
2) The proposed activity to meet the learning outcomes, including any technological tools used. This should be clear enough that an individual could DO the activity.
3) How you plan to assess the attainment of the learning outcomes.
4) Don't forget to justify your design choices.

GOOD LUCK!

On-Line Activity #3

The following activity has three parts: Debate, Design and Evaluation. It is worth 15% of your course grade and each of the three components is worth 5%. I have included tips for the effective completion of each component and methods I feel might help you organize your efforts in a productive manner. Please understand that these suggestions are simply guidelines to help you accomplish your learning goals not instructions that you are obliged to follow.

Part I   (5%)
Debate/discuss the strengths and weaknesses of computer use within a classroom.
> 1) What can be gained by having students use computers?
> 2) What are the constraints faced by students and teachers when computers enter
>   the classroom?

(I suggest that you compile a list of issues agreed upon by the group as they are discussed. In this way you have a reference for the second part of your assignment.)

Part II   (5%)
Design a classroom learning activity that draws on the strengths of computer use that you have identified in your debate/ discussion.
> 1) Specify the educational level the activity is designed for. (Grade level)
> 2) Provide a description of the context within which the activity is to be
>   preformed.
>> (Subject matter area, # of computers in classroom, students level of proficiency
>> with the medium, working collaboratively or individually, etc)
> 3) Clearly define objectives for the learning activity.
> 4) Describe the learning activity.
>> 5) Describe the method of assessment and the allocated grade value for the
>> learning activity.
>> 6) Define and describe the role of the Instructor/ teacher/ facilitator.
>> 7) Specify the time required to complete the learning activity.
>> 8) Justify your design decisions with specific reference to our course material or
>> other reference material you might be familiar with. (Video, textbook, readings,
>> as well as material from other courses you have done or are doing.)
>> 9) Provide a bibliography in APA format.

(Decide on a learning activity early on so your energy is spent constructively as a group. Focus on one learning activity and not the design of a complete course-as some of you did for the first on-line activity.)

Part III (5%)
Evaluate your personal contribution and the contribution of your group members to this on-line activity. (I will provide a form for each of you to complete this part of the assignment)
(Monitor each other's contribution and call group members on their lack of participation before the activity is over. Collaborative activities such as this depend on active participation and raise issues of accountability to the group as a whole. You are

responsible to each other for the quality of this learning experience, take that
responsibility seriously.)

SET YOUR GROUND RULES
Make sure every individual in the group understands and agrees upon what this activity
entails.
Set a timetable for your progression through this learning experience before you begin.
Negotiate deadlines in advance and stick to them.

Appendix 4.2 – Self and Peer Evaluation Questions

EVALUATION 5%

The following exercise is intended to help you organize your thought/perceptions about the quality of work your group has contributed to the on-line assignment #2. **For each member of your group** I ask that you answer the following 2 questions:

1) What was the quality of the individual's contribution to the group?
> Provide specific examples.

2) How did the individual contribute to the co-construction of knowledge within the group?
> Provide specific examples.

This should be presented in point form for EACH individual in your group.

Helpful hints: Here are a few questions that I recommend you consider when answering the 2 questions above.

– Sources of information—did individuals site literature or personal experience in relation to the discussion/assignment?
– What amount of detail and/or explanation was provided by the individual?
– Task completion component—did the individual take responsibility for some aspect of completing the assignment?

Based on these evaluations I ask that you rate each individual on a scale from 1–5, 1 being the lowest quality and amount of contribution and 5 being the highest. These rating should be justifiable based on the answers to the 2 preceding questions.

For your own evaluation I would like you to write a reflection of 200 words detailing:
1) What you feel you have gained from this on-line activity.
2) What skills you feel you have developed
3) How you might approach this type of activity differently in the future.
> Share responsibilities between group members.
> Keep in touch with your group activity-log into FirstClass frequently-this means more than twice a week, more like ONCE A DAY☺

Post Activity #1 Questionnaire

(Please do NOT complete this questionnaire until after you have received individual feedback for your on-line activity # 2)

The following questionnaire is designed to allow you to express your impressions of the assessment model used to grade your collaborative on-line activity. Please bold the response that matches your experience. The "Why" space is provided for you to elaborate upon your response.

