CONNECTING STUDENTS WITH GROUP WORK

Fay Sudweeks

ABSTRACT
Virtual learning environments provide an attractive method for information dissemination, but they are often adopted because of their technical innovativeness with little thought given to integrating the medium with learning objectives and pedagogical strategies. Moreover, computer-based learning is used increasingly as the solution to the problems associated with flexible learning, particularly for students situated in different locations and studying in different modes. Too often, though, global education typically lacks social and collaborative activities with the unintended consequence of feelings of social isolation. Technology can separate rather than connect students. This paper describes an action research project at Murdoch University, Australia. The project was a process of planning and evaluation of a group collaboration designed to connect multimodal and geographically disparate students. The analyses of the group collaboration indicate that the students gained significant benefits from collaborating online without meeting face-to-face.

KEYWORDS
Flexible learning, groupwork, action research, virtual learning environments, social interaction, collaboration, cooperative learning.

INTRODUCTION

In the rush to get courses online, some of the challenges of online teaching and learning are often ignored. Too often virtual learning environments (VLEs) are adopted because of their technical innovativeness and little thought is given to integrating the medium with learning objectives and pedagogical strategies (Coppola, Hiltz, & Rotter, 2001). Global education typically lacks social and collaborative activities with the unintended consequence of feelings of social isolation. In other words, technology can separate rather than connect students.

The term "virtual learning environment" (also referred to as "flexible learning environment", "online learning environment", "web-based educational environments") is used to describe a server software, dedicated to the design, management and administration of computer-mediated learning, including delivery of course materials, support of course communications, student management, tracking and evaluation. Among the virtues espoused by these environments are accessibility, flexibility, cost effectiveness and the feasibility of mature students being able to engage in lifelong learning (Heaperman & Sudweeks, 2001; Palloff & Pratt, 1999; Weston & Barker, 2001).

Yet, more than any other teaching medium, virtual learning environments have the potential to fully exploit theories of social and active learning through communication and collaboration (Sudweeks & Simoff, 2000; Tiffin & Rajasingham, 1995; Vygotsky, 1978). Dillenbourg and Schneider (1995) distinguish between collaborative and cooperative learning. Cooperative learning is "… a protocol in which the task is in advance split into subtasks that the partners solve independently". Collaborative learning is where "… two or more subjects build synchronously and interactively a joint solution to some problem". There is considerable evidence that cooperative learning enhances academic learning

(Johnson, Johnson, & Stanne, 2000; Tang, 1993).

This paper describes an action research project which was a process of planning and evaluation of cooperative learning designed to connect multimodel and geographically disparate undergraduate students at Murdoch University in Australia.

The questions addressed in this paper are:

1. Can we do more to encourage cooperative learning among students who are studying online?
2. How can we facilitate social interaction in virtual learning environments?
3. How can we connect students who are studying in different modes and in different locations?

LEARNING SCENARIO

The learning scenario described in this paper was developed initially for a postgraduate course at Sydney University in 1998 and evaluated with a number of quantitative analyses of communication (Simoff & Maher, 2000). It was modified and trialled for an undergraduate unit of study of Organisational Informatics at Murdoch University in 1999 with an enrolment of 19 students. Further modifications were made and the scenario was implemented again in 2000 at Murdoch University with an enrolment of 105 students (Sudweeks & Simoff, 2000). By 2002, the enrolment had increased to 156 students.

The virtual learning environment used for the learning scenario at Murdoch University is WebCT, which is one of the major commercial products of its type. WebCT integrates four types of learning tools: *resources* (lecture notes, assignment guidelines, readings, links to other web sites); *communication tools* (bulletin board, chat room, private email, calendar); *instructional tools* (glossary, surveys, quizzes); and *management tools* for tracking student progress and interactions. It is platform independent and is accessed using a web browser.

The Organisational Informatics course design has a key component of weekly virtual synchronous tutorials which are designed to facilitate students' construction of knowledge through participation and reflection (Sudweeks & Simoff, 2000). There is a collection of papers dedicated to particular topics and a series of tutorial discussions on the corresponding topics. Each tutorial is devoted to a particular topic that is complementary to lectures and course materials. The WebCT chat rooms are used as virtual spaces (Harasim, 1999) for the weekly tutorial.

There were six areas of assessment: (i) moderation of one tutorial session; (ii) participation in weekly tutorials conducted in the WebCT chat rooms; (iii) weekly reflective journals which included a critique of at least one required reading on the weekly topic and a reflection on the online tutorial discussions; (iv) a minor essay; (v) a major essay; and (vi) an end of semester examination.

