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CREATING A SENSE OF COMMUNITY IN THE CLASSROOM ENVIRONMENT: AN INVESTIGATION INTO COLLABORATIVE LEARNING AMONG GRADE 12 STUDENTS

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Abstract

Although collaborative group-work has become an integral part of the learning process, students often demonstrate and express their unwillingness to participate. This study utilized an action research design to explore the reasons for such responses by examining how a small group of grade 12 students experience collaborative learning. Participants established guidelines for the collaborative learning process, researched and constructed information on global issues, and negotiated possible solutions for such issues. They simultaneously volunteered their reflections through confidential interviews and a questionnaire on their experiences in collaborative learning throughout their schooling. While acknowledging the numerous benefits they had with collaborative learning, many voiced their dissatisfaction with the limited time allotment for in-class collaborative group-work, their concern about their grades, and their frustrations with the unequal task performances of group members. This action research provides the immediate feedback needed to improve the ways for implementing future collaborative activities for students.

Keywords: action research, collaborative learning, constructivist psychology, computer-supported collaborative learning, group cohesion, qualitative data

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Chapter 1

Introduction

In this thesis, I describe an investigation I conducted on collaborative learning among a class of grade 12 high school students at one secondary school in Ontario, Canada. I explain how I pursued the development of a learning environment that could provide opportunities for students to engage in collaborative problem-solving activities. Drawing on a socio-constructivist stance towards knowledge building, I investigated the benefits and challenges my students face when working in collaborative groups and how I might structure future collaborative problem-solving activities so that they work better. Using an action research method of investigation, I gathered qualitative data about students' experiences in collaborative activities through observation, interviews, and a questionnaire. My analysis of the findings underlines the importance of community among students within a group. I demonstrate how once students are afforded the responsibility of addressing the challenges that they face working together, they are more likely to collaborate in ways that deepen their understanding of the discussion topics while building the social skills necessary for doing so.

Background to the Study

For several decades, many schools have been practicing to varying degrees of success and in many formats a collaborative learning instructional method in which students work in groups toward a common academic goal (Lin, 2006; Woodruff & Brett, 1999). From the simple paired group of students working together on clarifying an assignment to the more complex five- or six-member groups of students engaging in a process of intellectual negotiation and collective decision-making, educators have

experimented with them all (Cohen, 1996; Phelps & Damon 1989). Although several studies have documented its effectiveness (Johnson & Johnson, 1986; Kagan, 1986; Slavin, 1988), implementing collaborative learning in classrooms presents challenges which are expressed through the tensions they pose between collaboration and competition, individual growth and community responsibility among learners, and on the locus of control and authority between teacher and his/her students. I have seen these tensions occasionally erupt into situations in which students openly expressed their dissatisfaction with collaborative activities. I therefore conducted this action research study for a deeper understanding of my students' experiences with collaborative learning. I envisaged that such an understanding would serve to inform my future designs of appropriate pedagogical strategies for enhancing students' experiences with collaborative learning.

Rationale

My rationale for this action research project is embedded in the very context within which the study took place. The nature of the subject matter of the course of study and the backgrounds of the students at this particular research site prompted my investigation into the ways that I could contribute to a more meaningful learning experience for my own students.

At the school in which I teach, we offer the Ontario Grade 12 Canadian and World Issues course (CGW4U) as a university preparation course that is designed to equip students with some of the knowledge and skills they need to meet the entrance requirements for university programs (Ontario Ministry of Education, 2005, pp. 86 – 95). There are two related pedagogical implications deriving from the course goals and design

that influenced my investigation into collaborative learning as a method of teaching. The course is more problem-based than content-based with the main focus hinging on students' examination of "the global challenges of creating a sustainable and equitable future through the study of a range of topics, including economic interdependence, geopolitical conflict, regional disparities in the ability to meet basic human needs, and protection of the planet's life support systems" (p. 86). The actual challenges themselves, as well as the circumstances under which they occur, are constantly changing. For example, the current Canadian mission in Afghanistan deviates from the country's traditional peacekeeping role (Toronto Star, 2006); this is likely to change people perceptive of Canada's international involvement. It is therefore better to acquire knowledge of global issues through a problem-based analysis of current world events and relationships as they unfold rather than through the transmission of established content-based information alone (Woodruff & Meyer, 1977). This problem-based analysis focus requires that students, along with their teachers, should be actively involved in discovering, transforming, and extending their knowledge and not passively accepting it. Such a learning approach goes beyond conventional rote learning and the subsequent regurgitation of information to a deeper understanding of the issues as they unfold. Secondly, the nature of knowledge building in this course suggests that creating a community of learners in the classroom is not only advantageous, but also necessary for all students in the class to construct such knowledge by working together interdependently. In acknowledging the value of a sense of community within the classroom, Bryant (1999) elucidates that such a learning environment is usually filled with the type of friendliness and caring that are likely to elicit open response and full

participation from most students. Crawford, Krajcik and Marx (1999), further extending this rationale for creating a learning community within the classroom, contend that students become more cognitively engaged when they are able to relate the topics of discussion to their own experiences. Castle and Rogers (1993) feel that the development of such a learning environment is conducive to knowledge acquisition and transfer, problem-solving skill development, and collaborative social skill enhancement. Barnett and Fallon (2007) also allude to the motivational effectiveness of a sense of community in promoting collaborative interactions among students. Bruffee (1995) concurs, "We construct and maintain knowledge not by examining the world but by negotiating with one another in communities of knowledgeable peers" (p. 9). While building a community of learners offers one of several approaches to the implementation of the Canadian and World Issues curriculum, the literature supports its use particularly in learning environments that pursue a problem-based course design. Entonado and Garcia (2003) have discovered that there are effects that are more positive when students' learning tasks require collaborative efforts than individual or competitive ones. In an earlier report, Bereiter and Scardamalia (1993) suggested that cultivating a feeling of belonging to a learning community can afford students "more agency in the learning process" (p.37). Various other studies conclude that a collaborative approach to problem-based learning can enable students to delve into subject-specific issues and to build knowledge more efficiently through social interaction (Cohen 1994; Woodruff & Brett, 1999; Sungar & Tekkaya, 2006). For example, Marttunen and Laurinen (2007) in their report on collaborative argumentation point out how students "learn together by examining different points of view and arguments for and against each other's positions" (p.113).

Hence, by discussing an issue in a group, students clarify and extend the meanings of concepts as they negotiate possible solutions for the problems under discussion.

A large number of my grade 12 students are first- and second-generation immigrants whose heritages emanate from a number of different cultural and geographic regions of the world. Consequently, the students bring diverse perspectives to bear in the classroom on the global challenges they are required to analyze. These perspectives provide a rich potential for inquiry, argumentation, and knowledge building within group discussions. However, my anecdotal observations of students' engagement in the classroom indicated that some of them were more comfortable working independently as they competed with one another. In addition, students tended to rely only on their teacher and textbooks as their primary sources of information and would seldom acknowledge their peers as an additional source. Their 'independent' approach to learning, although successful in many instances, appeared to make it more difficult to engage them in collaborative learning as an alternative learning strategy; a strategy that was more suitable for examining the "challenges" of the Canadian and World Issues course. I therefore conducted this study for a deeper understanding of students' experiences in a collaborative learning environment in order to be able to design appropriate instructional strategies that can enhance future collaborative learning.

While my current classroom provides an appropriate site for exploring collaborative group work, Davis (1993) claims that students learn more effectively and retain what they learn for a longer period through collaborative group activities than they do with other instructional strategies. Various studies illustrate ways that collaborative discourses have facilitated students' understanding of concepts and issues (Gokhale,

1995; Johnson & Johnson, 1986; Lyle, 1996; Slavin, 1991). Other studies demonstrate how computer technology can be a complementary tool for expanding and deepening such understanding in a collaborative environment (Woodruff & Brett, 1999; Brett, 2004; Kozma, 2003). However, as this study demonstrates, collaboration does not come naturally or easily for everyone working in a group. In the work environment, Aube and Rousseau (2005) stated that a group of individuals working together on a task do not automatically perform effectively as a team. For instance, the Stanford University Newsletter on Teaching (Anonymous, 1999) stated that some college students have expressed skepticism about the value of group work. In my own experience as a long time teacher of grade 12 Canadian and World Issues (Ontario Ministry of Education, 2005), I have found that the actualization of collaborative learning in schools is, at times, problematic. I have listened to students expressing stronger dislike for such work than can be accounted for by simple apathy towards the collaborative process. Their attitude to group learning in relation to their collective responsibility reveals different types of students, two of whom I define in this thesis as 'product-oriented' students and 'reticent' students:

Product-oriented students are those who prefer to take personal responsibility for an assignment and choose to work alone than collaborate with others in their class. When placed in a group they pressure themselves to take on the responsibility of completing the task for the entire group. Their apparent unwillingness to acknowledge the value of other group members' contributions likely impinges on their own development of those interpersonal skills they need to function effectively in a collaborative learning and working environment.

Reticent students also do not function well in an atmosphere of collective responsibility. They may simply stand back and allow the product-oriented students in their groups to do most of the work. When they continue to be non-active participants throughout the duration of the collaborative process, they are less likely to develop expected learning skills and may fail to develop their personal understanding of the topic. On the other hand, Lave and Wenger (1991) suggested that some of these non-participating students usually demonstrate "limited peripheral participation" (p.29) at first and then graduate to full participation over time. Such students eventually benefit from their collaborative engagement as they become progressively comfortable with their respective groups. Therefore, it is important to find ways to help various types of students become more fully engaged in the collaborative process.

In exploring the reasons for the lack of enthusiasm for collaborative learning among a group of grade 12 students, this research project contributes to the field at the elementary and secondary levels of education. In this study, I wanted to reach beyond the much-reported product-oriented approach (Bosworth, 1994) to that of the actual process of knowledge building. I needed to learn more about group dynamics and how students actually work in groups in order to be able to enhance their future collaborative learning experience with the design of appropriate learning strategies. I also wanted to investigate if the claim made by many (Johnson, Maruyuma, Johnson, Nelson, & Skon, 1981; Slavin, 1991), that collaborative learning promotes positive affective outcomes as well as academic achievement at the elementary and middle-grade levels, can be the same for the senior high school level as well. The development of positive inter-group relations at the elementary and middle levels is not only impressive, but offers an insight into how

positive social interaction in a multicultural environment (such as my grade 12 classroom) can be enhanced. Learning social skills is particularly important for the adolescent grade 12 group at a stage when their need to belong often conflicts with their need to be recognized as an individual (Wood, 1987). Slavin (1989, 1991), realizing that there is not enough studies done at the senior high school level, recommends further research at this particular level to enable educators to gain a better and more comprehensive understanding of collaborative learning.

Research Questions

Since collective responsibility of the group is the underlying premise of collaborative learning, it is imperative that group members work closely together in positive interdependence in order to realize their common goal. Whenever they are unable to do so, they have very little chance of fulfilling their collective responsibility and, as a result, become disillusioned with this learning strategy. Therefore, in order to get a better understanding of students' involvement in collaborative activities, the major question I explored in this study was: In what ways are students currently experiencing collaborative problem-solving activities, and how might better understanding of this experience inform future design of learning activities to enhance collaborative engagement? In order to direct this investigation I also posed the following sub-questions:

- What behaviour patterns were observed as students participated in collaborative learning?
- Which factors did the students perceive as contributing to or hindering the success of collaborative group work and in what ways?

