Preface

Online collaborative learning is an idea whose time has come. The desire by students to undertake programs and courses via the Internet and access resources online is forever altering the nature of formal education. Many institutions and educators have been caught largely unprepared for the radical changes forced upon them. Research into teaching and learning techniques that are effective in the online environment is therefore both urgent and important.

The educational changes necessitated by the new computing and communication technologies are profound. The new environment is one in which students are more likely to come from a diverse range of backgrounds, have differing levels of technical and language abilities and have the desire to study at times and in places of their own choosing. Thus research into paradigms beyond those traditionally associated with universities, where students are often obliged to attend classes on-campus, sit through lectures and attend face-to-face tutorials, is long overdue. One such paradigm that holds significant promise is that of online collaborative (or group) learning.

Collaborative learning itself is hardly a new idea. Indeed, it seems likely that people have been learning informally in groups for thousands of years. It is interesting to observe therefore that almost all formal learning today, particularly at university level, still takes place in an environment in which students are expected to learn individually. Despite this, students often form their own informal study groups to assist their learning.

As Gaillet (1994, p. 94) has pointed out, collaborative learning methods were experimented with, and found to be successful, at least as early the late 18th century, when George Jardine employed them for his philosophy classes at the University of Glasgow. He came to believe that “the teacher should move to the perimeter of the action. ...and allow the students freedom to...learn from one another.” An up-to-date review of the research and the long history of peer/collaborative learning can be found in Gaillet (1994).
The Russian psychologist Vygotsky (1978) was foremost amongst the pioneers who explored the causal relationships that exist between social interaction and individual learning. Piaget (1929) pointed out that collaborative learning and constructive cognitive development often go hand-in-hand, and conducted research more than six decades based on a framework that he termed “genetic epistemology,” perhaps more appropriately translated today as “developmental theory of knowledge.” For the American psychologist Bruner (1986), learning is an active, social process in which students construct new ideas or concepts based on current knowledge. In this version of constructivist theory, the learner “selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so” (Kearsley, 2000). More recently Lave and Wenger (1991) have stressed the importance of the environment, both physical and social, to the learning process. New theories of cognition and learning, many of them stressing the importance of interaction, continue to be put forward and vie for acceptance.

Today the benefits of collaborative learning are widely known but rarely practiced, particularly at the university level. Panitz (1997) has listed 67 distinct benefits — academic, social and psychological — that can be expected from the use of group work. These include such factors as building self-esteem, reducing anxiety, encouraging understanding of diversity, fostering relationships and stimulating critical thinking.

In particular, research has suggested that group work tends to advantage below-average students. Webb et al. (1997) reported that amongst groups with above-average students, the higher level of discussion translated into an advantage in the achievement tests for the below-average students in those groups, both when they were tested on a group basis and individually. On the other hand, high ability students performed equally well in heterogeneous groups, homogeneous groups, and when they worked alone. Both of these results have also been shown in different contexts by others (Azmitia, 1988; Dembo & McAuliffe, 1987; Hooper & Hannafin, 1998).

Many researchers have stressed that collaborative learning can also have disadvantages. Salomon (1992) among others has pointed out that despite the mass of literature praising collaborative learning, teams frequently do not work well, and lists as common problems the “free rider” effect (Kerr & Brunn, 1983), the “sucker” effect (Kerr, 1983), the “status sensitivity” effect (Dembo & McAuliffe, 1987) and the “ganging up on the task” phenomenon (Salomon & Globerson, 1987).

The use of collaborative learning techniques specifically within certain topic areas has not received much attention, though definite benefits have been found, for example, with their use in the teaching of a computer science curriculum (Wills, Deremer, McCauley, & Null, 1999), and for the teaching of electronic commerce (Roberts, Jones, & Romm, 2000; Romm & Taylor, 2000). Such examples tend to rely heavily on learner-learner interaction, with students
working asynchronously in groups and with minimal traditional instruction being provided by the course facilitator.