The course home page was designed to simplify access and navigation. It featured navigational links to the unit outline, the lecture schedule, unit materials, tutorial rooms, bulletin board, email and calendar. The hub of the site was the Unit Material area where resources, learner support and assessment materials were archived (0).
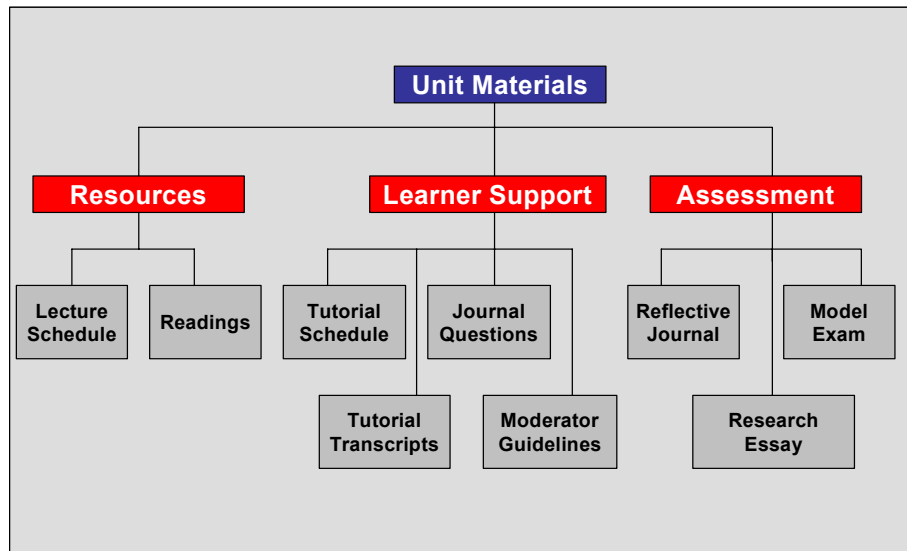
Figure 1. Virtual learning environment in 2001

The dilemma, though, was how to facilitate and motivate cooperative learning in group activities. "Hitchhiking" is a common feature of team projects, where some team members do not fulfil their responsibilities yet are awarded the same grade as their more responsible counterparts (Kaufman, Felder, & Fuller, 1999). "Lurking" is a feature of discussion groups where some subscribers passively read posts but fail to contribute to the discussions. Similarly, in the virtual tutorial, it is all too easy to log on and create a presence but take no part in the group activity.

The aim of this research was to encourage more social cooperative learning in a virtual learning environment. In 2002, therefore, a group activity was introduced as a component of the unit's assessment. In order to facilitate online groupwork, the learning environment needed to be extended.

EXTENDED LEARNING SCENARIO

The VLE needed to be developed further to include the necessary learner support for collaborative group activities. In addition to the public bulletin board in WebCT, private forums for each activity group were created. Groupwork guidelines and a shared whiteboard were also added.

The extended learning scenario has four types of material: (i) communication; (ii) resources; (iii) learner support; and (iv) assessment. *Communication* tools include a public bulletin board, 39 private forums, private email, calendar and shared whiteboard. *Resources* include lecture notes and downloadable copies of readings used throughout the course. *Learner support* includes guidelines for groupwork and for tutorial presenters, transcripts of synchronous online tutorials, and tutors' photos and contact information. *Assessment* includes descriptive requirements for reflective journals and assignments (0).
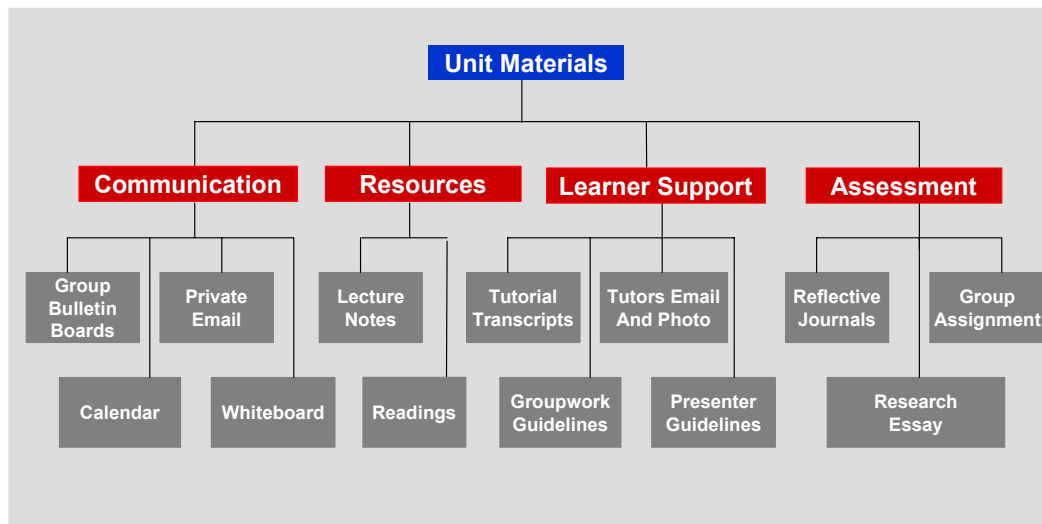
Figure 2. Extended Virtual Learning Environment

COLLABORATIVE GROUP ACTIVITY

The collaborative group activity involved the development of a proposal for a major event. Events chosen included weddings, funerals, safaris, conferences, product launches, 21st birthday parties, concerts, movie premiers and a store opening.