- To what extent did the students attribute group dynamics to the success or lack of success of their collaborative group? How did they suggest these dynamics might influence future collaborative group activities?

The Benefits of this Study

This action research project contributes to the field through its exploration of the experiences of a group of senior high school students, attending a public high school in a large city in central Canada, as they participated in collaborative group learning. It provides me, as the classroom teacher, with the immediate feedback I needed to improve the ways in which collaborative designs are implemented in the secondary school classroom to maximize not only their effectiveness as a learning strategy, but also their ability to contribute to a meaningful student community. It also reveals important information about collaborative learning that is of interest to teachers who embrace constructivist ideology and/or those who seek an alternative to the traditional didactic method of learning.

Chapter 2

Theoretical Background and Related Practices

In this chapter, I describe the context and background of the current study. I demonstrate how the many reports, the theoretical arguments on social constructivism and the practical attempts made by educators to foster collaborative learning, have greatly influenced the approach to learning I have adopted to practice and examine in this research project. I show what role the introduction of computer-supported collaborative learning could play in augmenting classroom discussions and sustaining the collaborative efforts beyond the classroom. I also examine the possibility of channeling the current knowledge and experiences of a group of grade 12 students into collaborative learning.

Theoretical Framework

The rationale for this study as outlined in Chapter 1 indicates my philosophical orientation toward the social construction of knowledge and skills in the classroom. My thoughts in this direction have been greatly influenced by the social constructivist psychology of learning. This idea posits that a group of learners constructs new knowledge based upon their interpretation of the knowledge and the experiences they have had in a particular context (Vygotsky, 1978). An important tenet of social constructivist psychology is that learners are collectively involved in active knowledge construction through analysis, synthesis, transformation, and evaluation of the information acquired. The pedagogical method that I use in my classroom (and I explored in this study) is drawn from a combination of problem-based learning and collaborative learning theories whereby learners are encouraged to actively engage in exploration and social collaboration. This chapter pursues social constructivism in further detail and

explores, through an examination of the literature on past practices, how a group of learners can evolve into a community of collaborative learners.

Learning Community. A learning community is a very complex phenomenon with many different aspects. McMillan and Chavis (1986) in proposing an operational definition that is applicable to the field of education, envision a learning community as a gathering of learners for a specific time. They suggest that these learners are coming together with a feeling of belonging, a feeling that members matter to one another and to the group, and a shared faith that members will be able to satisfy their learning needs through their commitment to be together. Implicit in this definition is the notion that group members must have a desire to contribute to, as well as having an expectation of benefiting from that community, and that group members must enter into interpersonal relationships in order to keep the community active. At the same time, group members need to understand the feelings and behaviour of other group members in order to gain acceptance within the community (Gardner, 1983).

Hill (1996) suggested that a sense of community among a community of learners is setting specific. Roth (2002) has identified in his analysis of the French village school of Moussac that appears to exhibit characteristics of a wider learning community whose membership comes from both the school and the wider population. Among the many features of this particular community is the interconnectedness that prevails among students, teachers, parents, and other members of the village.

Another such setting is that of a classroom community in which interconnectedness is developed only among the teacher and all of the students of that particular class. In this study, my learning community included my students and myself

(the teacher) in a particular course that encouraged a sense of democratic participation in a collaborative learning environment for a specific period.

Problem-based Instruction in a Collaborative Learning Environment. Widely used in professional education, problem-based instruction is now gaining ground in schools as it frequently builds around collaborative learning strategies (Cohen, 1994a). Many of these strategies evolve from common roots, especially the work of John Dewey (Noddings 1989) who believed strongly in the importance of giving students direct experiential exposure with real-world problems. In stimulating such real experiences, some teachers introduce problem-based learning into their classroom through simulations that require students to play the roles of stakeholders in a problematic scenario. While becoming emotionally invested in their respective roles, students develop different perspectives on the issues in question both during and after the simulation exercise. The appeal in this particular outcome for this study lies in the construction of new knowledge through negotiated consensus on the multiple perspectives brought by the students themselves.

According to Johnson and Johnson (1986), the results of problem-based instruction are encouraging for teachers who see numerous benefits. Some such benefits include: the development of students' responsibility for one another's learning as well as their own; an increase in interest among students in their activities; students' achievement at higher levels of thought; students' ability to retain information longer than when they work quietly alone; and, students' ability to think critically. Noddings (1989) also identifies the benefits of collaborative group work in terms of conceptual learning and higher order thinking. Cohen (1994a) further suggests that this type of learning is

conducive to positive inter-group relations and equal-status interaction in a multicultural and a somewhat multilevel classroom that is typical at the current research site.

Social Constructivist Perspective of Learning. A collaborative group-learning environment is an important component of the sense of community within the classroom (Kagan, 1994; Slavin 1991, 1995). The strategy of creating a learning community, which operates in a collaborative environment, is an important aspect of constructivist psychology in the claim that students acquire knowledge by actively constructing their own notions of reality from their experiences (Vygotsky, 1978). According to Piaget in 1926 (and reported by Wadsworth, 1984), students make sense of new experiences and information through the articulation of their personal schema. It therefore follows that when students create new information through discussion, they are likely to challenge and/or elaborate on it. Accordingly, in a social setting where group diversity in terms of knowledge and experience is prevalent, students are likely to develop different interpretations of any given situation. This exposure is likely to improve their problem-solving skills and thus contribute positively to the learning process. Vygotsky's notion of social constructivism also suggests that the peer support system in learning group "makes it possible for the learner to internalize both knowledge and critical thinking skills and to convert them into tools for intellectual functioning" (Gokhale, 1995, p. 28). Therefore, by working together on a clearly assigned collective task, group members are encouraged to participate without much teacher supervision or any direct instruction. This interpretation therefore distinguishes a learning community from other small groups that are involved in activities with intense direct instruction.

In identifying the significant positive effects of constructivist pedagogy, Hung, Tan, and Koh (2006) recommended the development of constructivist epistemologies at both the individual and collective levels within a school system in order for sustainable learning communities to emerge. This situation necessitates that both teachers and students need to shift their focus from knowledge as a product to knowledge as a process of inquiry and problem solving. In addition, they also need to embrace the notion that they are all co-learners whose individual knowledge and experiences are valued within their group for knowledge building to take place. Becker and Ravitz (1999) further suggested that in a constructivist-learning environment, teachers should design activities around the interests of group members "rather than in response to an externally mandated curriculum" (p. 356). Such activities may be difficult to implement since traditional learning strategies in schools, which largely consist of memorizing a body of knowledge and finding the correct answers, have long been established (Carson, 2007). Windschitl (2002) suggested that this learning style causes parents to "see [the] constructivist approach as dangerously experimental and are skeptical about the use of such pedagogy with their children" (p.155). Some of these parents may therefore be wary of the fluid structure characteristic of the learning community in a constructivist-learning environment. This may be due to their own educational experience that might have been in a behaviourist environment whereby they memorized information for subsequent recall. They may therefore fail to envisage the potential benefits of collaborative activities in helping their children prepare for further learning and the future job market. In support of this argument, Roth (2002) argued that we cannot regard learning and participation as separate entities. In addition, the nature of the problem-based Canadian

and World Issues curriculum, with its multiple perspectives and representations, affords students the autonomy to negotiate their own meanings of the issues within the collaborative learning environment.

Computer-supported Collaborative Learning (CSCL). Social constructivists propose that students construct new knowledge through "discourse and conversations situated in meaningful contexts" (Crawford, Krajcik, & Marx, 1999). However, time constraints in a classroom can curtail the effective completion of this process while limiting a comprehensive examination of the topics in the discussions. A study undertaken by Brett (2004) added significant information to the literature by introducing a CSCL component for more comprehensive deliberations. While online discourse can extend students' discussion time beyond the classroom, Brett's study contended that not every participant would have equal and positive experiences in this learning environment. The results suggested that the participants who benefit the most from the online component are those "who had had successful social and subject-related experiences in the program" (p. 83). Therefore, extending discussion time with the addition of an online component is likely to build upon the community already established in the classroom. However, Wighting (2006) noted that some researchers feel that the use of computers in the classroom may have a negative effect on the sense of classroom community unless students incorporate appropriate collaborative-learning strategies such as, sharing information and supporting one another. While acknowledging that few researchers have actually studied and reported on how the use of computer technology affects the classroom community, Wighting made the effort in his study to establish collaborative learning within the classroom before using the computer technology as a supporting tool.

The use of computers in the classroom relates directly to changes in teachers' practices in a constructivist direction (Becker and Ravitz, 1999). These authors further reported how teachers were attempting to incorporate constructivist practices of collaboration, project-based work, and hands-on activities into their lessons with the use of computer technologies. Kozma (2003) also claimed that computer technologies were causing a teacher to change his/her role "from that of primary source of information to one who provides students with structure and advice, monitors their progress, and assesses their accomplishments" (p. 6). Coincidentally, Becker and Ravitz (1999) reported that teachers' introduction of computers in a collaborative learning environment encourages students to indulge in critical thinking more than they would normally do without this tool. According to these studies, CSCL is more likely to support the collaborative process than restrict its success. Therefore, my rationale for the use of CSCL in this study was to provide a virtual meeting place for community members to sustain the relationships and communication that would have been established during their face-to-face encounters in the classroom.

Collaborative learning in a constructivist environment necessitates that participating students have access to information that can become the basis for their group discussions (Brett, 2004). Kozma (2003) concurred with this reasoning in her meta-analysis report of the findings of 174 case studies in 28 countries. The report confirmed that "networked technology can enable teachers and students to build local and global communities that connect them with interested people and expand opportunities for learning" (p. 1). This use of an Internet connection allows the inclusion of authentic information by obtaining it directly from experts outside of the school environment

whenever convenient and feasible to do so. In addition, Judson (2006) reported how students currently employ computer technologies "to compose reports, analyze data, communicate with experts, and perform research" (p. 582). Such uses of computers set the stage for students to engage in discussion, take responsibility for their own learning, and thus become critical thinkers.

While the literature implies that there is a connection between computer technology and constructivist pedagogy, Judson (2006) further advised that teachers should not think of this technology as a mechanism that automatically produces constructivist practices but as a tool that facilitates collaborative discussions. In this study, I therefore examined how we could use this tool to complement collaborative group work in the CGW4U classroom.

Relevance

The foregoing discussion briefly outlined the theoretical underpinnings of this study as it pertains to the social constructivist psychology. It defined the concept of a learning community and how it connects the complex pedagogical methods of learning associated the problem-based instruction in a collaborative learning environment. In so doing, the discussion examined the literature on past practices with collaborative learning as they relate to this study.