Many other cases of successfully utilizing collaborative techniques within an online environment have been reported in the literature. Thus, the field is not devoid of systematic empirical investigation. However, the difficulties of control and replication are substantial. Rarely is it possible to compare circumstances where variables such as class size, student background, curriculum and even the level of enthusiasm of the instructor are effectively controlled. This may be one reason why many educators remain unconvinced of the potential benefits of group learning.

Another reason that may be cited for a general lack of enthusiasm is inertia. It is clearly easier for practitioners to follow accepted methodologies, than it is for them to risk the wrath of superiors, colleagues and students that may be incurred by attempts to introduce what many view as still unproven methods of instruction.

Further research into online collaborative learning therefore needs to build on existing research in related areas, and ask further questions: how can groups with shared goals work collaboratively using the new technologies? What problems can be expected and what are the benefits? In what ways does online group work differ from face-to-face group work? And what implications are there for both educators and students?

This present volume attempts to go some way toward answering these questions by presenting a range of views and case studies from researchers and practitioners working at the forefront of this important area.

In Chapter 1, Sue Bennett, a researcher at the University of Wollongong, provides an excellent point from which to start exploring these issues. In “Supporting Collaborative Project Teams Using Computer-Based Technologies,” she describes the successes and challenges experienced by students working in an online collaborative learning environment. The case study offers many insights for those relatively new to the field, including the importance of properly organized class discussion forums, and the need for the instructor to take on the role of facilitator.

In Chapter 2, “Computer-Mediated Progressive Inquiry in Higher Education,” Hanni Muukkonen, Kai Hakkarainen and Minna Lakkala describe the theoretical background of a pedagogical model that has been implemented within the structure of a collaborative learning environment. They argue convincingly that three metaphors of learning — acquisition, participation and knowledge creation — together constitute a broad base for envisioning the future skills and competencies to be developed by higher education. They caution that simply introducing a collaborative environment is not enough because productive changes will often require a realignment of epistemic, pedagogical and institutional goals.
Some of the benefits and implications of learner-centered online learning are outlined in Chapter 3, “Moderating Learner-Centered E-Learning: Problems and Solutions, Benefits and Implications,” by Curtis J. Bonk, Robert A. Wisher and Ji-Yeon Lee. They focus particularly on the stresses and strains placed on the instructor. In this brave new world, they suggest that traditional teaching ability is likely to have to be redefined to include social, technical, pedagogical and managerial skills. Will the future of online collaborative learning see a leading role played by artificially intelligent electronic agents?

Most educators who have had firsthand experience with teaching online would agree that timely feedback to students is an essential factor of most successful courses. In Chapter 4, “Supporting Distributed Problem-Based Learning: The Use of Feedback Mechanisms in Online Learning,” Joerg Zumbach, Annette Hillers and Peter Reimann examine the effect of providing feedback about group member’s interactions, as well as their problem-solving processes; as they readily admit, research in this area is till very much in its infancy, and a large amount more could be done in this area.

Even with appropriate skills and good intentions on the part of the instructor, sufficient resources provided by the institution and timely feedback to students, online learning courses may still fail to provide effective learning environments that cater effectively for the needs of all participants. Chapter 5, “Online Collaborative Learning in Mathematics: Some Necessary Innovations,” by Rod Nason and Earl Woodruff, looks at knowledge-building communities within the sphere of mathematics, and identify problems and possible solutions, and in particular the advisability of including model-eliciting mathematical problems and comprehension modelling tools within the online environment. They argue persuasively that such innovations are necessary for students to achieve in mathematics the kind of sustained, progressive knowledge building that can occur in other subject areas.

Pasta may not be the first thing that comes to mind when one thinks about online collaborative learning, but that is the analogy used by John M. Dirkx and Regina O. Smith in Chapter 6, “Thinking Out of a Bowl of Spaghetti: Learning to Learn in Online Collaborative Groups” to describe the group dynamics that can occur when students are faced with the prospect of learning in online groups without proper preparation. Pulling no punches, they state categorically what many practitioners already know: that group members may find the team dynamics, the decision-making processes and the need for at least a certain level of consensus less than satisfying. They suggest that to create a space in which effective collaborative learning can take place, specific strategies need to be employed that help the learners to move from a subjective and individualistic sense of identity to one in which they can reconstruct themselves as group members.