The uniqueness of the activity was in the restriction of communication among group members to text-based mediated communication only. The communication tools available were private email, WebCT mail, bulletin board, private forums, WebCT chat rooms, IRC, ICQ, instant messaging and SMS.

The restriction of not being able to meet face-to-face had two distinct advantages:

1. providing a level playing field for students studying in different modes (part-time, full-time, externally) and in different locations (two campuses in Perth, national students located in other areas of the state and country, international students located in Italy, Singapore and Netherlands), and
2. providing a practical application of theoretical issues covered in the unit, such as computer-mediated communication, computer-supported collaborative work, and virtual organisations.

In the first week of the semester, tutors randomly assigned students in their tutorial groups to assignment groups of 4 students each. The 156 students enrolled in the unit were thus assigned to one of 39 assignment groups. However, simply assigning students to groups to work on a collaborative project does not necessarily mean that the activity will be cooperative. In order for cooperative learning to occur, a collaborative project must be "structured to create positive interdependence as well as individual accountability" (McGookin, 2002).

To facilitate cooperative learning, each group member had a choice of four "roles" in the group activity – client, consultant, researcher or presenter. The *client* was responsible for providing a budget and detailed requirements for the event. The *consultant* prepared plans, detailed costings and implementation steps. The *researcher* kept a diary of the time, frequency, topic and reflection of each communication channel. The *presenter* organised the information and prepared a PowerPoint file for an online presentation to their tutorial group in the final week of semester.

The defined roles gave a clear structure and division of tasks within the group, while still retaining interdependency. Scaffolding was provided by having a tutor and coordinator available via a the private assignment forums and email.
Each group was required to submit two files on a disk: (i) a PowerPoint file of the proposed event

including alternative plans, rationale for accepting one plan, budget and summary of communication; and (ii) an Excel file of a communication diary with worksheets for each communication type, documenting frequency, length, topic and reflection of each communication event (see 0 and 0 for an example of a communication diary).
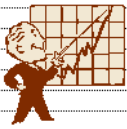
	A	B	C	D
1	*Tour the Wild*	**Group Communication Schemes**		
2		Frequency	Time	
3	Category	(no of times)	(minutes/secs)	Overall Rating (out of 10) for Each Medium
4	Email	36	283.00	7.5
5	WebCT Private Mail	5	21.56	5
6	Bulletin Board	8	41.65	6.5
7	WebCT Chat	13	615.00	8
8	Internet Relay Chat (mIRC)	10	454.75	9
9	ICQ	13	330.89	10
10	Instant Messaging (Yahoo/MSN)	6	209.05	7
11	SMS	7	21.76	6.5
12	Totals	98	1977.66	
13				
14–19				
20	*Summary and Findings : There was more time spent on text based chat systems although emailing had*			
21	*the most number of frequencies. Overall ratings were based on **convenience**,*			
22	*efficiency and effectiveness .*			
23				

Figure 3. Overview of communication events for a safari event

	A	B	C	D
1	**Internet Relay Chat (Client: mIRC)**			
2	Frequency	Time (mins/sec	Topic	Reflection
3	1	42.34	Exploring	This gave us another medium to communicate in and was adaptable to our suiting
4	1	36.22	Planning the event	Was useful as it helped generate many different approaches towards the event
5	1	46.23	Discussion on the clients specifications	Additional ideas were given and clarifications were made on certain specifications
6	1	38.23	Budgeting specifications	This was pretty difficult as different budgets did vary, it would have been better to have a face-to-face dis
7	1	56.16	Plan A & B discussion	Was effective although it did take a lot of time explaining and clarifying each concept
8	1	67.45	Plan A & B discussion (con'td)	This time it was effective as both plans were discussed thoroughly
9	1	41.23	Logistics and other tour aspects	Main types of transportional services were identified and was effective to discuss each Tour aspect suc
10	1	20.34	Analysis of assignment progress	This was a useful medium for the topic as it addressed our progress and also directed us for certain re
11	1	61.28	One plan is chosen by the Client	Took much time as reasons had to explained thoroughly, it would have been better if everyone met pers
12	1	45.27	Reasons for choosing a plan	Reasons were discussed more effectively this time
13				
14	Totals:			
15	10	454.75		

Figure 4. Summary of IRC communication for one group

In the final week of semester, the students were surveyed about different facets of their (i) group communication, (ii) group dynamics, (iii) perceptions of the group project, and (iv) perceptions of e-learning generally.

DATA ANALYSIS

There were 49 respondents to the survey, of whom 53% were male and 47% were female.

Group Communication

The first five questions of the survey were concerned with group communication. Almost half (49%) of the respondents reported a very high interaction with their group but almost as many (40.8%) found it difficult to get in touch with group members.

When asked to specifically compare their discussions in an online group with a face-to-face group approximately one quarter of the respondents (26.5%) felt more comfortable. Despite reporting feelings of discomfort in discussions, 38.8% are more likely to share their opinions and 46.9% are more likely to learn more about other students' opinions.