1) Did your grade fairly represent your contribution to this collaborative activity?
    a) Yes
    b) No
Why:
2) Did everyone in the group deserve the same grade for this collaborative activity?
    a) Yes
    b) No
Why:
3) Should your grade have been higher for this collaborative activity?
    a) Yes
    b) No
Why:
4) Did all group members contribute equally to the completion of the collaborative activity?
    a) Yes
    b) No
5) Was your peer review score for this collaborative activity an accurate evaluation of your contribution to the group effort?
    a) Yes
    b) No
Why:
Please **bold** all responses which apply to you personally
    a) Satisfied that my contribution was recognized?
    b) Uncomfortable about working in this group again.
    c) Having access to my peer review score was beneficial.
    d) My group did not appreciate my contribution.
    e) My peer review score was based on the work I contributed.
    f) My peer review score was based on interpersonal difficulties within the group.
    g) I learned something from the grading of this activity?
    h) I intend to work harder in my group activities.

Post Activity #2 Questionnaire

(Please do NOT complete this questionnaire until after you have received individual feedback for your on-line activity # 2)
The following questionnaire is designed to allow you to express your impressions of the assessment model used to grade your collaborative on-line activity. Please bold the response that matches your experience. The "Why" space is provided for you to elaborate upon your response.

1) Did your grade fairly represent your contribution to this collaborative activity?
   a) Yes
   b) No
Why:

2) Did everyone in the group deserve the same grade for this collaborative activity?
   a) Yes
   b) No
Why:

3) Should your grade have been higher for this collaborative activity?
   a) Yes
   b) No
Why:

4) Did all group members contribute equally to the completion of the collaborative activity?
   a) Yes
   b) No

5) Was your peer review score for this collaborative activity an accurate evaluation of your contribution to the group effort?
   a) Yes
   b) No
Why:

6) Along with the breakdown of your grade for On-line Activity #2 you were provided with the **criteria** the instructor used to assess you individual contribution as well as an **explanation** of how your "instructor assessed quality of individual contribution score" was tabulated.
Did you find this information helpful?   Yes☐   No☐
Why?

Please **bold** all responses which apply to you personally
   a) Satisfied that my contribution was recognized?
   b) Uncomfortable about working in this group again.
   c) Having access to my peer review score was beneficial.
   d) My group did not appreciate my contribution.
   e) My peer review score was based on the work I contributed.
   f) My peer review score was based on interpersonal difficulties within the group.
   g) I learned something from the grading of this activity?
   h) I intend to work harder in my group activities.

Post Activity #3 Questionnaire

(Please do NOT complete this questionnaire until after you have received individual feedback for your on-line activity # 3)

The following questionnaire is designed to allow you to express your impressions of the assessment model used to grade your collaborative on-line activity. Please **bold** the response that matches your experience. The **"Why"** and **"How"** spaces have been provided for you to elaborate upon your response.

1) Did your grade fairly represent your contribution to this collaborative activity?

     a) Yes

     b) No

Why:

2) Did everyone in the group deserve the same grade for this collaborative activity?

     a) Yes

     b) No

Why:

3) Should your grade have been higher for this collaborative activity?

     a) Yes

     b) No

Why:

4) Did all group members contribute equally to the completion of the collaborative activity?

     a) Yes

     b) No

5) Was your peer review score for this collaborative activity an accurate evaluation of your contribution to the group effort?

     a) Yes

     b) No

Why:

6) After On-line Activity #2 you were provided with the criteria used by the instructor to evaluate you individual contribution to the group product. Did your knowledge of the criteria change the way you participated in your group for On-line Activity #3.

     a) Yes

     b) No

How?

7) For the "self and peer evaluation" for On-line Activity #3 you were provided with the **criteria and a rating scale**—You were asked to use the criteria when evaluating your peers' performance as well as your own. Please answer the following questions concerning the evaluation process.

a) Did you find the criteria helpful in structuring the evaluation of your own performance?

     a) Yes

     b) No

How?

b) Did you find the criteria helpful in structuring the evaluation of your peers' performance?

     a) Yes

     b) No

How?

c) Would you have liked to have this information for the evaluation of On-line Activity #1?

     a) Yes

     b) No

Why?

d) What changes if any would you recommend be made to the criteria?

Please **bold** all responses which apply to you personally

    a) Satisfied that my contribution was recognized?

    b) Uncomfortable about working in this group again.

    c) Having access to my peer review score was beneficial.

    d) My group did not appreciate my contribution.

    e) My peer review score was based on the work I contributed.

    f) My peer review score was based on interpersonal difficulties within the group.

    g) I learned something from the grading of this activity?

    h) I intend to work harder in my group activities.