In Chapter 7, Lesley Treleaven presents “A New Taxonomy for Evaluation Studies of Online Collaborative Learning,” identifying three principal cat-
categories: phenomenographic, instructional method and sociocultural studies. As with the introduction of any new taxonomy, this very valuable and innovative contribution to the literature is likely to assist many and stir debate among others. The chapter also provides a very welcome reintroduction to the communicative model of collaborative learning, or CMCL (Cecez-Kecmanovic & Webb, 2000), which takes as its theoretical basis that communication and language acts are central to the social interaction through which collaborative learning takes place.

Charles R. Graham and Melanie Misanchuk outline critical differences between learning groups and work groups, and further explore the benefits and challenges associated with using group work in an online environment in Chapter 8, “Computer Mediated-Learning Groups: Benefits and Challenges to Using Groupwork in Online Learning Environments.” They stress that to ensure the maximal chance of success in the creation of an online environment in which effective collaboration can occur three factors must be addressed: group creation, including size and homogeneity; the design and implementation of structured learning activities and appropriate facilitation of group interaction.

In any field of endeavor, the same terminology can suggest different concepts to different people, even to those brought up within similar academic cultures. Similarly, different terminology can sometimes have meanings that can easily be conflated. Talking at cross-purposes to colleagues can result in misunderstandings, frustration and an enormous wasting of time and effort. Chapter 9, “Collaborative or Cooperative Learning?” by Joanne M. McInnerney and Tim S. Roberts, looks at the differences between these two terms. Are the differences significant? And do the benefits, problems and challenges outlined by other authors in this volume and elsewhere critically depend upon which type of learning is being studied?

Albert L. Ingram and Lesley G. Hathorn agree that drawing a distinction between collaboration and cooperation is important, and provide their own version of the important differences in which collaboration is seen as the more complex of the two. The central theme of their Chapter 10, “Methods for Analyzing Collaboration in Online Communications,” is the development of coding procedures for content analysis that can be used to examine the various factors that may play a vital role in any successful collaborative learning exercise.

The anthropologist, social scientist and cyberneticist Gregory Bateson conceptualized learning as a transcendence of levels of reflection taking place within different hierarchical layers of context (Bateson, 1979). In Chapter 11, Elsebeth Korsgaard Sorensen uses a Batesonian perspective as the basis for her chapter, “Reflection and Intellectual Amplification in Online Communities of Collaborative Learning,” in which she suggests that new didactic and instructional methods need to be developed in order to fully realize the potential that online collaborative learning has to offer. Scaffolding, in the normal sense as it is related to the decomposition of learning content, is not enough — rather,
attention should be directed towards helping the learner to navigate through different meta-cognitive levels.

In Chapter 12, “Do Online Collaborative Groups Need Leaders?,” Agnes Kukulska-Hulme explores the value and strategies of online group leadership. What are the appropriate roles for the instructor, the group leader and other group members, and what sets of skills do they require?

Finally, a return to evaluation in Chapter 13, “Drawing on Design to Improve Evaluation of Computer Supported Collaborative Learning: Two Complementary Views.” John B. Nash, Christoph Richter and Heidrun Allert examine scenario-based design and program theory in the evaluation of computer support for online collaborative learning, describe the similarities and differences between these two approaches and suggest ways in which both can be used to evaluate and improve online courses.

As all of the chapters in this volume indicate, the next few years hold enormous potential for further work in this area, by both researchers and practitioners alike. Whether or not online collaborative learning replaces the traditional lecture as the predominant paradigm, those of us with interest or expertise in this field seem bound by the ancient Chinese curse — We live in interesting times.

For researchers interested in the evolution of research into collaborative learning, an excellent starting point is Dillenbourg, Baker, Blaye and O’Malley (1996). For practitioners interested in introducing collaborative learning into their classes, an excellent list of practical strategies and tips is given by Davis (1999). For everyone interested in online collaborative learning in higher education, an extensive list of books, articles, journals and other resources related to this topic can be found at Roberts, McNamee and Williams (2001).

REFERENCES