Although collaborative activities vary widely, they mainly emphasize students' exploration of the course material rather than teachers' explication of them. In attempting to encourage such exploration, I made three assumptions about the participants and the learning process that I selected for investigation in this study. My first assumption was that my students possessed a wide range of geographic and ethnic backgrounds, learning

styles, experiences, and aspirations. Emerging from such diversity was a wealth of perspectives on the global issues that they were required to address in this course and the need for collaborative negotiation to do so. The second assumption, directly relating to the first, was that learning is inherently an active social process. Using a social constructivist psychology as the basis for my instruction, I attempted to engage participants in mutual exploration in negotiating their own interpretations for better understanding of the issues they were discussing. The third assumption was that students' learning depends on rich contexts to promote their engagement in higher order thinking. Through their constant exposure to the media reports on the very global issues that they were required to study in the CGW4U course, students were likely to possess some knowledge of the topics under discussion. In addition, many of the participants were first- and second-generation immigrants who might have had some connections to the countries/regions they needed to refer to in their discussions. Therefore, by adopting collaborative problem-based approaches in addressing global issues, I assumed that students would become actively involved in constructing new knowledge.

Chapter 3

Methodology and the Process of Investigation

In this chapter, I outline how I chose a practical action research method of investigation in pursuit of a better understanding of collaborative group learning among my own students, the challenges that collaborative learning presents, and how students and teachers can address such challenges. I revisit the issue addressed and the guiding questions that formed the basis for the current investigation. I explain the process of data collection, what I requested participants to do in the study as they engaged in their regular classroom activities in their study of Canadian and World Issues, and my dual role as a practitioner-researcher. I also explain how I addressed ethical concerns that are usually expressed whenever a practitioner-researcher conducts action research on his/her own practice.

Action Research

In strengthening my commitment to constructivist teaching practices, I have sought ways to create a learner-centered environment by encouraging my students to take responsibility collaboratively for their own knowledge acquisition and skill development. However, as is outlined in Chapter 1, such an approach has posed numerous challenges for my students as well as for me, the practitioner. I therefore needed to pursue a better understanding of collaborative group work, its challenges, and possible ways in dealing with such challenges in order to enhance my students' collaborative experience. I chose action research methodology to facilitate my examination of my own teaching praxis within the context of my own teaching environment. According to the process of action

research, this method of investigation would not only allow for a disciplined inquiry into the challenges of collaborative learning, but would also facilitate direct action of promising possibilities in addressing such challenges while allowing me the opportunity to monitor whether and how well the action worked.

Masters (2000) stated that reports in the literature are not clear on the origins of action research. She cited many authors, including Kemmis and McTaggart (1990), Zuber-Skeritt (1992), and Holter and Schwartz-Barcott (1993), for tracing this research methodology back to Kurt Lewin, a social psychologist and educator who conducted work on action research throughout the United States during the 1940s. Although the value of action research in improving teaching practice has been promoted since the 1940s, interest in this method of inquiry decreased between the mid 1950s and 1970s when "experiments with research designs and quantitative data collection became the norm" (Ferrance, 2000, p. 8). Some critics today still view action research as unscientific and the work of amateurs (Ferrance, 2000). Nonetheless, in recent times there has been a growing interest in action research as an alternative form of professional development for teachers (Hargreaves, 2000) as opposed to training sessions that are designed to "fix up teachers" (Grundy, 1983). Hargreaves also suggested the need of action research, as a form of professional development, to enable teachers to face the challenges engendered by an increasingly diverse student population in an emerging technological and globalized learning environment. As if in response to this call, Peters (2004) illustrated how a number of recent professional development projects in Australia have encouraged action research as a process for professional learning and educational reform for teachers. While other jurisdictions are without a national agenda for action research, many

individuals and groups of collaborating teachers who engage in this type of inquiry are conducting one of four types of action research: individual teacher research; collaborative action research; school-wide action research; and, district-wide action research (Ferrance, 2000). Jamieson (2000) and Juneja (2002) demonstrated how individual teachers can successfully engage in action research, a pursuit that is of interest to me in this study.

Carr and Kemmis (1986), and Mills (2003) see this method of investigation as a way of informing teachers about their own practices while empowering them to take ownership for their local teaching context in directly addressing those concerns that are closest to them in their classroom and/or their school. Without a basis in action research, teachers are constrained to follow and implement pedagogical suggestions made by researchers outside of their teaching environment. While some of these suggestions have worked well in some classrooms, it is possible that researchers who are not closely involved in teaching and learning will often miss many important factors affecting the education in a particular context. In addition, since no two learning contexts are alike, implementing a common teaching/learning strategy for all may not be appropriate. Therefore, blending research with action is a sure way for teachers to improve teaching and learning (Ferrance, 2000).

The Research Questions Defined

It has become incumbent upon us as teachers to constantly review and tailor any learning strategy to suit our respective context of practice. While we may gather insight into several dimensions of collaborative learning from numerous reports (Cohen, 1996; Johnson & Johnson, 1986; Slavin, 1988; Jamieson, 2000; Junja, 2002; Barnett & Fallon, 2007), we find its practice to be flourishing in so many ways that it sometimes defies

precise definition. Like other teachers who embrace collaborative learning, I therefore need to seek a deeper understanding of this method of instruction in order to be able to design appropriate strategies for enhancing my students' learning experience. In this pursuit, I recognize how feedback and accountability from the students themselves are critical elements in an effective design for collaborative learning. The central question I posed (in Chapter 1) for this action research study therefore illustrates my quest for a better understanding of students' current experience with collaborative problem-solving activities. While relating directly to my own context, the study reveals findings that may be of interest to others in the field. The results of this action research study complement reports on collaborative learning, most of which have been mainly concerned with comparing its effectiveness to traditional forms of instruction that are more competitive and/or individualistic (Cohen, 1994a). The analyses of some such reports emerge from a product-oriented perspective (Bosworth, 1994) with the quality of a group's product as the focus of investigation. The current study extended further to gather information about group dynamics and the challenges that students' collective responsibility faces with the current implementation of collaborative learning.

The three sub-questions I posed in this action research study helped to garner a wealth of qualitative data to add further insight into collaborative learning. The first question sought to identify behaviour patterns of students as they participated in collaborative small group activities. I wanted to investigate if certain expected behaviour patterns that are typically portrayed in group dynamics would emerge in this study. Examples of such behaviour patterns include dividing the workload and dealing with equal and active participation of all members of the group; resolving conflict relating to the group process;

resolving conflict relating to controversial topics of discussion; working together to complete a task; and, giving and receiving help. The second question required students to suggest what factors they thought were contributing to and/or hindering the success of collaborative group work. This particular question intended to garner general information about students' experience with collaborative learning throughout their schooling. It also intended to bring out the many benefits and challenges that would normally prevail in such a learning environment. The third question sought to explore what participants considered the factors that attributed to the success and/or lack of success of their respective groups during this study. This question encouraged participants to reflect on their current group engagements, give specific feedback on their impressions, and suggest how to implement collaborative learning to enhance students' learning.

Participants

Thirty students, ranging in age from seventeen to eighteen-and-a-half years, participated in this study. They were in a grade 12 Canadian and World Issues course (CGW4U) at a secondary school in Ontario, Canada, at the time of the investigation. A large number of these participants were first- and second-generation immigrants who came from China, India, Pakistan, Sri Lanka, and the Philippines. Their wide range of cultural and geographical backgrounds enabled them to bring different perspectives on global issues to their negotiations in a collaborative learning environment.

Data sources

The information in the current research, gathered from the three data sources of field observations, interviews, and a questionnaire, centered on students' experience in a collaborative learning environment. The research process started in the first week of May,

2007, and lasted for six weeks during the latter part of Semester 2. Participants met daily in their regular scheduled time slot for a period of seventy-five minutes during which time they engaged in small-group collaborative learning activities.

Canadian and World Issues Assignments. In this research project and as part of their regular course of study in Canadian and World Issues (CGW4U), participants addressed authentic and highly controversial global issues (Table 3.1) that are reflective of the dilemmas faced by world leaders and policy makers. Taken from the broad concepts of international security, human population, global environment, and international economy and stated in the form of questions, these issues are very complex in nature. While some of them are dire world problems that require immediate attention, others are strategies that have both positive and negative consequences in aggravating or alleviating other problems.

During their discussions, participants took on the challenge of exercising discrimination in determining under what circumstances they could define these issues while proposing possible solutions for them. At times, members of a group would simulate the roles of the inherent stakeholders of the issues they examined while presenting various perspectives that further helped to deepen their understanding. At the end of their deliberations, each group documented a proposed plan of action for addressing the issues. Participants then presented their proposals to the entire class for further discussion.

Table 3.1	Global Issues
1. Has the Green Revolution been beneficial to all?	
2. Can Genetically Modified Organisms help to prevent starvation in the world?	
3. How can the world community strike a balance between public health and private profits that saves lives and yet still provides rewards for continued innovation?	
4. Should governments use all the means at their disposal to deal with terrorism, even if this involves the restriction of constitutionally protected civil rights?	
5. Should Canada offer amnesty to illegal immigrants?	
6. Do you view globalization as an opportunity or a threat for developing countries?	
7. Is globalization likely to make sustainability easier or more difficult to achieve?	
8. Was/Is the Chinese government justified in imposing the one-child policy on its people?	
9. Can developing countries benefit from the building of large-scale dams?	
10. Explain how a declining population might affect Canada's economy and lifestyles.	
11. Does the experience of Kerala point the way to demographic transition for the poorest developing countries?	
12. How should the international community respond to states that are believed to sponsor terrorism or to provide safe heaven to terrorists?	
13. Does fear of terrorism justify violations of sovereignty?	
14. Should minimum standards for human rights, the environment, and political freedom be linked to trade agreements, or is this a violation of state sovereignty?	
15. Should debt forgiveness be linked to concessions made by indebted countries?	
16. Can a single approach to the prevention of diseases like HIV/AIDS be crafted to include all religion, political, and cultural perspectives?	
17. Should Canada allow the transfer of its water to the United States?	
18. Should a country be able to count the size of its carbon sinks against its requirement to cut greenhouse gas emissions?	

Method

Preparing Participants for Collaborative learning. Once approval to proceed with the proposed research was granted by the ethical review committees of both the university and the district school board, and by the principal of the school (Appendix A), I invited 32 Semester II, 2006-2007, Grade 12 Canadian and World Issues students to take part in

the research process. In the first week of May, 2007, the principal distributed the letter of information and consent forms (Appendix B) to students 18 years old and over and to parents of those students who were under 18 years of age at the time of the research (Appendix C). She advised students that they were to return all signed consent forms secretly to her and that I would not be informed of their participation status until the course was over and they knew their final grades. Thirty students consented to participate.

The nature of the current research required students to communicate with one another in both face-to-face and online environments. While their presence in the classroom during their regularly scheduled class time enabled their face-to-face collaboration, they needed to have Internet access in order to connect to the school's online educational link at home for their online interactions. The district school board facilitated this for all staff and students who needed to register as online participants in order to access the facility that provided the communication tool as well as a safe and controlled environment for them to collaborate. Through examination of the data gathered from an informal survey (Appendix D) I usually conduct at the start of every course I teach, I learned that participants in this study possessed the basic technological and word-processing skill-requirements to do online messaging, online research, and online presentation of information that are necessary for the incorporation of CSCL into their learning. The survey indicated that students all had Internet connection and computer for their use at home. They also had access to the school's computer lab where they communicated via the education link before and after their regularly scheduled classes.