The degree of interaction in this group was very high

	SA	A	N	D	SD
	12.2	36.7	38.8	12.2	0.0

Online group discussions about the project among group members were more comfortable for me

	SA	A	N	D	SD
	14.3	12.2	38.8	24.5	10.2

I am more likely to share my own opinion in an online group

	SA	A	N	D	SD
	14.3	24.5	34.7	18.4	8.2

I am more likely to discover what other students think about a given topic in an online group

	SA	A	N	D	SD
	12.2	34.7	26.5	20.4	6.1

Getting in touch with group members was easy

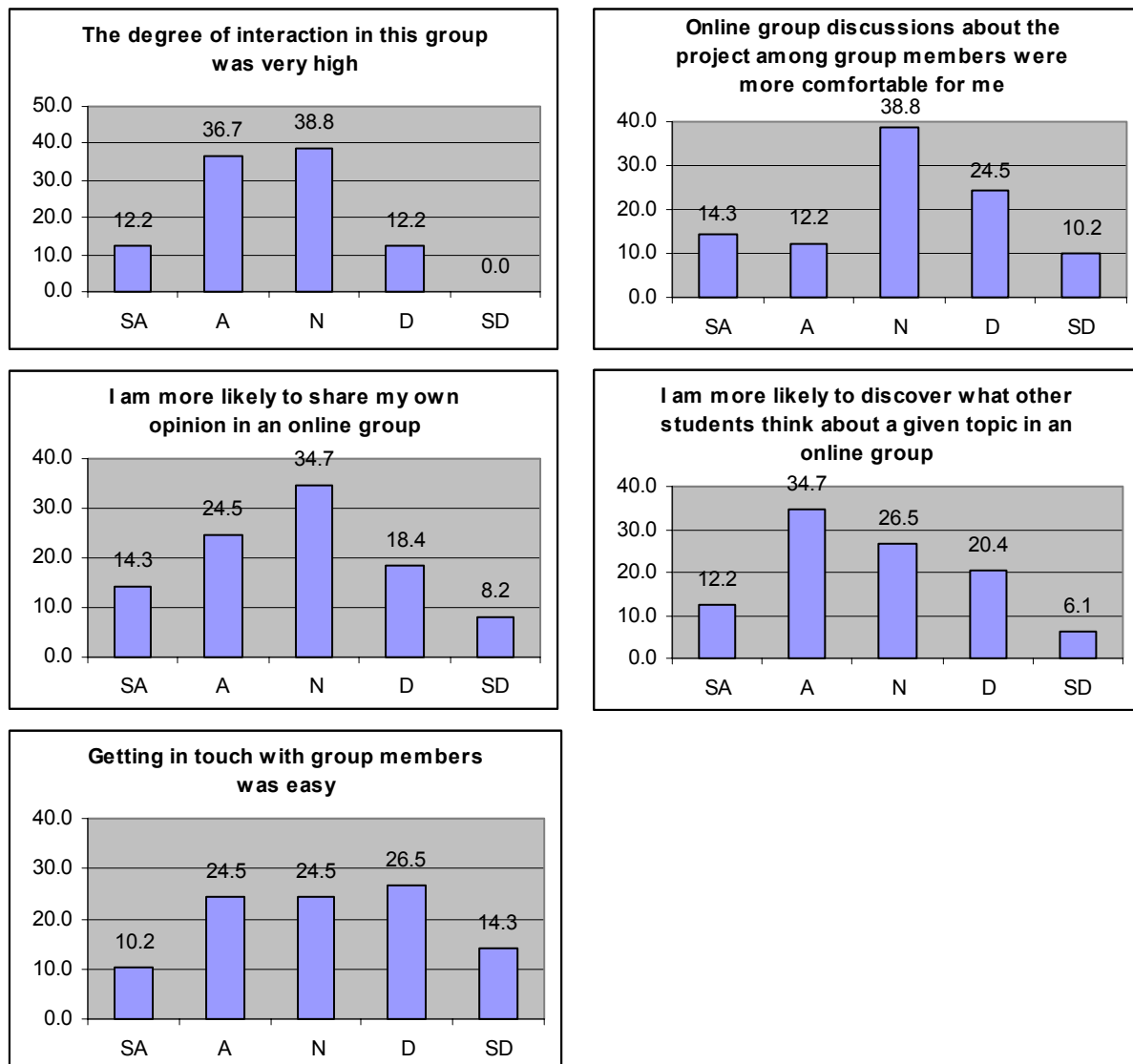|	SA	A	N	D	SD
	10.2	24.5	24.5	26.5	14.3

Figure 5. Responses to survey questions about group communication

Group Dynamics

The second group of five questions were concerned with group dynamics. Even though the guidelines for the project did not specify that a leader should be elected, it is interesting that in more than half of the groups (55.1%) there was one person who acted as a de facto leader by taking on the responsibility of keeping the group activities on track.