Based on the Ontario Ministry' guidelines for learning strategies at elementary and secondary schools (Ontario Ministry of Education 2004, 2005), most students in Ontario will have had some experience learning in the cooperative environment by the time they reach grade 12. I therefore assumed that my participants would have had the necessary social skills for collaborative learning. While such an assumption may hold true for many grade 12 students in Ontario schools, two important considerations influenced the way I introduced students in this study to collaborative learning. First, I needed to ensure that they had a common understanding of the expectations for collaborative learning and that they possessed the necessary social skills for participation. Cohen (1994b) advised that it is a mistake for an educator to assume that students know how to work with one another in a constructive collegial fashion although they may have had experience in this type of learning. Secondly, a large number of the participants in this study spent less than five years in the Ontario school system and may not have had adequate preparation for the collaborative activities I was planning to take them through. Studies done by Webb, Ender, and Lewis (1986) have shown that if students do not adequately prepare for collaborative group activities, they usually end up talking about specific procedures instead of discussing ideas or articulating their own thinking. Therefore, I reintroduced training in small group learning to my participants in an effort to encourage their construction of appropriate norms or rules that would determine the way they were expected to behave in a collaborative learning environment.

Small discussion groups formed the main setting for this study. Participants in each group engaged in verbal and/or written exchange with the goal of reaching some level of consensus in their deliberations. The expected behaviour in this setting was that everyone

should contribute equally and that no one person should dominate the group. Inherent in this expectation were the skills of listening and being able to reflect on what others in the group were saying. I encouraged participants during their deliberations to practise the skills of asking for other's opinions, being concise in their own explanations, giving reasons for their position on an issue, and trying to pull ideas together in an effort to obtain consensus.

Social skills for collaborative learning can develop through cooperative skill building exercises. Matthews, Cooper, Davidson, and Hawkes (1995) suggested that when attempting to establish a collaborative classroom, a good place to start is with cooperative activities. The authors hold the view that students first need to do structured activities with each individual taking on a specific role like that of a chairperson or a scribe in the cooperative learning group before letting them organize and negotiate their own. The teacher needs to observe, listen, and intervene in a group when necessary before allowing students the freedom to conduct their own pursuit of the information they need without supervision. Thus, Epstein's *Four-Stage Rocket* (Cohen, 1994b) was selected to prepare participants for collaborative group work in the current study because of its three properties: it focuses on group discussion, it is relevant to the age group of the participants, and it allows for minor adaptations to include a variety of social skills that are necessary for collaborative group work.

For the purpose of this study, I placed participants into 'permanent' groups of five. I assigned each participant a number from one to five in recurrent alphabetic sequence based on his or her surname. I formed six groups by this process with each group comprising five participants with the same assigned number. As an introductory activity

to the *Epstein's Four-Stage Rocket* (Table 3.2), I allowed each group twenty minutes to discuss an issue based on global population, international conflict, economic interdependence, and global environment with one group member observing 'good' and 'poor' discussion techniques. Participants practised four skills to illustrate the 'take off'

Table 3.2 Epstein's Four Stage Rocket

Stage (Each stage lasts for five minutes)	Activity
4	Everyone contributing: - Everyone in the group is required to speak. - The speaker must wait three seconds after the person before has spoken before speaking. - No one may speak a second time until everyone in the group has spoken. - Each person speaks for fifteen seconds.
3	Reflecting: - The speaker must wait three seconds after the person before has spoken before speaking. - Everyone who speaks must begin by repeating to the group something that was said by the person before him/her. - The previous speaker has to nod his or her head to indicate if the reflection is right. - Each person speaks for fifteen seconds. - A new timekeeper is selected.
2	Listening: - The speaker must wait three seconds after the person before has spoken before speaking. - Each speaker continues to discuss the same topic as in stage 1. - Each person speaks for fifteen seconds.
1	Conciseness: - A timekeeper is selected. - The speaker must wait three seconds after the person before has spoken before speaking. - Each person speaks for fifteen seconds.

of a discussion as in four take off stages of a rocket take: *conciseness* (Stage 1), *listening* (Stage 2), *reflecting* (Stage 3), and *everyone contributing* (Stage 4). As an instructive

debriefing to the process, each group of participants asked their group's elected observer to say what he/she observed about their respective performance during the group's deliberations. They then joined in a class discussion about what they considered 'good' and 'poor' group discussion techniques. Cohen (1994b) contended that a successful training program, as the one used in this study, would enable students to internalize new norms of collaboration and to take charge of themselves and others as a result. The author further suggested that it would also translate into group members assisting one another in their activities while helping them to understand the content of the issues under discussion.

Cohen's (1994b) idea influenced my adoption of the preparation training to set the stage for increased social interactions between participants and the eventual development of a sense of community in the classroom. At the same time, I decided that the introduction of CSCL into the process would also serve to provide an additional channel for sustaining the community's collaborative endeavour beyond classroom time.

Observation. During the collaborative deliberations as per the foregoing discourse, I participated as a teacher-researcher. As I moved around and joined groups in their discussions from time to time, I would trouble-shoot, encourage, and facilitate their collaborative efforts. I realized that, although the three methods of data collection I used collectively allowed me a wide range of lenses for studying students' behaviours in a collaborative environment, I might have missed some data. As a teacher-researcher, I found it difficult to sit at the back of the class and observe every student's learning behaviour. Instead, I had to narrow my observation to one group at a time and continue with the same group on the following day to get a clear understanding of the

developments as they were occurring. During this process, however, I observed the group dynamics and took field notes on students' behaviour during their deliberations. I was looking specifically for information pertaining to how participants encouraged one another, clarified concepts, delved deeper into issues, and contributed additional information to the discussion. I continued to take these field notes as I joined participants in their asynchronous online discussions and kept printed texts of their postings for analysis. These discussions took place during school time and after school through their secured education link as they read and sent online messages.

I devised an observational protocol for taking field notes during my observation in keeping with Creswell's (2005) suggestion. The form contains a header where I recorded such information as the purpose of the research, time, place, setting, and my role as an observer (Appendix E). Below this header are two columns. In the left column I recorded, in chronological order, the process of participants' collaboration and behaviour during their deliberations. In the right column, I recorded reflective thoughts about my insights, hunches, and emerging patterns and themes.

At this point of the investigation, since I did not know which students had consented to participate in the research, I needed to tag opinions or statements made by individuals with their names. In this way, it was easy to discard those statements made by non-participants during the data analysis.

Interviews. I conducted informal interviews with twenty-four participants on an individual basis for a maximum of five minutes each. I did not interview six of the thirty consenting participants because of time constraint and their absences. I audio-recorded 120 minutes of these interviews and later transcribed the data for analysis. Since my

objective was to understand students' experiences in collaborative group work, I attempted to elicit their candid responses by conducting the interviews in a non-threatening way in the form of casual conversations in a relaxed atmosphere. My questions were semi-structured and open-ended. They centered on how participants felt about group activities and what they noticed happening during their collaboration with others in their respective groups (Appendix F). I took the opportunity at that time to have students edit or endorse those statements ascribed to them during my observation of their collaborative efforts.

Questionnaire. I also administered a questionnaire (Appendix G) with open-ended questions to allow participants to express how they felt about collaborative group work and to explain why they felt that way. All thirty participants returned their completed questionnaire forms for analysis.

Data Analysis

Preparing for Analysis. By the time the data collection process was completed, the school had notified participants of their individual final grades for the Canadian and World Issues course. At that time, my principal permitted me to examine the consent forms in order to eliminate the information I had gathered on the non-participating students. Of the 32 students I invited to participate, one withdrew from the course before the investigation began, and another left school after he realized that he had met the requirements for a high school diploma. Thus, 30 consenting participants remained for the inquiry. I then prepared the data for analysis. I transcribed all information obtained through my observations and interviews into a text document with a two-inch margin on each side for my use during the analysis. While preparing the data for analysis was the

most obvious step to follow data collection, I had actually started transcribing my field notes and interviews at the end of each day during the actual investigation process. I noted all responses under their respective respondents' names.

Initial Analysis. I conducted a manual analysis of the qualitative data I had gathered after transcribing the audio tape recordings of the interviews and entering my observation field notes into text. I constantly read over both my rough notes and the transcribed version of the field and interview notes in order to get a general sense of what the students were saying about their group work experience. I used inductive analysis for a better understanding of the perceptions of participants. I underlined the key statements that were direct answers to the research questions (Chapter 1) and wrote key words and phrases in the margins that illustrated such statements. These key words and phrases became codes that I gathered into emergent themes, following the constant comparative method of analysis outlined by Miles and Huberman (1994). I conducted this coding exercise at the end of each session of a collaborative activity. At such times, I would discover the need to seek further data on certain specific patterns that were starting to emerge. For example, students' comments during their interviews and questionnaire revealed that they were developing an understanding of the expectations of collaborative group work. This led me to seek specific information pertaining to their actual attempts at applying themselves accordingly. One such attempt I noticed was in the way they tried to adhere to the guidelines they had developed at the start of their deliberations.

I was initially overwhelmed with the amount of data. Every time I thought I had discovered certain discernable patterns, I would notice a tremendous amount of overlap among the variables and the complexity of their connections. Later, when all the data was

gathered and documented, I re-examined my transcripts in detail to describe what I learned and to develop themes from the data.

Coding the Text for Description. Creswell (2005) suggests that after the initial reading and coding of the data, the logical next step is to analyze the data from all sources for a description of the setting and the interactions of the participants in it. In this action research study, I analyzed the data to construct a chronology of activities during the collaborative process. I also noted the circumstances under which each activity took place as I attempted to relate them to group dynamics. For example, I noted how long it took participants to join their respective groups of five at the very start of their deliberations and, whether they joined their groups on their own volition or they were prompted to do so. At another stage in the sequence of their deliberations, I noted how participants were clarifying concepts for their peers.

Coding the Text for Themes. During my initial analysis, I identified and noted in the left margin of the text key words and phrases as identifiable codes for the statements I had originally underlined. I repeated this process several times as soon as all the data was collected. I later reduced the number of codes by discarding redundant ones. I then grouped the remaining codes together into distinct themes according to their similarities. I eventually reduced their number to five by combining themes with somewhat similar codes. This proved to be a manageable amount from which I could address the research questions I set out to answer.

At this stage, I revisited the text data and grouped identical responses made by all participants on their questionnaire forms and in their interviews into various categories according to their relevance. For instance, under the category of "Preference for Self-

Selected Groups," I placed the response made by a participant, "Communication lines with friends are open any time and anywhere." These responses were then carefully examined, sorted according to similarity, and then recorded (Tables 4.1, 4.2, 4.3, 4.4, & 4.5). I brought together under one theme various categories that referred to the same issue, concept, or idea.

Maintaining Accuracy and Credibility of Data and Analysis

I maintained accuracy and credibility of the research findings and interpretations through triangulation and participant checking according to Creswell's suggestion (2005). I triangulated the three different data sources according to the method of collection – observation, interview, and questionnaire. I searched for evidence from each source to support or challenge each of the themes I discerned in the data. I also examined the data from the three sources for consistency to ensure that I had recorded them accurately.