The majority of groups were congenial with a high level of agreement among members. More than half the groups found it easy to reach consensus (57.2%), enjoyed working together (61.2%) and expressed interesting in meeting face-to-face (59.2%).

The student population at Murdoch is culturally diverse and the B230 groups represent this campus-wide diversity. The countries of origin reported by group members include Brunei, England, Indonesia, Ireland, Hong Kong, Malaysia, Pakistan, Poland, Singapore, South Korea, Sweden and Yugoslavia. Almost half of the students (47%) appreciated the learning experience of working in culturally diverse groups.
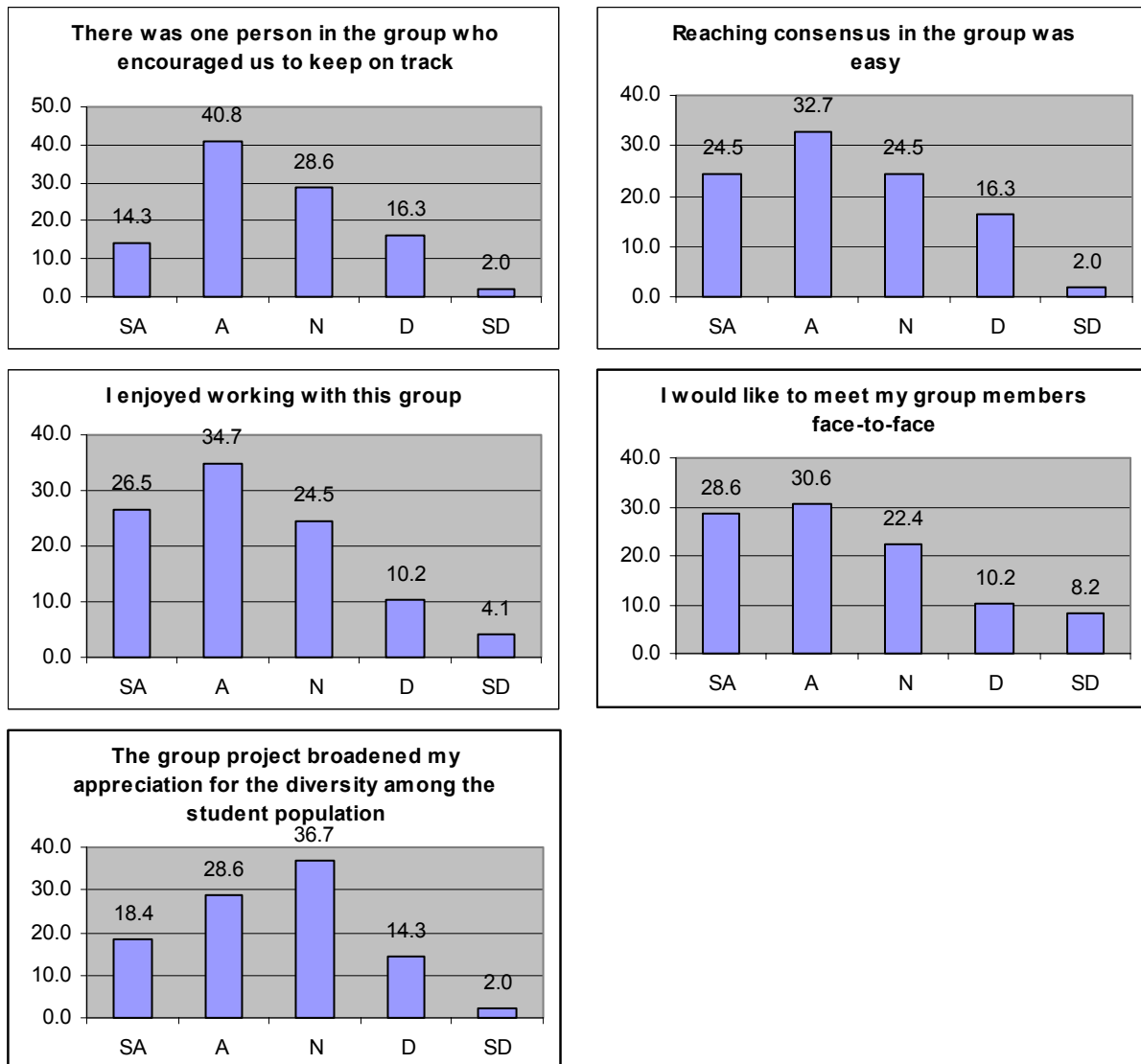
There was one person in the group who encouraged us to keep on track

	SA	A	N	D	SD
Value	14.3	40.8	28.6	16.3	2.0

Reaching consensus in the group was easy

	SA	A	N	D	SD
Value	24.5	32.7	24.5	16.3	2.0

I enjoyed working with this group

	SA	A	N	D	SD
Value	26.5	34.7	24.5	10.2	4.1

I would like to meet my group members face-to-face

	SA	A	N	D	SD
Value	28.6	30.6	22.4	10.2	8.2

The group project broadened my appreciation for the diversity among the student population

	SA	A	N	D	SD
Value	18.4	28.6	36.7	14.3	2.0

Figure 6. Responses to survey questions about group dynamics

The Project

The third group of five questions were concerned with the project itself. It is clear that sufficient information was given in the project guidelines as three-quarters (75.6%) of the students reported they understood what they were expected to do and only a small percentage (10.5%) found the project difficult. More than two-thirds of students (69.4%) reported a sense of autonomy in being able to work independently on their own tasks.

Although more than a third of the students (38.8%) were in groups in which all participants did not work equally well, almost two-thirds (61.2%) found the group project a positive experience.
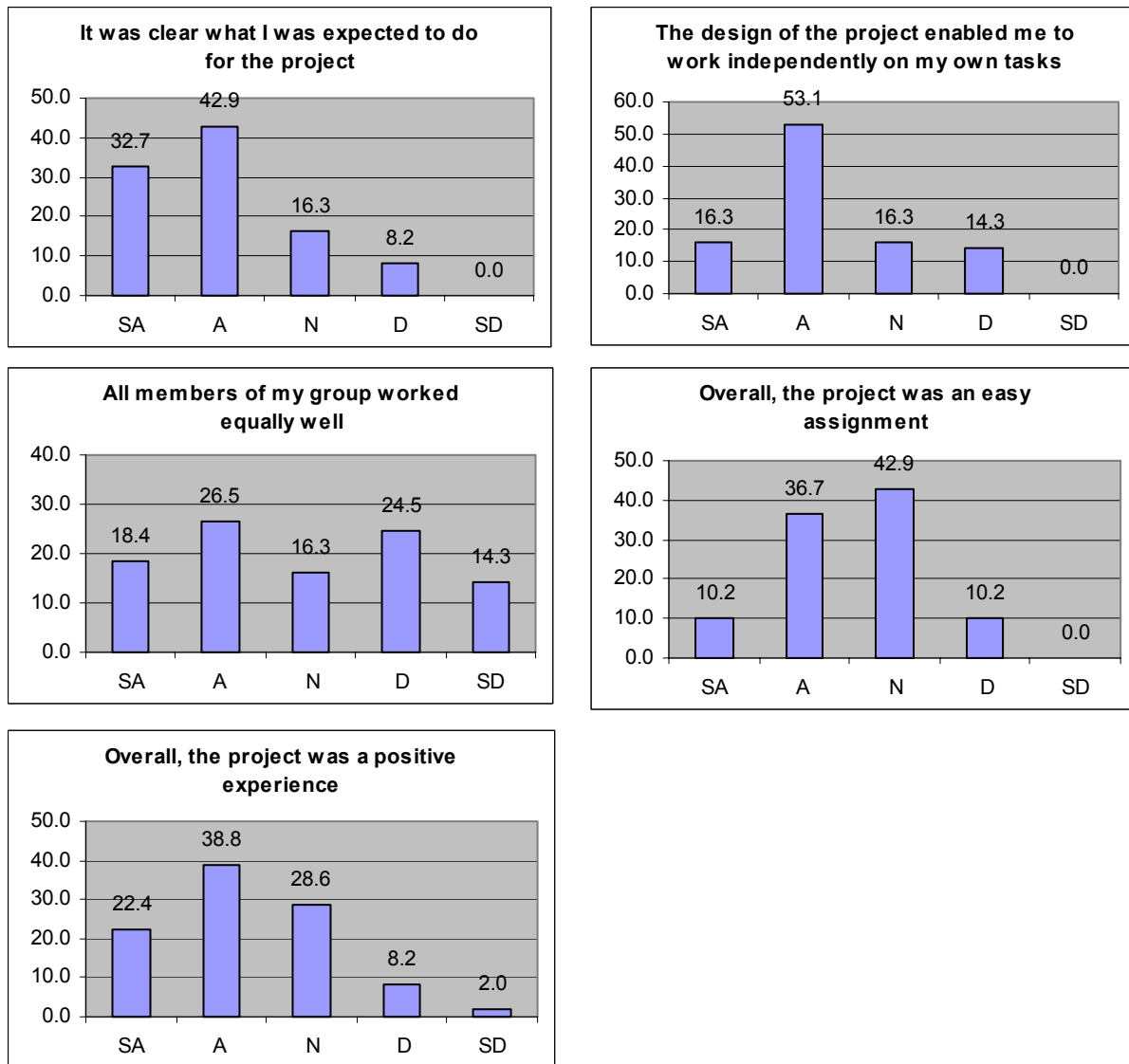
Figure 7. Responses to questions about the project

E-Learning

The fourth group of five questions were concerned with e-learning. Overall, working in a VLE proved to facilitate learning. Approximately three-quarters of the students reported an effective learning experience (77.5%), a greater understanding of working in a virtual team (79.6%), and being responsible for their own learning (73.5%). More than a third of the students (40.8%) also found the project a practical application of the theoretical aspects of the unit.