I invited participants to take part in the member checking process on an individual basis and in a confidential manner. I asked each student to verify individually whether I had accurately recorded what he or she had said about group work during our interviews. Participants also reflected on their collaborative learning experience during the debriefing session at the end of the course as a class activity. They expanded and clarified some of their impressions on such experience in general terms without making any specific reference to individual participants as per my recommnedation. I later noted their impressions as additional data for analysis.

Research Protocol and Ethical Concerns

Any research that involves human subjects must adhere to certain strict ethical protocols. I needed to consult all relevant persons, committees, and authorities, and to

ensure that they accepted the principles guiding the work in advance of any research undertaking (Bournot-Trites & Belanger, 2004). Because of my affiliation with two academic and professional organizations, I needed to conduct the current study in accordance with their ethical requirements, especially since my participants were high school students. I first sought permission to conduct the study from the university's ethical review committee, after which it was necessary to get the principal of the research site's permission (see Appendix C) before going to the district school board for their approval. Once I received the approval to proceed with the inquiry from these official authorities, I then sought the consent of the students registered in the CGWU4U course that I was teaching at the time.

In inviting my own students to participate in this investigation, I needed to recognize and respect the privileged nature of the teacher-student relationship and to ensure that their freedom to withhold consent was not compromised. Bournot-Trites and Belanger (2004) believe that a teacher-researcher is likely to coerce his/her students into participating. I was able to address this concern by having the principal of the school inform students about the nature of the research, their expected role in the data gathering process, the measures that would be taken to ensure they would not be harmed in any way, and how there would be no penalty for non-participation. Apart from making my research objectives and its procedure transparent to my participants through the principal, I also tried at the start to establish a partnership with them in the decision-making process as we examined various aspects of collaborative group activities and decided how these aspects could be improved upon. Fraser (1997) suggested that creating an informal atmosphere and allowing students to participate in the decision-making process would

assist in establishing the credibility I sought in my investigation. In addition, I invited the principal to monitor the consent process. As stated before, she directed students to return all signed consent forms secretly to her. She also informed them that I would not have any knowledge of their participation status until the course was over and their final grades had been submitted.

Assuring anonymity was another area of concern that I had to address in this study. Since participants needed to know that they would not be easily identifiable in this report, I established at the outset how anonymity and confidentiality would be guaranteed. I informed my participants that their names would not be mentioned in this study. When quoting his or her responses, I would use a number for each participant instead of using his/her name. In addition, I would keep all information I collected confidential and stored in a locked filing cabinet in the principal's office. I would later shred all hard data and erase electronic files two years after the completion of this study.

In attempting to ensure a balanced description and analysis of the data, I needed to continually interrogate my own understanding of the data in order to prevent any bias from clouding the true meaning of the data gathered (Fraser, 1997). I attempted to deal with this concern by first conferring with participants individually at the end of each session as to the accuracy of my notes and then correcting any inconsistencies therein.

Chapter 4

Results

In this chapter, I organize this study's findings into five themes: selecting groups; identifying the effects of collaborative group work on learning; identifying the factors responsible for the success/failure of collaborative learning; identifying the role of electronic communication in collaborative learning; and, improving small group collaborative learning. For each theme, I state the categories of responses I arrived at through constant comparative method analysis of the qualitative data I gathered from interview, questionnaire, and observation sources. I then represent the themes with their respective categories in a table format. I also added up the number of responses that are similar or relevant to their respective category. For the purpose of this study, I regard the numbers only as indicators and I do not use them in a statistical analysis since the data is qualitative in nature. I also assign each participant a specific number from 1 to 30 to maintain anonymity when quoting his or her remarks.

Selecting Groups

In this study, the method of group selection dominated a major part of the preliminary discussions of the collaborative process. In answer to the query of their preference for group selection, whether they preferred to select their own groups or have their teacher do that for them, the most frequent response of participants was that they preferred self-selected groups. The reasons (Table 4.1) they gave for this choice were getting to work with group members of the same or known capabilities and feeling comfortable working with familiar individuals. For example, Participant 10 stated, "I prefer to select my own group because I know who (m) I work well with." In agreeing

with this statement, Participants 2, 5, 7, and 8 explained how important it was for them to be able to communicate with their peers at any time and anywhere when collaborating on a project; they felt that this facility was only possible if they were working with their friends or with individuals that they knew well. Participant 24 further rationalized the choice of self-selected groups by saying, "I prefer to select my own group. This allows me to work with people I know who will pull their weight, with whom I get along, and with whom I am able to meet at any time."

Although participants responded with less frequency than they did with their choice of self-selected groups, they stated how their preference for teacher-selected

Table 4. 1. Method of Group Selection

Responses	# of Responses per Theme
Preference for Self-Selected Groups:	
- Familiarity encourages participation	28
- Known capabilities encourage fair work distribution	19
- Communication lines with friends are open any time and any where	6
Preference for Teacher-Selected Groups:	
- More balanced grouping	9
- More efficient work ethics	12
- Making new acquaintances	5
- Lack of peer pressure experienced in self-selection	6
Preference for Alternate Selections:	
- Broad experience working with old and new acquaintances	4
- keeps interest in group work alive with new ideas	3

groups was important. The most common reasons they offered for this choice were working with students of various strengths and backgrounds, making new friends, and giving everyone an opportunity to contribute. They also claimed that a major difficulty

they had encountered with self-selected groups during their previous engagements was due to the amount of time and effort they would invest selecting group members. Participant 11 in explaining this situation said, "... choosing your own group can put pressure upon you because of the amount of friends in the class." In addition, participants preferring teacher-selected groups suggested how peer pressure had been responsible for compromising their individual accountability when working in their own selected groups during their previous collaborative engagements. For example, Participant 13 claimed that, "If you choose your own group, you are most likely to go with friends who usually slack off while producing poor work. You would not report them to your teacher because they are your friends."

Participants also revealed a preference for alternating between self-selected and teacher-selected groups although their response for this choice occurred with the lowest frequency. Those who embraced this arrangement felt that it would serve to broaden their experience in working with a larger circle of old and new acquaintances. While choosing the students they knew and could rely on to help the entire group to produce quality work, they expressed their desire to enrich their group projects with the new points of view that students outside their circle of friends were likely to bring to collaborative negotiations. Participant 5 said, "Choosing my own group would allow me to choose members with whom I can work effectively. But, allowing my teacher to choose for me would give me an opportunity to work with various people with different perspectives."

Identifying the Effects of Collaborative Group Work on Learning

In answer to the query about the effect of collaborative group work on learning, participants overwhelming responded that collaborative group activities greatly

Table 4.2. How Collaborative Group Work Affects Learning

Responses	# of Responses per Theme
Contributes to Learning:	
- Sharing knowledge	20
- Sharing different perspectives	18
- Building self-confidence	4
- Building interactive skills and communication techniques	14
- Supporting one another	8
- Increasing critical thinking	7
- Building team spirit	5
- Developing individual responsibility and accountability	5
Limits Learning:	
- Building expertise in only one aspect of the assignment	15
- Too much socializing and losing focus as a result	4
- Domineering members not allowing others to contribute	7
- Frustrations for independent learners	6

contributed to learning. Occurring with much less frequency was the response that such activities actually limited their opportunities for learning. In providing the reasons for their respective claims, respondents from both camps pointed out how collaborative group work affected learning in both positive and negative ways (Table 4.2). The most common response was that collaborative group activities contributed to learning through the sharing of knowledge. Many felt that this process was crucial to knowledge building since group members could readily accumulate additional information on a topic or concept from their peers. Participant 19 suggested that when working in a group "you get to share different ideas that you might not have thought of by yourself." During their group activities, I observed participants responding to the queries of their peers by researching the questions before stating their answers for all within their group to benefit. For example, when Participant 15 wanted to know who the members of the International

Community were, Participant 7 suggested, "The Wikipedia Encyclopedia states that the International Community is all countries that are represented in United Nations."

The second most common response in support of collaborative group activities suggested that while it was helpful to gather new information, it was also important to understand the issue more thoroughly by examining the varying perspectives presented by various group members. Participant 8 stated, "...in this class, where we are bouncing ideas off of one another, I find it [this inquiry process] very helpful." Another relatively high frequency response maintained that this type of learning strategy built interactive skills and communication techniques in both oral and written formats. Other reasons given by participants in support of collaborative learning, but occurring much less frequently, included group members supporting one another, the development of critical thinking among peers, the building of team spirit, and the development of individual responsibility and accountability. During their online deliberations, students were making an effort to seek deeper understanding of the issues and concepts pertaining to their discussions. For example, Participant 8 stated, "I do not think that lenders should just forgive a country's debt like that. For one thing, the lender will lose out and, what will stop other countries from also claiming that they could not repay their debts?" In a contradictory view, Participant 19 answered, "Yes, but what about the ordinary citizens of the country? I do not see how they would ever get a chance to satisfy their needs if they do not get help from outside."

In considering the reasons why collaborative activities limited learning, most participants suggested that the process allowed them to develop expertise in only one aspect of the assignment at the expense of learning about the whole issue under

discussion. According to further responses made by participants, this situation had occurred in their previous collaborative engagements when a group would identify several variables of an issue through brainstorming and then assign each variable to one group member for research and subsequent presentation to that group. Participant 16 explained how this approach limited learning "because I tend to learn only the material I am responsible for." In some instances, during observation in this study some participants simply appeared to be listening to what their group members were saying without making any comment or query. Instead, they would be checking over their own notes while waiting for their turn to present. In offering another explanation why they felt that group activities hinder learning, one response claimed that whenever there was a domineering person in a group, s/he would prevent others directly or indirectly from having an equal chance to contribute to the group's assignment. At the same time, other responses suggested that familiarity among group members at times would result in too much socializing and an inefficient use of a group's allotted time for collaborative activities. A response of relatively low frequency suggested that some participants were frustrated with collaborative group and would rather work alone. For example, Participant 11 stated, "I don't find it very enjoyable because I like to work alone which helps me to think clearly and easily."

Identifying the Factors Responsible for the Success/Failure of Collaborative Learning

Table 4.3 outlines what participants considered as factors that contributed to and obstructed the success of their collaborative group work in this study. The most frequent response for this theme suggested that having students of different backgrounds and varying strengths and weaknesses working in the same group would contribute to the

success of collaborative learning. Participant 27 summarized this claim in the statement, "A benefit is when working in a group, those people who have certain skills and know a certain topic very well can produce work that is beneficial to the entire group." In expanding further, Participant 13 suggested that group members could use such diversity to support one another in the statement, "... people have different strengths so when someone is struggling with something and because you have the strength, you can help that person..." Another response of relatively high frequency claimed that the online component utilized in the learning strategy in this study was partly responsible for its success. Other responses that explained the reasons for successes, but with less frequency, included: relevant and interesting topics/issues; a chance to interact with peers; fair work distribution; appropriate preparation in planning and organizing activities; and setting and following appropriate guidelines for group activities. Those with much less frequency included setting common goals and obtaining accessibility to online and other resources.

Participants also stated what factors they considered to be hindering the success of their collaborative efforts in this study. The most frequent of their responses pointed to inappropriate work habits, two of which were quite noticeable during their group activities: students engaging in social conversation instead of beginning their discussion topic and, lacking new material to add to their discussions. The response of unequal participation closely followed these two in frequency. Other factors identified were stated with much less frequency and these included: the occasional negative criticisms instead of constructive criticisms among group members; poor preparation and planning of group activities; lack of interest in certain topics/issues; preference for working alone;

insufficient class time; absences from school/class; awarding group mark instead of individual mark; and, lack of self-confidence by some group members.

Table 4.3. Factors Contributing to Success/Failure of Collaborative Group Work

Responses	# of Responses per Theme
What Helped:	
- Mixture of students with different backgrounds and varying strengths and weaknesses	23
- Appropriate preparation – planning and organization	10
- Relevant and interesting topics/issues	15
- Online communication	18
- Setting common goals	5
- Interacting with peers	13
- Fair work distribution	12
- Accessibility to online and other resources	5
- Setting and following appropriate guidelines for group work activities	8
What obstructed success:	
- Poor preparation – planning and organization	5
- Unequal participation	14
- Inappropriate work habits	15
- Absences from school/class	3
- Awarding group mark instead of individual mark for assignment	2
- Lack of self-confidence by some members	2
- Insufficient class time	4
- Lack of interest in certain topics/issues	5
- Preference for working alone	5
- Occasional negative criticisms instead of constructive criticisms	7

In some cases, participants tried to address the circumstances that obstructed their collaborative goals. For example, one group chair advised a group member to do an immediate Internet search after chastising her for neglecting to bring in her research notes for her group's discussion for the day.

Identifying the Role of Electronic Communication in Collaborative Learning

In this study, I introduced electronic communication to extend students' collaborative discussions beyond the classroom. When asked what they thought about the

use of this tool in their collaborative group work, participants claimed that it was helpful. On the other side of the spectrum, but with much less frequency, was their response that electronic communication hindered their collaborative work.

Table 4.4. The Role of Electronic Communication in Collaborative Group Work

Responses	# of Responses per Theme
How Helped:	
- Allows extended time for further discussions/negotiations	8
- Provides an efficient form of communication of any time and any where	26
- Allows for instantaneous sharing of information and feedback	45
- Promotes full participation even with 'shy' members	3
- Establishes a supporting forum for all members	8
- Allows for quick online research to aid discussions	10
- Promotes the development of a sense of responsibility and accountability	10
How Hindered:	
- Irregular communication due to occasional technical difficulties and lack of Internet access	7
- Difficulty with face-to-face interaction once online interaction became more common	6
- Irregular communication due to lack of time after school	3

In identifying the reasons (Table 4.4) why it was felt that electronic communication was helpful, the most common response was that this tool allowed for instantaneous sharing of information and feedback. A somewhat similar reason that participants gave in another high frequency response stated that electronic communication provided an efficient form of communication at any time and any place. Less frequent responses pointed to other reasons, such as, electronic communication promoted the development of a sense of responsibility and accountability, allowed for

quick online research to aid discussions, established a supporting forum for all members, and assisted in extending their discussion time beyond the classroom. Participants also claimed that the use of electronic communication in their collaborative group work promoted full participation among all members including those in the group who were shy and/or lacked self-confidence. At the same time, observations of students' postings during their discussions indicated that they were making statements that are more informed in support of the positions they would take on certain issues. For example, in support of birth control measures for countries experiencing rapid population increase, Participant 14 wrote, "India will soon have the largest population in the world, without the resources to support it. With a growth rate of 1.6%, it is growing at a formidable rate; almost double that of Canada's 0.87%."

In their explanation of how electronic communication hindered their collaborative group work during the study, participants cited factors that would actually prevent them from using the tool. For instance, they suggested that occasional technical difficulties with Internet access caused irregular online communication, while some students were unable to communicate electronically after school because they were heavily involved in other activities at that time. Participants further suggested that once they became comfortable and established in the online communication part of their collaborative activities, they started to experience difficulty with their face-to-face interaction. Although this response was of very low frequency, it highlighted a surprising negative impact of online communication on group dynamics. In her explanation of this phenomenon, Participant 15 stated that electronic communication hindered collaborative

efforts "because people became lazier and the group dynamics were lost because there was less social contact."

Improving Small Group Collaborative Learning

While most participants acknowledged that they benefited from collaborative learning, they all made suggestions for improving the collaborative experience. According to Table 4.5, one suggestion to this effect that became the most frequent response for more than one theme was that there should be more self-selected groups than teacher-selected groups. Participants suggested in another response of less frequency that each group should have a balanced mixture of students with varying strengths and weaknesses and differing socio-cultural backgrounds for successful collaboration to occur. They also suggested that there should be regular rotation of group members to prevent them from becoming too complacent and non-productive as a result of such complacency.

The second most frequent response for this theme suggested that each group member should establish a working knowledge of every aspect of their discussion topic instead of only being responsible for the part assigned to individual members of their group. Participants making this response explained that they sometimes became too engrossed in their own respective research assignments that they would ignore the other aspects of their issue and would therefore be unable to relate to the issue as a whole. In another frequent response for improving collaborative learning participants identified the need for group members to establish guidelines prior to their group activities. Those making this response claimed that once group members figured out what their goals were for their assignment, they should establish guidelines pertaining to: deadlines; the

frequency and means of communication; progress evaluation; and, the resolution of conflict within the group. Another suggestion that many felt was crucial in enhancing collaborative learning was the need for an equitable workload distribution

Table 4.5. Improving Small-Group Collaborative Learning

Responses	# of Responses per Theme
- Establish guidelines – goals, frequency and means of communication, deadlines, evaluating progress and resolving conflict within the group	9
- Get to know one another prior to assignment	2
- Provide interesting and relevant topics to students' experiences	5
- Individual tasks should be teacher-assigned instead of student-generated for accountability	2
- Equitable workload distribution	7
- Teacher to closely monitor each member's contribution	2
- Establish a working knowledge of every aspect of discussion topic instead of only the part assigned for research by the group	12
- Lengthen class time for face-to-face discussions	4
- Set specific guidelines for absent and officially-excused students to 'catch up' with the discussions	4
- Peer evaluation of the efforts and products of each group member	5
- More role-playing activities	3
- Constant switching of group members	3
- More self-selected groups	18
- A balanced mixture of students in every group (varying strengths and weaknesses and differing socio-cultural backgrounds)	4

among the members of each group. This response emerged in more than one theme as participants suggested that it was not only a matter of fair workload distribution, but also a chance to include the introverts in their discussions. Another response that applied to more than one theme was the suggestion that collaborative learning should focus on topics/issues that were interesting and relevant to students' experiences. An examination

of participants' online postings would serve to corroborate this response. For example, when participants were negotiating conditions for UN's intervention in a country's internal affairs, Participant 17 wrote,

> I disagree with ... [Participant 16] on his point that the UN shouldn't handle other country's affairs, and more peaceful methods should be used to improve countries. However, military intervention is sometimes necessary to stop genocide, civil war, or another gross violation of human rights. For example, the Rwanda genocide could not be stopped by developed countries helping Rwanda, by giving them aid. Sending in a military force would have been the only way to stop the genocide. Not intervening in situations like this would be immoral: which matters more, millions of lives or the sovereignty of a country?

Participants did not feel the same with regard to their own responsibilities in the collaborative learning process. While some felt that they should have more responsibility in assessing their own efforts and contributions through peer evaluation, others suggested that their teacher should closely monitor each member's contribution. Another aspect of accountability that emerged in their responses pertained to work distribution. Some felt that individual tasks should be teacher-assigned instead of student-generated in order to establish fair work distribution and set the stage for better accountability. For those students not contributing to the group efforts for reasons such as absenteeism, participants suggested that a group should establish specific guidelines prior to any group deliberation. At the same time, many felt that they should take immediate actions in dealing with problems that would occur during their deliberations. Some felt that they could lessen the amount of infrequent contributions by some group members if the members of a group should spend time getting to know one another's strengths and weaknesses prior to the beginning of the collaborative group engagement.

One surprising response that emerged under the theme of improving collaborative learning was that some participants wanted their class time to be longer in order for them

to complete their in-class group activities. They felt that there were times when they needed to suspend their discussions in order to conduct on-the-spot research for addressing certain queries and adding new ideas. Their class time would elapse by the time they returned to continue their discussions.

Concluding Remarks

Based on the qualitative data collected on students' experiences in collaborative learning, participants claimed that they mostly enjoyed and benefited from their engagements in the learning strategy. Their most frequent responses pointed to such reasons as opportunities afforded by collaborative learning for knowledge-sharing, exposure to different perspectives, relevance of and interest in topics/issues, incorporation of electronic communication, construction of supportive learning environment, and opportunity for social interaction. The data also indicated that students had encountered numerous challenges with the implementation of collaborative learning from time to time throughout their schooling. Their most frequent responses to this effect were unequal participation among group members, inappropriate work habits of some members, exclusion from the group selection process, and inability to learn deeply about the whole issue in question as a result of each member doing a separate part of the whole assignment.

Chapter 5

Discussion

In this chapter, I discuss my interpretations, and outline a few implications of the findings that resulted from this action research study that I conducted in my teaching context.

The main research question I posed for this study sought to examine students' current experience with collaborative problem-solving activities. My intent in this pursuit was to explore ways in which a better understanding of students' experience in collaborative learning might be used in future design of learning activities to enhance their collaborative engagement. In order to gather as much information I could on the issue, I divided the main question into three sub-questions. The first sought to identify behaviour patterns of students as they participated in collaborative small group activities. The second required students to suggest what factors they thought were contributing to, or hindering, the success of collaborative group work. The third sought to explore what participants considered were the factors that attributed to the success and/or lack of success of their respective group during this study. I outline in this chapter my interpretations of the findings of these questions under the headings: group selection; group cohesiveness; benefits of collaborative learning; challenges to collaborative learning; and, benefits of online discourse. In so doing, I compare my interpretations to the social constructivist framework that forms the basis of my inquiry. I also examine the limitations of this study and make suggestions for further research on collaborative learning at the high school level.

In my conclusion, I identify certain areas where my students experienced some improvement in their learning as a result of their engagement in collaborative learning. I also highlight some important 'lessons' I learned from this study and state how I intend to incorporate them into my future designs for collaborative learning.

Group Selection

Students' attitudes to the methods of selecting group members were a major challenge at the very beginning of the collaborative learning process in this study. In this study, I tried to encourage participants to collaborate with others outside of their immediate circle of friends and acquaintances by assigning each participant a number from one to five in a recurring sequence. However, since the majority of them wanted to be in the same group with their friends and acquaintances, they immediately expressed their dissatisfaction with the teacher-selected groups.