More than half of the students (51%) did not mind having tutor and coordinator access to group discussions. It is not clear, though, whether this was perceived as an advantage or just a benign form of monitoring.
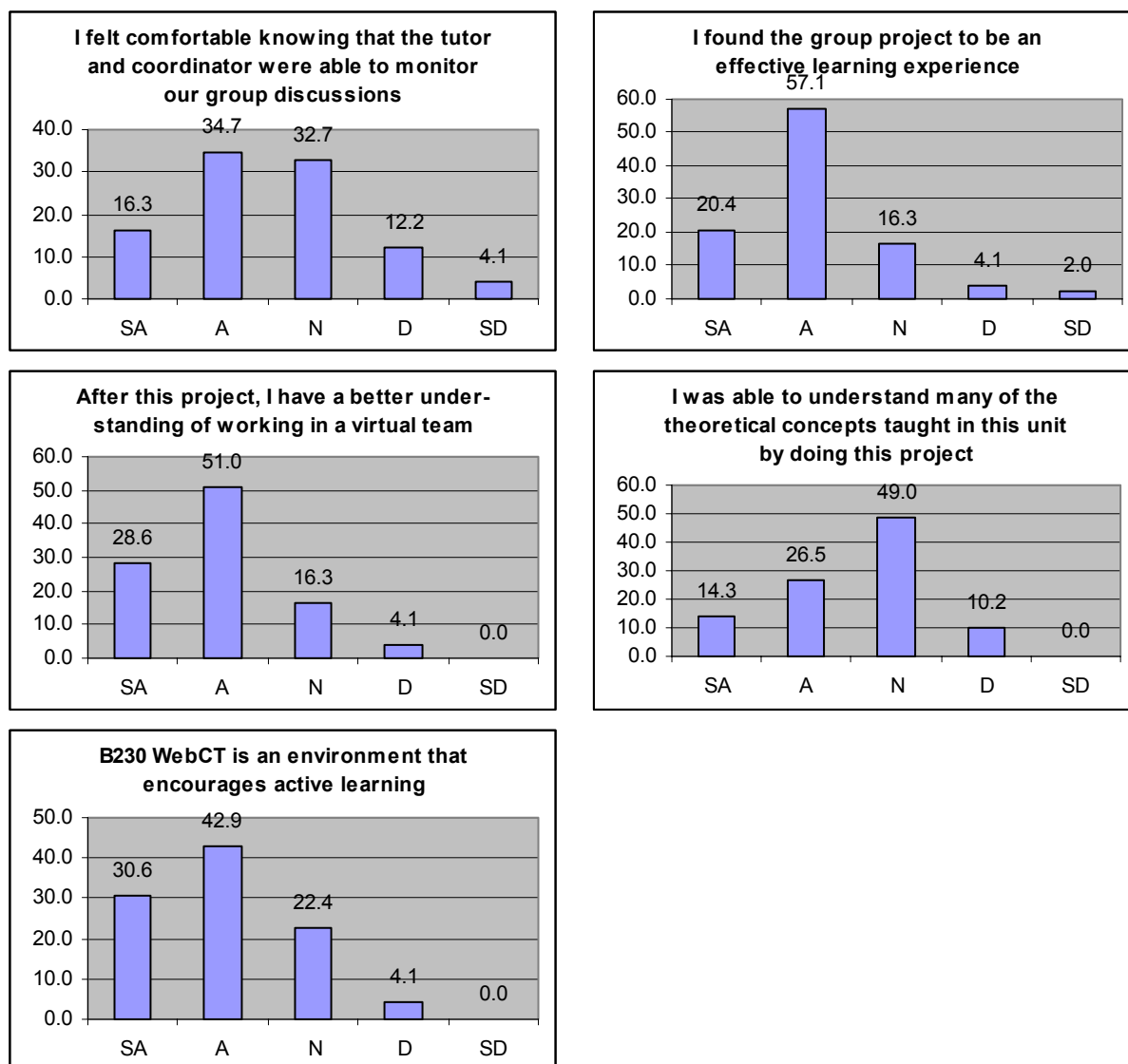
I felt comfortable knowing that the tutor and coordinator were able to monitor our group discussions

SA: 16.3
A: 34.7
N: 32.7
D: 12.2
SD: 4.1

I found the group project to be an effective learning experience

SA: 20.4
A: 57.1
N: 16.3
D: 4.1
SD: 2.0

After this project, I have a better understanding of working in a virtual team

SA: 28.6
A: 51.0
N: 16.3
D: 4.1
SD: 0.0

I was able to understand many of the theoretical concepts taught in this unit by doing this project

SA: 14.3
A: 26.5
N: 49.0
D: 10.2
SD: 0.0

B230 WebCT is an environment that encourages active learning

SA: 30.6
A: 42.9
N: 22.4
D: 4.1
SD: 0.0

Figure 8. Responses to survey questions about e-learning

The standard of projects was very high with more than two thirds (69%) of the groups attaining a higher grade.

Table 1: Distribution of Project Grades`

Grade	No of groups
High Distinction	11
Distinction	16
Credit	8
Pass	4
Total	39

CONCLUSIONS

Working with students drawn from a wide spectrum in terms of location, access to campus facilities and cultural backgrounds is difficult. Engaging this diverse group of students in social interaction to facilitate reflective construction of knowledge through collaboration is enormously difficult. The results of the survey, however, indicate that students did gain significant benefits from collaborating online. The results also support that social interaction and learning was not adversely affected by the restriction of not being able to meet face-to-face. In fact, students did engage with group members and student self-reports indicate a very high level of satisfaction with the group process and the experience of participating in a very different and innovative activity:

> "I think that the on-line group is a great idea for university courses. Why: Its so easy to see who is at meetings, record minutes, have tasks pinpointed. You have time to think before answering via email and the ability to get good written feedback. Maybe I was lucky in that the team I was part of were excellent. So far it has been one of the best group experiences."
>
> "I found this project to be much better than I first anticipated. Communication went smoothly, and so did the project. Because I had to keep track of how many mails that were sent, everyone sent the mail to me as well as to the person it was meant for. I could then record what the topic was, and at the end of the mail the sender wrote down how long time they had used to write it. Thanks to good group members, my work became very easy. This has been one of my best group experiences; no fights only good discussions, everyone has done their bit excellent, it has been a pleasure to work in this group."

Two areas in which students highlighted potential problems which could be addressed in future activities are group expectations and leadership. Possible solutions to these problems are:

1. Groups could be assigned according to students' own perception of expectation in terms of product quality. Some students are satisfied with working at the last minute and attaining a pass grade while others are prepared to commit a considerable amount of time to attain a much higher grade. A survey of student attitudes towards study could be undertaken prior to group assignment and group composition be more homogeneous rather than assigning group members randomly.

2. Groups could be asked to elect a leader to facilitate the work process. This appeared to be happening in an adhoc fashion so it would be preferable to make it manditory. The ideal leader would be the student in the research role.

This research has been useful in highlighting the issues associated with online group work but further activities with different cohorts would improve our understanding of how groups can be connected even more effectively.

ACKNOWLEDGEMENTS

REFERENCES

Coppola, N., Hiltz, S. R. and Rotter, N. (2001). Becoming a Virtual Professor: Pedagogical Roles and ALN. Paper presented at the 34th Annual Hawaii International Conference on System Sciences, Maui, Hawaii.

Dillenbourg, P. and Schneider, D. (1995). Collaborative learning and the Internet. This paper is available online at: http://tecfa.unige.ch/tecfa/research/CMC/colla/iccai95_1.html.

Harasim, L. (1999). A framework for online learning: The Virtual-U. IEEE Computer Society.

Heaperman, S. and Sudweeks, F. (2001). Achieving self-efficacy in the virtual learning environment. Paper presented at the Crossing Borders: New Frontiers for Educational Research, Perth, WA.

Johnson, D. W., Johnson, R. and Stanne, M. B. (2000). Cooperative Learning Methods: A Meta-Analysis. Cooperative Learning Center at the University of Minnesota. This paper is available online at: http://www.clcrc.com/pages/cl-methods.html.

Kaufman, D. B., Felder, R. M. and Fuller, H. (1999). Peer ratings in cooperative learning teams. Paper presented at the Proceedings of the 1999 Annual ASEE Meeting.

McGookin, M. (2002). I can't let them down! Affiliative motivation and co-operative learning in higher education. in Proceedings of the 2002 Annual International Conference of the Higher Education Research and Development Society of Australia, edited by A. Goody and J. Herrington and M. Northcote (pp. 417-425). Perth, WA: HERDSA.

Palloff, R. M. and Pratt, K. (1999). Building Learning Communities in Cyberspace: Effective strategies for the online classroom. San Francisco: Jossey-Bass.

Simoff, S. J. and Maher, M. L. (2000). Analysing participation in collaborative design environments. Design Studies, 21, 119-144.

Sudweeks, F. and Simoff, S. (2000). Participation and reflection in virtual workshops. Paper presented at the Proceedings Western Australian Workshop on Information Systems Research.

Tang, K. C. C. (1993). Spontaneous collaborative learning: A new dimension in student learning experience? Higher Education Research and Development, 12(2), 115-130.

Tiffin, J. and Rajasingham, L. (1995). In Search of the Virtual Class: Education in an Information Society. London: Routledge.

Vygotsky, L. S. (1978). Mind in Society: The Development of the Higher Psychological Processes. Cambridge, MA: Harvard University Press.

Weston, T. J. and Barker, L. (2001). Designing, implementing and evaluating web-based learning modules for university students. Educational Technology, July-August, 15-22.

Fay Sudweeks
School of Information Technology
Murdoch University, Murdoch WA 6150
Australia
Email: sudweeks@murdoch.edu.au