As participants became engaged in their collaborative activities, I closely examined their attitudes and behaviour toward the method of group selection utilized in this study. I noticed that the longer they remained engaged in their collaborative activities, the more their social interactions with their respective group members increased. I also discovered that they became a little more accepting of their assigned groups after the rationale for the method of teacher-selected groups was explained to them and they had a chance to practice social skills in their assigned groups during their preparation activities. By the end of this study, their choice of selected groups, although important to most of them, was no longer a priority. They eventually stopped complaining about their teacher-selected groups. Students' maturity level as well as their prior experiences with collaborative learning might have also contributed to this attitude

change. By the time students reach grade 12, they may have engaged in many different forms of collaborative learning (Ontario Ministry of Education, 2005) and may have learned how to collaborate with individuals other than their friends. There is, therefore, need for further studies to determine what connections, if any, exist between maturity levels and students' attitude to small group membership. Further studies also need to be done on the effectiveness of various types of group selection.

Group Cohesiveness

A gradual development of interpersonal cohesiveness, bonding as a group, became noticeable when participants remained in the same groups for the entire duration of this study that lasted for six weeks. Participants started to socialize with one another even though they had no prior mutual interests or closeness through the occasional sharing of personal information and discussion of common topics of interest at the start of their group discussions. Participants' desire for peer interaction and social networking could have been a possible reason for this level of interaction. The data from this study corroborates this assumption by suggesting that familiarity increases interpersonal cohesiveness in a group.

Interpersonal cohesiveness started to develop as the members of a group made a concerted effort to problem-solve the issue(s) presented for their deliberations. Cunningham (2005) in another study made a similar discovery among a group of ethnically dissimilar persons. The author suggested that group cohesion developed as a result of the establishment of their group's common goals. This finding therefore dispels the perception initially held by some participants that they needed to be in groups that comprise their friends and acquaintances before the group cohesiveness, a necessary

condition for effective collaboration, could emerge. It therefore follows that although some students may not know members of their assigned groups very well, they will become familiar enough to be able to collaborate with one another if they stayed in the same group for some time.

Benefits of Collaborative Learning

The findings of this study indicate that a large majority of the participants felt that collaborative group activities greatly contribute to learning. In support of this claim, some of the key benefits they identified are the sharing of knowledge, listening to different perspectives on an issue, building interactive skills and communication techniques, developing individual responsibility and accountability, and supporting one another. There were certain underlying ramifications in the actual learning process in this study that prompted students to realize the importance of these benefits. During their group engagements over time, participants developed a particular sequential pattern of operations for conceptualizing the issues, dividing their tasks into manageable mini-research projects, assigning each project to an individual group member, and then reporting their individual findings to their entire group for further discussion and negotiation. Any interruption in this sequence of operations would result in stress and frustration for the entire group on a few occasions. Such negligence, categorized in their responses as unequal participation/non-participation and inappropriate work habits, proved to be an enormous challenge that students had to face in their collaborative engagements; however, participants devised certain ways to address this particular concern. During their training session for collaborative learning, they raised the topics of unequal participation and non-participation. They decided that from the onset they should

establish certain guidelines that would govern their performances. One such guideline was that they needed to allow time for individual research and gathering of new and relevant information to aid their discussion. On many occasions, students took breaks from their group discussion to access classroom resources, including the Internet. Another guideline that affected the benefits identified required group members to provide individual positions along with their supporting points and to report their findings to their group. This particular guideline promoted interactive skill development along with individual responsibility and accountability. It also prompted frequent interactions among group members and a somewhat fuller participation from all. In the midst of their interactions, students demonstrated support for one another. This behaviour was more noticeable in their online communications than in face-to-face communications as they responded to their peers' queries and needs for clarification of issues of process and/or content.

This study corroborates others in suggesting that different group members, who have different areas of expertise, ideas, opinions, perspectives, and information to offer their group, usually participate more fully. Cohen (1994a) acknowledged the importance of such heterogeneously composed groups to high-quality solution to the issue discussed and to the participation of most members. In another report, Slavin (1990) recognized the importance of the group tasks requiring ill-structured solutions, as were assigned in the current study, in solving the problem of some members not contributing during group deliberations. Another factor of equal importance is that participants were trying to take responsibility for their own learning as they devised ways of getting everyone in their group to adhere to the guidelines pertaining to participation.

Challenges to Collaborative Learning

While the majority of participants readily identified numerous benefits, many of them claimed that collaborative activities actually limited learning. They were concerned, in particular, about their inability to comprehend fully the entire issue being discussed as a result of the emphasis they had placed on their individual assignments as per the sub-topics into which their group had divided their main issue of discussion. However, in this study, their research on a 'need-to-know' basis as a part of their guidelines actually helped them make informed contributions to their group discussions. They challenged one another's statements while engaging in intense arguments about the issues under discussion.

Although some participants felt that they became distracted from their group's goals when they socialized, they realized the importance of social conversations in creating an atmosphere of cooperation in collaborative learning environment. The challenge here was to balance the amount of time spent socializing with the amount of time devoted to the group's task.

Some participants claimed that a domineering member in a group would limit the collaborative experience for the rest of their group. In attempting to explain the reasons for such behaviour, Cohen (1994a) suggested that activity and influence in a group by the domineering member might be related to an individual's status in the group. The author suggested that this status emerges from students' perceptions of each group member's attractiveness, popularity, or academic competence. In coping with this phenomenon in this study, students constantly rotated their group leaders for every new topic they discussed and by setting up rules pertaining to the distribution of work and the discussion

protocol. The method worked well since everyone tried to adhere to the very rules that they had made up themselves at the start of their deliberations.

An important observation that emerged in this study relates to students' learning styles. A few who expressed their preference for independent learning stated that they did not feel that they could learn from collaborative activities in the classroom. One reason for such an attitude may be due to their previous schooling experience and/or that of their parents who might have experienced the behavioural type of schooling whereby independent learning in a highly competitive atmosphere is greatly valued. There is therefore need for further research to substantiate this assumption and to help teachers understand the challenges they face when they implement collaborative learning in their classrooms. In this study, a very few participants neglected to prepare for their groups' discussions while others would not voluntarily join in the discussions without being prompted by their peers to do so. While these behaviours partially explain the possible effects of students' previous schooling experience on the collaborative process, they cannot serve as conclusive evidence to that effect since other factors could be responsible for such behaviours as well.

Participants cited examples from their current experience in identifying the factors that helped and/or hindered collaborative group work. They suggested that having a fair mixture of students with different backgrounds and varying strengths and weaknesses in every group was the most important factor in enhancing their collaborative experience. In this study, I had assigned groups through a numbering system that gave all participants equal probabilities of being in a heterogeneous group. Although I did not use any particular device to assess the effectiveness of such groupings, I observed participants

displaying certain behaviours that were consistent with heterogeneous groupings. For example, they were constantly sharing information, helping one another understand the concepts dealt with in their discussions, encouraging one another to participate, and generally engaging in lively discussions.

Benefits of Online Discourse

Most participants felt that the introduction of CSCL into lessons greatly enhanced their collaborative learning. They cited numerous instances to highlight its benefits during their interviews and on their questionnaire forms. During their deliberations, they also made use of this tool to support one another, intensify their interactions, and post quality statements on their respective topics. These findings support Wighting's (2006) report on the compatibility of "technology use in the classroom and a constructivist approach to education" (p. 378). The author based his report on the premise that students favour an element of learner control that encouraged them to value teamwork and appreciate the sharing of information to complete a task collaboratively. Evidence of such attitudes emerged in the current study through the quantity and quality of students' online interactions during their collaborative deliberations in the current study.

Coincidentally, the major concerns that participants had with the use of this tool in their collaborative activities centered on the occasional technical difficulties they encountered and their inability to join online discussions outside of school time due to their other commitments. The provision of Internet access at school before classes, at lunch, and after school addressed these concerns. A small number of participants claimed that the establishment of online discourse in their discussions actually hindered their face-to-face interactions. This was a surprising feedback since the introduction of electronic

discourse seamlessly integrated participants' face-to-face interactions with their online asynchronous conferencing as a natural extension of their overall in-class deliberations. Further probing revealed that participants felt that once they started their online discourse, there was less social contact and group members were becoming less productive during their face-to-face interactions. This finding raises several questions: Does the online component influence students' approach to learning in promoting a more intense focus on their problem-solving tasks and less focus on their social interactions? Do students feel that their online postings are all the evidence needed to verify their participation in their group activities? What impact does instant online research have on students' negotiations? Further research on these and other related questions need to be pursued in order to determine if and/or what modifications are required to enhance students' collaborative experience with an online component.

Conclusion

My quest for ways to incorporate a collaborative learning environment into my practice is greatly influenced by my interest in social constructivist psychology. In order to understand the complexity of the nature of such a learning environment, I conducted this action research investigation into collaborative learning among a small group of high school students. In this study, I explored the ways students experience collaborative groups activities and how I could structure such activities so that they work better. The results of this study provide interesting insights into how the collaborative approach can be an effective strategy for learning at the senior high school level. They also replicate the benefits associated with collaborative learning observed at both the elementary and middle school levels (Slavin, 1991). Prominent in the data in answer to the sub-questions

posed in Chapter 1 of this report are the themes relating to group selection, benefits and limitations, factors responsible for success and/or failure, computer-supported communication, and recommendations for improving the collaborative experiences for students. Weaving through these themes are four factors that serve as a binding force for group collaboration and its practice of social construction of knowledge and skills: having relevant and interesting discussion topics; establishing rapport; being able to effect changes; and, having additional time for collaborative activities.

An important finding to the query of what factors hinder or contribute to the success of collaborative group work relates to the assigned topics of discussions. This finding demonstrates that the provision of interesting and relevant topics to students' experiences can be the impetus for intense interactions within every collaborative group. Many participants claimed that they did not participate much in their previous collaborative activities because they were simply not interested in their assigned discussion topics. However, during the current study, they demonstrated much interest in their problem-solving assignments of topical local, national, and global issues, most of which were closely related to their own experiences. A large number of the participants were first- and second-generation immigrants who originated from countries and regions featured in their discussions. They were therefore able to contribute first-hand information along with their own perspectives that richly enhanced the quality of their negotiations and their social construction of knowledge. In attempting to incorporate this finding into my future design for collaborative activities, I will allow students some latitude in relating their personal experiences and knowledge to their topics of discussion.

A major finding in answer to the sub-question on how group dynamics affected the success/failure of student's participation in collaborative activities was the necessity for participants to be well acquainted with their fellow group members in order to be able to work effectively in a group. Most suggested that by selecting their own groups they would have already established the kind of rapport necessary for collaborative activities. However, during their deliberations in this study, students socialized by making personal enquiries of their fellow group members as they continued with their discussions. Although this behaviour seemed like a distraction at the time, it was necessary to develop productive collaborative relationships among the participants that, in turn, enhanced the quality of their collaboration. In addition, once students understood the process of collaboration, they engaged fully in the collaborative activities. This behaviour became evident from the time of their introduction to the *Epstein's Four-Stage Rocket* preparation strategy (Cohen, 1994b). This finding demonstrates that it is not only necessary for group participants to understand the collaborative process, but they also need to acquaint themselves with one another for group cohesion to emerge. My future design for collaborative activities will therefore incorporate preliminary preparations to achieve these two goals of catering to students' understanding of the process and enabling them to feel comfortable working with one another.

In addressing concerns pertaining to participation that arose during their collaborative engagements, students took on the responsibility of deciding how they should collaborate. At the very beginning of the collaborative process, each group established common group goals and guidelines that they would follow throughout their deliberations. They subsequently adhered to these group-generated guidelines while

enforcing such rules upon all members of their group. Later in the process, they realized that they needed to modify and add new guidelines pertaining to inappropriate work habits, unequal participation, and negative criticisms about others in the group. Their increased involvement in their group's discussions underlined the importance of students taking on this responsibility. This finding complements what the literature reveals about the role of clear directions and expectations in determining how team members are to contribute and interact and how these factors can facilitate successful collaboration (Cooper et al., 1990). My future design for collaborative activities will therefore incorporate students' input into determining their group's expectations and guidelines.

Most participants found that the time allotment for their class discussion in their earlier collaborative engagements was too short to enable any comprehensive discussion. In dealing with this concern, I introduced a CSCL component into the process. I later discovered that the use of online discussion did not only extend participants' discussion time beyond the classroom, but it enhanced the quality of their contributions. Their online postings were frequent and more informative especially since they were encouraged to do online search of information on their topics of discussion. Whenever the circumstance warrants such an intervention, I will therefore attempt to incorporate CSCL into my future design of collaborative learning.

My main objective in conducting this investigation was to examine the ways students were currently experiencing collaborative problem-solving activities, and how a better understanding of this experience might inform future design of learning activities to enhance their collaborative engagement. At the beginning of the study, I was examining group dynamics through the lens of a teacher-researcher, but as we became

further immersed into the process, I started to blend in as a participant and to perceive the engagement differently. I encouraged participants to examine with me the collaborative setting in which they worked and for them to make appropriate adjustments and/or accommodations whenever necessary. This strategy afforded them an opportunity to exercise some control over their learning as they engaged in problem-solving negotiations in a collaborative environment. It was a very rewarding experience for us all and the most compelling 'lesson' I have learned from this action research. While it is every teacher's goal to inculcate in his/her students a sense of responsibility for their own learning, I have discovered a way to make this a possibility. Throughout the process of this study I made my objectives transparent to all participants as I encouraged them to 'work with me' to devise ways to enhance their collaborative experience in class. Thus, by including them in the decision-making process, I was able to boost their confidence and that resulted in a dramatic increase in their willingness to take responsibility for certain aspects of what they were doing in class. The degree of collaboration I experienced with my students in this study has therefore reinforced my commitment to treat my students as equal partners in a collaborative learning environment.

Although I am passionate about promoting universal student success in my own classroom, I would always feel at the end of the day that, despite my best efforts, I have failed to help every student progress as far as he or she could go. I often wondered how I could address this personal frustration. Although my experience with professional development opportunities at various levels of the education system in which I practice has served to increase my knowledge about teaching, I would still feel a void in what I could achieve in my own classroom. I realize now that my classroom context is unique

and that whatever I have learned from the experts in education may need to be modified to suit my particular circumstance. Therefore, by embracing action research, as I did in this study, I have found a way to pursue systematically and vigorously any issue that emerges in my own practice within my own context. This research methodology has contributed to the development of the skills I need to be able to analyze my own teaching methods; it has empowered me to make informed decisions about what to change and what not to change, and to be able to link prior knowledge to new information. This research framework has led me to a deeper understanding of constructivism. It also demonstrated how inclusive constructivist practice could be in promoting student participation. It has enabled me to narrow the gap between theory and practice and to realize its transformative power in helping me to increase my knowledge about my own teaching and learning.

In the final analysis, this action research study has provided me with the kind of professional development at a personal level that can be used to foster informed discussion with my colleagues in the teaching practice. I am eager to conduct further studies into my own practice in other aspects of learning instructions and curriculum-related issues and to collaborate with teachers of similar interests on a school-wide or board-wide basis. I have already started to examine my own teaching methods while subconsciously utilizing the principles of action research.

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Appendix A

Consent Form – Principal of Research Site

Creating a sense of community in the classroom environment: an investigation into collaborative learning among grade 12 students

I have read the Letter of Information relating to the above-titled project. I understand the proposed research, its aims, and the methods of investigation that will be used during the investigation, and all my questions have been answered to my satisfaction. I am given the assurance that the ethical requirements pertaining to research with students of the school as set forth by both the University of Western Ontario and the Toronto District School Board will be adhered to, and that the strict confidentiality of the participating students of Marc Garneau Collegiate Institute will be maintained at all times during and after the research has been completed.

I hereby give my consent for the above-titled research to be done at Marc Garneau Collegiate Institute.

Ms. Deborah Blair (Principal, Marc Garneau Collegiate Institute).

[Signature] [Date]

Appendix B

Letter of Information and Consent Form – Students 18 Years and Over

University of Western Ontario

February 28, 2007

Dear Student:

I am a graduate student at the University of Western Ontario and a practicing teacher with the Toronto District School Board (TDSB). I am researching the ways in which Grade 12 World Issues students learn in groups. Information from this study will be useful in helping teachers design lessons that can foster more engaged participation in students' group learning.

The External Research Review Committee of the TDSB has granted approval for this study. The Principal has also given permission for this study to be carried out at Marc Garneau Collegiate Institute.

You will be asked to complete a questionnaire of six short questions about your experiences in group learning and to take part in a five-minute informal interview with me about group learning. This interview will be taped and then transcribed into written format for you to check and make necessary changes to the transcript. You will also be asked to allow me to use the information gathered in our normal classroom activities through observation as research data.

Participation in this study is voluntary and will not affect your attendance in class or your evaluation by the school. The principal of Marc Garneau Collegiate Institute will collect consent forms for the study and will not inform me, whether or not you agree to participate until the final grades for this course have been submitted. After the final grades for the class have been submitted in July 2007, only the data from those who agreed to participate will be analyzed for the research study. All information collected will be strictly confidential. After all data have been collected, students will not be identified individually.

Please indicate on the attached form whether you agree to take part in this study. Your cooperation will be very much appreciated. Please contact me at [redacted] you have further questions.

Sincerely,

Omadat Persaud

STUDENT CONSENT FORM

I have read the Letter of Information, have had the nature of the study explained to me, and have had questions on the study answered to my satisfaction. The following check marks indicate my decision to take part in this study:

(1) the audio-taping of five minutes of in-class interview – **Yes [ ] / No [ ];**

(2) the inclusion of my classroom information as research data for this study

– Yes [ ] / No [ ].

_____

Student's Name (in print)

_____ _____

Student's Signature Date

Appendix C

Letter of Information and Consent Form – Parent/Guardian of Students under 18 Years Old

University of Western Ontario

February 28, 2007

Dear Parent or Guardian:

I am a graduate student at the University of Western Ontario and a practicing teacher with the Toronto District School Board (TDSB). I am researching the ways in which Grade 12 World Issues students learn in groups. Information from this study will be useful in helping teachers design lessons that can foster more engaged participation in students' group learning.

The External Research Review Committee of the TDSB has granted approval for this study. The Principal has also given permission for this study to be carried out at Marc Garneau Collegiate Institute.

Your son/daughter will be asked to complete a questionnaire of six short questions about his/her experiences in group learning and to take part in a five-minute informal interview with me about group learning. This interview will be taped and then transcribed into written format for your child to check and make necessary changes to the transcript. Your son/daughter will also be asked to allow me to use the information gathered in our normal classroom activities through observation as research data.

Participation in this study is voluntary and will not affect your son/daughter's attendance in class or his/her evaluation by the school. The principal of Marc Garneau Collegiate Institute will collect consent forms for the study and will not inform me, whether or not you agree for your son/daughter to participate until the final grades for this course have been submitted. After the final grades for the class have been submitted in July 2007, only the data from those who agreed to participate will be analyzed for the research study. All information collected will be strictly confidential. After all data have been collected, the students will not be identified individually.

Please indicate on the attached form whether you permit your son/daughter to take part in this study. Your cooperation will be very much appreciated. Please contact me at
if you have further questions.

Sincerely,

Omadat Persaud

PARENTAL/GUARDIAN CONSENT FORM

I have read the Letter of Information, have had the nature of the study explained to me, and have had questions on the study answered to my satisfaction. The following checkmarks indicate my consent for my son/daughter, _____, to take part in this study:

(1) the audio-taping of five minutes of in-class interview – **Yes [ ] / No [ ];**

(2) the inclusion of my son/daughter's classroom information as research data for this study – **Yes [ ] / No [ ].**

Parent's/Guardian's Signature: _____ Date: _____

Acknowledgement for Non-English-Speaking Parent/Guardian.

I, _____ acknowledge that I translated the above letter and consent form for _____ in the _____ language before s/he signed the consent form.

_____ _____
Signature Date

_____ _____
Witness Date

Appendix D

SURVEY ON THE USE OF COMPUTER TECHNOLOGY

Name _____ **Date** _____

1. Do you have access to the use of a computer and a printer at home? _____
2. If yes to Question 1, please state what computer and printer you have at home.
   _____
3. Do you have Internet access at home? _____
4. Please use the following scale to indicate the extent of your knowledge of the following programs:

   SCALE: Very Good, Good, Little, None at all

   Microsoft Word _____
   WordPerfect _____
   Appleworks _____
   Microsoft Excel _____
   Microsoft PowerPoint _____
   Microsoft Internet Explorer _____
   Mozilla Firefox _____
   Microsoft FrontPage _____
   Other _____

5. Please use the following scale to indicate the extent of your skill level in the use of the following programs:

   SCALE: Very Good, Good, Little, None at all

   Brochure making _____
   Letter writing _____
   E-mail writing _____
   Web page making _____
   Slideshow making (PowerPoint) _____
   Flash/animation making _____
   Chart making _____
   Table making _____
   Online Messaging
   (e.g., MSN chat line) _____
   Copying and pasting text & images
   from one program to another _____

6. Circle the search engines you have used – Google, MSN Search, Yahoo Search, Lycos, Dog Pile. List any other. _____

Appendix E

Observational Field Notes - Dynamics of Collaborative Small Group Learning

Setting: **Observer:**

Group Members:

Role of Observer:

Discussion Topic:

Time & Date of Observation: **Length of Observation:**

Description	Reflective Notes

Appendix F

SEMI-STRUCTURED INTERVIEW ON COLLABORATIVE LEARNING

Direct Questions

1. What do you think group work is designed to do?
2. What benefits and drawbacks do you see in group work?
3. Tell me about a time when group work was
    a) a positive experience for you
    b) a negative experience for you.

Probing Questions to follow the flow of the discussion .....

Appendix G

QUESTIONNAIRE

ATTITUDES TOWARD SMALL GROUP LEARNING IN CLASS

Respondent's Name _____

Instructions for Completing Questionnaire

The following questions are asking you to write your impressions about collaborative small group activities in which you have participated.
Please write a brief answer for each question on the appropriate lines provided.

Questionnaire

1. Do you prefer to select your own group or have your teacher do that for you? Why?

_____

_____

_____

_____

2. Do you find group work in this class enjoyable? Why or why not?

_____

_____

_____

_____

3. In what ways does working in a group contribute to or limit your learning?

_____

_____

_____

_____

4. What do you think might have helped or obstructed the success of your group in this class?

5. Do you think the introduction of electronic communication has helped or hindered the progress of your group? Why do you think so?

6. What suggestions do you have for improving small-group collaboration?